

Standard Operating Procedure (SOP) 10: Field Safety, Version 1.0

Southeast Alaska Network Water Quality and Streamflow Monitoring Protocol

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Please cite this Standard Operating Procedure as:

Goodwin, D. 2022. Standard Operating Procedure (SOP) 10: Field Safety, Version 1.0. Water Quality and Streamflow Monitoring Protocol, Southeast Alaska (SEAN) Inventory and Monitoring Network. National Park Service, Juneau, Alaska. Available online at <https://irma.nps.gov/DataStore/Reference/Profile/2291597>.

Revision History Log:

Previous Version #	Revision Date	Updated By	Changes Made	New Version #
-	February 2022	D. Goodwin	Initial version	1

1 Summary

The Southeast Alaska Network (SEAN) places utmost importance on the occupational health and safety of its employees and partners. Every NPS employee has the right to a safe workplace and the right to refuse unsafe work; likewise, every employee is responsible for maintaining a safe work environment for themselves and their collaborators. The network is committed to ensuring all persons involved with monitoring activities receive adequate training on NPS safety procedures and regional hazards prior to conducting fieldwork. Principles of Operational Leadership are adhered to, empowering field personnel to speak freely about safety concerns and courses of action.

SEAN staff and water quality program Park Leads are required to be familiar with and follow the safety policies of each NPS unit in which they work, and details vary between units. Park Leads are identified and designated by the SEAN Program Manager in consultation with the park Technical Committee member and Resource Management Division leadership. Typically, Park Leads conduct field activities within their own NPS unit, and thus are already well-versed in local safety policies. SEAN personnel must develop an awareness of site-specific differences in front- and backcountry operations, vehicle use, communications, and other relevant policies, then apply appropriately as they travel between monitored rivers. Parks periodically create new safety policies and update existing guidance. Questions and requests for updates should be addressed to the SEAN Collateral Duty Safety Officer, SEAN Program Manager, and the Southeast Alaska Parks Safety Manager.

The SEAN's water quality monitoring sites are all located within or closely proximal to park communities, and required travel is minimal and straightforward (Table SOP 10-1). Fieldwork typically consists of short-duration (1-2 hours) site visits once per month during the ice-free season to confirm sensors are performing correctly and upload data. These steps can occur without Park Leads entering the water. Every few years, site infrastructure (pipe housings, in-water hose clamps and bolts) maintenance may demand in-water access. Specific Park hazards, emergency contact information, and anticipated procedures should be reviewed with any water quality program personnel or volunteer assistants at the start of each field season and before each monthly site visit. An example Job Hazard Analysis is included at the end of this document (Figure SOP 10-2).

Table SOP 10-1. Required travel for SEAN water quality monitoring sites.

Site / Park	Vehicle Travel	Foot Travel
Salmon River / GLBA	10 mile drive on established roads from NPS office to parking area	0.8 mile walk on gravel road/trail from parking area to sonde
Indian River / SITK	1 mile drive on established roads from NPS office to parking area	500 feet walk on sidewalk/trail from parking area to sonde
Taiya River / KLGO	8 mile drive on established roads from NPS office in Skagway to Dyea parking area	20 feet walk on trail from parking area to sonde

2 Training

All SEAN personnel and Park Leads will complete NPS Operational Leadership Training within their first year of employment. Bear Awareness Training, including use of bear spray deterrent, is

required prior to fieldwork and should be renewed every three years. Additional background in wilderness first aid and water safety are encouraged but not required for this vital sign.

3 Communications

A minimum of two forms of two-way communication are strongly recommended, particularly for GLBA site visits further from well-traveled roads. Park radio, cell phone, satellite phone, and two-way satellite messaging devices are all acceptable; note that SEAN staff are not usually issued park radios. Communication equipment should be reliable and redundant throughout fieldwork and associated travel, so familiarization with local dead zones for cell service and radio coverage is essential. Park Leads should leave a detailed itinerary with their supervisor or designated alternate before heading into the field.

For any Alaska fieldwork, whether in the remote wilderness or the frontcountry, the Alaska Region Communication Center (ARCC; Figure SOP 10-1) is available to monitor InReach or other satellite tracking devices, hold active float/hike/flight plans, and answer radio/phone calls 24 hours a day, 7 days a week, 365 days a year. SEAN water quality staff and Park Leads should complete, file, and activate a backcountry accountability form (“hike plan”) in advance of starting a fieldwork session (https://doimspp.sharepoint.com/sites/nps-arcc-region/SitePages/home_formsresources_backcountry-operations.aspx). Voice or satellite messaging check-ins at designated times are required; if missed, ARCC will attempt to reach field personnel on their listed communication devices and, if not successful, initiate overdue procedures in coordination with the park. More details on ARCC procedures are available from links at the SharePoint site above.

