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INTRODUCTION

Controlling invasive species is fundamental to maintaining and improving ecosystem health and function. This training is designed to help Stewardship Workday Leaders lead effective workdays while employing best practices for managing invasive species.

Invasive species management occurs year round, utilizing a variety of control methods and approaches. Effective invasives management is based on correctly identifying target species and determining the appropriate method of control. In addition to Site Stewards, Stewardship Workday Leaders are responsible for instructing volunteers on how to safely perform these tasks within the approved management schedules for each site.

Class objectives are to:

- Give background of Invasive Plant Management and how it fits into overall Land Management
- Present a variety of techniques that can be used on different species
- Overview of herbicide use
- Species identification for 12 common invasive species
  - Common & Glossy Buckthorn
  - Multiflora Rose
  - Asian Honeysuckle
  - Oriental Bittersweet
  - Japanese Barberry
  - Garlic Mustard
  - Common/Cutleaf Teasel
  - Yellow/White Sweet Clover
  - Purple Loosestrife
  - Lesser Celandine
  - Common Reed
  - Reed Canary Grass

Purpose of Invasive Plant Management

Invasive species are one of the most critical problems facing our natural communities and threatening biological diversity. Their impact is second only to habitat destruction or elimination by humans (or their bulldozers). In fact, nearly half the species currently listed under the Endangered Species Act are threatened by invasive species. Invasives can affect the habitat in a number of ways. They compete with other plant species for water and sunlight. They are often inferior in providing food and shelter for native birds and other animals. They decrease diversity and alter the ecosystem dynamics by displacing other plant species.
Whenever possible, preventing invasive species from becoming established is the most effective and desired method. Controlling established invasive species is difficult and costly; complete eradication is extremely difficult and rarely possible. Early detection and management can help to avoid permanent species loss that could result from a pest invasion.

Native vs Non-Native vs Invasives

The terms non-native and invasive are often used interchangeably but they are not the same.

Non-natives are species that have been introduced from other areas. They can be from other parts of the world, other parts of the US, other parts of the state or just from another region or ecosystem nearby. Another term that is often used for introduced species is “exotic.”

Natives are plants and animals that historically evolved and adapted to the ecosystem at that site. Native communities developed under the specific conditions that shaped the surrounding landscape.

Invasives are species that are able to take advantage of degraded ecosystems or altered conditions to displace or eliminate native species, upsetting the balance of the local ecosystem. The term is more about the behavior of the species rather than about where it came from originally.

It is often easier to explain the concept of non-natives to new volunteers or the public and can be a good starting point for discussion. However, we actively manage against invasives so the discussion needs to move towards talking about the behavior of the species in that particular environment.

Successful plant invaders are often characterized as having one or more of the following traits: efficient photosynthesis, habitat flexibility, rapid growth rate, high levels of seed production, long-range seed dispersal, and resistance to pathogens and pests. Typically their natural predators, pests or pathogens are absent, allowing for these opportunistic plants to thrive.
Fortunately, the majority of non-native species are not invasive and do not pose a threat to natural communities. Many will co-exist in small numbers within the surrounding matrix of species and will be ecologically benign. But aggressive species may take advantage of the right ecological conditions and become invasive. By increasing in number and displacing native species, they out-compete natives for resources, particularly water and sunlight.

Some native species can also become invasive when the natural processes are interrupted. Populations of native woody species like grey dogwood, black cherry, sugar maple or box elder were kept in check by wildfire in the past. When fire was eliminated from the landscape, fire sensitive woody species expanded into fire dependent habitats.
When ecosystem processes are altered, health and function can be negatively affected. Restoring these processes and removing invasive species is critical to improving the health of the land.
Threat of Invasive Species
Invasive species may affect the native community in a number of ways. By competing for nutrients and sunlight, native species reproduction is diminished. Changing the physical structure of the community changes or eliminates habitat for certain species of animals (birds, amphibians, reptiles, mammals) and may increase the habitat for other species of animals. The long-term effects of these changes are unknown. Adaptation typically takes place at a slow evolutionary rate. The present rapid rate of ecosystem change raises concern about the ability of native species to adapt, particularly in the face of reduced habitat availability, increasing human encroachment and the effects of climate change.

How Invasive Species Spread
There are many pathways that facilitate invasive species spread. Some of these occurrences are natural phenomena such as long range seed dispersal by birds, mammals and wind. Disturbance events such as tree fall gaps, flooding or fire may provide opportunities for invasive species to get a foothold.

Human caused disturbance can also help invasive species spread. These disturbances include seed dispersal from vehicle tires, hiking boots, mower decks, off-trail hiking or equestrians. It also includes large scale activity such as trail or road construction, mowing or any other event that causes fragmentation of habitat or movement of material.

Newly disturbed areas should be closely monitored for changes in floristic composition and the presence of new invasive species. As indicated by the graph below, preventing invasion is the most effective strategy. If invasive species are introduced, rapid response including communication with Site Stewards & Regional Ecologists, mapping of populations and immediate treatment will limit the spread and damage done by these species.

LAND MANAGEMENT

Land Management Guidelines

The Land Management Guidelines (see Appendix) is a document that reflects the land management policy and practices of the Forest Preserves. It is approved by the Forest Preserve District Board of Commissioners and acts as the "pledge" that is made to the Board that establishes guidelines on how the Forest Preserves will operate. The current edition was approved in March of 2012 and includes a provision requiring a review within five years so that the policy and practices stay current.

The Guidelines govern all land management activities conducted on Preserve property by Preserve staff, contractors, other agencies, interns and volunteers. It includes the overall framework of our policy on land management issues. This policy is then further defined in more specific documents such as management schedules, training manuals, procedures, etc.

Sustainability Doctrine

FPCC Sustainability Doctrine (see Appendix) reflects the value and importance of sustainability. It was written in 2010 and serves to inform the public in a non-technical, easily accessible way.

Chicago Wilderness Biodiversity Recovery Plan

The Biodiversity Recovery Plan was developed in collaboration between landowners, government agencies and partner organizations to develop a strategic vision for protecting, managing and restoring natural communities in the Chicago Wilderness region.

Management Schedules & Plans

Each of our volunteer managed sites has a guiding document that defines all approved restoration activities that may be conducted by staff, interns, contractors and volunteers. These are either management schedules or management plans.

A Management schedule is a document that lays out the site management priorities and approaches for the short-term future (1-2 years). Typically, schedules do contain a general long-term vision for the site as part of the site description. Management schedules are prepared collaboratively with the Regional Ecologist and the Site Steward(s). These are living documents and may be updated as needed, although they typically require an annual edit or full update. The Regional Ecologist and Site Steward work together to develop management schedules for volunteer managed sites. The Site Steward's level of involvement depends on their interest, knowledge and time. The schedule defines which restoration activities are to be completed by volunteers and also states the role of contractors, interns and/or Resource Management crews in site management.

Management plans are primarily prepared for dedicated Nature Preserves and Land and Water Reserves. Plans include a more detailed history of the site, explain what makes the site ecologically valuable and lay out long-term goals for site management, in

addition to approved short-term restoration activities included in the management schedule section. Besides the Site Steward(s) and Regional Ecologist, plans are developed in collaboration with the Illinois Nature Preserves Commission. There are 22 Nature Preserves and 2 Land and Water Reserves within the Forest Preserves of Cook County.

Although the Site Steward(s) is the primary point person for FPCC in the development and update of the management schedules, input from other leaders at the site is strongly encouraged, depending on their knowledge, time and interest in leadership development. Minimally, all site leaders should be familiar with the management schedule. The most current copy is available to site leaders on the Online Volunteer System (OVS). If a new activity or area is identified for possible restoration efforts, the Site Steward(s) should discuss the proposed changes with the Regional Ecologist so that the schedule can be updated as needed.

All restoration activities conducted at a site should be reflected on the management schedule. In addition to Site Stewards and Stewards, Stewardship Workday Leaders are also responsible for knowing what activities are approved within the schedule and should plan their workdays accordingly. There are many tasks that go into the restoration of a site. It is important to know how specific tasks and workdays fit in the overall sequencing of activities and goals for the site. Performing a task in isolation is not always the best decision for the overall goal for a site.

A sample management schedule is available in the Appendix.

