Harvard LTER Schoolyard Program

Lesson Title: Student Sheets for Buds, Leaves Project Quadrat Study
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School: Belchertown High School
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Buds, Leaves and Global Warming Quadrat Study Templates and Lesson plan on next 6 pages....
BHS BLG Quadrat Study

Tree # _____ species __________________ Group Leader ___________________________
Recorder(s)_____________________________________

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Mark the plot perimeter: sticks, measuring tape
   Set sticks – 3meters (~10') to a side - around your plot area by running the measuring tape around the area with your tree close to the middle of the left edge, except for Tree #2 – right edge

Site map/Overhead/Birds-eye-view sketch: Grid paper, rulers, clipboard, model
   On the left edge of the grid paper (right for Tree 2), draw your tree as a scale-sized circle (by dbh) and mark the tree number inside the circle. Also measure/estimate the large trees, small trees, saplings and shrubs. Fill in the information about structures to the North and South.

Vertical map/Landscape sketch: graph paper, rulers, clipboard, model
   Draw your study plot as you see it from ground level. Clearly mark your tree and include labels for canopy, substory, understory, and groundcover. Include and label any dead trees, rocks, and logs, or manmade (permanent) structures. Report to your group leader when you are done.

Age (dbh) class analysis: dbh tape
   Use the dbh tape and measure your tree at approximately 4 ½ feet above the ground, report the dbh to the Site map team. Count how many Saplings (1-4in dbh), Poletimber(5-7in dbh), and Sawtimber(8+in dbh) trees are in your plot. Report to the group leader.

Study tree and Sawtimber (10+ in) dbh and height: dbh tape, tape measure, clinometer, meter stick
   With the dbh tape measure the dbh and height of all of the sawtimber trees

Canopy cover: canopy cover tube, calculator
   On a corner-to-corner diagonal, look straight up through the canopy cover tube(it’s really a toilet paper tube!) every 1 meter and record whether the sky is clear(0%), obstructed(50%), or fully covered(100%). Calculate the average canopy cover as a percentage for all of your measurements (don’t leave out the zero’s!!) Report to the group leader.

Ground cover density: a sharp eye
   Walk around the plot to determine the types of groundcover in your quadrat and estimate the percent of each type of ground cover – use your best judgement. Report to the group leader.

Observe evidence of wildlife & Observe wildlife directly:
   Keep your eyes open! Report to the group leader

Wind speed, desiccation & Open skies: Beaufort scale
   Use the Beaufort scale to estimate the intensity and direction of the wind.
   Estimate/predict the desiccating (drying) effects of the wind at this location
   Examine the area to determine the direction from which your tree gets the most light.

Air and soil temperatures: Soil thermometer
   Hold the thermometer still, in the shade, for the air temp.
   Insert the thermometer 3 inches into the ground for soil temp. Report to the group leader

Relative humidity: Spark device, weather probe
   Use the Spark Weather probe. Report to the group leader

Light intensity: camera, calculator
   Use the camera to measure the light intensity in all four directions from the center of the plot.
   Take a picture, switch to Playback, press display twice.
   On the bottom of the screen reads a red A and F3.3, then a fraction... multiply the denominator
of the fraction by the ISO (ex 1/30 and ISO 300 ... multiply 30 x 300 = 900) that’s your estimate of light intensity. Average the 4 light intensities.

Mark the plot perimeter: sticks, measuring tape

Set sticks – 3meters (~10’) to a side - around your plot area by running the measuring tape around the area with your tree close to the middle of the left edge, except for Tree #2 – right edge

Site map/Overhead/Birds-eye-view sketch: Grid paper, rulers, clipboard, model

On the left edge of the grid paper (right for Tree 2), draw your tree as a scale-sized circle (by dbh) and mark the tree number inside the circle. Also measure/estimate the large trees, small trees, saplings and shrubs. Fill in the information about structures to the North and South.

