

Standard Operating Procedure (SOP) # 1: Preparations and Equipment Setup Prior to the Field

Version 1.1

Revision History Log:

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
1.0	1/11/20	N. Hupp	Removed language that was stated more than once, updated field prep requirements to match newer procedures and technologies	SOP no longer reflected MOJN requirements; MOJN now uses more tech in the field than in 2015	1.1

1. Before the Field Season

1.1. 3-6 Months before field sampling

Well before the field season, the Protocol Lead or Field Lead needs to:

- ✓ Prepare and post position descriptions for seasonal field hires.
- ✓ Depending on the park, determine if research permits are required (this may require contacting the permitting office or the natural resource chief at the park). Permits are submitted on the NPS internet site <https://irma.nps.gov/rprs/>. If substantial monitoring design changes have been made, update the parks to facilitate the permit request.
- ✓ Compile a list of sites that will be monitored from the GRTS draw or previous field season.
- ✓ Even if a permit is filed, contact park natural resource staff and provide them a list of sites to parks for comment (e.g., accessibility, compliance, etc.) before they are visited.
- ✓ Coordinate with the appropriate park staff to submit compliance requests and to ensure proper procedures are followed, particularly since permanent markers are used.
- ✓ Review the entire protocol to become familiar with any changes made from the past field season. Proposed changes to the sampling design, time, and methodology must be discussed with appropriate I&M staff to allow for time to change affected tasks.
- ✓ Work with the Data Management Team to make sure that all field forms and databases have been updated from the previous field season and are in good working order.
- ✓ Review and update IU-related SOPs, training, and safety documentation.
- ✓ Check over equipment list (Table 1.1). Repair or order any equipment that needs to be replaced from the previous field season. Order enough consumable supplies for the field season.

1.1.1. Gear Checklists

The lists below are the amount of gear needed by one field crew. Multiply the amount by the number of crews that will be in the field. Items marked with an asterisk * are optional and depend on crewmember's preference. Items marked with ** are for multiday trips only.

Table 1.1 Measuring Equipment Checklist:**Measuring Equipment**

Item	Use and notes	# Needed per crew	# Packed
Meter tapes	200 ft (they are longer than 50m which is nice for when rebar is offset therefore the transect is longer than 50m), need 3 for revisits, 5 for establishment	3-5	
Wire pin flags	LPI, invasive quadrats, marking transects; make sure at least 3 are very straight!	~15	
Small tape measure	5m; measuring camera distance, generally helpful	1	
Chaining pins (candy canes)	Anchoring transects	~15	
Compass	Setting tapes along correct bearings; make sure declination is appropriate for the park you are working in	1 per person	
Laser rangefinder	Estimating slopes; with capacity for measuring tree height; tree height and distance; double check batteries are good	1	
Ruler tool for shrub ht.	Custom made for measuring shrub height	1	
Moosehorn	Measuring overstory along LPI line	1	

Table 1.2 Navigation, Electronics, and Recording Equipment

Item	Details
Digital camera	MOJN point-and-shoot
High accuracy GPS and spare battery	Arrow or Bad Elf; needs spare batteries and charger, must be paired with tablet or cell phone
Tablet or MOJN cell phone and charger	Must have arc collector with downloaded maps, and paired with GPS; also preload with SOPs, narrative, and plant ID materials
Pens and clipboards	Pens preferred over pencil for data mgmt. purposes
Spare batteries	AA and AAA's for GPS and laser range finder
Macroplot revisit forms	Forms from previous visits
Revisit photos	Print the old plot photos to match the new photos
Weatherized field data entry forms	1 per plot plus 2 backups; store in plastic tote if possible
Backup battery	For recharging tablet and cell phone

Table 1.3 Plot Monumenting Equipment

Item	Details and purpose	# Needed per crew	#Packed
Rebar (establishment only)	36" inches long, ½ in diameter; Diameter of rebar MUST match the diameter of the rebar caps	7 per plot	
Aluminum rebar caps (May not be necessary, check previous photos/notes per plot)	Make sure they are blank or at least that the right park has been stamped	7 per plot	
Sledgehammer (establishment and capping only)	Installing rebar	1	

