MM-WI-004

HOW TO PREPARE A MONITORING CAMPAIGN
WORK INSTRUCTIONS

Last updated: October 19, 2023

1. Overview

A successful monitoring campaign starts with good preparation. This Work Instruction (WI) document provides step-by-step instructions and checklists for Field Supervisors on how to prepare for conducting base monitoring campaigns (i.e., Planting Quality Monitoring (PQM), Replanting Quality Monitoring (RQM), and Seedling Survival Monitoring (SSM)).

2. Resource planning

To plan monitoring work, the following general steps are taken by the Field Supervision team as part of the MM-SOP-001 Monitoring and Maintenance Iberia (workflow):

1. Use Land Life Monitoring Calendar (MM-DOC-001) as input to decide which sites are part of this year's monitoring season
2. Use resource planning sheet to make a resource plan for the season
3. Add individual jobs to the Asana FS planning
4. Discuss in the weekly Friday meeting the jobs for the next 3 weeks per Field Supervisor and confirm jobs for upcoming week
5. Update the weekly planning sheet from the Friday meeting

Once the need for a monitoring campaign is identified by the team, the necessary resources to conduct it must be identified and collected. These resources include staffing, vehicle, items (e.g., tools, equipment, consumables), etc. needed for monitoring.

2.1. Staffing and vehicle

Once the monitoring need is identified, staffing and vehicle arrangements should be the first step, and be initiated at least 1-2 months in advance. The amount and types of necessary resources vary by the needed monitoring phase but securing sufficient and appropriate staffing and vehicles will always be crucial. In Iberia, staffing and vehicles are scheduled and arranged through this weekly planning sheet.

2.2. Checklist for items needed for monitoring

Specifics of items necessary for monitoring also differ depending on the monitoring phase. Here, a general check list for essential items needed for monitoring is provided so that they can be prepared before a monitoring campaign. As the first step, necessary quantities needed for each item should be determined for each monitoring campaign considering the size of area to be monitored and the number of monitoring crew for effective and efficient monitoring. When these quantities are determined, Field Supervisors should ensure that they are all in good working conditions, up to date, and

that sufficient quantities are available. If needed, more supplies should be purchased or ordered, and repair or replacement of items in need should be arranged in advance.

Iberia's inventory of equipment and consumables can be found here and should be updated after each planting, replanting, and monitoring campaign. Before a field visit, Field Supervisors should also ensure that each person is responsible for having appropriate attire (e.g., rain jacket, footwear, hat) and personal belongings (e.g., water bottle, meal, personal medication) for monitoring, which could last for long hours over days and weeks.

This checklist is based on the "Seedling Establishment Monitoring protocol (MM-POL-001)" document version 0.6. What may be needed for monitoring may change over time, especially when new technology becomes available. The checklist should be periodically reviewed to ensure that what is needed is up to date.

	Monitoring phase	Category	Quantity	Object	Purpose
●	All base monitoring	Equipment and tools	1 per crew	Up-to-date Android (13 or later) device	To conduct monitoring
●	All base monitoring	Equipment and tools	1 per crew	External backup battery	For backup battery
●	All base monitoring	Equipment and tools	1 per crew	Charging cable	To charge device
	All base monitoring	Equipment and tools	1 per crew	Mallet	To firmly insert wooden stakes as plot centers
●	All base monitoring	Equipment and tools	1 per crew	8 m rope	To determine the plot border
●	All base monitoring	Equipment and tools	1 per crew	Seedling ID guide with the latest species names	To learn species identification for those who need training

