



Georgia Native Plant Society

Habitat Restoration Manual

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Introduction/Overview

This manual provides guidelines for planning and executing a GNPS habitat restoration project to recreate a native plant habitat or to restore one to its natural condition. These guidelines offer strategies for creating projects that are carefully thought out and planned so that they are successful, can be realistically completed, and are as true as possible to native habitats.

The guidelines are intended to be appropriate for a wide range of habitat restoration projects, but they are not intended for large-scale projects involving consultants and contractors.

Each restoration project presents a unique challenge, and planners will have different objectives and resources. In practice, you need to be flexible and realistic about what can be accomplished and adapt the guidelines to the specific project you are planning.

Anyone with a desire to promote the planting and use of native plants for education, recreation, landscaping in public areas, municipal or state parks or other similar areas is encouraged to use this manual to plan a restoration project and complete a GNPS Restoration Site Application. These guidelines can also be used by homeowners seeking to remove invasive species and create habitat on their own personal property, although projects on private property are not eligible for official GNPS restoration site status and benefits. Benefits of being an approved GNPS Restoration Site are detailed in the application.

What is habitat restoration?

Habitat restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates ecosystem recovery with respect to its health (functional processes), integrity (species composition and community structure), and sustainability (resistance to disturbance and resilience).

Why is habitat restoration important?

Habitat restoration is an opportunity to repair ecological damage. There are many environmental benefits to both large and small projects.

- elimination of non-native invasive plants,
- preservation of native species (including threatened and endangered species),
- maintenance and enhancement of biodiversity,
- provision of native habitat to support a wide range of wildlife
- improvement of air and water quality, and other ecological functions.

Further, restored habitats allow humans to enjoy and study the plants and animals that depend on them. Working on habitat restoration projects in public spaces provides valuable opportunities to learn more about conservation and stewardship of natural communities.

A restoration project such as a schoolyard habitat or a neighborhood park may be a very small part of the larger regional, national, or even global ecosystem, but individual projects can, in the

aggregate, repair or reconnect fragmented natural habitats. Moreover, individual projects can become a focus for the activities of groups, neighborhoods, and communities. They can also provide immediate benefits to the local community and perhaps may ultimately result in regional and/or national benefits.

Components of healthy, functioning ecosystems

A healthy ecosystem consists of native plant and animal populations interacting in balance with each other and their environment. Features of a functional ecosystem include adequate species diversity, healthy community structure, and appropriate physical conditions.

A **reference ecosystem** is useful in determining what the target community should be for the subject area being restored. (A reference ecosystem is a local, undisturbed native community upon which the restored habitat will be modeled and against which it will be evaluated. See Glossary for details.)

- **Species diversity** is the number and type of species present. Species diversity is an indication that there is an adequate number and type of native plant species to ensure sustainable populations.
- **Community structure** encompasses the composition of species present at the various layers within an ecosystem. Healthy community structure is an indication that the species can interact and carry on their natural functions in the ecosystem.
- **Appropriate physical conditions** include soil structure, fertility, and hydrology that ensure species and their functions in the ecosystem are sustainable. Each ecosystem is adapted to the physical conditions found at a particular site.

Types of GNPS Habitat Restoration Projects

For the GNPS Habitat Restoration program, the following three “types” of habitat restoration projects have been defined. As part of the site evaluation process and applying for GNPS Restoration Site status, you will determine for your site which type of project applies.

1. **Type 1 - Rehabilitation** – These sites have relatively intact native plant communities but require corrective management to address existing factors that inhibit normal habitat functioning. Projects in this category require management plans, non-native invasive plant removal, and/or physical alteration (e.g., soil amendment, erosion control). They may also require planting native species.
2. **Type 2 - Restoration** – These sites lack significant native plant diversity and require more substantial corrective management and addition of native species to re-establish normal habitat functioning. Projects in this category require management plans, planting and care of native plant species, non-native invasive plant removal/management, and/or physical alteration.
3. **Type 3 - Replacement** – These sites have little to no existing native plants and will involve complete reconstruction with native plants to establish a healthy ecosystem most

appropriate for the site. Examples include re-creation of an extensive meadow or replacing expanses of non-native wetland plants with native species. Projects in this category require intensive planning and design, management plans, planting and care of native plant species, non-native invasive plant removal/management, and/or physical alterations. These projects often require a significant investment of time and money.

Native Plant Educational Gardens – These projects include establishing native plant gardens or displays primarily for educational purposes. The garden/display must provide habitat resources (e.g., pollinator garden, bird/wildlife habitat) and be installed on public properties such as schools, parks, or nature centers. Because these projects usually involve an area of limited size and scope, these are not considered true restoration projects; however, they are covered in this manual because many of the same issues must be considered in their planning as Type 1-3 restorations. For educational gardens, the plants installed should be both regionally appropriate and adapted to the physical conditions of the site. Projects in this category require design, planting native species, and possibly physical alteration to create appropriate site conditions. Non-native invasive plant removal may be required.

Size of the Project Area

Small Projects – Projects up to 10,000 square feet (approximately 0.25 acre).

Intermediate Projects – Projects between approximately 0.25 acre and 1 acre in size (larger community gardens, nature trails, stream banks, park renovations, botanical gardens).

Large Projects - Projects greater than 1 acre in size (large community gardens, state and local parks/recreation areas, conservation/restoration sites, prairies, savannas, meadows, grasslands, wetlands).

Getting Started

Before you even begin to work on your restoration plan and start your application, take the time to carefully consider the following questions:

What do you want to do? Why do you want to do it?

Determine the specific type of restoration project(s) you want to accomplish at your site and define your project goals. Stewardship of nature is a primary motivator for many people. Other people have recreational, educational, or aesthetic reasons for undertaking a project. Still others are working for specific goals such as protection of threatened or endangered species and/or water and air quality improvement.

Be clear about why the project is worth your time and energy and what benefits will result. It can be particularly helpful for groups to create a list or brainstorm the “what” and “why” to clarify everyone’s expectations, desired outcomes, and motivations. Different types of restoration projects require different strategies for accomplishing your goals.

What resources will you need to do this?

Consider the following items to help you identify what resources you will need.

Expertise: It isn't necessary for you to be an ecologist or a botanist to undertake a habitat restoration project. A working knowledge of native plants and their habitats is helpful, but it is also ok to learn as you go. A site restoration project manager's primary responsibility is to act as a facilitator. Be prepared to bring people together, seek answers, plan, solve problems, and commit to moving the project forward. The primary qualifications for a good restoration site project manager are a commitment to attain the project goals, to ensure the continuity and care of the project long-term, and to make informed, ecological, and scientifically-based choices.

Keep in mind, however, that the overriding principle guiding your actions should be to DO NO HARM. If you do not have the expertise to make appropriate choices about how to restore your site, find someone who does. Your GNPS liaison or the GNPS Restoration Subcommittee can help you sort through the resources available to help you. For example, consider whether your site may harbor protected (endangered, threatened, rare, or unusual) species. If so, you should reach out to the Georgia Plant Conservation Alliance (GPCA) or Georgia Department of Natural Resources (GA DNR) to help ensure their protection. Information on choosing plants, designing landscapes, and removing non-native plants is available on the GNPS website and in the suggested publications in Appendices I, II, and III in this document.

Plants: Regarding the plant species you plan to install in GNPS-approved restoration projects, GNPS requires that the following principles apply:

- All projects must install native plants, exclusively.
- Type 1-3 restoration projects must avoid installing cultivars of native plants.
- Native Plant Educational Gardens should avoid installing cultivars of native plants.
- All project types should install plants that are local (sourced within 60 miles) or regional ecotype, if possible.

To determine whether a plant species is native to your area, you can check the Biota of North America Program (BONAP) <http://bonap.net/Napa/Genus/Traditional/County>.

Efforts should be made on all projects to remove non-native invasive plants prior to installing any native plants and plan for their long-term control to avoid re-establishment. It is not necessary to remove all non-native species within the project boundary, provided they are not listed as invasive species. Check the non-native invasive plants listed in Georgia Exotic Plant Pest Council (GA EPPC) (<https://www.gaeppc.org/list/>).

People: Habitat restoration is a team effort. You will need people to manage the project, recruit and coordinate workday volunteers, handle finances, handle publicity and communication and document the project. Volunteers for workdays may be available from your local GNPS chapter through your GNPS liaison (the GNPS member who has agreed to guide you through the process).

A key part of building your team is identifying the stakeholders in the project and involving them early in the planning process. Building a shared vision with all stakeholders helps ensure the success of your project. Stakeholders can become roadblocks if they are excluded or valuable resources if they are engaged. Some of your stakeholders will be obvious, such as the residents who live in the immediate vicinity of the site. Other stakeholders may be less apparent, such as city and county authorities.

Time: Be realistic about the amount of time you and your team can devote to the project. Undertaking a project and leaving it unfinished could result in damage to the site and to public relations. Make sure the project is a manageable size for the resources you have available. Long-term maintenance should be an integral part of your plan. Larger projects should be broken into phases.

Finances: Develop a budget for the project. Small projects can be successfully completed using “freebies,” such as volunteer labor, loaned tools, rescued plants, etc. Many professionals are willing to contribute some time or materials to worthy causes. Larger projects, however, will require professional help that costs money, such as consultant fees, non-native invasive plant control, special tools, and materials. Such costs can be funded by contributions from interested parties or by a grant. You should plan thoroughly and well in advance if your project will require significant contributions or a grant. Applying for external grants can be very involved and time consuming.

When do we start and how long will it take?

You can start the planning process immediately. Good planning takes time, but it ensures efficient use of resources and effective results. Expect to spend several weeks to months, depending on the project type and scope, to gather information, brainstorm, analyze, and set goals and objectives. Once you have planned well, the actual restoration work such as removing non-native invasive plants, transplanting rescued plants, etc., will move forward more quickly and smoothly.

Failure to plan usually results in the project bogging down for numerous reasons: an invasive species is discovered to be difficult to remove, unforeseen site conditions delay work, or suitable native species prove difficult to source. These types of issues cause major delays in the project’s progress. Worse, delays dampen the enthusiasm of volunteers and often result in a shakeup of the project team when the original timeline stretches out.

The duration of a project depends on its size and scope, the objectives that you lay out for yourself, the size, skills, and motivation of your team, etc. A small project, such as a schoolyard habitat may be accomplished in one season with minimal annual maintenance. A large project may require several years with on-going maintenance. In general, habitat restoration is a slow and deliberate process; this ensures that appropriate choices are made, that no damage is done, and that the site has a firm footing on which to recover and become self-sustaining.

Guidelines for GNPS Habitat Restoration Projects

The habitat restoration process consists of three main steps.

- The **planning** step describes the objectives of the project, actions necessary to achieve the objectives, logistics and estimated costs.
- The **implementation** step lays out the steps involved in executing the plan.
- The **evaluation**/follow-up step describes how you will measure attainment of the objectives.

I. Planning

1. Identify the site.

Identify the location of the project and the boundaries of the site using a topographic map and/or aerial photograph. Identify ownership of the site including name, address, telephone number, and email address. If an organization or institution owns or manages the land, specify names, titles, addresses, and contact information for key decision makers. Identify under what authority actions will be conducted (e.g., Atlanta City Parks, Etowah Water and Sewer Authority).

2. Identify legal restrictions.

What permits may be required by federal, state, and/or local authorities (e.g., endangered species, historic sites, etc.)? Are there any landscape/land use/water use restrictions - present or future? In some instances, a conservation easement or binding agreements with neighboring landowners is needed to ensure the integrity of the restoration site is not compromised.

3. Identify the type of project (see Types 1 - 3 above) and target habitat type.

After you identify the type of project, you must identify the target habitat type (or natural community) to be restored. For those without ecological expertise, you likely will need some expert help for this step. First, refer to "The Natural Communities of Georgia," by L. Edwards, *et al.* to find a community description that matches your site. Check your tentative habitat type with your GNPS liaison or a GNPS Habitat Restoration committee member. Consult with an ecologist, botanist, or landscape architect/designer, if necessary.

For project types 1 - 3, you will need a reference ecosystem (a local habitat upon which the restored habitat will be modeled and against which it will be evaluated) to help you fine-tune planning for your target habitat. See the Glossary for further discussion on reference ecosystems. Each natural community described in Edwards *et al.* has a "featured place" as a reference ecosystem.

Be sure to identify any special needs of the habitat. For example, some habitats require special stressors, such as fires, flooding, periodic drought, or salt spray. Are there any

special habitats and plant or animal communities that are targeted for restoration? Identify any threatened or endangered species on the site.

Another good starting document to read is “An Introduction to Using Native Plants in Restoration Projects,” by Jeanette Dörner.

https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/intronatplant.pdf

4. Identify the project team.

Identify project manager, GNPS liaison, volunteer coordinator, and team members. Identify a back-up project manager, if possible. Project team members can come from the public, residents in the immediate area of the site, and other stakeholders.

5. Identify requisite resources.

Identify what labor, materials and equipment will be needed. What plant material, either live plants or seeds, is required and appropriate? Where will you obtain the plant material? Are there GNPS plant rescues on property being developed in your area that may have suitable material? If plant material will be purchased, what is the provenance of that material?

