



# Early Detection of Invasive Plant Species Monitoring Plan

## *Standard Operating Procedure #1: Before the Field Season*

**Version 1.0 (6 June 2017)**

### Change History

| New Version | Revision Date | Author                    | Changes Made | Justification                                       |
|-------------|---------------|---------------------------|--------------|-----------------------------------------------------|
| 1.0         | 6/6/17        | A. Ainsworth,<br>J. Gross | Developed.   | Significant changes to draft ED narrative document. |
|             |               |                           |              |                                                     |
|             |               |                           |              |                                                     |
|             |               |                           |              |                                                     |
|             |               |                           |              |                                                     |

Only changes in this specific SOP will be logged here. Version numbers will be incremented by a whole number (e.g., Version 1.3 to Version 2.0) when a change is made that significantly affects requirements or procedures. Version numbers will be incremented by decimals (e.g., Version 1.6 to Version 1.7) when there are minor modifications that do not affect requirements or procedures for publication in the series.

### Purpose

This SOP describes pre-season procedures required to conduct early detection surveys within Pacific Island Network (PACN) parks as part of the Early Detection of Invasive Species Monitoring Plan (Ainsworth et al. 2017). Before conducting surveys, observers will review the plan narrative and all SOPs. Equipment lists for the Early Detection of Invasive Plant Species Monitoring Plan (ED) are listed below.

### General Preparation and Review

Review of native and local plant species identification is particularly important because familiarity will increase surveying efficiency and reduce the amount of time required to identify species after returning from the field. This SOP also gives a brief description of how early detection plant species will be scheduled at Pacific Island Network (PACN) parks. Preseason planning facilitates the completion of scheduled work. All of the equipment and supplies listed in this SOP will be organized and made ready for the field season, and copies of the field data form in SOP #8 “Conducting Corridor Surveys” will be made. All field data forms will be copied to waterproof paper. As a precaution some data forms will be taken into the field even if data will be collected electronically. If the field crew will collect data on a tablet or other handheld computer/electronic device, then the appropriate data dictionaries, forms, and maps need to be installed prior to the field season.

### ***Previous Survey Summaries and Reports***

Summaries and reports from previous surveys will be reviewed. Any problems or concerns from the previous surveys should be noted and addressed before the season if possible. Previous incipient species detections should also be noted and additional research performed to determine current management status or population trends as necessary.

### ***Survey Species and Species Lists***

Non-native plant species recorded during early detection surveys can include species that are considered ahead of time (i.e. target species) and species that are undocumented in the area, or unknown to the identifiers. In either case, an appropriate plant species list for the survey area will be an essential tool to help crewmembers make informed decisions in the field. At the most basic level, a species checklist for each PACN Park is maintained by PACN and publicly available on NPSpecies. This list can be used to determine if an encountered plant species is in fact undocumented in the park and a species to be included in the early detection survey. Some parks, such as HAVO, maintain plant species checklists with additional geographic occurrence information by ecological zone and it is a good idea to check for availability of these lists before the season. The park may also have a list of non-native target species to be documented during surveys. This list may include species for which control programs already exist, species previously removed from the area, etc. Early communication with the park's resource management staff will help ensure the timely production of target species lists and facilitate a collaborative approach. See SOP #5 "Identifying Potential Incipient Species" for a list of reference materials to assist with the development of target species lists.

### ***Survey Maps***

Previous survey maps and other pertinent maps will be examined to increase familiarity with the survey corridors (i.e., roads) and the general lay of the land (i.e., towns, districts, landmarks). These maps will be updated when necessary, such as when there are new roads, developments, or other new features.

### ***Scheduling Field Work***

#### ***Survey Dates***

Survey dates will be scheduled and logistics organized before the field season begins. Corridor surveys will take between one and five months depending on the park and will be scheduled accordingly. Some species are easier to detect at certain times of year, such as when flowering, fruiting, or when leaves are changing color, which will also require special scheduling. The project lead and field leader are responsible for coordinating with resource managers to survey before herbicide spraying when possible.

#### ***Field Crew(s)***

Monitoring efforts within most parks require a field crew of two people with excellent knowledge of the local flora. In some park-specific situations, one field member may be allowed to work alone if previously approved to do so by their supervisor. Ideally, the more people dedicated to early detection surveys, the more will be found. In most cases, however, two people are enough to conduct the surveys.

### ***Organizing Supplies and Equipment***

The gear, equipment, and supplies needed to conduct corridor surveys are listed below. Lists will be updated at the end of each field season. Prior to each field season lists will be reviewed so that

appropriate purchases can be made with adequate time (at least three months) to prepare for the upcoming season.

### ***Field Data Forms***

Field data forms are found in Appendix B “Form for Recording Field Data.” Copies of field data forms will be made on waterproof paper (e.g., Rite-in-the-Rain). Data forms will be carried by crews as backup, even if data will be collected on an electronic device (e.g., tablet or other handheld computer).