•	All base monitoring	Equipment and tools	1 per crew	Grade rod, Metal tape measure, or Measuring tape	To measure seedling height
•	All base monitoring	Equipment and tools	1 per crew	Clipboard or notepad	To take any notes
•	All base monitoring	Apps and files on device	1 per device	Updated Land Life monitoring app	To record monitoring data
•	All base monitoring	Apps and files on device	1 per project site	Downloaded Planting Monitoring Plans	To record monitoring data
•	All base monitoring	Apps and files on device	1 per device	Mapas de España app (Android or iOS)	To collect and tag additional observations
•	All base monitoring	Apps and files on device	1 per device	Land Life Emergency Management Plan (HSSE-SOP-001) pdf	To prepare for emergency
•	All base monitoring	Apps and files on device	1 per device	My112 app (Android or iOS)	To be alerted in case of emergency
	All base monitoring	Apps and files on device	1 per device	El tiempo de AEMET app (Android or iOS)	To be alerted in case of emergency
•	All base monitoring	Apps and files on device	1 per device	Wildfire Watch Spain app (Android or iOS)	To be alerted in case of emergency
•	All base monitoring	Apps and files on device	1 per device	Fogos.pt app (Android or iOS)	To be alerted in case of emergency
•	All base monitoring	Apps and files on device	1 per crew as needed	Species identification app(s)	To identify plant species

	All base monitoring	Consumables	Number of plots for the day + 2 spares (PQM) or 30% of that number	Wooden stakes with brightly painted tops	To mark plot centers (PQM) or to replace missing centers (else)
	All base monitoring	Consumables	2 per crew member + 4 extra per crew	Permanent markers	To write plot id on stake marking the center point
•	All base monitoring	Consumables	1 roll per crew	Flagging tapes	To mark 1s tree at the start of the plot
•	All base monitoring	Consumables	1 per crew member + 2 extra per crew	Ball-pointed pens	To take any notes
•	All base monitoring	Consumables	2 liters per crew member per day + 5 liters extra per crew	Water	To stay hydrated and for seedlings if needed
•	All base monitoring	Consumables	2 servings per crew member per day + 10 extra per crew	Electrolytes	To stay hydrated
	All monitoring	Consumables and HSSE	1 per crew	Sunscreen	To protect from severe sun burn
	All monitoring	Consumables and HSSE	1 per crew	Bug spray (e.g., ~30% DEET for gears and skin, 0.5% Permethrin for gears)	To protect from insect-borne disease
	All monitoring	Consumables and HSSE	1 per crew	First aid kit	To prepare for emergency
	All monitoring	Consumables and HSSE	1 per vehicle	Up-to-date fire distinguisher	To prepare for emergency

•	All monitoring	HSSE	1 per item per crew member	Personal Protective Equipment (e.g., hard hat, reflector vest)	To prepare for emergency
•	All monitoring	HSSE	1 per crew1 per crew	List of emergency contact for staff/contractor/ Incident Commander	To prepare for emergency
•	All monitoring	HSSE	1 per crew1 per crew	List of staff/contractor medical needs and allergies	To prepare for emergency
•	All monitoring	HSSE	Number of visitors + 5 extra per crew	Liability waiver form for field visitors	To inform visitors of potential risks
•	Biomass monitoring	Equipment and tools	1 per crew	Digital caliper	To measure plant diameter
•	Biomass monitoring	Equipment and tools	1 per crew	DBH tape to measure tree diameter	To measure plant diameter
•	Biomass monitoring	Equipment and tools	1 per crew	Forestry Pro or Laser Distance Measuring Device	To measure tree height (only when needed)
•	Biomass monitoring	Equipment and tools	1 per crew	Drone	To remotely collect digital biomass data

3. Fieldwork preparation

Along with resource planning, some pre-field visit preparation is also needed. Fieldwork preparation includes preparing the monitoring device needed for monitoring and necessary training for monitoring and HSSE.

3.1. Checking equipment list

In a separate google doc, create a copy of the checklist for items needed for monitoring in the 2.2. Checklist for items needed for monitoring and check off each item to prepare for the upcoming monitoring campaign.

3.2. Preparing the device for monitoring

Follow the instructions in section 2 of How to use the Monitoring App (MM-WI-014) document to make sure that the Land Life Monitoring App and necessary Planting Monitoring Plans (both seedling/tree level and monitoring plot level) are loaded onto the device.

3.3. Prepare a field guide for species identification

In all of the base monitoring, correctly being able to identify species will be crucial, especially when natural regeneration of congeners is possible in the same stand type. For Seedling Establishment Monitoring (SEM), all species that were planted within a stand type need to be recorded, including seedlings that could have occurred from natural regeneration but not clearly distinguishable from plantings (e.g., occurs inside the same planting hole). In the future, it is possible that different species may be color-coded at nurseries, which will facilitate species identification but even when such practice is implemented, it is important to be able to identify species as mistakes at the nurseries may be possible.

