Invasive Plant Phenology Site Selection Protocol

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Project Coordinators: Elizabeth Spinney, FPR; Lina Swislocki, FPR

Project Phase 1 of 2 – Establish Monitoring Sites

Overview:

We are working to establish study areas across VT to monitor the status and intensity of phenophases for invasive plants as part of a long-term study. Each study area will have monitoring sites specific to the target species we're monitoring (one site for *Lonicera,* one site for *Rhamnus,* one site for *Celastrus*) (**Fig. 1**). The study areas are representative of the environmental conditions for the area at large. As a baseline, we have decided to locate a given study area within the existing boundaries of Vermont's Fire Danger Rating Areas (FDRAs). The following are the selected study areas (SA) that need to have sites established:

- SA1 – Lake Bomoseen State Park, Castleton
- SA3 – Ethan Allen Homestead, Burlington
- SA4 – Audubon IBA, Huntington
- SA5 – St. J. Academy Field Campus, Danville

Who's involved:

- Study area leads: If you are reading this protocol, you've been identified as a study area lead. For Phase 1, you are responsible for setting up sites and individual plants for observation.
    - SA1 – Lisa Thornton (FPR)
    - SA3 – Lina Swislocki (FPR)
    - SA4 – Elizabeth Spinney (FPR)
    - SA5 – Kathy Decker (FPR)
- Project Coordinators: If you have questions or concerns, please reach out to project coordinators (listed above)

Target species* we will be observing are:

Honeysuckle *Lonicera morrowii* **

Buckthorn *Rhamnus cathartica*

Bittersweet *Celastrus orbiculatus*

*Each species listed above is hyperlinked to a species profile page. For more information about identifying these specific species, refer to the training resources on the project webpage: https://vtinvasives.org/vermont-invasive-plant-phenology-project

**You will observe *Lonicera* phenology even if you are unsure what species it is. The method we'll use will be described in the Monitoring protocol in more depth, but essentially, you'll use paper datasheets until you are able to identify the species, then transcribe data into database with positive ID.

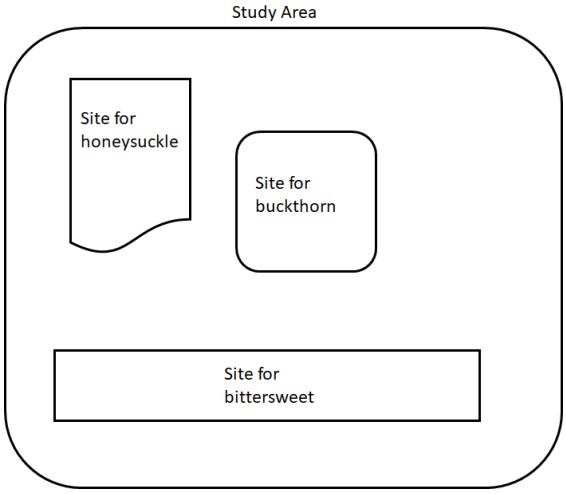

Figure 1. Diagram showing how a given study area will have monitoring sites specific to the target species we're monitoring (one site for *Lonicera,* one site for *Rhamnus,* one site for *Celastrus).*

Workload:
In Phase 1, monitoring sites need to be established within the selected study areas. As a study area lead, you will select site location and specific individual plants to monitor. This will require time spent: traveling to the study area; assessing the study area for locations of the three target invasive plant species; selecting and collecting location data for each site; and for each site collecting location data for each individual plant; physically tagging 2-3 individual plants with the data provided below.

Criteria for Site Selection:
Within a study area:

1. Assess the study area and locate each of the three target species to be observed.
2. You will create 3 sites – one site for monitoring each of the three target species (**Table 1**).
    a. Each site should be its own distinct area
        i. A site can have more than one species present, but the observations will only be made for one species per site.
    b. A site should be accessible and convenient to you because you and the other observers for your study area will need to visit it frequently (at least weekly). If it is easy to get to, or you already visit it often, you will be more likely to collect data on a regular basis.
    c. A site should be no more than 15 acres, ex: pick individual *Lonicera* plants that are closer together, but if needed, can be acres apart (but the total area of the site should not exceed 15 acres).
    d. All sites should be within the pre-selected study areas, where we already have permission from the landowners/managers to be present and collect observations.
    e. Record the location data for each of the 3 sites, including descriptive boundaries in the notes. Share this data with project coordinators.
        i. Be as creative as you like with capturing location – draw on a physical or digital map, take a waypoint, take notes and find it on Google Earth. The important factor is that you and others can return to the exact same spot and exact same plant each time. **Click here for a video** showing how to use your smart phone to take coordinates.
        ii. Click here for a video showing how project coordinators will be creating each of the sites once you collect and share the site location data
        iii. Useful information to record includes:
            1. Lat/Long & nearest street address
            2. Rough estimates to the following questions:
                a. Degree of development surrounding the site
                b. Forested? Field? Farmland? Meadow? Landscaped area? Something else?
                c. How close is nearest paved or maintained dirt road (for vehicles)?
                d. How close is the nearest permanent body of water?
                e. What is the area of the site?
                f. If trees at site, what is the dominant tree overstory (deciduous/coniferous/mix/other)?
                g. Is site near a slope? (y/n)
                    i. If near a slope, is it: on top or on a ridge/in the middle/at base or in valley between slopes?
                    ii. If near a slope, what direction does slope face?

