

Monroe, S. A., M. Dyer, S. Stumpf, C. Bliss, and C. Parker. 2016. Water quality monitoring protocol for streams and springs in the Southern Colorado Plateau Network. Natural Resource Report NPS/SCPN/NRR—2016/1298. National Park Service, Fort Collins, Colorado.

Standard Operating Procedure #2: Hiring and Training Field Personnel, Version SCPN_WATER_QUALITY_ SOP02_20160901

Contents

1 Hiring personnel.	3
2 Preparedness and training.	4
2.1 Be prepared for physically challenging field conditions	4
2.2 Training for water quality monitoring methods.	4
2.3 Briefing on park procedures	5
2.4 Safety training.	5
3 Revision history.	6

Standard Operating Procedure #2: Hiring and Training Field Personnel

Version SCPN_Water_Quality_SOP02_20160901				
Revision History Log				
Previous version number	Revision date	Section and paragraph	Change(s) made	Approved by

Only changes in this specific SOP will be logged here. Record the previous version number and date of revision; identify sections and paragraphs where changes were made, who approved the revision, and the new version number. More detailed descriptions of the changes made and the reason for the changes is provided at the end of this SOP.

This Standard Operating Procedure (SOP) describes the steps for hiring and training personnel to collect data for the SCPN Water Resources monitoring program. The steps described here are integral to the monitoring effort because they reduce interobserver variability, which can potentially reduce the quality of the data or obscure otherwise detectable trends.

1 Hiring personnel

The SCPN Water Resources staff will consist of 5–7 individuals with responsibilities for conducting monitoring in accordance with this protocol and with the network’s integrated riparian, aquatic macroinvertebrate, and spring ecosystems monitoring protocols. Current operational plans call for accomplishing water resources field work through a combination of permanent and term NPS positions, and positions funded through a cooperative agreement with Northern Arizona University (NAU).

In addition to the permanent NPS positions, the SCPN water resources staff will consist of 2-3 part-time or seasonal staff members who work with the network through a cooperative agreement with Northern Arizona University. Additional technicians and interns may be hired as necessary. See Table 2-1 for detailed descriptions of the SCPN/NAU Water Resources staff positions.

Time commitment for water quality monitoring on the part of the NPS hydrologic technician is estimated to be 50% for fieldwork, 40% for data management, data analysis and reporting, and 10% for scheduling and coordination of fieldwork. The project managers time is split between water quality and aquatic macroinvertebrate monitoring, with 25% for fieldwork, 20% for data management, data analysis and reporting, and 5% for scheduling and coordination of fieldwork. SCPN/NAU staff should expect to be conducting field work 25–50% of the time, with the remainder of their time spent in the office to transfer and manage data and

Table 2-1. SCPN/NAU Water Resources staff positions.

Senior Research Specialist
Minimum qualifications: • Bachelor's degree in biology, ecology, geology, or environmental sciences AND 4 years or related research experience, OR • Any equivalent combination of experience, training, and/or education Desired qualifications: • Two years of specialized experience as a Biological or Hydrological Technician with duties similar to those of this position • Two years of related research or ecological experience or master's degree in biology, ecology, geology, or environmental sciences • Field experience working in remote backcountry settings and harsh field conditions Knowledge, skills and abilities: • Knowledge in the following subject areas as related to aquatic and riparian ecosystems of the Colorado Plateau: aquatic macroinvertebrates, water quality, hydrology, geomorphology, and riparian vegetation • Knowledge and experience with the methods, procedures, and techniques for collecting of physical, biological, and water quality data • Ability to recognize, record, and adapt to unusual conditions or data encountered in the normal course of work • Skills conducting field research in ecological, biological, or environmental topics • Skill and ability to work in remote backcountry settings with little supervision • Ability to perform detailed data collection, data organization and record keeping duties • Ability to communicate information in a clear and concise manner, in order to develop reports and communicate results of data collection • Ability to work with a wide variety of people from federal, state, and tribal land management agencies, educational and research institutions, and non-profit organizations
Research Specialist
Minimum qualifications: • Bachelor's degree in biology, ecology, geology, or environmental sciences AND two years related research or experience; OR • Any equivalent combination of experience, training, and/or education Desired qualifications: • Two years of specialized experience as a biological or hydrological technician with duties similar to those of this position • Two years related research or ecological experience or master's degree in biology, ecology, geology, or environmental sciences • Field experience working in remote backcountry settings and harsh field conditions Knowledge, skills and abilities: • Knowledge in the following subject areas as related to aquatic and riparian ecosystems of the Colorado Plateau: aquatic macroinvertebrates, water quality, hydrology, geomorphology, and riparian vegetation • Knowledge and experience with the methods, procedures, and techniques for collecting of physical, biological, and water quality data • Skills conducting field research in ecological, biological, or environmental topics • Skill and ability to work in remote backcountry settings with little supervision. • Ability to perform detailed data collection, data organization and record keeping duties • Ability to communicate information in a clear and concise manner, in order to develop reports and communicate results of data collection • Ability to work with a wide variety of people from federal, state, and tribal land management agencies, educational and research institutions, and non-profit organizations