Preserves Staff Connections

Stewardship volunteers in leadership positions work with various departments, units or sections within the Forest Preserves. A contact list is provided in the Appendix. This list includes all the key individuals that you may need to contact before, during or after a workday.

Volunteer Resources (VR) – This unit handles the human resource and administrative component of the relationship between the Stewardship community and the Preserves. Within this unit are the Stewardship Program Coordinator, a Volunteer Program Specialist and an Administrative Clerk who support the Stewardship program. Areas that they coordinate include:

- Training and development of volunteers
- Recruitment of new volunteers
- Connection to third party monitor agencies
- Connection to school groups, community groups and corporations for workdays
- Certification of volunteers into task based or leadership roles
- Online Volunteer System (OVS) support
- Reporting volunteer work to Preserves management
- Coordinating tool and herbicide supplies
- Permitting – regular workdays and special events
- Liaison with other Forest Preserves staff

Resource Management (RM) – This unit is responsible for all the land management being done in the Preserves. It includes RM

Crews, Ecology, Project Management, Trail Maintenance, Wildlife and Fisheries sections. The three sections that have the closest relationship with the Volunteer Stewardship Program are Ecology, RM crews and Project Management sections.

Ecology – Ecologists collaborate with the Stewardship community and FPCC staff, including Wildlife, Fisheries, and other Resource Management sections, to develop ecological management priorities and approaches. Forest Preserve sites are divided into four ecology regions, each having its own designated Regional Ecologist. As a Stewardship Workday Leader you should know your Regional Ecologist and will often have opportunities to work with them. The Regional Ecologist connects to the site via the Site Steward.

RM Crews – There are 3 RM crews (and 2 Trails crews) that do the work in natural areas as well as picnic groves, trails, building grounds, etc. They operate on a Work Order system. Regional Ecologists submit work order requests on behalf of the Site Steward. Because of their training, experience, access to equipment, etc. they are able to work on larger scale projects at restoration sites. Crew leaders are listed in the Contact List.

Project Management – This unit oversees all contract work done in natural areas as well as picnic groves, trails, building grounds, etc. We have open contracts with multiple contractors. Regional ecologists submit contractor requests on behalf of the Site Steward and Project Management oversees contract performance and communication with the Site Stewards. Key members of this unit are listed in the Contact List.

Landscape Maintenance Department – This department maintains picnic groves, picnic shelters, driveways, trash removal, restroom facilities – both brick-and-mortar and port-a-let, etc. They work seven days a week so are often a resource to use for emergencies on weekends. The list of Superintendents by region is in the Contact List.

Role of Interns, Contractors, Resource Management Crews

In many cases there is overlap between work conducted by third party agencies, interns, contractors and RM Crews. In all cases, the management schedule drives what work should be done. Decisions on resource allocation are based on the complexity of the project, timing, availability, and urgency. Ecologists and Project Management collaborate in this process and maintain communication with the Site Steward.

Volunteer Site Management Roles

Site Stewards are responsible for overseeing all volunteer work done at their site. Site Stewards collaborate with Forest Preserve staff and other volunteers to create management schedules that are the basis for all work at their site. Other volunteers may have more detailed knowledge ofsome aspects of ecological stewardship, but ultimate decisions are the responsibility of the Site Steward.

Stewards assist the Site Steward with overseeing volunteer work done at their site. A Steward has the skill set, knowledge, experience and capacity to be a Site Steward but does not have the ultimate administrative responsibilities. While Site

Stewards are the primary contact person for site management, Stewards play a pivotal role in restoration efforts, workdays, planning and site administration.

Stewardship Workday Leaders are authorized to lead groups of volunteers (or work individually) in restoration activities. All work requires approval and at least indirect supervision by a Site Steward. Stewardship Workday Leaders are responsible for immediate decisions at workdays in the absence of a Site Steward.

MANUAL REMOVAL

Effective invasive species management may involve multiple control methods employed at different stages through the growing and dormant season. Many variables influence management strategies including the target species, seasonality, skill level of the volunteer, community composition, available resources, etc. Effective control may involve a combination of multiple methods.

Soil disturbance should always be considered when making the decision to use pulling or digging as a control method. The benefit of removing the plant(s) must be weighed against the damage to the soil structure and the removal of organic material. Soil disturbance can also facilitate germination of the invasive being controlled, although in some cases this might be desirable if the goal is to exhaust the seed bank, such as with garlic mustard. Soil disturbance and the removal of root systems can also lead to erosion issues. All of these factors should be considered before plants are pulled or dug up.

Pulling

There are a few species that can be pulled out with their root system intact. These are potential candidates for pulling since regeneration from established root systems does not occur. Pulling is the primary control method for garlic mustard. It is an alternative method for purple loosestrife and sweet clover. Wet soils make pulling easier but can increase the potential for soil compaction. It is a method that is better employed in an area with scattered invasives rather than a mass population.

Digging

There are some schools of thought that use digging to remove some species such as teasel or first year garlic mustard. For several reasons, this method is not recommended. Digging often causes even more soil disturbance than pulling; roots can often be left to regenerate later (teasel) and time is better spent on removal at a later stage when pulling or seed head removal is more efficient (garlic mustard). If digging is used, it should be done on a very limited scattered basis and not in a widespread setting.

Cutting

A common characteristic of invasive species is that they are prolific seed producers and their seed may be widely dispersed by wind, water or animals. Ideally these species are chemically treated or mechanically removed before plants have set seed. However, when treatment does not occur or was ineffective, mechanical removal of seed heads or the entire plant may be an effective management strategy.

Seed Head removal is used on teasel, reed canary grass and purple loosestrife. Seed heads should be cut by scissors/pruners then bagged and removed. It has limited effect on garlic mustard or sweet clover since partial plants can regenerate a new seed head depending on seasonal conditions and growing cycle.

Plant cutting is used on sweet clover and garlic mustard. Whole plants are removed by hand cutting, scything or brush cutting. Sequential top down cutting (or mowing) can also be used. Plants are first cut below seed

head height. If any generate new seed heads, they are cut again at a later date. This often requires a second and third cutting until regeneration of seed heads no longer occurs.

TIPS:

- Care should be taken not to spread or disperse seed while actively removing plants. Brushing against plants, shaking plants, etc. can disperse seeds quickly.
- In all cases, work gloves are recommended.
- If seed heads are to be removed from the site, always use a heavy-duty bag or bucket. Avoid using plastic grocery sacks as they are easily snagged and torn which ultimately spreads seeds. Contractor weight bags or yard waste bags with all seams taped to prevent leakage of seeds can be effective.
- Remember to consider soil disturbance in your decision on whether to use a manual method

Composting

Certain species like garlic mustard or sweet clover may be composted on site. After removal, seed heads and/or full plants may be piled in a degraded area or on an old brush pile burn scar. There still may be some viable seed that germinates but stacking the plants localizes the seed source. These pile areas can be reused year upon year.

TIPS:

- Fewer large piles are preferred to many small piles as this practice will localize and limit potential seed sources
- Public visibility should be considered. Compost piles in remote areas are fine but placement of piles is prohibited along paths, trails, parking lots, driveways, etc.
- When deciding on composting vs. offsite removal, consider the distance needed to remove plants from the site. Recognize that composting may leave some portion of viable seed and will require follow up. Measure that against the risk of spreading or carrying seed across long distances as well as the amount of effort to physically remove the plants from the site.

Offsite Removal

Species that can re-establish easily from composted seed heads should be disposed of rather than composted. Also, in areas within public view, full removal should be used instead of composting. As noted above, distance to an off-site location needs to be part of the decision. Although removal may be desirable, it isn't always possible.
Heavy duty plastic garbage bags (available from FPCC) should be used. When bags are full, tie flagging ribbon around the neck of the bag. Place the bags by the road sign for the site or next to the map sign. Do not put these "yard waste" bags near the trash cans or dumpsters as they can be easily confused with other garbage. We do not want this "yard waste" type material to go into our regular trash system. Instead, we will compost it in a controlled setting.

E-mail or call your regional RM crew leader and Maintenance Superintendent with the number of bags and location. They will work

out who will be picking up the bags the next day.

TIPS:

- Any sites that have public visibility issues should use disposal rather than composting.
- Inform Maintenance and RM in advance that “yard waste” pickup will be needed at your Site so that they can tell their crews to be looking for the flagged bags. We like to move these off site as quickly as possible.

CUTTING AND SAWING

Section VII of the Land Management Guidelines covers Vegetation Management. Sections B & C addresses removal of vegetation. Removal by cutting or sawing is just one of the steps to completing the work. Cutting stumps to ground level (or no more than 2") and herbiciding stumps are both necessary additional steps that must be part of the workday plan. The Land Management Guidelines also state the requirement that the removal of any trees larger than 6" dbh must have prior approval by Resource Management.

Removing invasive species creates a disturbance. Major removal creates a newly cleared open area which now has more sunlight and low competition. This can allow other invasives to rapidly colonize. Management schedules typically call for planting sufficient vegetation to seal the wound. It is important to frequently monitor recently disturbed sites to assure early detection of any new invasives which will enable a quick management response.

Recommendations on seasonal considerations are in the management schedules for each site. Seasonality can help predict site conditions (i.e. the ground is typically frozen in winter and wet in spring). However, actual site conditions on the day that work is being done should inform the decision for management activities. Adjustments to a planned workday should be ground truthed and adjusted based on site and weather conditions. Winter is a great time to do mechanical removal because the ground is frozen, specimens are easier to manage without leaves, brush pile burns feel good but deep snow can affect how we do the removal and care for the site. See notes about working in snow at the end of this section.

Pruners

Pruners can be used for seed head removal but are not practical for invasives removal. Even youth can operate loppers more easily than pruners.

Loppers

A good guideline is the "rule of thumb": loppers are good for brush that is the size of your thumb or smaller. It is important to keep loppers sharp. They cut much more easily and are safer to use when sharp. Loppers should be sharpened periodically using a flat file.

Leather gloves must be worn while using loppers. Stems should be cut as low as possible with a flush, level cut. Angled/pointed stumps may not be left on site for safety reasons. They become "impalers."

Instruction tips:

- Kneel or squat low to the ground, keep the lopper parallel to the ground and cut as close as possible to the ground.
- When cutting down a larger shrub or tree, it is sometimes helpful to use loppers to cut off branches for better maneuverability and for more direct access to the base of the trunk. This also helps prevent injury from being scratched by branches.

- If the lopper is causing you to struggle or force a cut, the stem is too large and a bowsaw should be used
- Applying extreme force can bend or break loppers
- If the effort being made is requiring that you twist or turn the lopper, it is probably too big for a lopper and a bow saw should be used.

Bow saws

Bow saws can handle any size tree including the 6"DBH maximum that is allowed. There are practical limits on size, however, for each individual. Larger trees are sometimes best left for a chainsawyer to do at a later date.

It is important to always use a sharp saw. When the blade becomes dull, rusty, or bent, it should be replaced. Bow saws cannot be re-sharpened due to the hardness of the blade. FPCC uses a live wood blade that is different than the standard bow saw that is equipped with a dead wood blade.

Leather gloves must be worn while using bow saws. When transporting or walking with bow saws, sheaths should be used to cover the blade if available. If not available, saws should be carried by their handles with blade facing backwards and close to your body. Stems or trunks should be cut as low as possible to the ground with a flush, level cut. Angled/pointed stumps may not be left on site for safety reasons. Again, this can create "impalers".

Instruction tips:

- Kneel or squat low to the ground, keep saw parallel to the ground and cut as close as possible to the ground.
- The pull stroke is the cutting stroke so push saw forward with minimal effort and pull using a long, smooth stroke through the wood.
- Don't overpower the saw; let it do the work.
- Brace the wood to be cut against a solid support or grasp the upper section firmly.
- If the cut starts to bind, apply pressure to keep the cut open.
- With the proper technique, the two-person method of cutting larger trees is fast and requires less effort. The two take turns pulling the saw (neither pushes). The result is easy back and forth strokes, requiring less work for either sawyer.

Scythe/Snaths

The scythe is an interesting tool that is effective for specific uses. The long curved handle is called a snath or snaith. Scythes are very effective on stands of grasses or sweet clover. Be aware that there is a different blade for sweet clover than for grasses. Scythes are useful for selective or "surgical" control of tall goldenrod, rubus, etc. in areas where there are other desirable species. Scythe blades are kept sharpened using a whetstone.

Instruction tips:

- The cutting stroke is a short, repeated stroke not a wide, golf type stroke
- Different blade styles can be used for different target species

Machetes

Machetes are also a common tool that is used in restoration. Currently, that tool is not provided by FPCC.

Brushcutters

Brushcutters are line trimmers fitted with a round saw blade and a protective shield over the blade. They are a very efficient way of cutting grasses, resprouts and even small diameter trees or shrubs (recommended up to 3" diameter). They are much safer to operate than chainsaws. There are several styles of blades available for the full range from grasses to small trees.

Operation tips:

- Long use can be tiring on shoulders so switch off amongst other volunteers
- When making a cut, keep saw at full throttle
- If cutting blade becomes loose, tighten immediately
- Leather boots are recommended but not OSHA required
- Use the right style blade for the right job
    - 3 or 4 tooth blade – Grass
    - Chisel or sawtooth – Brush and fibrous stemmed plants

Chainsaws

Chainsaws are powerful tools for removing brush and trees. They are very efficient in getting work done and finishing up work at the end of a workday. However, there are safety and noise issues to consider when making them part of your workday.

A full description of Chainsaw policy is presented in the Chainsaw Safety class but a few main points are presented here.

Personal Protective Equipment All volunteers operating chainsaws on FPCC property must be certified and outfitted in the required personal protective equipment (PPE). The minimum required PPE includes Kevlar boots, chaps, operator's helmet with earmuffs, leather gloves and eye protection. Kevlar boots may be provided by the volunteer or can be obtained through the District free of charge with a minimum of 6 times per year chainsaw work commitment.

Certification All volunteers, especially volunteer leaders, are encouraged to take the chainsaw class even if they do not intend to become sawyers. Having a full understanding of chainsaw safety will keep our workdays safe. This class is led by Resource Management. Volunteers can sign up for a training waitlist on OVS and will be notified when a training class is scheduled.

In addition to classroom attendance, the certification requires one field observation by RM staff. You do not have to do the field observation if you do not intend to become certified to actually saw. Instead you will be designated a Chainsaw Assistant.

Size limits Certified sawyers may fell trees up to 6 inches diameter at breast height (DBH). An advanced sawyer certification is also available through classroom training and field observation from Resource Management. This class is by invitation only. Candidates are selected by Resource Management, Ecology or Volunteer Resources. Advanced sawyers may fell trees up to 12 inches DBH with specific District approval. All tree removal must be approved in the management schedule for the restoration site.

Safety During chainsaw operation, volunteers and members of the public must be kept at a safe distance from the chainsaw operator. Chainsawyers cannot operate alone. There

must be a designated Chainsaw Assistant who assists in brush removal, crowd control and overall safety. Although this person can be a fellow sawyer, they cannot be sawing while in the role of person. They are also required to wear a helmet/earmuffs but not full PPE and must be certified as a Chainsawyer or Chainsaw Assistant.

When brush clearing, Chainsaw Assistant must maintain a safe distance from the sawyer and may only approach the sawyer while the saw is idle, assuring that the immediate area is kept secure. When felling larger diameter trees, the swamper/safety person is monitoring a larger fell-zone which includes 360° around the tree, not just the expected felling direction. The fell zone should be approximately two times the height of the tree being felled.

Chipping

Chipping should only be utilized when burning is not possible due to site conditions, age/group of volunteers prevents burning or if issues exist with smoke-sensitive neighbors or other public concerns. If chipping is required, the drop site must be accessible to a chipper. This will require brush to be stacked neatly 1 foot off of a curb, sidewalk or parking area. All stacked brush should have the cut ends facing the direction of access by the chipper. All chipping requests must be communicated to the Stewardship Program Coordinator in advance of the workday. They will arrange for RM crews to be present at the workday or soon thereafter (depending on site) to do the chipping.

Brush Pile Burning

Burning is the most effective way of eliminating cut brush. Brush pile burning at stewardship workdays requires a certified Brush Pile Burn Boss be on site. To become a Brush Pile Burn Boss you must complete the Brush Pile Building and Burning class and then complete 2 field observations. There is a wait list on OVS to be notified of classes when scheduled.