Table 1. There will be three monitoring sites for each study area. The numbering system corresponds to a specific species, so for any given study area, site 1 will always be *Lonicera*, site 2 will always be *Rhamnus*, and site 3 will always be *Celastrus*.

	Within FDRA1	Within FDRA3	Within FDRA4	Within FDRA5
Study areas (1-5)	"SA1"	"SA3"	"SA4"	"SA5"
Species				
Lonicera morrowii	1-1	3-1	4-1	5-1
Rhamnus cathartica	1-2	3-2	4-2	5-2
Celastrus orbiculatus	1-3	3-3	4-3	5-3

Once you have decided on your site, within each site you will:

1. Select 1-3 (one to three) individual plants of the target species.
    a. At least two individual plants is preferred, but if only one is present that is OK.
        i. This is to account for any microclimates and variability between individuals
    b. Avoid picking say, a *Lonicera* and a *Rhamnus* that are immediately adjacent to each other. They each get their own site
    c. Use the provided materials and physically tag each of the 2-3 individual plants of the target species with their plant "nickname" (**Fig. 2**).
2. Record the location data for each of the 2-3 individual plants of the target species, including descriptions that will make it easy for other observers to return to the same individual plant. Share your recorded location data for sites and plants with project coordinators in a timely fashion so that the location data can be entered into the project and observers can start observations.
    a. Useful information to record includes:
        i. Lat/Long
        ii. Photograph of plant

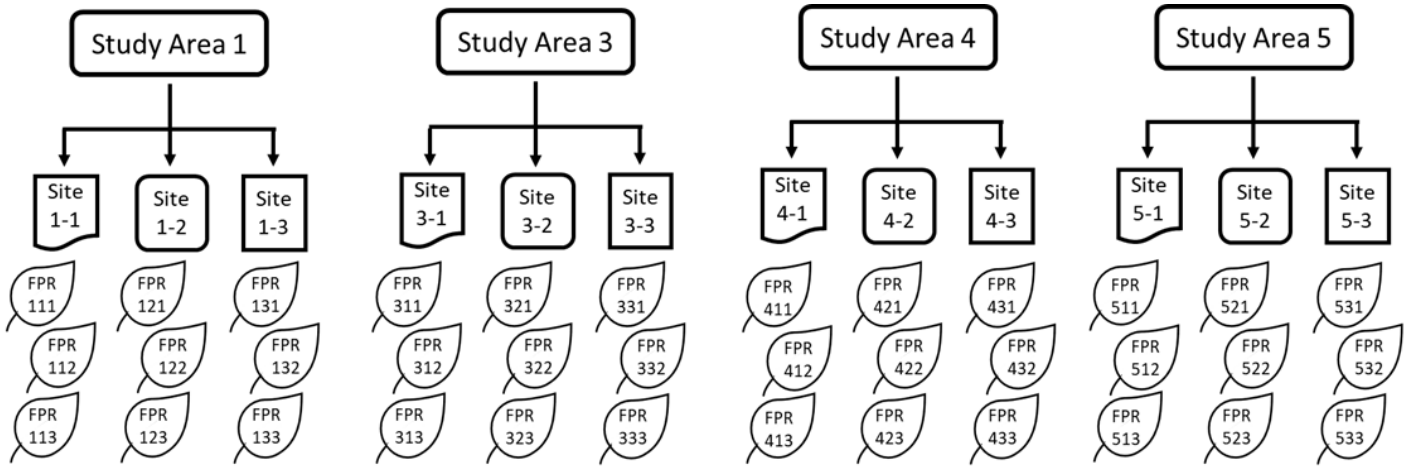

Figure 2. Plant nicknames are determined by their location. The study areas are numbered 1-5, each study area has 3 monitoring sites (ex: study area 1 has sites 1-1, 1-2, and 1-3), and each site has 2-3 individual plants of a given target species (ex: study area 1, site 1-1, has 3 individual plants, 111, 112, and 113). This allows us to look at the data and quickly know which study area, site, or specific plant it corresponds to.

Site Selection Checklist:

- ❑ Study area assessed and locations of three target species found
- ❑ Site 1 of 3 selected - *Lonicera*
    - Site is accessible and convenient
    - Site is no more than 15 acres, and within study area, and on land we have permission to be on
    - Location data for site has been recorded
    - 1-3 individual plants physically tagged
    - Location data for each tagged plant has been recorded
- ❑ Site 2 of 3 selected - *Rhamnus*
    - Site is accessible and convenient
    - Site is no more than 15 acres, and within study area, and on land we have permission to be on
    - Location data for site has been recorded
    - 1-3 individual plants physically tagged
    - Location data for each tagged plant has been recorded
- ❑ Site 3 of 3 selected - *Celastrus*
    - Site is accessible and convenient
    - Site is no more than 15 acres, and within study area, and on land we have permission to be on
    - Location data for site has been recorded
    - 1-3 individual plants physically tagged
    - Location data for each tagged plant has been recorded
- ❑ Location data for each site and plant are recorded
    - Metadata like descriptive boundaries are recorded
    - It will be easy for other observers to use this data to return to the exact same spot and plant
- ❑ Location data is shared in a timely fashion with project coordinators
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