Burn Severity Lab Experiment (BSLE) Vegetation Collection Protocol

Pacific Northwest National Laboratory River Corridor Science Focus Area – Research Campaign 3

Purpose: Gather vegetation common to the American West to provide material for burn experiments to analyze how resultant pyrogenic organic matter chemistry differs across fire burn severities.

Targeted Species:

Gymnosperm Trees

- Pseudotsuga menziesii (Douglas Fir)
- Pinus ponderosa (Ponderosa Pine)

Angiosperm Shrubs

- Artemisia tridentata (Big Sagebrush)

Collection Procedure (for collaborators):

Goal: to have at least two lawn bags (one filled with living vegetation and one filled with dead vegetation) per plant species.

Supplies:

- 30 gallon lawn bags
- Isopropyl prep pads
- Peel n stick label sheet
- Data recording sheet
- Plant Identification guide
- Collection Directions
- Size large nitrile gloves
- Standard clipping/pruning shears (feel free to use whatever is most accessible)
- Stapler
- Permanent marker
- Gardening gloves
- Small rake

Pre-Collection Prep:

1. Identify and locate which target plant species you will be collecting vegetation from.
2. Label the lawn bags with label stickers.
    a. Write in permanent marker on each label 1) plant species common name, 2) dead or living material and 3) date of collection.

i. Ex: **Douglas Fir Dead 02/01/2021; Douglas Fir Living 02/01/2021**

ii. ***Note**: Sagebrush species do not need to be separated into dead and living*

b. Stick the label on the front of the bag. Feel free to write the label directly on the back & sides of the bag.

3. Sterilize & clean clipping/pruning shears
    a. Be sure rakes and shears are clean of previous debris
    b. With gloves on, open an isopropyl alcohol prep pad and wipe down blades of shears thoroughly.
    c. If necessary, wipe down rake teeth with another prep pad
4. Record data on provided recording sheet:
    a. Time of collection
    b. Sample location (provide lat & long coordinates if possible)
    c. Photograph plant(s) which are being collected from
    d. Note date of last rainfall (if known), current moisture amount (i.e, are branches covered in water, damp to the touch, or dry), and ambient weather conditions

<u>Vegetation definitions:</u>

- Branch = any woody material ~1.5-6cm in diameter
- Twig = woody material <1cm in diameter
- Litter = brown/dead leaves or needles of specific plant species

<u>Collection Process for Gymnosperm Trees Plant Species (Douglas Fir or Ponderosa Pine)</u>

1. With gloves fill the lawn bag labeled “living” with a variety of still living branches, needles, and twigs.
    a. Clip off living branches from the tree no thicker than the shears allow. Snip or break into shorter sections as necessary to fit into the lawn bag.
    b. Keep all needles/twigs attached to the branch when placing into the bag.
    c. Continue to clip branches of various thickness from the tree until the bag is close to full. Leave enough room to fold the top over several times.
2. With gloves fill the lawn bag labeled “dead” with a variety of dead branches, twigs, and littered needles

a. Assess the ground around the base of the tree for any dead/brown needles or twigs. Using gloved hands (and a rake), gather the littered material and place into the lawn bag.
b. Clip any brown branches or needles noticed still attached to the tree and put into the lawn bag.
c. ***Note**: Feel free to sample from multiple trees in the area of the same species if needed to fill up the bags. If material seems abundant, more than just two lawn bags can be collected. Be sure to always keep dead and living material separate and to not mix plant species within one lawn bag.*

3. Tightly fold the lawn bags opening over 4-5 times. Staple across the top to securely seal the bag.
4. Record the type of material collected on the data sheet.

Collection Process for Angiosperm Plant Species (Big Sagebrush)

1. Fill the lawn bag labeled with a variety of branches, twigs, and leaves.
    a. Clip off branches from the bush, ranging from 1-7cm in diameter (or as thick as the shears allow). Snip or break into shorter sections as necessary to fit into the lawn bag.
    b. Keep all leaves/twigs attached to the branch when placing into the bag.
    c. Continue to clip branches of various thickness from the bush until the bag is close to full. Leave enough room to fold the top over several times.
2. Tightly fold the lawn bags opening over 4-5 times. Staple across the top to securely seal the bag.
3. Record the type of material collected on the data sheet.

Drop Off Immediately after Collection:

1. Staple finished recording sheet to top of lawn bag.
2. Bring full lawn bags to PNNL Richland campus. Prepare for shipment to PNNL Sequim campus.
3. Thank you so much for your generous contributions!

Shipping/Storage Procedure:

Shipping Immediately after Collection:

1. With packing tape, seal the top of the bag shut to ensure no material will come out
2. Place bags into large cardboard box shipping containers.

3. Ship to PNNL MCRL address via FedEx for drying & storage

Storage:

1. Place lawn bags in an open, warm, well-ventilated room such as a shed, garage, or greenhouse.
2. Spread out vegetation contents from bag onto a cleaned tarp in an even layer
3. Turn materials over on tarp with a clean stake every few days to make sure nothing molds and is well ventilated.
4. Wait 1-2 weeks. Once material is completely air-dried place into a clean paper lawn bag and store in a well-ventilated room until time of burns.