NADP Mercury Litterfall Network (MLN)
Site Operator Instructions

1. Study plot location

The NADP site sponsor and site operator will consult with the NADP site liaison when selecting the location for the forest study plot to assure it is representative of the forest land cover near the NADP Mercury Deposition Network (MDN) or Atmospheric Mercury Network (AMNet) site. The center of the sample plot should be less than 300 m (984 ft) from the MDN or AMNet collector. The study plot should have the same tree species and tree age as most of the forest land around the NADP site. While colocation with MDN or AMNet is preferable, it is not a requirement.

For example (figure 1), if the majority of the natural forest land cover in the vicinity of the site is deciduous oak-hickory forest, but a stand of planted white pine is also nearby, the forest study plot should be located in the oak-hickory forest, not the white pine stand. Similarly, if the majority of the natural forest land cover in the vicinity of the site consists of mature trees that are mostly greater than 12 inches in diameter at eye level, but a stand of immature trees of the same species that are mostly less than 4 inches in diameter at eye level is also nearby, the forest study plot should be located among mature trees, not in the stand of immature trees. The forest study plot should be located where it is unlikely to be disturbed by foot and vehicle traffic and should be away from game trails.

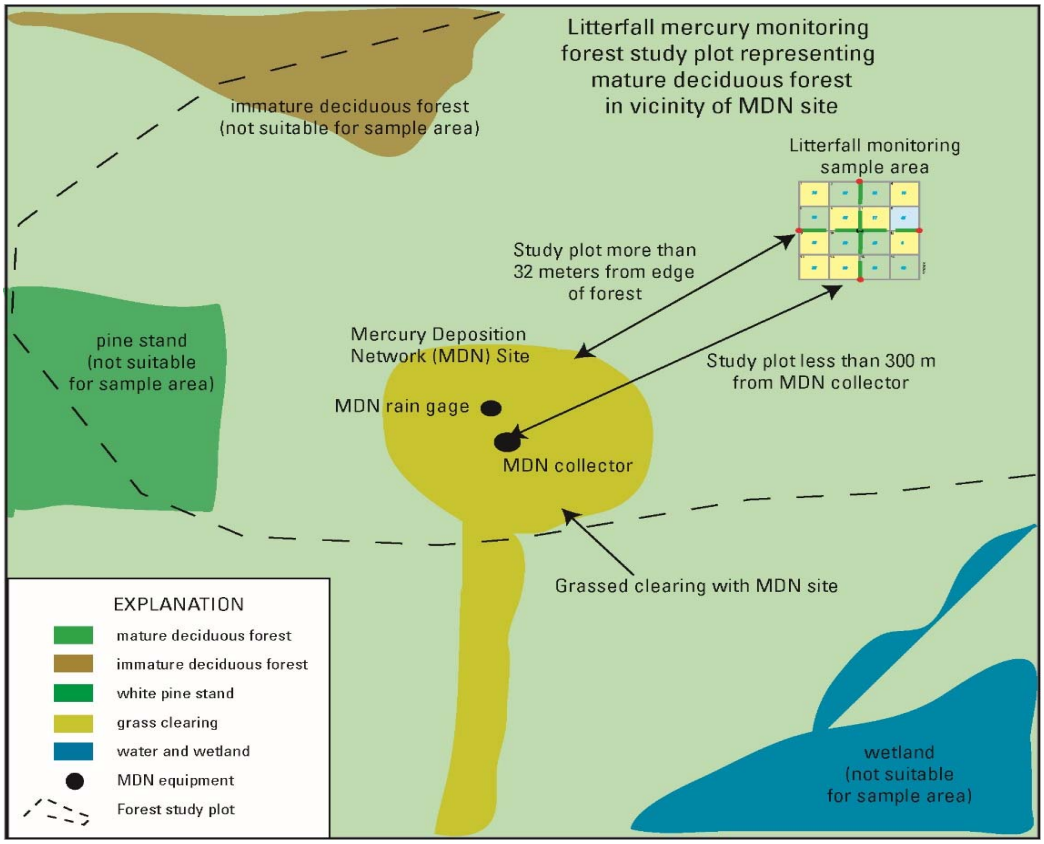

Figure1. Example of forest study plot at an NADP site.

2. Sample Area

Note that the sample area should be more than 32 m from the edge of the forest study plot and should not include a creek, gulley, ravine or other feature of uneven terrain. It should be an area with relatively homogeneous terrain.