Figure SOP 10-1. Quick reference card provided by the Alaska Region Communication Center (ARCC).



4 Personal Gear and Protective Equipment

Each person participating in water quality fieldwork is responsible for ensuring they are wearing clothing and footwear appropriate to the planned activities and weather. Hiking or rubber boots, long

pants, long sleeves, and rain gear are recommended for all months in Southeast Alaska. Depending on the conditions, additional warm clothing, gloves, hat, sunscreen, bug spray, and/or a bug net may be warranted.

Site visits are typically of short duration (1-2 hours), but basic food and water should be carried in the event of delays. All SEAN staff and Park Leads should carry bear spray when working in the field, following completion of NPS Bear Awareness Training. Backcountry essentials, such as flashlight, knife, fire starter, and small first aid kit, are highly recommended.

Monthly water quality site visits for sonde/sensor calibration checks and data upload (SOP 1) do not require Park Leads to work in the river. All instrumentation can be retrieved and deployed from shore without leaning far over the water. Therefore, hip or chest waders, dry suits, and personal floatation devices (PFD) are not mandatory personal protective equipment on a routine basis. Should SEAN staff or Park Leads discover a situation that requires in-water work to resolve, the site visit should be aborted until a larger team with additional equipment can be assembled and a detailed safety plan established in consultation with the water quality Project Leader. Data collection may be temporarily halted, and the sonde removed from the field if required.

5 Terrain Safety

Uneven terrain, slippery rocks, dense brush, and fatigue are all hazards that could result in a slip, trip, or fall. Always wear appropriate footwear and pay attention to the trail. Carefully assess footing at river's edge when retrieving or deploying the sonde, and be mindful of debris floating downstream. Move well away from the water to a flat area to conduct water quality site visit activities.

Weather conditions in Southeast Alaska can change quickly. Park Leads and SEAN staff are responsible for taking the local weather forecast into account when planning fieldwork and maintaining weather/river awareness. In steep watersheds, heavy localized rainfall can cause rivers to rise rapidly. Do not conduct fieldwork during storm events or while the water level remains high in the days immediately following a storm. Check the relevant USGS gaging station for real-time river height and predictions.

If in-water work is required (i.e., modifying site infrastructure or clearing debris from pipe housing), always have at least two additional persons on the field team and coordinate operations and safety plans with the Project Leader. Wait until a low-to-moderate water level (personnel should not feel pressed to work during flood stage or a rain event) and defer if any question about safety. Anticipate river current velocity will be faster than it appears visually. Wear rubber boots, chest waders, or a dry suit depending on river location, one's level of training, and water level. Be aware of the possibility of slipping and going underwater (feet up, head down) while wearing them. Avoid boots with tight ankles and tight-fitting waders – these are difficult to remove in an emergency. Wear a belt with chest waders to prevent their filling with water; whenever chest waders are worn, a PFD also must be worn.

6 Dangerous Plants and Animals

SEAN parks are home to brown and black bears, among many other wildlife. Encounter likelihood increases near rivers, where bears spend much of their time and water noise masks human presence; this is particularly a concern during the late summer/fall salmon spawning season. NPS personnel working in the field must complete Bear Awareness Training and carry bear spray as a deterrent in the event of an encounter. Maintaining situational awareness, traveling and working in a team rather than solo, making plenty of noise, and careful handling of any food carried will help fieldwork go smoothly in bear country. Park Leads are reminded to keep their distance from any bears observed and diligently endeavor to not surprise them; if bear activity near the monitoring location precludes safe operations, the monthly site visit should be aborted and rescheduled.

7 Vehicle Safety

Park Leads and SEAN staff may drive NPS vehicles from park headquarters to the monitoring site. Once authorized to use park transportation (check-out process varies by NPS unit), drivers are responsible for inspecting their vehicles before every use to ensure they are in safe working condition. This includes visually checking tire pressure, adjusting mirrors, and making sure equipment is secure. Preventative maintenance must be performed in a timely manner by qualified, park-designated mechanics, so drivers should report any potential hazards or needed repairs to their supervisor.

When operating a NPS vehicle, the following safety rules must be followed:

- Everyone in a government vehicle is required to wear a seat belt.
- Texting and other cell phone uses are strictly prohibited while driving. Pull over to a safe location off the road if you must answer or make a call.
- Drivers must adhere to all federal and state vehicle regulations, including all posted speed limits.
- Only NPS employees or authorized cooperators and contractors are authorized to operate a government vehicle.
- Individuals who are not NPS employees, authorized cooperators or contractors, or other authorized individuals on government business, are generally forbidden from riding in a government vehicle.