If there are any field crews who are new or there are new species to be planted, as we increase in the biodiversity of plantings, it may be beneficial to prepare a field guide for in-the-field training. New species can be added to existing field guides.

All field crew should familiarize themselves with the planted species, and spend some time using the field guide to learn the characteristics of each planting species to be able to identify them correctly. The planted species for each planting can be found via the Plantings section in the Internal Admin. Search and select the desired planting, then select the blue tab at the top titled ‘Plant materials’. Such pre-field visit preparation should be followed by in-the-field training as plants can be fairy plastic and the same species may look fairly different depending on their environmental conditions.

Although seedling identification is normally more difficult than tree identification, several plant identification apps exist, which may assist learning species for any new crew members. These apps are all free and include:

PlantNet: This app allows you to take a picture of the plant and different plant parts (e.g., leaf, flower) or use a photo you have taken and lists potential candidate species based on the photo. Good for a beginner user because no knowledge of plant morphology and their terminology is required as in keys. Android or iOS.

Forest Tree Identification: This app specializes in forest tree species. It helps you identify species from leaf trait keys, and works offline. Android or iOS.

Arbolapp: This app specializes in tree species in Iberia. It helps you identify species from different plant parts or guided keys. It has an option to switch between English and Spanish, and works offline. Android or iOS.

In addition to species identification, it is important to stay informed on potential species name changes. Species names change more often than one would think, and some of the species names we have used may become "synonyms", and another species name may become "accepted names." An accepted name should be used even when a synonym has been used for a given species. Species names thus need to be standardized, and synonyms should not show up as an option in the Planting Monitoring Plan. Before each monitoring campaign, Operation Managers will check all the species names to be included in the Planting Monitoring Plan, and update any synonyms to accepted names as needed. Because new accepted names may not be recognized as the same species known by the old synonyms, it is important that Field Supervisors and Operation Managers communicate such changes before every monitoring campaign.

3.4. Checklist for Health, Safety, Security, and Environment (HSSE) preparation

In any fieldwork, Health, Safety, Security, and Environment (HSSE) are always the number one priority. Although some accidents may not be avoidable, being fully prepared will allow us to minimize the risk and damage. Use the following checklist to prepare before a field visit.

	Who	What
•	All field crew	Review Land Life Emergency Management Plan (HSSE-SOP-001)
•	All field crew	Review the procedures to report accidents and near misses
•	All field crew	Install, update, and check My112 app, El tiempo de AEMET app, Wildfire Watch Spain app, and Fogos.pt app

•	All field crew	Review the latest fire prevention document
•	All field crew	Check and ensure the conditions of all Personal Protective Equipment
•	Field Supervisors	Prepare a list of up-to-date emergency contact information for staff/contractor/Incident Commander
•	Field Supervisors	Prepare a list of up-to-date medical needs/allergies
•	Field Supervisors	Prepare and update a daily monitoring checklist (PQM, RQM, SSM)
•	Field Supervisors	Check and ensure the conditions of field vehicles
•	Field Supervisors	Check and ensure sufficient supply of necessary first aid kit
•	Field Supervisors	Check and ensure that inspection of fire distinguishers is up to date
•	Field Supervisors	Check and ensure all field crew has taken necessary HSSE trainings (e.g., first aid, tire replacement)
•	Field Supervisors	Check and ensure liability waiver form are signed by any field visitors
•	Field Supervisors	Check and ensure that this HSSE checklist is up to date

3.5. Other preparation actions

Other potential preparation activities required are:

1. Requesting required permissions/access with the landowner to enter the land for monitoring activities.
2. For land prep and planting quality monitoring: plan and conduct training with the contractor before land prep and before planting to explain the quality parameters we will record after land prep (hole density), and after planting (planting quality parameters). See Briefing con la contrata antes del comienzo de una obra (IMP-WI-023) document. This so that they can conduct their own quality checks (e.g., counting holes with an 8 m rope) right there and then in the field, to prevent them not working according to our quality standards.

4. Questions

If there are any questions regarding this document, please contact Santiago Martínez Rodríguez, Stijn Depla, or Anna Sugiyama.