The 4 litterfall collectors will be deployed in a 16-m by 16-m sample area within the forest study plot. The collectors will be deployed in 4 of the 16 cells in the sample area (figure 2). A random selection method will be used to determine which of the 4-m by 4-m cells will receive the collectors. Designation of collector locations will be shared with site operators each year ahead of the litterfall season.

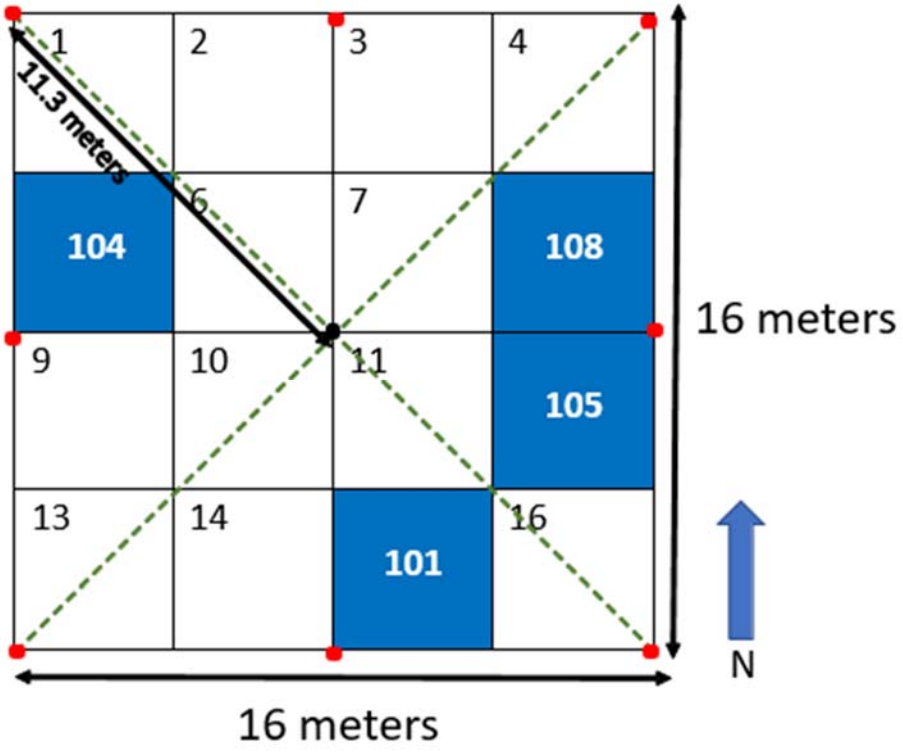

Figure 2. Diagram of litterfall sample area with example collector locations marked in blue.

3. Sample Area Set Up

If you have participated in the Litterfall Network previously, your sample area may already be set up. If you are a first time participant, or you need to re-define your sample area follow the steps below using the supplies provided in the sample kit (11.3m pre-measured line on two stakes and marked with a ribbon at the 8m mark, 8 marker flags). Site operators should keep these supplies at the end of the season for marking the plot in the next season.

1. Select center point of sample area, such as a prominent tree that can serve as a future reference mark.

2. Stretch full length of 11.3m line to corner of area and set a flag.
3. Repeat step 2 for other three corners of area and set three more flags.
4. Mark the distance from the center of the sample area to the middle of each side by using the 8m distance labeled with a ribbon on the line.
5. Set a flag in the middle of each side.

4. Sample collectors

The 4 litterfall collectors are intended to passively collect litterfall falling to the forest floor. Each collector consists of a plastic mesh crate lined with a fine mesh net. The size is 0.25 m^2 and has 17.8 cm side walls. Each collection bin has a unique ID number marked in several places.

5. Placement of sample collectors

The locations for the 4 sample collectors in the sample area are randomly selected for each forest study plot. Site operators will receive a list each year with the assigned random numbers for their site.

Figure 2 shows an example where the collector number sequence is 101, 104, 105 and 108. The 101 collector is located in sub-plot 15 and the collector 108 is located in sub-plot 8. Typically, a collector will be placed somewhere within the assigned cells using observational judgement based on stake flag locations to properly locate the collector. A collector should not be placed in a cell if thick understory or fallen limbs would obstruct litterfall from entering the collector or if the terrain would prevent the collector from sitting level. Use the nearest unoccupied cell in these cases. In summary:

1. Consult the diagram of the sample area plot (Figure 2). Orient the top of diagram north.
2. You will be provided with 4 random cells in which to place your collectors.
3. Estimate the location of the cells in the sample area based on flag placement and deploy the collectors.
4. If the area is obstructed in a cell, move collector to nearest adjacent unoccupied cell.