### ***Plant Species and Target Species Lists***

Once reference species lists are finalized for the park in which the survey will be conducted, copies will be made on waterproof paper for field reference.

### ***Maps***

Copies of all necessary maps will be made on regular and/or waterproof copy paper.

### ***Global Positioning System (GPS) Units***

GPS units will be made ready for the field by uploading all necessary locations and layers and charging batteries. Operation manuals will be read before going into the field. For more detail see SOP #7A “Using Global Positioning System (GPS) Units.”

- GPS unit. Depending on the unit, the length of surveys, and the targets being surveyed, multiple units may be necessary and should be available.
- Extra batteries for GPS unit.
- Operation manual.
- Personal computer. A computer and all the associated cables will be necessary for downloading data from the GPS unit upon returning from the field.
- Note, if a tablet or other handheld computer is used with built in GPS a separate GPS unit and personal computer will be unnecessary (see SOP#7B “Using ArcCollector”).

### ***Camera***

Cameras will be made ready for the field by clearing memory cards and charging batteries. Field observers will review the operation manual before going into the field.

- Digital camera with batteries and memory card. Make or model of camera is unspecified but a minimum of 8 megapixels or higher is suggested.
- Extra camera batteries.
- Extra memory cards.
- Field Data Forms. Image data will be recorded on the field data form and will include image number, card number, subject of the photograph, and specific location information to supplement the occurrence data.
- Note, if a tablet or other handheld computer is used with built in camera, a separate digital camera will be unnecessary (see SOP#7B “Using ArcCollector”).

### ***Voucher Specimen Collecting Supplies***

Supplies needed to properly collect plant specimens will be purchased and made ready for the field season. For more details see SOP #9 “Collecting and Vouchering.”

### ***Collection Equipment and Supplies***

- 2-gallon freezer food storage bags
- Gloves, 1 pair per person (to protect hands when collecting)
- Clippers, hand held
- Small folding saw
- Small spade
- Pens and pencils
- Field notebook
- Voucher data forms
- 100 Cardboard tags (with string; to label collections with collection #)

#### *Plant Identification Equipment and Supplies*

- 1 Microscope
- Hand lens, one per person
- Reference materials or keys for identifying plants
- 1 Flatbed scanner
- 1 Computer
- Voucher data forms

#### *Plant Pressing and Drying Equipment and Supplies*

- Standard plant press with straps
- Newspaper (16 x 11.5 inches is optimal)
- Cardboard spacers/ventilators
- Blotters, felt, or absorbent paper
- Polyurethane foam padding
- Standard plant press dryer
- Standard food freezer
- Plant dryer (provides even, low heating without scorching/burning/cooking specimens)

#### *Plant Mounting Equipment and Supplies*

- California-style heavy duty 100% rag, acid-free herbarium sheets (11-1/2x16-1/2x.015' White)
- Prepared herbarium labels (100% rag, acid-free)
- Fragment folders (different sizes; 100% rag, acid-free), for loose material such as fruit
- White glue
- Plexiglass sheet (¼ inch thick, at least 33 X 46 cm [13 X 18 inches])
- Paint brushes 5-cm, 2.5-cm, 0.6-cm (2-in, 1-in, 0.25-in)
- Wax paper
- Weights (sandbags, small weights, or reinsert into plant press and dry in dryer or leave in air-conditioned room)
- Water bottle
- Technical pens to create labels
- Waterproof ink for pens
- Print-making roller

### *Plant Storage Equipment and Supplies*

- Missouri Botanical Garden genus covers (16-1/8 x 24 inches, scored twice and folded to 16-5/8 x 11-1/2 inches with 1 inch spine)
- Species folders - acid-free (Caliper .006, 16-1/2 x 23-1/8 inches; scored once in the center and folded to 16-1/2 x 11-9/16 inches)
- Insect pest sticky traps
- Hanging traps
- Insect pheromone inserts for hanging traps
- Humidity indicator strips
- Freezer, large enough to accommodate mounted plant specimens
- Herbarium specimen case
- Cardboard spacers/ventilators to carry specimens

### **Corridor Survey Equipment** (See SOP #8 “Conducting Corridor Surveys”).

- Checklists of plant species (per ecological zone, if available) and additional target species list
- Map of corridors to survey
- Corridor survey data forms
- Pencils or pens
- Compass
- Global Positioning System (GPS) unit with batteries (see GPS list above) or tablet with GPS capability
- Digital Camera with batteries and memory card (see camera list above) or tablet with camera capability
- Extra batteries for electronics
- Binoculars
- Reference materials, as needed
- Plant collecting supplies (See plant collection equipment list above)
- 2 Radios, two-way (safety and communication between crew members)
- Spare radio batteries
- Cell-phone (recommended)
- First Aid Kits, one per person
- Safety Equipment, one per person. This may include but are not limited to: safety glasses, emergency blankets, matches/lighters, extra clothes, and other personal protective equipment.