to organize and maintain equipment.

2 Preparedness and training

2.1 Be prepared for physically challenging field conditions

Field work in SCPN parks often occurs in remote locations and can be extremely physically demanding. Some of SCPN's water resources monitoring fieldwork requires physical capacity for backpacking to remote field sites and long days of hiking in rugged, steep terrain. Field staff must be comfortable working in and around water and should be able to swim. Field staff may remain in the field for long periods of time, experiencing

extreme and highly variable weather. The remote nature of this work requires the ability to function as a member of a coordinated crew, as well as to independently exercise excellent judgment in difficult situations. Field staff should have prior experience working and camping in backcountry situations and should be prepared for difficult field conditions.

2.2 Training for water quality monitoring methods

2.2.1 Review protocol

New staff should read the four water resources monitoring protocols prior to

starting field work or data entry. Returning staff will review the protocols. These include SCPN monitoring protocols for water quality of streams and springs, aquatic macroinvertebrates, integrated riparian, and springs ecosystems.

2.2.2 Crew workshop

Early in each calendar year, a crew workshop will be held, and may be coordinated with other I&M networks or other agencies. The workshop will provide the field crew with technical training to ensure that all crew members are familiar with the methods described in these protocols. The workshop is mandatory for all field staff and will cover the following:

- purpose and objectives of monitoring
- field and lab safety
- low-impact camping practices and inherent dangers of camping/working in the parks of the Colorado Plateau.
- general safety procedures
- content of the SCPN water quality of streams and springs protocol as well as the water quality sections of integrated riparian, aquatic macroinvertebrate, and spring ecosystems monitoring protocols
- scheduling field activities
- instruction in
 - proper use and care of all sampling equipment
 - sampling techniques
 - sample preparation, labeling, and shipping
 - filling out datasheets
 - computer data entry and QA/QC procedures

2.2.3 Formal training in water quality sampling procedures

The SCPN water quality project manager and the hydrologic technician or another long-term field staff should attend the two-week USGS training course entitled *Field Water-Quality Methods for Ground Water*

and Surface Water or an equivalent course. This course is generally offered twice per year in Lakewood, Colorado. Attendance by NPS staff is permitted on a space available basis. The course includes classroom and field demonstration of all aspects of surface and groundwater sampling. Shorter refresher courses are also offered by USGS.

In the event of staff turnover, replacement personnel will obtain the required USGS training as soon as practical. In the interim, training will be provided by the project manager or other trained staff performing water quality monitoring for the SCPN.

2.3 Briefing on park procedures

SCPN Water Resources field crews should be familiar with the rules, regulations and guidelines of relevant SCPN park units. SCPN staff should maintain good working relationships with park staff adhering to permit requirements, backcountry hiking and camping guidelines, check-in requirements, and emergency procedures for each park where they are working. Specific park procedures are in the site folders.

2.4 Safety training

All SCPN and NAU field staff are required to adhere to the SCPN Field Safety Plan (SCPN 2012). In addition, staff must familiarize themselves with and abide by the NAU Field Safety Manual (Office of Regulatory Compliance 2013) and the Chemical Hygiene Plan (Office of Regulatory Compliance 2007).

Wilderness First Responder training is recommended for the hydrologic technician and project manager, but it is required that at least one of the two have that training. It will be provided by SCPN for the hydrologic technician and other long-term NPS staff. Wilderness First Aid and CPR training are recommended for other staff.

3 Revision history

Provide the following information for each revision made to SOP #2.

New version:

SCPN_WATER_QUALITY_SOP02_YYYYMMDD

Date:

Author:

Sections affected:

Changes & reasons: