



LEAF: Learning About Forests

POST-ACTION AUDIT, GRADES 3-5

Consider contacting a local non-profit, business, government agency, college or university. Their involvement is a great way to connect to the community, inspire students, demonstrate career possibilities and share resource expertise. If you cannot conduct a study in the field please determine the best way to gather data, i.e. a phone call, an email or ideally a virtual conferencing tool with someone who works as a forester, forest ecologist, landscape architect, park planner, volunteer, etc. Contact your state forest service office for resource specialist contacts, resources or recommendations.

Invite parents and community members to participate in the auditing process. Students can take on the role of educator by working with volunteers on citizen science. This experience is a great way to build community.

Did the team/class work with any resource specialists and/or volunteers? _____ Yes _____ No
If yes, please list.

Using the same sample group as in the baseline audit, conduct the survey again post action plan implementation. Insert the average response. On a scale from 1-10, 10 being the most important and 1 being the least important,

- How important are trees to plants and animals? _____
- How important are trees to an ecosystem? _____
- How important are a school's actions to forest conservation and stewardship? _____

REQUIRED DASHBOARD METRICS

1. What is the total worth, in dollars, of the trees in the forest study site? _____



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TABLE 1. DEFINING THE STUDY SITE

<p>1. Confirm the GPS coordinates for the forest study site, by comparing them to your coordinates in the baseline audit. Use your smartphone's GPS or go to: https://www.whatsmygps.com to find the coordinates.</p>	<p>Latitude N _____ Longitude W _____</p>
<p>2. Is the study site being actively managed? If yes, for what? Check all that apply.</p>	<p>() Yes () No () Timber () Firewood () Wildlife Habitat</p>
<p>3. How many trees are in the forest study site?</p>	<p>() A few (less than 5) () Some (between 6 and 12) () Many (more than 12) () Exact number if known _____</p>
<p>4. If there are dead trees on the study site, count the number of standing fallen dead trees.</p>	<p>_____ N/A _____ Standing dead trees (snags) _____ Fallen dead trees (logs)</p>
<p>5. What types of trees are found in the study site?</p>	<p>() Deciduous () Evergreen () Mixed</p>
<p>6. How is land used surrounding the study site? Check all that apply.</p>	<p>() Residential () Park or Public Green Space () Commercial () Undeveloped Land</p>



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CHART 1. TREE SPECIES DATA

Reassess the 5 trees from the baseline audit and complete Chart 1. If needed, refer to the Forest Study Site Measurement Guide.

Tree Species	Deciduous (D) or Evergreen (E)	Age Sprout, Seedling, Mature, or Snag	Tree Height in Feet	Tree Diameter (DBH) in Inches
Example: Sugar Maple	D	Mature	17	28
#1				
#2				
#3				
#4				
#5				

Think about the following questions as you summarize the information in Table and Chart 1.

1. What changed in and/or around the forest study site between the baseline and post-action audit or between audit years?
2. Since the action plan was implemented, has tree biodiversity improved?



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TABLE 2. WEATHER

1. Identify the season during which data is being collected.	<input type="checkbox"/> Summer <input type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring
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Think about the following question as you summarize the data in Table 2.

1. How is the season's weather different from the weather during the baseline audit?
2. How do the trees look different during the post-action audit than they did during the baseline audit.
3. Have there been any extreme weather events since the baseline audit?

TABLE 3. WATER QUALITY

1. Did the team/class conduct water quality tests in the baseline. If yes, conduct the following water quality tests.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. pH Test 1 _____ pH Level Test 2 _____ pH Level Test 3 _____ pH Level <input type="checkbox"/> Acidic <input type="checkbox"/> Neutral <input type="checkbox"/> Basic	3. Temperature Test 1 _____ °F _____ °C Test 2 _____ °F _____ °C Test 3 _____ °F _____ °C
4. Conductivity (optional) Test 1 _____ μS/cm Test 2 _____ μS/cm Test 3 _____ μS/cm	5. Dissolved Oxygen (optional) Test 1 _____ mg/L Test 2 _____ mg/L Test 3 _____ mg/L