Typically, the litterfall collectors are deployed on a Tuesday. Complete block 6 of the field form included in the kit at the time the collectors are deployed.

6. Sample collection

Litterfall samples will be retrieved once every 4 weeks on a Tuesday. Depending on the latitude and altitude of the NADP site, the length of the litterfall sampling season will require that samples will be collected 2 or more times at 4-week intervals until the leaf drop ends.

a. The sample kit contains a pre-assigned shipping pouch for each 4-week retrieval (#1 for the first 4-week sample, #2 for the second 4-week sample, etc).

b. Each pouch contains a sample field form, a set of gloves, and 4 Ziploc bags.
c. The Ziploc bags have been pre-label with the ID numbers that correspond with the numbers on the litterfall collectors at the site.
d. Take the appropriately labeled pouch for the retrieval to the sample area.
e. Put on the gloves, remove the empty Ziploc bags, match the collector number to the label on the bag and empty the contents of the collector into the Ziploc bag using a gloved hand to transfer the litterfall. Expel the air from the Ziploc bag and seal firmly.
f. Wet litterfall samples can be submitted. Avoid including substantial amounts of frozen precipitation or sticks greater than ~1/2 cm in diameter.
g. Put the empty collector bin back in its cell in the sample area.
h. If a bin is empty upon retrieval, send the empty Ziploc bag back to the lab.
i. Place all four Ziploc bags back into the pouch.
j. Figure 3 has a series of photographs showing the sample collection procedure.