Brush pile burn policy is presented in greater detail in the Brush Pile Building and Burning class. The Brush Pile Burn Boss or the Stewardship Workday Leader is required to make all the pre and post calls to local fire or police, have Illinois EPA & Cook County Department of Environmental Control permits on site, check weather for AQI under 100 and have sufficient suppression tools on site as warranted by site conditions. They are also responsible for posting smoke alert and hot coals signs and must assure that there is no live flame when volunteers leave the site.

End of Day Considerations

The Stewardship Workday Leader, Steward or Site Steward must wind down the workday in enough time to clean up the site and leave it in a tidy or at least organized state.

Unburned brush should be stacked neatly to be burned at the next workday. Ideally this should be burned as soon as possible. Mini workdays to finish the burning can be added. Waiting until next workday is also permissible if wildlife habitat considerations are taken into account. Policy on unburned brush is covered in Brush Pile Building and Burning class.

Punji sticks, impalers and "buckthorn graveyards" Our overall policy as stated in the Land Management Guidelines is to leave all stumps (large or small) trimmed down to

no more than 2" at the end of the workday. Different circumstances and different philosophies impact how strictly and how quickly that policy is adhered to.

- **Snow** affects access to the base of the specimen being cut. If snow is light to moderate (2-4"), we expect that the bow sawyer, lopper or chainsawyer, brush away the snow and make a good low flush cut no more than 2" high. The snow removal also facilitates better and safer herbicide stump treatment. If snow is deeper, a higher cut may be the only thing possible that day. But a plan for trimming them down to 2" should be in place as soon as snow depth allows.
- **Size of specimen** impacts the decision for safety reasons. Falling on something that is 8" high and 1" in diameter can impale and cause serious injury. Falling on something that is 8" high and 6" in diameter can still hurt and bruise but is not as likely to cause serious injury.
- **Visibility** impacts the decision as well. If the work area is visible to the public, i.e. along a path, driveway or road, it creates a negative perception of the great work that all of us are doing. It is difficult to look at a "buckthorn graveyard" and see the positive impact of stewardship work. If the "buckthorn graveyard" with all of its 3' high markers are in a remote area it still looks unsightly but is far less likely to generate negative comments from the public.
- **Youth or inexperienced volunteers** may not be physically able or don't have the tool savvy to get a good low flush cut. In these cases, stumps may be cut at waist level at first and then followed up with cutting down to the below 2" level. If you are unable to cut all the way to the base, higher is better than almost to the base.

Bottom line, the very best option for efficiency, safety and beauty is to cut all the way down to the 2" maximum on the one and only cut of the specimen. We recognize that as the goal but understand that it isn't always possible.

- When snow is not an issue, the cutting should be done later that same day or early the next day and should never be left more than 24 hours.
- When snow is an issue, the chainsaw finish needs to be addressed as soon as the snow has receded to a few inches. They should not be left indefinitely or automatically delayed until spring. It should be on the group's radar to finish as soon as conditions allow. It also should be reported to Volunteer Resources so that we can handle any public questions or in some cases, arrange for RM crew work to be done.

Although RM crews can sometimes help with the chainsaw finish, the first and best approach is to work with Volunteer Resources to see if they can get a sawyer from another site to come and help finish the workday properly. Re-application of herbicide is also suggested to add to effectiveness of the earlier application whenever possible

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CHEMICAL CONTROL METHODS

Section VII of the Land Management Guidelines covers Vegetation Management. Section D of this section addresses herbicide use. Chemical herbicides are one of the primary methods used to manage invasive plants. They are part of a broader group of chemicals called Pesticides which are used to manage insects and diseases as well. Herbicides can efficiently and effectively suppress or kill unwanted plants and should be used judiciously, safely, and in a way that minimizes adverse effects on non-target resources.

This section will cover who can apply herbicides, what herbicides may be used, how to obtain them, when to use them and other policies related to herbicide use.

HERBICIDE

The choice of herbicide and concentration level depends on the target species, stage of growth, time of year, the presence of desirable species that may be affected, the proximity of water resources and weather conditions (high winds and temperatures). Additionally, there may be some areas where chemical control is inappropriate, for example if rare species are present. Herbicides must always be applied in accordance with the label.

Always use the lowest concentration of herbicide that is effective and preferentially use more selective herbicides that degrade and break down quickly. General guidelines are in the Species ID section of this manual and in some management schedules.

Types of Herbicides

Contact herbicides: injure only the portion of the plant contacted by the herbicide

Systemic herbicides: are translocated from the leaves to the roots causing plant mortality

Broad Spectrum herbicides: kill or suppress all vegetation because they affect physiological processes common to all plants. Example: Round-Up (glyphosate)

Grass Specific herbicides: formulated to kill or suppress only grasses without harming forbs or sedges. Example: Poast herbicide

Broadleaf herbicides: formulated to kill forbs and other broadleaf plants without harming grasses or sedges. Examples include Garlon 3A & Transline

Herbicide Additives

Surfactants are compounds that lower the surface tension of a liquid. Surfactants are adjuvants, chemicals that increase the effectiveness of herbicide chemicals. Surfactants are used to help herbicides adhere to plants, penetrate into the vasculature of the plant which allows more of the herbicide to be retained by the plant after rainfall. Surfactants help spread out herbicide over the leaves so that it does not run off. Surfactants can also make the herbicide rain-safe faster.

Colorant is added to herbicide mixtures to allow the applicator to verify that the herbicide formulation was applied to the intended target and to provide notice to the others who may be using the site. Colorants are required by FPCC. Application equipment usually requires more maintenance and regular cleaning when colorants are used and they can have a slight effect on the potency of the herbicide. Do not apply more than the recommended amounts on the label.

The following additives are also available:

- Premier (replaces Ax- it): Typically used as a carrier oil for Garlon 4
- Colorant
- Methylated seed oil: Typically used as a carrier oil for grass specific herbicides
- Surfactant

Herbicide Decisions

Characteristics, traits, limitations

Aquaneat (Rodeo)

- Active ingredient is glyphosate
- Broad spectrum, systemic herbicide for use near aquatic environments and over standing water
- Kills anything green
- Rainfast 6 hours after application

Element 3A (Tahoe 3A or Garlon 3A)

- Active ingredient is triclopyr
- Systemic, broadleaf specific herbicide mixed with water
- Can be especially damaging to eyes
- Can be used near water or drainages but not over open water
- Restricted entry interval is until the treated area is dry
- Rainfast 2 hours after application

Element 4 (Tahoe 4 or Garlon 4)

- Active ingredient is triclopyr
- Broadleaf specific herbicide mixed with oil for stump treatment or water for foliar treatment
- Volatilizes at high temperatures and should not be applied over 85F
- Restricted entry interval is until the treated area is dry
- Rainfast 2 hours after application

Round-Up

- Active ingredient is glyphosate
- Broad spectrum, systemic herbicide mixed with water and kills anything green
- Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds, effects may not be visible for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms.
- Use in wetlands and other areas where water is present is limited to aquatic approved formulations only (e.g. Rodeo, Glyphomate, Aquaneat, etc.)
- Standard formulation for use in upland areas only – do not use regular Round-Up in wetlands!
- Restricted entry interval of 4 hours
- Rainfast 1 hour after application

Poast

- Active ingredient is Sethoxydim
- Systemic herbicide for control of annual and perennial grass mixed with water and methylated seed oil
- Grass specific herbicide that will not damage forbs or sedges
- Breaks down readily in direct UV light and is thus best applied during overcast conditions
- For control of reed canary grass, early season application is most effective
- Cannot be applied in the presence of water. For use in upland areas only
- Restricted entry interval is 12 hours
- Rainsafe 1 hour after application

Transline

- Active ingredient is clopyralid
- Broadleaf specific herbicide mixed with water and is especially effective on legumes including bird's foot trefoil, crown vetch, sweet clover and is very effective at controlling teasel, thistle and tall goldenrod
- For use in uplands areas only

- Very expensive and labeled for low concentrations
- Restricted entry until herbicide has fully dried
- Rainfast 2 hours after application

Different brands of these herbicides are supplied, depending on availability from the State of Illinois, which is the supplier of herbicides to the Forest Preserves. The chemical formulations will remain consistent across these brands.

No other herbicides may be used in the Preserves without the prior approval of your Regional Ecologist. If you become aware of an herbicide that you think may have some practical use at your site, please present it to your Regional Ecologist. They can research it with area contractors and other agencies.

Seasonality & Timing

There are many variables that must be taken into consideration when determining the best control method for managing different invasive species, including seasonality and timing. Understanding plant life cycles, seasonal prioritization of species treatment, and logistical considerations pertaining to invasive plant management will help you be more effective in controlling these species.

Plant life cycles

- Perennial plants can be long lived and grow and bloom over the spring and summer, die back every autumn and winter, and then return in the spring from their root-stock. Examples include purple loosestrife and reed canary grass.
- Annual plants complete their life cycle, from germination to the production of seed, within one year and then die
- Biennial plants take two years to complete their lifecycle. First year the plant grows leaves, stems, and roots and then enters a period of dormancy. Usually the stem remains very short and the leaves are low to the ground, forming a rosette. During the next spring or summer, the stem of the biennial plant "bolts." The plant then flowers, producing fruits and seeds before it finally dies. Examples include sweet clover and garlic mustard.
- Monocarpic plants may live as basal rosettes for years then bolt, flower, set seed and die. Examples include teasel.

Biennial plants, such as sweet clover or garlic mustard, are more effectively controlled with herbicides as first year rosettes or mechanically controlled as second year, bolted plants. Second year plants will produce seed and should be a management priority over first year plants. Monocarpic plants like teasel have a longer window to be controlled in the basal rosette stage. Once the plant bolts, however, mechanical removal of flowering/seed heads should be a priority.

Seasonality

Woody species such as buckthorn and honeysuckle can be cut and treated at any point in the year while certain herbaceous species such as lesser celandine and garlic mustard have relatively short windows when treatment can be effective/efficient. Herbaceous species that have yet to flower or are currently in flowering stage should be higher management priorities than many

invasive woody species that do not set seed until later in the season.

Seasonality is also important for early season herbicide application. Immediately after snow melt, lesser celandine greens up before a majority of natives, is readily identifiable and there is little chance of damaging non-target species. Another example is garlic mustard that greens up well in advance of most native flora in our woodlands. Herbicide treatment is effective because the plant can be readily identified and treated with little collateral damage.

Later in autumn, most of our native shrubs and trees have lost their leaves while invasives like buckthorn and honeysuckle retain green leaves, making them readily identifiable to inexperienced volunteers.

Phenology

A chart showing the timing of growth stages and treatment options for the 12 species we are studying is in the Appendix.

Calendar of Typical Restoration Activities

The following is a list of tasks that work towards restoring a site and the time of year that they are most often done in. It is important to remember that each of these is just a task on a long path towards restoration. Although the tasks themselves are done independently of each other, they build on the prior step and prepare for the next step. Decisions on what you do today are informed by what tasks you are prepared to do in the future.

JANUARY

- Brush clearing & brush pile burning

FEBRUARY

- Brush clearing & brush pile burning

MARCH

- Brush clearing & brush pile burning
- Garlic mustard rosette & lesser celandine herbiciding
- Sow seed mixes
- Prescribed fire season

APRIL

- Sow prairie and woodland seed mixes
- Prescribed fire season
- Reed canary grass, garlic mustard

MAY

- Reed canary grass, garlic mustard, dames rocket, teasel rosette treatment

JUNE

- Garlic mustard, dames rocket, sweet clover, purple loosestrife, reed canary grass, tall goldenrod, bird's foot trefoil, invasive thistle(s), tall goldenrod
- Seed collection
- Woody resprout herbicide
- Reed canary grass seed head removal

JULY

- Seed collection
- Sweet clover, purple loosestrife, herbicide woody resprout, bird's foot trefoil, tall goldenrod

AUGUST

- herbicide purple loosestrife, bark girdle buckthorn, herbicide woody resprouts, phragmites
- Seed collection

SEPTEMBER

- Seed collection
- Reed canary grass, herbicide woody resprouts, teasel seed head removal

OCTOBER

- Seed collection

- Reed canary grass, herbicide woody resprouts
- Teasel seed head removal
- Brush clearing & brush pile burning

NOVEMBER

- Prescribed fire season
- Seed collection
- Seed sowing
- Brush clearing & brush pile burning

DECEMBER

- Brush clearing & brush pile burning
- Sow seed mixes

HERBICIDE HANDLING

Mixing

The Applicator is responsible for mixing herbicides for themselves and all Operators that work under their license. They must assure that they are mixed properly so that they retain their properties and toxicity. It is illegal to mix pesticides with other products that are prohibited on the label.

Herbicide concentrate needs to be carefully handled, measured and transferred. Eye protection, long sleeves, and rubber/latex gloves must be worn when mixing herbicides. Always mix herbicide on flat, level surfaces and in areas that are well ventilated.

- Herbicide packs, sprayers, and storage containers should be flushed after each use with rinse water sprayed on target species.
- All containers must be clearly labeled and should include the name of the chemical, the percent solution and what date the herbicide was mixed.
- When switching from a broad spectrum to broadleaf specific herbicide, all packs/applicators must be thoroughly flushed or unintended plant mortality may occur after application.
- All measuring cups, funnels, containers, etc., must be triple rinsed after usage.
- If possible, mix herbicides out of public view.
- Dye is extremely concentrated and will persist on pavement long after many rains.

Storage

The Applicator is responsible for setting up the proper storage methods for each chemical and instructing Operators on proper methods. Product labels must be on all containers. In addition, concentration levels of any herbicides that have already been mixed must be indicated on the container.

Transporting

Never transport herbicide within a closed cab vehicle. Herbicide should be stowed in an open air bed or in closed trunk compartment. Double check all lids, fittings, nozzles and containers before placing herbicide sprayers/containers in vehicles to reduce the chance of spillage.

Container Recycling

Herbicide containers can be recycled but careful handling is required. They should be triple rinsed with water and then punctured so that they can't be accidentally repurposed. You can use the rinse water on a patch of invasives. Although this is highly diluted, it could have some positive effect and is better than running it into a drain system. Only tripled rinsed containers can go in recycling.

Recordkeeping

FPCC requires that records are kept of herbicide usage. (See Appendix for sample form). These forms can be kept by the Applicator or they can be turned into the Forest Preserves periodically. The records are useful to provide historical information of what methods, chemicals and concentrations were used to inform future practices. They are also needed to answer any complaints

made by other agencies or the public. Data must be kept for three years to prove that the herbicides were applied properly and within the law.

Labels and MSDS/SDS Sheets

The label is a legal document. The Applicator and Operator are legally responsible for following the label directions on the product container. As a Stewardship Workday Leader, you should also read the label before herbicide is applied at a workday that you are leading.

Detailed information about labels and MSDS/SDS Sheets is given in the Herbicide training class but a few key points to look for are:

- Product Information – Ingredients, EPA registration number, Emergency Contact information and Danger rating
- Precautionary Statements - Human and animal hazards, Personal Protective Equipment (PPE) needed, First Aid and Hazard Statements
- Directions for use - Agricultural or Forestry Use Requirements, Worker Protection Standard (WPS), Reentry information/notification (for unprotected people) and PPE required for workers; Directions for application; Storage/ disposal directions; Use Restrictions

Safety Data Sheets (SDS) communicate the dangers of using hazardous chemical products. They were formerly known as Material Safety Data Sheets (MSDS). Every chemical manufacturer, distributor, or importer is required to make these available to general public. They contain more information about chemical composition, toxicity, exposure control, first aid, disposal, and other topics. Safety Data Sheets should be read by both Operators and Applicators in conjunction with the label; but it is not a substitute for reading and understanding a pesticide label. Stewardship Workday Leaders should be aware of their content in particular as it addresses safety.

Personal Safety

The herbicide label has minimum safety requirements set by OSHA. In general, being dressed properly and avoiding spills and splashes are keys to safety.

Suggested minimum requirements:

- Closed toe footwear
- Long pants
- Long sleeved shirt
- Protective eyewear – safety glasses or goggles
- Chemical Resistant Gloves
- Rinse water for first aid

Safe mixing setting

- Funnel, measuring cups or other appropriate tools
- Level work surface
- Proper containers & labels
- Water available for cleaning and for first aid if needed

HERBICIDE METHODS

The method used to apply herbicide is dependent on point in the annual growth cycle, weather conditions, species, site conditions, etc. All necessary tools are available from FPCC.

Foliar Spray

Herbicide application by foliar spray is one of the most cost-effective methods for treating many types of herbaceous and woody invasive plant species. With this method, herbicide mixtures are applied to the foliage and especially the growing tips of woody plants, or to completely cover herbaceous plants. Backpack or handheld sprayers are effective tools for controlling larger populations.

Foliar treatment can only be used when winds are low as winds can cause drift and non-target damage. If non-target foliage is accidentally sprayed, clip or remove treated foliage to prevent herbicide uptake. It is important to note that RoundUp is non-selective, meaning it will kill almost any plant. Thus, foliar spraying is generally reserved for invasive "monocultures" and may not be advisable when desired native species are present in an area. In such cases a more targeted approach may be preferred (see below).

Roller/paintbrush

Rollers are effective tools for applying low volumes of oil-based herbicides directly to stems and cut stumps. Attached to wooden extension rods, 2" paint rollers are dipped into a container of herbicide. Avoid over saturating rollers to the point of excessive dripping.

Wicking: small diameter brush can be effectively controlled with basal bark herbicide application. Use the roller around the entire circumference of the stem, applying herbicide evenly in a wide band. If possible, apply herbicide to the root crown. Avoid herbicide application to soil.

Cut Stump: use the roller over the surface of a cut stump and down the side of the stem with an even application of herbicide. If possible, apply herbicide to the root crown. Avoid herbicide application to soil.

Weed Wand

Handheld weed wands apply ultra-low volumes of herbicide by wiping the mix onto the target leaf surfaces or bark. The herbicide mixture is contained in the handle of the wand making this method effective for small infestations. It is efficient on small diameter items such as resprouts but would be too tedious to use on larger diameter growth.

Handwick/glove

Handwicking is typically used in wetlands and fens to control cattails and phragmites but can be used on a variety of species. If invasives are in dense pockets, foliar spraying might be the best option while handwicking is an effective in areas with small, diffuse populations where foliar treatment may be too detrimental to surrounding native species. Size and density of the invasive population and quality of the surrounding

plant community should always be taken into consideration. Handwicking is a slower process but is highly effective and greatly limits collateral damage.

Handwicking requires rubber/latex gloves and a sponge or cotton glove. Place a cotton glove over a latex/rubber gloved hand or hold a sponge in a latex/rubber gloved hand. Dip hand/sponge into the appropriate herbicide and limit the saturation so that herbicide does not drip or run. Wipe down both sides of the leaf blades from base to tip. Be sure to get complete coverage and to treat each leaf and all stems. Follow up treatment may be needed.

SAFETY & FIRST AID

Public Safety

The Stewardship Workday Leader and the Site Stewards are responsible for the safety of the other volunteers during the workday as well as the general public who may be using the area after the workday. In addition to requiring that colorant be used in mixing herbicide, FPCC requires the following signs be used to inform the public that herbicides were used at the site.

Herbicide Notice: This alerts volunteers and other Forest Preserve patrons that herbicide has been applied to a restoration site. The sign indicates the time when re-entry is safe. This reusable sign should be posted in a highly visible location before herbicide application begins. It is commonly taped to a tree near the work site. The re-entry time and date is required. If specific requirement is not noted on the chemical label, use 12 hours from time of application.

Herbicide Notice Flags: Wire or plastic staked flags that indicate the use of pesticides at a restoration site are placed around the perimeter of the area where herbicide was applied. Reasonable flag intervals are recommended as dictated by since flags. Although the immediate removal is not required, the less time the signs and flags are displayed, the better. Leaving them out there for weeks at a time gives the impression that we are continually herbiciding which is not the case. conditions, proximity to trails, and the public. It is desirable for a volunteer to return to the site the next day to remove the sign and the

Remember:

- **ALWAYS read and follow label**
- Always wear appropriate personal protection equipment, including eye protection, rubber gloves, long sleeves and proper footwear.
- Be aware of high wind speeds that cause drift and non-target damage.
- Know rain-safe times & restricted entry interval (REI) for each herbicide.
- Know how to engage the trigger lock and always keep wand tip pointed low when spraying, transporting and stowing
- If wand tip is leaking, get repaired. If slow leak, keep wand tip up-turned to avoid injuring desired plants.
- Bend at the knees, not the waist. Herbicide can leak out the top of backpack sprayers.
- Use O-ring lubricant on O-ring on top of backpack sprayer cap to avoid leakage.
- Always post Managed Area signage when applying herbicide

First Aid

External irritants cause:

• redness, blisters, rash, and/or burns on skin
• swelling, a stinging sensation, and/or burns in eyes, nose, mouth, and throat

Ingested (Pesticide poisoning) may cause:

• excessive sweating, chills, and/or thirst
• chest pains
• difficulty breathing
• muscle cramps or body aches

First Aid Treatment: The following are *general* guidelines for pesticide exposure. They are not a substitute for reading the pesticide label to understand its toxicity, effects, and specific first aid procedures. Remember: The toxic effect of pesticide exposure depends on the quantity of pesticide involved and the duration of exposure.

Get medical advice quickly if you or any of your fellow volunteers have unusual or unexplained symptoms starting at work or later the same day. Call 911 in emergency.

Pesticide on skin:

- Thoroughly flush or soak the victim's skin and clothing with water
- Wearing gloves, remove all contaminated personal protective equipment
- Wash skin and hair with a gentle liquid detergent and water
- Dry victim and wrap in clean, loose clothing or blanket

Oral exposure:

- Thoroughly rinse mouth with water
- Provide victim with up to one quart of milk or water to neutralize the pesticide
- Induce vomiting only if instructions to do so are on the pesticide label

Pesticide in eye:

- Flush eyes for 15 minutes with saline (first aid eyewash) solution or clean water
- Seek prompt medical attention
- Do not use chemicals or drugs in the eyewash water

Inhaled pesticide:

- Remove victim to fresh air
- Loosen any clothing that would constrict breathing
- If other people are in or near the area of contamination, warn them of the danger
- Monitor breathing. Rescue breathing or CPR may be necessary. If required, use barrier device to prevent direct contact with the victim's mouth

General precautions:

- Get medical advice quickly if you or any of your fellow workers have unusual or unexplained symptoms starting at work or later the same day
- If other people are in or near the area of contamination, warn them of the danger
- Know where the nearest phone and hospital are located. Maps and phone numbers to the closest hospitals, and a first aid kit should always be kept with the pesticide.
- Take the pesticide container (or the labeling) to the physician

Reporting The first priority is handling the medical situation. After that, the spill itself should be handled and then last, an Accident Reporting Form (see appendix) documenting the injury/illness should be completed and sent in to Volunteer Resources.

Herbicide Spills

Given the potential for many herbicides to cause harm to humans and the environment, it is imperative that all herbicide users understand the procedure for dealing with spills. The priorities for addressing spills should always be preventing/treating injuries, containment, and disposal of the

herbicide. Considerations for dealing with spills may vary slightly according to the quantity of herbicide spilled, type of herbicide, concentration, and other factors as determined by the herbicide label and SDS.

Minor Spills:

- **Prevent/Treat Injuries**
  - Control access to the area. Keep others away from spilled herbicides. If possible, rope off the area to prevent others from coming into contact with the herbicide.
  - Do not leave the area unless someone is there to confine the spill and warn of the danger
  - If the pesticide was spilled on anyone, wash it off immediately. If necessary, begin first aid procedures outlined in this manual.
- **Containment** Spilled herbicide can be confined through the use of absorbents. Absorbent material includes cat litter, absorbent pillows or pads, soil, sawdust, or absorbent clay to soak up the spill. It is important to prevent spilled herbicide from reaching water.
- **Disposal:** If there is no danger to employees or the public, shovel or sweep contaminated material into a leak-proof container for disposal. Consult the pesticide label for specific directions for other information about herbicide disposal. Do not hose down the area as this spreads the herbicide. Always work carefully and do not hurry. Control access to the area until the spill is completely cleaned up.