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TABLE 4. SOIL QUALITY

1. Soil Temperature <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">At 5 cm</td> <td style="width: 50%; text-align: center;">At 10 cm</td> </tr> <tr> <td style="text-align: center;">_____ ° F _____ ° C</td> <td style="text-align: center;">_____ ° F _____ ° C</td> </tr> <tr> <td style="text-align: center;">_____ ° F _____ ° C</td> <td style="text-align: center;">_____ ° F _____ ° C</td> </tr> <tr> <td style="text-align: center;">_____ ° F _____ ° C</td> <td style="text-align: center;">_____ ° F _____ ° C</td> </tr> </table>		At 5 cm	At 10 cm	_____ ° F _____ ° C	_____ ° F _____ ° C	_____ ° F _____ ° C	_____ ° F _____ ° C	_____ ° F _____ ° C	_____ ° F _____ ° C	2. Soil pH Test 1 _____ pH Level Test 2 _____ pH Level Test 3 _____ pH Level () Acidic () Neutral () Basic	
At 5 cm	At 10 cm										
_____ ° F _____ ° C	_____ ° F _____ ° C										
_____ ° F _____ ° C	_____ ° F _____ ° C										
_____ ° F _____ ° C	_____ ° F _____ ° C										
3. Soil Consistence () hard () loose () firm () plastic and sticky		4. Soil Color A. () dark () light B. () brown with yellow hues () brown with grey hues () brown with green hues () brown with blue hues									
5. Nitrogen (N) (optional) Test 1 () Low () Medium () High Test 2 () Low () Medium () High Test 3 () Low () Medium () High	6. Phosphorus (P) (optional) Test 1 () Low () Medium () High Test 2 () Low () Medium () High Test 3 () Low () Medium () High	7. Potassium (K) (optional) Test 1 () Low () Medium () High Test 2 () Low () Medium () High Test 3 () Low () Medium () High									

Think about the following questions as you summarize the data in Table 3 and 4.

1. Review why it is important to observe and test water and soil quality near tree systems?
2. What connections did students identify between soil quality and tree health?



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TABLE 5. WILDLIFE - GENERAL

1. Are there animals present at the forest study site?	() Yes () No
2. Did students see animals in the following families? Check all that apply, then fill in Chart 2. Wildlife-Animal Observations.	<p>___ mammals ___ birds</p> <p>___ insects ___ reptiles</p> <p>___ amphibians</p>
3. Did you observe other plant types, besides trees, at the study site?	() Yes () No
4. Did students see plants from the following groups? Check all that apply, then fill in Chart 3. Wildlife-Plant Observations.	<p>___ bushes ___ grasses</p> <p>___ wildflowers ___ ferns</p> <p>___ mosses ___ other (fungi)</p>

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CHART 2. WILDLIFE – ANIMAL OBSERVATIONS

Allow students opportunities to practice identifying what wildlife species they are observing. For example, is the bird a Robin or a Black-throated blue warbler? Is the squirrel a red or a gray squirrel? Often the type of wildlife you find in the study site will help to define the health and the type of forest.

Birds, Mammals, Insects, Reptiles, Amphibians	# of Animals Observed	Animal Evidence (tracks, burrows, nests, droppings, etc.)	Other Notes
Example: Birds	5	One nest	Nest had a broken egg, made up of pine needles, feathers and leaf litter

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CHART 3. WILDLIFE – PLANT OBSERVATIONS

Ground Cover (plant life on the ground)	Species or Description	Estimate the Amount Found at the Study Site (a lot, some, a little)
Bushes	Example: Blackberries	a lot
Grasses	Example: Woodland Sedge	some
Wildflowers	Example: White Trillium	a little
Moss, Fungi, and Other	Example: Oyster Mushroom	some

Think about the following questions as you summarize the information in Table 5 and Charts 2 and 3.

1. How have student's ability to make observations and identify plants and animals changed from the baseline audit?
2. Have students observed greater numbers of wildlife at the study site?
3. Describe one action the team/class took to improve wildlife habitat and/or tree biodiversity at the forest study site.



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TABLE 6. TREE WORTH

Use the *National Tree Benefit Calculator*, <http://www.treebenefits.com/calculator>, to collect the data below. Some data will be used as metrics for your school's Eco-Schools USA Dashboard.

Use the information from Chart 1 to begin populating the table below. Next input the requested data into the online calculator at *National Tree Benefit Calculator*. If you would like to provide data for more trees or you would like to calculate multiple trees for a species, please enter the information into an Excel spreadsheet or other document and submit as evidence when applying for an Eco-Schools award.

Tree Species	Tree Diameter in Inches (in.)	Land Use	Stormwater Runoff in Gallons (gal.)	Energy Saved in Kilowatt Hours (kWh)	CO ₂ Captured in Pounds (lbs.)	Annual Overall Tree Benefit in Dollars (\$)
Example: American Beech	25	Park/Vacant	4,191	171	854	\$212
TOTALS						

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Think about the following questions as you summarize the information in Table 6.

1. Has the data in changed since the baseline audit? Explain.
2. Were any assessed trees lost? Were other trees, not directly assessed lost? How many and if known, why were they lost?
3. How have students attitudes toward trees changed?
4. What did student learn about ways cultures connect to trees?
5. Describe one action students took to support current conservation efforts in the area/region.

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Review of All Data

1. Based on what is known and has been learned, what conclusions can be drawn based on current knowledge and evidence.
2. How has using systems thinking and models of systems helped student understand trees and where trees fit in an ecosystem?
3. What patterns did students identify while collecting data at the study site? How have these patterns impacted learning? Explain.
4. What connections have students made between wildlife, soil and trees?