Hacksaw	Shortening rebar	1
Gloves (establishment only)	Installing rebar	
Cap imprinting kit (capping only)	For labeling rebar caps	1

Table 1.4 Miscellaneous Field Equipment

Item	Details
Field notebook	<i>One per person required!</i> Each crewmember needs one for writing down plot notes or recording numbers in the field.
Field-relevant SOPs	Need at least one copy per crew; can be on tablet but a hardcopy is nice to have
Daypack and overnight backpack	Depending on hitch schedule.
Trowel or hori-hori	For collecting vegetation samples (and bathroom breaks)

Table 1.5 Plant Identification Materials

Item	Details
Plant ID references	Shrub ID, and for crew curiosity (e.g., regional floras and photographic tree guides)
Target invasive species list	Need info for keying these out as well; is printed on the data sheets
Hand lens	Keying out shrubs
Small plant press	Make sure there is space for new plants and that it has newspaper in it; leave large one in the office and plants can be transferred in the office instead of in the field
Newspaper	For use in pressing plant specimens

Table 1.6 Communication and Safety. Need at least one per vehicle of each item.

Item	Details
Cell phone + charger	Share phone numbers with other drivers or crewmembers
Park radio + charger	Know how to get to park repeaters
Satellite phone + charger	
InReach satellite locator device + charger	<i>Must</i> program in office before use to assign to a person and ensure appropriate contacts are synced
Battery charger + charge cable	Charge ahead of time
Copy of backcountry travel plan	1 per vehicle; Make sure it is accurate and contains safety contact information
Fire extinguisher, shovel, and other park-specific vehicle safety equipment required	
Sunscreen	
Water cube	Make sure it is filled.
First Aid kit	Make sure it is fully stocked and medications are not expired
Handheld 2-way radios + charger*	And charging cable; Necessary for communication within a plot

*Items with a * are optional, they're not necessary for the field work, but some may prefer to use them. This depends on style.

1.2. 0-3 Months Before Field Sampling

The Field Lead will need to:

- Make sure that field crew members have been hired and background checks initiated.
- Create a field schedule:
 - Find location data for macroplots within parks
 - Make a travel schedule to get to each plot in the season
 - Determine potential car camp and backcountry camp sites (consult with parks as needed)
 - Anticipate that roughly one macroplot will be completed per field day, including travel time.
 - When in the field, crews often work eight consecutive 10-hour days, followed by six days off, especially when working in the backcountry (called “8 on, 6 off” or an “8 day hitch”).
 - *Seasonality* - Sampling visits should be scheduled to optimize phenology for the park vegetation. Park units and monitored macroplots should be visited at approximately the same time and in the same order each revisit to maximize repeatability.
 - Ensure schedule meets the objectives for the field season and maintains the integrity of the sampling design. Don’t be an optimist when it comes to planning a field schedule, include flexibility for unforeseen events.
- Create a training schedule:
 - Work with the Protocol Lead to organize and update crew training materials.
 - At the start and end of the field season, field crews are scheduled for eight-hour days, Monday through Friday, to allow for trainings, field preparation, data management, or office work.
 - Training should include plant ID, field safety, detailed training of each SOP, and all field methods.
- Work with the park staff:
 - Provide parks (e.g., resource staff, chief ranger) with the dates that crews will be working in the park, names of field crew members, vehicle descriptions, and approximate locations of monitoring activity (see *MOJN SOP M4 – Safety* for more details).
 - Arrange for and schedule pre-field work meeting with relevant park staff to provide park orientation and to discuss park regulations and park safety regulations.
 - Determine lodging options and contact parks early to determine whether park housing will be available.
 - If camping, reserve camping sites or acquire backcountry camping permits.
 - Work with the park to determine daily and field tour check-in and check-out procedures for the field season at the park.
- Coordinate with Data Management Team:
 - Make sure that Arc Collector apps are updated and ready for navigation and data collection.