Major Spills The cleanup of a major spill may be too difficult for you to handle, or you may not be sure of what to do. In either case, keep others away, give first aid if needed, and confine the spill. Then call 911 for assistance.

Reporting of Spills

Applicators must report any major spills to the EPA. Notify the FPCC (Volunteer Resources or Resource Management) as well.

HERBICIDE LICENSING

Categories of Licenses

All volunteers using herbicides at FPCC stewardship sites must possess a valid Public Category Pesticide License issued by the Illinois Department of Agriculture. Two levels of licenses are offered: **Operator** and **Applicator.** The operator or applicator must have their license with them whenever they are applying herbicide.

Operator is a person who uses herbicides at a stewardship site under the guidance of the stewardship site's pesticide Applicator. Operators cannot be licensed without an Applicator being properly licensed. Operators are expected to be in contact with their supervising Applicator the day of herbicide application. Operators may not legally work under another supervising Applicator.

Applicator is a person who is responsible for herbicide ordering, storage, handling, mixing, transportation, and providing guidance to Operators working under their license. Each stewardship site should have at least one person licensed as an Applicator. They must be available for supervision of the Operator while herbicide is being applied. That means that the Applicator cannot be on vacation, in the hospital, etc. while an Operator is applying herbicide. In some cases, an Applicator may be willing to oversee operators at multiple stewardship sites.

While Operators make valuable contributions to the restoration process, the Forest Preserves strongly encourages all volunteers interested in herbicide application to earn the Applicator license, even if they plan to work primarily as an Operator and still receive guidance from a more seasoned, experienced Applicator.

Testing Process

Two pesticide license exam sessions – one on a weekday and one on a Saturday - are typically offered each fall at the Volunteer Resource Center. A review workshop is also offered in conjunction with these sessions to help aspiring license holders prepare for the exam. Registration for the exam sessions and workshop is conducted on the Online Volunteer System. There is also a wait list on OVS so that you will be notified when the class is being offered. Additionally the Department of Agriculture conducts several weekday sessions each spring within the county. Testing year-round is offered in DeKalb and Springfield.

Operators must pass the 100-question General Standards exam. Applicators must pass the General Standards and also pass one or more 50-question Category exams. All pesticide exams are valid for a period of three years.

Besides offering the review class and testing, the Forest Preserves provide manuals and practice workbooks to assist in exam preparation. If a volunteer cannot test on the day selected for Cook County Forest Preserves, they can also test year round in DeKalb or Springfield and at a few selected sites in Cook County in winter and spring. A sample of the alternate site selections from the prior year is in the Appendix.

Renewal Process

Renewals are required every year. All pesticide licenses expire on December 31st of each year. For years one and two, a simple renewal application is all that is required to renew a license. Individuals who are in the third year need to retest.

Renewal applications as well as notices for retesting will be sent by Volunteer Resources in early November. The Forest Preserves pays for the licenses but not any late fees or duplicate license fees. All paperwork must go through the Preserves for processing. The license application forms must be completed and returned to Volunteer Resources. The Forest Preserves will issue a check for renewal and send it to the state. The state then issues the license, returns it to Volunteer Resources and they will send it to the volunteer. The process has many steps and often takes several weeks to accomplish.

To check on the status of your license, please visit:
http://www.agriculture.illinois.gov/Environment/Pesticide/certlic.html

INPC Indemnification Form

Volunteers are also required to fill out an Illinois Nature Preserve Commission (INPC) indemnification waiver each year. For those who test at an FPCC-sponsored exam session, the INPC waiver can be completed on the day of testing. For all others, the form will be sent out by FPCC with the renewal application.

OTHER METHODS BEYOND THIS CLASS

Fire is essential to the diversity and maintenance of natural communities of Cook County; it helps restore soil fertility through nutrient cycling, increases light availability to promote understory growth, helps control some aggressive species, and enhances some native seed germination. Federal and state agencies, accredited colleges and universities, and the Chicago Wilderness consortium endorse prescribed burning as a vital ecological management tool. The District safely conducts controlled burns in urban and suburban areas by adhering to established guidelines and policies. Section VII, Part A of the Land Management Guidelines covers our policy on prescribed (controlled) burning.

History: Typified by fluid and shifting boundaries resulting from interactions between climate, topography, grazing and fire, the landscape of pre-settlement Illinois was a transitional zone between the eastern deciduous forests and the tall grass prairies of the Plains states. In periods of drier conditions, increased fire intensity limited woody establishment while in periods of wetter conditions, infrequent fire allowed for trees to expand their range. These dynamic conditions allowed for a patchy mosaic of woodlands, prairies, savannas, and wetlands, each with its own suite of species.

The cumulative effect of widespread conversion of natural areas to agricultural land use, invasion of non-native species and 20th century fire suppression has increased habitat fragmentation and has led to the overall decline of species diversity and ecosystem functionality of the natural areas in Illinois. Restoring the natural component of fire back to the landscape is critical to restoration efforts.

Prescribed Fire at FPCC

FPCC staff, volunteers, and contractors conduct prescribed fire in spring and fall. The fire return interval and seasonal considerations per site are covered in the management schedule. Spring burning is dependent on rate of snow melt, timing of plant green-up, and emergence of reptiles, amphibians, insects and mammals. Fall burning is more dependent on fuel moisture and precipitation.

Site Stewards submit burn requests to the regional ecologist who collaborates with the Site Steward to refine the request, before submission to Resource Management. Due to proximity to roads, homes and other development, certain sites many have very specific prescription requirements including specified wind directions and fuel conditions. Weather, location, fuels, and crew size all determine burn feasibility. All burn scheduling and prioritizing is subject to change.

Biological Controls

Animals, fungi and pathogens can be used as control mechanisms for invasive plant populations. Control organisms usually come from the native range of the target species, and require a period of study to ensure that they will remain specific to the target population. Biological control typically does not eliminate the invasive species. However, biological control has been effective for some species including the Galerucella beetle

which has been used with some success to control the European perennial purple loosestrife (*Lythrum salicaria*).

ADMINISTRATIVE

Tool/Supply and Herbicide Ordering

Volunteer Resources provides and loans most of the tools and all of the herbicides needed to run successful workdays. Supplies are delivered to various Preserves sites across the county. The catalog of available tools can be found on the resources section of the fpdcc.com/volunteer or also in the appendix of this manual. The Volunteer Supply Order form, Herbicide Order Form and the Supply Loaner form are available in the appendix of this manual and also can be found in the resources section of the website.

Ordering Procedure

- Site Stewards download the most up to date copy of the *supply order form, herbicide order form or loaner form* available on the resources page of the FPDCC.com/volunteers.
- Complete the fields in the top portion of the supply order form: name, email/phone, site, and need by date, and delivery location (options are identified in the Facilities Directions and Hours).
- Select the items needed.
- Send competed supply order form and any questions to Volunteer.fpd@cookcountyil.gov. A representative of Volunteer Resources may contact you with questions or to inform you that one or more the items in your request are on backorder.

Delivery Procedure Volunteer Resources can deliver requested items to one of twenty different FPCC facilities located around the county. We can also deliver to schools or places of business that have front desks to drop supplies off at but cannot meet people, wait for them, etc. Drop-off site options are on the *Facilities Directions and Hours* overview. There is a second Steward *Facilities Directions and Hours* that has additional agreed to drop-off spots for stewards only (individual garages, special storage units, etc.) that are not available to the general public.

Pick-up Another option is for the volunteer to come to the VRC to pick up the items. All items to be picked up will be waiting for them in the Room Rental office (unless too large).

Deliveries are typically conducted each Thursday and Friday. To insure timely delivery of your items, please submit your supply order form no earlier than one week prior to their intended use.

Herbicide ordering Procedures for ordering herbicide are the same as the tool/supply order procedure outlined above, except that a different form is used and it must show the license number of the Applicator.

Loaner Tool Requests

Stewardship groups and FPCC facilities typically have enough supplies for most projects and workdays. However, for larger projects or workdays, Stewardship groups may need additional tools. Volunteer Resources loans out tools for these purposes. The order and delivery process is the same as tools, supplies and herbicides except that

arrangement for the pickup of the items must be defined.

Given that loaner items are used for short periods, it is imperative that loaner items be returned to Volunteer Resources by the agreed upon return date, typically 1-5 days after the workday. Arrangements should be made with Volunteer Resources if the loaner items will be returned to a location other than the original delivery location

WORKDAY CONSIDERATIONS

Pre and Post work

Determining the flow of the workday is the responsibility of the Stewardship Workday Leader and must consider the volunteers attending, the other leaders available to you and the site conditions.

- **Chainsaws** are efficient but they do make noise and have safety concerns. Sawing before or after a workday or at a distance from the main group may allow for a more enjoyable (quieter) or safer workday especially if there are a lot of youth or new volunteers present.
- **Burning** brush is the most efficient way to dispose of it but does have safety concerns and requires dedication of a Brush Pile Burn Boss to just that task. Burning at the end of the workday may be more pleasant (less smoky) or safer (no sparks) especially if there are a lot of youth and not enough leaders.
- **Herbiciding** is required to prevent resprouts but it has safety issues and requires dedicated herbiciders concentrating on the task. Herbiciding at the end of the workday when most volunteers are gone or at the far edge of the work site towards the end of the workday may be a better approach.

Flagging and Marking

Depending on the experience level of the group, how many leaders are available, and the number of desired species in the area, flagging plants to be protected and marking plants to be removed is an option to assure that the right plants are being cut.

Flagging desired species with colored ribbon (available from FPCC). This is advantageous even if you have quite a few leaders or experienced ID volunteers working. The colored ribbon alerts people to avoid cutting a desirable plant accidentally.

Flagging should not mean that people don't pay attention to ID when cutting though. It would be easy to miss flagging a desirable plant. It just alerts volunteers to be aware.

Marking plants to be cut with spray paint (available from FPCC) is helpful on workdays when you have mostly inexperienced ID individuals. It is difficult to make sure that you paint every invasive. Volunteers must still follow the branches down to assure that they are cutting the right base.

Working with Youth

While youth can be wonderful volunteers at garlic mustard pulls and buckthorn removal workdays, their presence presents certain considerations for those leading workdays or applying herbicide. Special considerations for workdays involving youth include:

Tips:

- Explain the purpose of restoration, the nature of invasive plants, and teach youth how to identify and remove the invasive species
- Emphasize that buckthorn should be cut low and flat
- Work with chaperones and teachers, if applicable, to review expectations

for the workday prior to the start of the workday
- Remember that your primary responsibility is for managing the workday, not managing students in a school group. Managing school group is the responsibility of chaperones and teachers
- Provide youth with safety glasses or goggles (available from FPCC) at buckthorn cutting workdays. Youth are required to wear safety glasses/goggles when loading piles, but encouraging and modeling safety eyewear at all times is a great way to keep everyone safe
- Divide youth into small groups, if necessary
- Remember that not every volunteer needs a tool
- Review tool, fire, and felling rules with youth prior to the start of the workday
- Teach youth how to identify poison ivy before the start of the workday
- Groundtruth before the workday to identify and mitigate hazards (proximity to high-usage bike trail, poison ivy, etc.)
- Use chainsaws before large groups of youth arrive at the worksite.
- Apply herbicide after large groups of youth have left the worksite or
- Explain why using herbicide is an important ecological tool

Managing group size and sub groups

Dividing larger groups into smaller groups is discussed in Group Leadership class. It is important that every volunteer either has good ID skills and good tool skills or is being guided by or has access to another volunteer who has those skills. If you don't have a lot of experienced people, still divide them into small groups of 3 or 4 so that they can challenge each other on ID skills and speak to safety issues of each other.

Tool Management

Each volunteer site has a tool storage plan. This varies tremendously site to site. The Stewardship Workday Leader should work with the Site Steward to determine where the tools are kept, how to access them, the quantity needed, etc.

Delete sentence. Although we encourage volunteers to register for a workday, we operate primarily on a drop-in basis which makes it difficult to plan perfectly for tool quantities needed. Bringing extra to the site may be difficult. Although it is great to have enough tools for everyone, there are tasks to be done without tools - check ID decisions, move cut brush to the staging area or on to the fire, etc. Three people can work together easily with one lopper, one bowsaw and another person to drag the brush.

To assure that tools are not lost during the workday, you should have a system in place to make sure all are accounted for. Counting, numbering or naming the tools (Alfred, Bertha, Clarence, etc.) and then checking numbers before you leave the site is suggested.

Group Safety

Workdays have a lot of activity happening all at once. If organized, they are safe even though some of tasks, sawing, burning, herbiciding, have some inherent risk to them. If the workday is unorganized, the risks

increase and a workday can become hazardous. The Stewardship Workday Leader should maintain a continual awareness of what is going on and adjust the tasks as needed to assure safety. Particularly on workdays with inexperienced volunteers, they need to be walking the work site continually and observing and should not be the person doing the most work .

ENGAGING THE PUBLIC

Visitors and Preserve User Passersby

Visitors to the preserves are not always familiar with the need to manage natural areas, and may object to non-intuitive activities such as cutting trees and applying herbicide. Questions and challenges can be an opportunity for education, although efforts at explanation are not always successful. In those few cases, there are guidelines for how the public may or may not interact during the workday. These rules protect both volunteers and the public.

Education

- If part of the site has been restored, show them the "after" effect of restoration by asking them to compare how the two areas look
- Inform them about invasive species vs. natives. That invasives have an unfair advantage and what you are doing is just returning the advantage to the natives
- Explain how our ecosystems are fire dependent based on natural fires and Native Americans' historic use of fire. You are substituting mechanical brush removal with what fire would have removed had it been allowed. Plants characteristic of many of our natural ecosystems (including oak trees) require a fair amount of sunlight to grow, and they are being eliminated due to excessive shade levels in most of our wooded areas.
- Explain that a healthy woodland allows people and animals to move through it and see through it which isn't possible with heavy brush.

Guidelines for interaction with Public with concerns or questions

- Avoid arguing or confronting anyone
- Respectfully let them know that by law, they must keep at least 30 feet away from the worksite
- Also by law, no one can take pictures of any youth under 18 without explicit parental consent
- If individuals continue to interfere with the workday, call FCPP police at 708-771-1001 and ask for their assistance. They are trained and paid to deal with these situations.
- If the situation is uncomfortable, take a work break until Police arrive
- If you feel that your safety is being threatened in any way, extinguish the fire, pick up the tools and herbicide and walk away. The safety of the volunteers is most important.

At some sites where we anticipate protestor activity, we can get FPCC Police to monitor the workday and in cases where youth groups are present, they will actually stay at the workday from start to finish. These are not common or universal experiences, but if they do occur, FPCC wants volunteers to feel safe and protected so please involve us when needed.

SPECIES SPECIFIC TREAMENT & ID

Most workdays Stewardship Workday Leaders will lead on their own, focus on a very few species. The Stewardship Workday Leader may also lead sub-groups of volunteers on other workdays aimed at less common species with the Site Steward leading the overall workday. It is important for the Stewardship Workday Leader to be able to identify the most common target species. Not only for workday purposes but for reporting and observation to the Site Steward to address new issues as they arise.

- *Rhamnus spp.* Common & Glossy Buckthorn
- *Rosa multiflora* Multiflora Rose
- *Lonicera spp.* Asian Honeysuckle
- *Celastrus orbiculatus* Oriental Bittersweet
- *Berberis thunbergii* Japanese Barberry
- *Alliaria petiolata* Garlic Mustard
- *Dipsacus spp.* Common/Cutleaf Teasel
- *Melilotus spp.* Yellow/White Sweet Clover
- *Lythrum salicaria* Purple Loosestrife
- *Ranunculus ficaria* Lesser Celandine
- *Phragmites australis* Common Reed
- *Phalaris arundinacea* Reed Canary Grass

Resources:

NIIPP - Northeastern Illinois Invasive Plant Partnership
Phenology Calendar
General Invasive Species Fact Sheet and Resources

Herbicide Use in Natural Areas – The Nature Conservancy & Illinois Nature Preserves Commission

Illinois Nature Preserves Commission – Management Guidelines
http://dnr.state.il.us/INPC/Management_guidelines.htm

http://www.chicagowilderness.org/resources/