UPHAM WOODS CONSERVATION MANUAL

Updated 2019

Extension
UNIVERSITY OF WISCONSIN–MADISON

UPHAM
WOODS

Conservation Safety Policies

These safety policies are based off of the standards set by various organizations including Boys Scouts of America, Americorps (NCCC), and the Youth Conservation Corps of the Department of Fish and Wildlife.

It is the responsibility of all Upham Staff to ensure the safe use of hand tools by conservation program participants on site during the programming which includes giving the proper safety briefing before anyone touches a tool, ensuring that the proper personal protective equipment (PPE) is wore by everyone at the site for the entirety of the project, correcting any unsafe behavior that is seen, and working with group leaders to maintain safe project sites.

Safety Briefing:
Before the safety briefing, inform the adults on the project site that you are expecting them to help enforce the safety rules at all times. The safety briefing needs to include all the safety points listed below for all the tools that are intended to be used **and** include standard safety practices. The standard safety practices are:

- Maintaining 10-foot spacing between participants while carrying or using tools
- Identifying and explaining any environmental hazards unique to that programming site (See Environmental Hazard Safety)
- A reminder about hydration and frequent break taking when needed
- Reminder to continually wear proper PPE while on site
- Reminder that communication about what you are doing keeps you and your neighbor safe when using tools
- State that there is a first-aid kit present if needed
- Proper lifting technique if applicable (See Proper Lifting Technique)
- Debrief must include a tick check reminder

Proper Personal Protective Equipment (PPE):

Gloves - Gloves must be wore during all conservation programming. Anytime there is a tool in hand, gloves must be worn including during the sharpening and rehabbing of tools.

Hard Hats – Hard hats must be worn by all people on site when swinging tools are present and when there is potential for overhead cutting. Hard hats must also be worn while working in project areas with hazard trees present (See Environmental Hazard Safety).

Safety Glasses – Safety glasses must be worn by everyone when swinging tools or cutting tools are present on the project site. Use of power tools by approved staff also require safety glass. Any sharpening of tools and tool rehab require safety glasses as well.

Sunscreen and bug repellent should be worn by participants and staff. This limits exposure to both sun damage and insect-borne diseases like Lyme's disease and West Nile Virus.

First-aid kit must be present on all project sites.

Individual Tool Safety:

We will use a variety of hand tools in our programming. Each tool has its own unique safety points that must be communicated to conservation program participants before tools are distributed. All tools must be in working condition in order to be used and should be inspected before, during, and after use. All tools should be kept sharp as dull tools are unsafe. No handles should splintered, cracked, or broken. If any tool is broken or was broke during the project, it should be reported to the Conservation Program Coordinator and taken out of use until it is repaired. It is important to make an equipment inventory for each project in order to ensure that no tool is left at a project site.

Bow Saw – Bow saws are considered a **cutting tool**. Proper use of this tool is to saw through smaller vegetation and roots from 1 to 5 inches in diameter. One hand will be gripping the saw on the metal hinge that is used for removing the blade. The other hand will grip the vegetation that is being cut. The saw will be pulled back and forth in a smooth motion using the full blade. Extra care should be given as to where the cut vegetation will fall. When carrying a bow saw, the blade should be pointed down away from one's body.

Loppers – Loppers are considered to be a **cutting tool**. The proper use for loppers are cutting small branches, vegetation, and roots up to 1 inch in diameter. The blade edge must remain sharp and handles be fully extended. No lopping should be done above one's head. The cutting end of the tool should face away from one's body when carrying it. The cutting end should never be stuck into the ground as this damages the cutting edge.

Rake – A rake's proper use is to rake and move vegetation or dirt. While using a rake, it is important to watch one's feet as well as your neighbor's feet. The rake head should be firmly fitted to the handle. When placing the rake on the ground, the head must be facing down so the tines are in the ground. When walking with the rake, the head must be facing the ground so the tines are pointed away from one's body.

Shovel – A shovel is considered to be a digging tool. The proper use for this tool is to dig earth, move earth, and spread earth. The end of the shovel is a sharpened edge. Shovels should not be used for prying. When setting the shovel down, the sharpened edge should be placed facing the ground. When walking with the shovel, the sharpened edge should be placed facing the ground.

Hoe – A hoe is considered to be a digging tool. It has a single sharpened edge. The proper use of a hoe is to dig into earth as well as scrape the earth. It may also be used to compact soil. When carrying a hoe, the sharpened edge should be pointed down and away from one's body. When placing a hoe on the ground, the sharpened edge should be facing the ground.

Ax – An ax is considered to be a **cutting** and **swinging tool.** It has a sharpened ax head. The proper use for this tool is to cut larger roots or split wood. It may also be used for sounding hazard trees, but only by approved staff. No swings should be overhead. All swing should be below the shoulders. Make care to watch for your own feet while swinging. Before making a swing, announce to the surrounding people that you will be swinging. Be aware that bounce back may occur after a swing, so the tool needs to be held firmly. When carrying an ax, the sharpened edge should be pointed toward the ground and away from one's body. Do not carry an ax over your shoulder. When placing an ax on the ground, the sharpened edge should be parallel to the ground. The sharpened edge should not be stuck in the ground as it can damage the ax head itself. No one under the age of 18 can wield an ax.

McLeod – A McLeod is considered to be a digging tool. It has two heads, a sharpened hoe head and a rake head. The proper use for this tool is digging through the organic layer, raking vegetation, cutting small roots and compacting soil. When carrying the McLeod both edges should be pointing away from the body. When placed on the ground, the sharpened edge should be placed on the ground with the rake head pointing up. Because the rake head may still be a tripping or falling hazard, the safest way to place a McLeod on the ground is by making sure it is out of the way of walking traffic.

Pick Mattock – A pick mattock is considered to be a digging tool. It is also a **swinging tool**. It has both a pick head and a sharpened hoe head. The proper use of this tool is dig into the earth and rock. It can also be used to scrape earth. No swings should be overhead. All swings with this tool should be below the shoulders. When swinging, one must be aware of their surroundings. Before making a swing, announce to the surrounding people that you will be swinging. Make care to watch for your own feet. When carrying a pick mattock, both the hoe head and the pick head must be facing away from one's body. Do not carry a pick mattock over your shoulder. When placing a pick mattock on the ground, neither the hoe head nor the pick head should be put into the ground. Both heads should be parallel to the ground. Tightening of the head onto the handle may happen prior to/during use. To do this, find a hard surface (often a rock). Turning the tool upside down so that the head is close and parallel and to the hard surface. The handle should be perpendicular to the hard surface. Strike the handle on the hard surface forcing the head to slide down the handle tightening it.

Cutter Mattock – A cutter mattock is considered to be a digging, **cutting**, and **swinging tool.** It has both an ax head and a sharpened hoe head. The proper use of this tool is to dig and scrape into the earth and cut medium sized roots. No swings should be overhead. All swing should be below the shoulders. Make care to watch for your own feet while swinging. Before making a swing, announce to the surrounding people that you will be swinging. When carrying a cutter mattock, both the ax head and hoe head should be held away from the body. Do not carry a cutter mattock over your shoulder. When placing a cutter mattock on the ground, neither the hoe head nor the ax head should be put into the ground. Both heads should be parallel to the ground. Tightening of the head onto the handle may happen prior to/during use. To do this, find a hard surface (often a rock). Turning the tool upside down so that the head is close and parallel and to the hard surface. The handle should be perpendicular to the hard surface. Strike the handle on the hard surface forcing the head to slide down the handle tightening it.

Pulaski – This is considered to be a **cutting**, digging, and **swinging tool.** It has a full ax head and sharpened hoe edge. The proper use for this tool is digging into earth and cutting small to medium sized roots. No swings should be overhead. All swing should be below the shoulders. Make care to watch for your own feet while swinging. Before making a swing, announce to the surrounding people that you will be swinging. When carrying a Pulaski, both the ax head and hoe head should be held away from the body. Do not carry a Pulaski over your shoulder. When placing a Pulaski on the ground, neither the hoe head nor the ax head should be put into the ground. Both heads should be parallel to the ground. No one under the age of 18 can wield an ax.

Power tools -
Power tools will not be used by any conservation program participants, this includes, but is not limited to, chainsaws, brush cutters, and weed whackers. Chainsaws may only be used by Upham staff who have been trained and approved to by the Facility and Operations Director. Other power tools may only be used by Upham staff or formal volunteers who have been trained and approved to run that equioment. This may include, but is not limited to, brush cutters and weed whackers.

However, a chainsaw may be run by an approved staff member during a project. When a chainsaw will be running during the project participants must follow certain safety procedures and the operator certain restrictions.

Operator:

- Must establish a safe zone with a diameter of at least 2.5 times the height of any tree being felled
- Must establish an appropriate safe zone for any bucking operations
- A staff member who is not sawing must be on project site and assume project leadership
- Chain brake must be engaged at all times while not actually cutting
- Saw must be turned off to walk more than 50 feet

Participants:

- All participants must stay at least 25 feet away from any bucking operation
- All participants need to be informed that the operator will not hear them while the saw is running
- If a participant needs to speak with the staff running the saw, they need to flag them down from a safe distance and wait for the operator to turn off the saw and approach them

Appropriate PPE for the equipment being run must be worn by the operator of power equipment (safety glasses, gloves, long pants, long sleeves, hearing protection, hard hat, boots, chaps, etc.).

Environmental Hazard Safety:

No work will be conducted with conservation program participants in either cold or heat conditions that have potential to do bodily harm to the participants. This includes conditions that have risk of heat stroke, frostbite, wind burns, etc.

Harmful plants - If there are any harmful plants that are on the programming site, plant identification and information must be provided to the conservation participants. The common plants that have the potential to cause harm and have been seen on property are below.

Poison Ivy: Poison ivy contains urushiol oil within in the plant that causes skin irritation in humans. The leaves of poison ivy are alternate, somewhat shiny, 3-parted, leaflets with large teeth or shallow lobes. It is considered to be an herbaceous vine and in some cases can be a small woody shrub. Poison ivy never has thorns or five leaflets. If someone comes into contact with poison ivy immediately wash the area with soap and water, then inform our first aid coordinator. (Photo courtesy of Wisconsin DNR)

Stinging Nettle: Stinging nettle has hollow, ribbed, stout stems. The dark green, pinnately shaped leaves are opposite with coarse teeth, and a rough, papery texture. When brushed against the leaves or stems, the fine stinging hairs can penetrate the skin and cause itching and stinging. This sensation will be brief and no medical attention is needed. (Photo courtesy of Wisconsin DNR)

Wild Parsnip: This is a perennial plant that grows as a rosette with upright leaves, persisting for at least 1 year. Second year plants then produce flowers with stem that are stout, hollow, grooved, and up to 5 feet tall. The flowers are small and yellow being arranged in a flat umbel on top of stems and branches. The sap of wild parsnip reacts with sunlight producing phytophotodermatitis which is essentially a chemical burn on one's skin. The rash/burn that results blisters over and can be very painful even scarring. If someone comes in contact with wild parsnip, immediately cover the exposed are to avoid sunlight, wash the exposed area with soap and water. Follow up with our first-aid coordinator. (Photo courtesy of Wisconsin DNR)

Hazard trees – Hazard trees are considered to be standing trees that are dead or have large dead portions. Often times these trees have branch snaps and are sometimes referred to as widow makers. These trees are likely to fall or have large branches fall. Hazard trees should not be cut or touched by any conservation participants due to the inability to foresee how the wood fibers in the tree will react. Only approved trained staff can cut hazard trees.

Bees and Wasps – All project sites outside have the potential for bee stings. When a nest is identified, no participant or staff should approach the hive. The Facility and Operations Director should be informed of its location. It is important that anyone who has an allergy of bee stings is prepared to handle the allergic reaction. When someone is stung by a bee, contact the First-Aid Coordinator.

Herbicide Application – No conservation program participants will be using herbicide in any project or be in areas where herbicide was recently applied. Herbicide will only be applied by certified staff when no participants are present and follow the University of Wisconsin - Madison Pesticide Application Policy.

Age of Participants and Tool Use:

The use of tools, by any youth or adult, requires continuous staff supervision and discipline during the project.

Below 4th grade - will not be able to use our hand tools. They will be limited to conservation projects that do not involve tool use.

Grades 4-6th - will not be able to use any swinging tools. They will be limited to digging tools and loppers.

Grades 7th and up - will be able to use all of the hand tools listed above, with the exception of axes and pulaskis. Extra care must be given when swinging tools are present in all projects.

Proper Lifting Technique:

- Do not attempt to lift a heavy object by bending forward and arching your back. Bend your hips and knees in order to squat down to the object you are trying to lift. Keep it close to your body and straighten your legs keeping your chest broad.
- Never lift a heavy object above shoulder level.
- Avoid turning or twisting your body while lifting or holding a heavy object.

General Program Structure

The main structure of every conservation project will be the same. It will start with our pre-amble, project specifics and importance, safety briefing, tool distribution, work and de-brief. It is important that pictures are taken during these activities. All pictures taken should be sent to the Conservation Program Coordinator by the end of the day.

1. Conservation Pre-amble
    a. Thank you for coming out to this project today. We have challenged ourselves and our participants to perform 10,000 hours of conservation service to this land by the end of 2020. To date we are up to *blank* hours. Your group will help contribute *blank* hours to that today.
    b. Ask "what is *conservation*?"
    c. Conservation is the application of many different sciences, like ecology, biology, chemistry, and geology, to sustainably use and preserve our natural world. The land, water, plants, and animals are all part of the community that we live in. Taking care of that natural community has many benefits not only to nature, but to us. To have clean water, soil we can grow crops on, and clean air we need to take care of the world around us. **That's what we are going to do today. We are going to take care of our land and water.**
2. Project specifics and importance
    a. Explain what the project is and how we will accomplish it (each project will be different).
    b. Explain the why of the project. This is usually done in the ecological sense. (See Project Examples and Project Information)

3. Safety Briefing
    a. State the standard safety practices outlined under Safety Briefing
    b. State the unique safety instructions of all tools to be used
4. Distribution of Tools
    a. **Pass out PPE**
    b. Once everyone has their PPE on, distribute tools. Forming a line to do this is the most organized way. It does not matter what tool the participants pick. Switching tools can happen throughout the work so everyone can try every tool if they want to.
5. Work
    a. Start the project. This is the time where everyone will need the most instruction.
    b. When the group starts getting tired, be alert for unsafe tool use.
6. De-Brief
    a. Whoa! Look what we did! This is your time to point out all the work that was accomplished by the participants. Ex) Count the total number of bags of invasives pulled. Make a connection to the amount of seed that will not be spread. Walk the trail they built. Etc.
    b. We overcame obstacles. Point out the teambuilding aspects. Ex) We had 6 people work together and figure out how to move a large downed tree. I saw this pair of people really figure out the best way to lay tread.
    c. Point out individual successes. Give them a high five. Ex) I saw that you were exhausted, but you stuck through it. High-five. You just demolished laying backline. You were able to cut an entire honey suckle bush and pile it. Etc.
    d. Re-enforce the ecological significance and impact of the project. Ex) Why invasives are detrimental to the ecosystem, why a trail not only provides access to other programming for upwards of 11,000 people a year for years to come, but also keeps other areas preserved and open to restoration.
    e. Thank you! Have a final round of applause. There work is very much appreciated it. Remember to check for ticks.

Project Examples and Project Information

Invasive Species Pull (Dialogue):
At the morning meeting, you will be given a sheet with information on the targeted species including plant identification, history of the how the plant got here, and the ecological problems it causes. The following is an example project focused on pulling garlic mustard. It is helpful to have a plant that you pulled to show people as they learn to identify it.

1. **Pre-amble**
    Thank you for coming out to this project today. We have challenged ourselves and our participants to perform 10,000 hours of conservation service to this land by the end of 2020. To date we are up to 944 hours. Your group will help contribute 50 hours to that today.
    What is conservation?
    Conservation is the application of many different sciences, like ecology, biology, chemistry, and geology, to sustainably use and preserve our natural world. The land, water, plants, and animals are all part of the community that we live in. Taking care of that natural community has many benefits not only to nature, but to us too. To have clean water, soil we can grow crops on, and clean air we need to take care of the natural world around us. That's what we are going to do today. We are going to take care of our land and water.

2. **Project specifics and importance**
   We are going to be doing that by removing an invasive species. Does anyone know what an invasive species is? An invasive species a species that was introduced by humans into this ecosystem. They outcompete the native species because they have no natural predators here and have different life cycles than the native species. They often come up earlier in the year and stay up longer than native species. We are going to be pulling garlic mustard today for a few different reasons. First, garlic mustard produces chemicals from its roots that inhibit all other plant growth. These chemicals can stay in the soil for up to 5 years. It also comes up earlier in the year than our native plants, so it outcompetes them for light as well. It was originally brought over here from Europe by settlers and used as a spice, and it is almost entirely spread by humans. The seeds can be spread by mowing and boot tread. It is edible, and if you break a leaf and smell it, it smells like garlic. The leaves are heart shaped and wrinkly in appearance. The flowers are on the top of stems and are small, white, and have four petals. It is a biennial plant so that means it lives for 2 years. The first year is comes up with just the leaves, and the second year it comes up with a flower stalk. We want to try and pull both first year and second year plants. To pull them, you want to grab as close to the ground as you so you can pull up the whole root. Then, put them in a garbage bag so none of the seed will be spread. Any questions? Let's split up into two teams and see who can pull the most. (Pulls usually work best if make it a competition)
3. **Safety Briefing**
   We are all going to need to wear gloves to protect our hands while we are pulling. Now, it is hot out here today so make sure you are drinking water and taking breaks if you need it. I have not seen any plants in the work area that will hurt you, so you don't need to be worried about poison ivy or anything. In case anything should happen though, I do have a first-aid kit with me.
4. **Distribution of Tools**
   Let's all grab gloves. You will need to take one out of the bucket labeled right and one out of the bucket labeled left. I'll start to hand out garbage bags when you have your gloves on.
5. **Work**
   Pitterpatter let's get at 'er. Keep the teams focused on the competition aspect and be very high energy so they get into it.
6. **De-Brief**
   Alright, alright, alright. Let's bring it together. Let's look at team 1. They pulled 7 full bags of garlic mustard. Team 2 pulled 8 full bags of garlic mustard. Congratulations team 2; you all did a great job, but the real winner here is the environment! Together you pulled 15 bags of garlic mustard. That's amazing! Not only did you all remove 15 bags of plants, but that's 15 bags of plants that will not spread their seed. Each plant produces countless seeds, so you all just kept thousands of garlic mustard seeds off of the landscape. That is something to be proud of. Not to mention your teamwork was awesome. I saw team 1 just have two people follow up with garbage bags to make them more efficient, and that was a great idea. Team 2 had the same idea, and it worked great. Nice job! We really helped our native species today. Removing the garlic mustard is going to give them the opportunity to repopulate this area. That's going to have many impacts. Native species are great at decreasing soil erosion and help filter rain water down into the ground instead of running off and picking up pesticides and fertilizers that can find their way into our drinking water. This has been a great pull, and I want to thank you all for putting in the effort here today. We accomplished a lot and I greatly appreciate it. Thank you so much; let's give ourselves a round of applause. One more point, tonight make sure you all check for ticks.