- Work with Data Management Team to update field data management procedures to reflect any changes in equipment.
- Coordinate with Program Manager or Protocol Lead:
 - Make sure that research permits have been approved.
 - Prepare Protocol Review Certificate and submit to park superintendent or superintendent designee for signature.
 - Have the field vehicle thoroughly inspected for back country roadworthiness. Make sure that the field vehicle is fully equipped with all necessary safety equipment and all associated equipment (e.g., spare tire, jack, bungee cords, etc.) is in good working order.
- Data collection and gear prep:
 - Review plant species lists for each park unit and update them with any new species detected in the previous field season.
 - Make sure first aid kits are well-stocked, organized, and ready to go for the season.
- Prepare for plot visits and logistics:
 - Prepare site packets for each field site that may be visited, including potential back-ups.
 - Review maps and plot locations in AGOL or Collector to make field plans.
 - Organize materials and review relevant information for each macroplot.
 - *Revisit field forms* – provides directions to the macroplot, coordinates of monuments, and any other specific information from the previous visit.
 - *Macroplot species list* - list of species detected during the previous monitoring visit.
 - *Repeat photos and notes on camera placement* – provides information on how to locate the repeat photopoint and photo frame.
- Collaborate with the rest of the office about safety:
 - Test that all field communication devices (e.g., radio, InReach, satellite phone) are working, plans have been paid for the duration of the field season, and units are ready for the field season.
 - Update the safety and communications procedures if needed.
 - Review and update the Job Hazard Analysis (JHA) and emergency/park contact lists.
- Collaborate with the rest of the office about safety:
 - Test that all field communication devices (e.g., radio, InReach, satellite phone) are working

1.3. Before Beginning a Field Day or Multi-day Hitch

The Field Lead will:

- Submit a daily backcountry travel plan to appropriate contacts at each park (e.g., dispatch, park designee) and contact the park to let them know the crew's estimated time of arrival and anticipated field schedule. Crews should review the *MOJN SOP M4 - Safety* for specific procedures.
- Prepare and provide the following documents for each crew:
 - copies of the protocol (only SOPs and reference table sheets are needed in the field)

- permits (e.g., research, backcountry camping)
- emergency contact information and procedures
- shrub species list for each park
- target invasive species list and field guides
- adequate copies of all field forms (Table 1.2)
- relevant flora, keys, and field herbaria

The field crewmembers will:

- Obtain all equipment and gear needed for field sampling and make sure that everything is in good working order (Tables 1.1 and 1.2).
- Make sure that all batteries and rechargeable equipment are fully charged to start field work.
- Make sure Arc Collector is set up appropriately, basemaps are downloaded, and devices are on airplane mode.
- Take all mandatory trainings in field skills, procedures, and safety (see *SOP 2 – Training Observers*).
- Read and understand the MOJN Integrated Upland Protocol, volumes 1 and 2. If there are any questions after the field training, ask the Protocol Lead to clarify before heading to the field.
- Read the MOJN safety plan, review the JHA and/or GAR with the Field Lead, and sign a copy of the JHA and/or GAR.
- Demonstrate an understanding of the check-in and check-out procedures at the park to be visited.
- Make sure to take the appropriate site packets for the field tour.
- Make sure that they are prepared, have all of their own gear in order, and are ready to go to the field.

Table 1.2. Sets of field forms needed to sample each IU macroplot.

Field Forms	Number
Site Characterization (initial site visit only; <i>SOP 6</i>)	1
Macroplot Establishment (initial site visit only) or Macroplot Revisit (<i>SOP 7</i>)	1
Point-Intercept (<i>SOP 8</i>)	3
Canopy and Basal Gap (<i>SOP 9</i>)	3
Invasive Species Quadrat (<i>SOP 10</i>)	3
Site Assessment for Invasive Plant and Target Tree Species (<i>SOP 12</i>)	1
Repeat Photos (<i>SOP 13</i>)	1
Unknown Shrub Species (<i>SOP 14</i>)	10
Unknown Shrub Log (<i>SOP 14</i>)	1