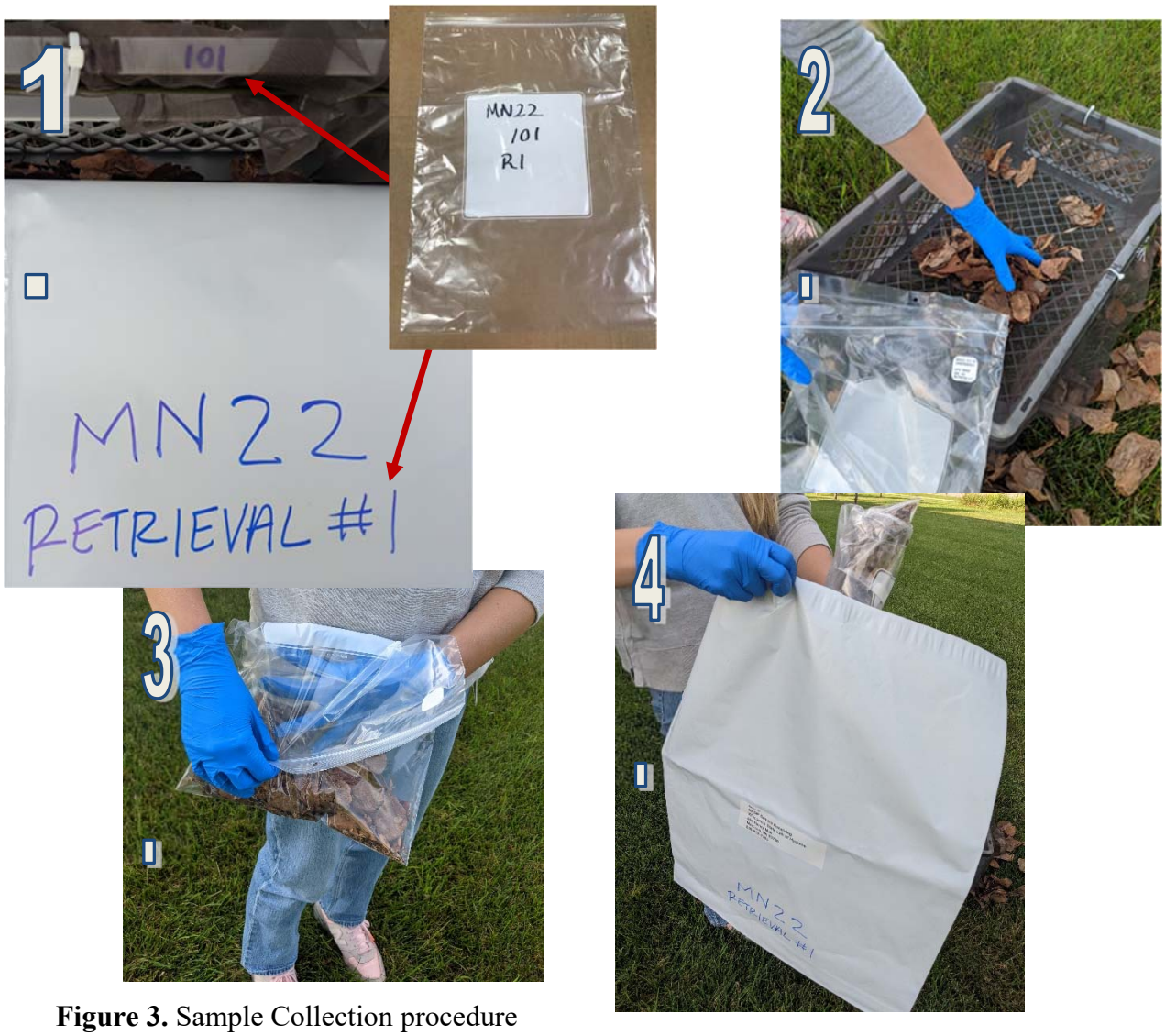

Figure 3. Sample Collection procedure

7. Sample field form

A sample field form, included in the kit, should be used for recording information about each of the 4-week litterfall sample retrievals. Include the white copy of the completed form in the pouch with each set of samples shipped to NADP. Retain the blue copy for the site records. See Figure 4.

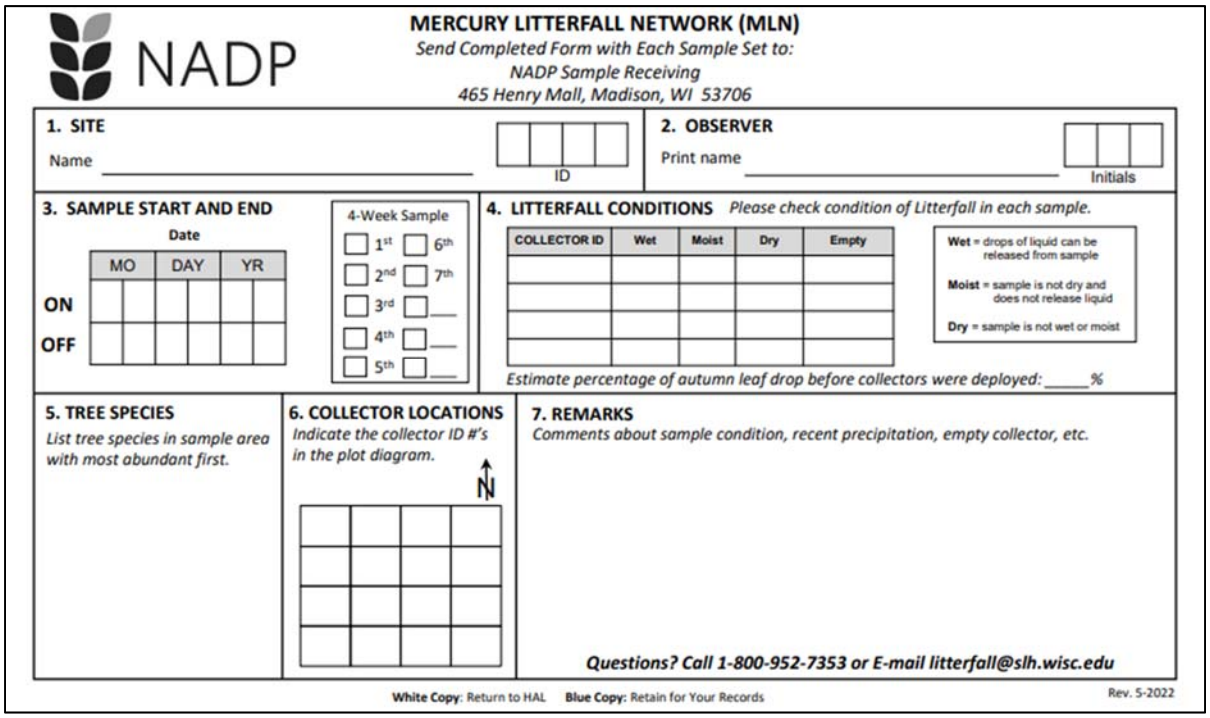

Figure 4. Image of sample field form

8. Shipping

Each retrieval pouch should be shipped back to NADP Sample Receiving once collected. The cost for shipping samples (and litterfall collectors at end of season) is the responsibility of the site sponsor. The shipping address is listed below. Alternatively if there is a collocated MDN site, the pouch can be shipped in the MDN cooler box. If a pouch cannot be shipped immediately, store it in a refrigerator or freezer until you are able to ship it.

Ship to:

NADP Sample Receiving
465 Henry Mall
Madison WI, 53706