Understory thinning:

Understory thinning helps open up the overgrown understory to light. Most of our understory work on the property will involve cutting a majority of invasive plants like prickly ash, honey suckle, buckthorn and an invasive species of raspberry. It may also involve thinning understory white pine trees/white pine ecology. Clearing will often have a dual purpose of facility access. All understory areas that will be cleared will be shown to you beforehand, as well as the focus of clearing.

Trail Building/Maintenance:

Trail will be built in four separate steps: Clear Corridor; Lay Backline; Lay Tread; Finish
All trail projects will be flagged out and prepped for building. Maintenance projects will be scouted and information will be presented during the morning meeting.

Some helpful terms to know are:
Tread: The flat part of the trail hikers will walk on.
Grade: Refers to how level a surface is. This will often be used to describe the tread itself or the elevation change in the trail.
Corridor: The area on each side and above the trail. We will use a 10 feet corridor off of the trail midline. Think "if I were walking this trail and stuck my arms out and above me, would I hit anything?"
Midline: The center line of the tread. This will often be what is flagged during the builds.
Backline: The edge of the trail on the higher part of the slope. This will be what sets the depth of the tread.
Critical Edge or Frontline: The edge of the trail on the lower part of the slope. This is the side of the tread that will degrade the fastest and should not be stepped on during the building process.

Steps of Trail Building:

1. Clear Corridor
   This step will clear the land where the trail will be built. The corridor will be 10 feet off of midline in all directions (right, left, and above). The corridor needs to be cleared of branches, downed trees, and the majority of vegetation. The total tread area plus 2 feet needs to be raked in order to remove any debris. The raking should expose bare dirt.
2. Lay Backline
   The backline is the initial cut into the ground that will help the treading process and set the depth of the tread. The backline will be dug into the edge of the slope with the higher elevation. The grade of the slope will determine the backline depth needed. By making an initial cut like this into the ground, we create a stable edge for the trail that will hold up to water movement. The backline needs to be level with the following tread to keep from creating a path for water to easily move across the tread and erode it.
3. Lay tread
   In order to tread a trail, the organic layer must be removed. Once the organic layer is moved and the resulting loose tread is level (this may involve back filling dirt in areas or cutting deeper in some areas), the soil of the loose tread needs to be compacted. Note that as you are creating the tread, you are also creating the critical edge. No one should walk or stand on the critical edge. It is the most fragile part of the trail and will degrade the quickest. The grade of the laid tread should be level; there are areas where the tread should have a 5-8% percent grade on

steeper slopes. This will allow water to naturally flow off or the trail. If the tread of an area will have slight grade, you will be informed before the build.

4. Finish
   The dirt and vegetation that was dug during the build needs to be dispersed. This will often times just be done with a rake. Under very particular circumstances, the dirt can be transported via buckets and used to back fill areas. Make sure no one is walking on the critical edge during this step.

In some cases, more advanced trail building techniques will need to be used, for example structures and water bars. In those circumstances, that information and building technique will be conveyed at the morning meeting.

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