8 Chemical Safety

Three water quality sensors (specific conductance, pH, and turbidity) are calibrated using chemical solutions. All Park Leads are provided the relevant Material Safety Data Sheets with the annual consumables resupply, and the SEAN Project Leader maintains copies of the same.

Chemicals should be stored at room temperature before and after opening, and not be allowed to freeze. No special storage equipment or environmental precautions are required. Conductivity, pH, and turbidity solutions are classified as non-toxic, non-reactive, non-corrosive, and non-flammable.

Water quality fieldwork typically occurs outdoors, thus in a well-ventilated environment that minimizes direct inhalation of chemical vapors; if working indoors, ensure good airflow. Nitrile

gloves are recommended for extended use (i.e., Project Leader calibration of all sensors pre-season) and when working with pH 4 standard. Should contact with the eyes or skin occur, promptly flush with plenty of water to reduce irritation and remove contact lenses if applicable. If ingested, dilute by drinking water (pH, turbidity) or induce vomiting (conductivity if swallowed in large quantities). Seek medical attention if feeling unwell.

The following actions further protect Park Leads and SEAN staff working with project chemicals:

- Do not eat, drink, or smoke around chemical solutions.
- Avoid unnecessary spills – place chemicals where they will not be knocked over.
- Stow chemicals securely during transport, away from persons in the vehicle. Use a larger container, such as a cooler or box, to reduce potential contamination of other items.
- Ensure all chemical solutions retain their original, complete labels.
- Dispose of chemical waste properly after each monthly site visit or calibration. All solutions used for SEAN river monitoring may be disposed down the drain with plenty of water.

9 Responding to an Incident

In the event of a life-threatening emergency, field personnel should first call 9-1-1 or the ARCC. As soon as practical, the Park Lead or SEAN staff must also inform their supervisor and the park's emergency contact.

In case of non-emergency incidents, injuries, and/or near misses, personnel should contact their supervisor immediately. Depending on severity or nature of the incident, further reporting may be required. For example, all motor vehicle related accidents must also be reported to the park's Chief Law Enforcement Ranger. The Safety Management Information System (SMIS; www.smis.doi.gov) is used to report injuries and complete worker's compensation forms to qualify for benefits.

Figure SOP 10-2. Example Job Hazard Analysis for SEAN water quality monthly site visit.

JOB HAZARD ANALYSIS (JHA) - EXAMPLE		Date:	
Park Unit:	Division: Resource Management	Branch:	Location: Salmon, Indian, or Taiya River, Alaska
JOB TITLE: Water quality monthly site visit (no in-river work required)		JHA Number:	Page: 1 of 1
Job Performed By: Designated Park Lead	Analysis By:	Supervisor:	Approved By:
Required Standards and General Notes:	Complete all required training before job begins.		
Required Personal Protective Equipment:	Proper footwear (hiking or rubber boots); bear spray; park radio; cell phone; InReach; clothing appropriate to the weather (warm layers, rain gear, etc.)		
Tools and Equipment:	Hiking or rubber boots; bear spray; park radio, cell phone, InReach; backpack; clipboard with data sheets, protocol, and pencils; YSI handheld, field cable, and spare parts; sonde calibration supplies (standards, DI water, and cleaning materials); thermometer; rain tarp		
Sequence of Job Steps	Potential Hazards/ Injury sources	Safe Action or Procedure	
1. Team will travel via NPS vehicle from Park Headquarters to the river access trailhead. 2. Team will walk along the trail to the SEAN water quality site. 3. Team will perform routine data download and monthly check on the SEAN water quality sonde. 4. Team will walk back to vehicle and drive back to Park Headquarters.	1. Potential for motor vehicle accident. 2. Potential for injury due to loss of footing on uneven and slippery terrain on the trail. The possibility for ankle sprains, contusions, or more severe orthopedic injury exists. 3. Potential for encounters with animals and insects, possible hypothermia, and drowning. The possibility of close surprise encounters with bears, and possible subsequent injury or fatality exist.	1. Equipment will be packed to maintain even weight distribution and avoid overload. When walking, packs will not exceed 40-45% of the persons total body weight. Individuals will maintain situational awareness for changing conditions and hazards. 2. Well-fitting footwear should be worn. Anticipate rain and cold weather and dress accordingly. 3. Bear spray will be carried by the team. Individuals will have received bear awareness training. 4. A backcountry itinerary will be filed with park dispatch and the ARCC. Check-in times will be established. 5. Defensive driving techniques will be used while operating NPS vehicle. Seatbelts will be worn at all times when vehicle is moving. 6. River conditions (water level, current velocity) and recent rainfall will be assessed before accessing the sonde. If conditions appear unsafe or likely to change rapidly, abort site visit. If in-water work appears to be required, abort site visit and contact the Project Leader.	