Vertical map/Landscape sketch: graph paper, rulers, clipboard, model

Draw your study plot as you see it from ground level. Clearly mark your tree and include labels for canopy, substory, understory, and groundcover. Include and label any dead trees, rocks, and logs, or manmade (permanent) structures. Report to your group leader when you are done.

Age (dbh) class analysis: dbh tape

Use the dbh tape and measure your tree at approximately 4 ½ feet above the ground, report the dbh to the Site map team. Count how many Saplings (1-4in dbh), Poletimber(5-
7 in dbh), and Sawtimber (8+ in dbh) trees are in your plot. Report to the group leader.

Study tree and Sawtimber dbh and height: dbh tape, tape measure, clinometer, meter stick
   With the dbh tape measure the dbh and height of your Study Tree & all of the sawtimber (10+ in) trees

Canopy cover: canopy cover tube, calculator
   On a corner-to-corner diagonal, look straight up through the canopy cover tube (it’s really a toilet paper tube!) every 1 meter and record whether the sky is clear (0%), obstructed (50%), or fully covered (100%). Calculate the average canopy cover as a percentage for all of your measurements (don’t leave out the zero’s!!) Report to the group leader.

Ground cover density: a sharp eye
   Walk around the plot to determine the types of groundcover in your quadrat and estimate the percent of each type of ground cover – use your best judgement. Report to the group leader.

Observe evidence of wildlife & Observe wildlife directly:
   Keep your eyes open! Report to the group leader

Wind speed, desiccation, & Open skies: Beaufort scale
   Use the Beaufort scale to estimate the intensity and direction of the wind.
Estimate/predict the desiccating (drying) effects of the wind at this location. Examine the area to determine the direction from which your tree gets the most light. Report to the group leader.

Measure plot perimeter: sticks, string
Set the sticks 10’ apart in the area marked off in the classroom, tie the string to your sticks, leaving one corner open. Set up your plot area by inserting the sticks into the ground, with your study tree no closer than 3 feet from one corner (3 feet from that one stick), and being sure to include the edge of the wooded area.

Overhead sketch: Graph paper, rulers, clipboard, model
On graph paper, start with a 20x20cm square and sketch in the large trees, small trees, saplings and shrubs, following the model. Draw a key and a scale directly on the graph paper.

Vertical structure sketch: graph paper, rulers, clipboard, model
Draw a representative “slice” of your study plot, following the model like a landscape, with labels for canopy, substory, understory, and groundcover. Include and label any dead trees.

Age (dbh) class analysis: dbh tape
Use the dbh tape. Count how many Saplings (1-4in dbh), Poletimber(5-9in dbh), and Sawtimber(10+in dbh) trees are in your plot.

Study tree and Sawtimber dbh and height: dbh tape, tape measure, clinometer, meter stick
With the dbh tape measure the dbh and height of your Study Tree & all of the sawtimber (10+ in) trees

Air and soil temperatures: Soil thermometer
   Hold the thermometer still, in the shade, for the air temp.
   Insert the thermometer 3 inches into the ground for soil temp.

Relative humidity: Spark device, weather probe
   Use the Spark Weather probe

Canopy cover: canopy cover tube, calculator
   On a corner-to-corner diagonal, look straight up through the canopy cover tube (it’s really a toilet paper tube!) every 5 feet and record whether the sky is clear (0%), obstructed (50%), or fully covered (100%). Calculate the average canopy cover as a percentage for all of your measurements (don’t leave out the zero’s!!)

Light intensity: camera, calculator
   Use the camera to measure the light intensity in all four directions from the center of the plot. Take a picture, switch to Playback, press display twice.
   On the bottom of the screen reads a red A and F3.3, then a fraction… multiply the denominator of the fraction by the ISO (ex 1/30 and ISO 300 … multiply 30 x 300 = 900) that’s your estimate of light intensity. Average the 4 light intensities.

Wind speed: Beaufort scale
   Use the Beaufort scale to estimate

Ground cover density: a sharp eye
   Walk around the entire plot to estimate the ground cover density as a percentage

Observe evidence of wildlife
   Keep your eyes open!
Observe wildlife directly
Keep your eyes open!!