Special care should be taken when procuring plant materials. Using well adapted, ecologically appropriate, and local ecotype species has been shown to increase the success of restoration projects. GNPS discourages the use of cultivars/nativars of native plants in any GNPS restoration project that they approve, and prohibits their use in anything other than Native Plant Educational Garden projects. GNPS encourages the use of local or regional ecotypes whenever possible. Conservation practitioners suggest a best practice of sourcing plant materials within 60 miles of a restoration site. For a more complete reading of the GNPS policy and associated publications on plant materials, see Appendix III and the Glossary of this document.

6. Conduct a site assessment and document site conditions, plants, and animals.

Describe the site conditions in detail – topography, hydrology, and soil. Comment on any site history that may be pertinent. Thorough documentation of the original site conditions will be helpful both as a baseline and to measure the success of the project. Take plenty of photographs. On your site map mark features, including significant features to be changed, removed, protected, or added. List both existing plant and animal species.

6a. Note the composition and abundance of native plant species and document the structure of component communities (see Appendix I). List all identified native species, providing both common and botanical names. Use the list of native species found to help confirm the type of natural community that characterizes the site (refer to Edwards, *et al.*) as identified in Step 3.

6b. List all identified non-native/invasive species, providing both common and botanical names (categories 1-3 in <https://www.gaeppc.org/list/>). Identify the method(s) of control that will be used to remove and maintain future control of unwanted species.

7. Prepare a list of specific objectives designed to achieve restoration goals.

Consider the three components for a functioning ecosystem (species diversity, community structure, and physical conditions) with a view to developing a comprehensive list of actions that should be undertaken to achieve the objectives/goals. Objectives are the features of the project necessary to achieve the goals. Objectives are explicit, measurable, and have a designated time element.

Some examples of objectives are:

- Remove all non-native invasive species before planting.
- Enhance the diversity of the herbaceous species at the site by end of year 1.
- Attract more birds and other wildlife to the site within a year of project completion.
- Increase the depth and fertility of the site before planting.
- Improve pedestrian access to the site before restoration begins.

8. Identify the actions necessary to attain each objective.

Provide detailed instructions and timeline for implementing each of the objectives. Provide a detailed list of labor, equipment, supplies, and plant materials needed.

9. List and schedule the tasks needed to fulfill each objective.

Scheduling must account for season, time to acquire live plant or seed material, availability of labor and equipment, and other items. Most objectives ideally should be implemented within the first or second year of the project timeline; however, some objectives may have to be delayed. For example, the re-introduction of plants with specialized habitat requirements may have to be postponed several years until habitat conditions become suitable. If non-native invasive species are present, they will need to be eliminated prior to planting native species to ensure the project is successful. Adequate elimination of invasive species can sometimes take several years of solid work.

10. Define and describe all maintenance and management tasks necessary to attain each objective.

Be sure to plan for watering, pruning, supplemental treatment of invasive plants and weeds, replacement of dead plants, etc., as needed. Also, most sites will need some form of protection from damage, either natural or man-made. Minimizing soil disturbance can reduce unwanted weeds and non-native invasive species. Describe what maintenance and management will be required once the project (or each project phase) is complete and identify who will do it.

11. Define a plan to demonstrate the success of the project.

Plan how you will measure the success of your project. Determine what, how and when measurements are necessary to demonstrate that each objective has been attained. For example, if your goal is to increase native plant species diversity, you can count the number of native plant species annually. For a schoolyard native habitat, perhaps you hope to increase class lessons focused on native plants. In this case, you can count the students or classes using the space each month.

12. Prepare a detailed budget for the restoration plan and identify funding sources.

Determine final estimates for each cost and compare to the funds you expect to have available. What are the sources of funds to cover the cost of the project (definite and potential)? You may need to adjust your plan to fit your budget. Solicit bids from any commercial service providers. Include a contingency or buffer amount to cover unexpected or miscellaneous costs.

13. Plan to publicize the project.

Solicit public participation in project implementation. Contact the media when appropriate. Plan for the necessary and appropriate signage for the completed project.

Once you have completed your application and restoration planning, submit your application and supporting documentation to the GNPS Habitat Restoration Subcommittee for approval.

II: Implementation (After project approval)

1. Secure permits required by regulatory and zoning authorities. Install GNPS Habitat Restoration Site signage to indicate that habitat restoration is beginning or in progress.
2. Engage and train project leadership personnel who will supervise and conduct project tasks.
3. Recruit volunteers and provide any needed training.
4. Procure equipment, supplies, and appropriate plant materials.
5. Monitor progress of project
 - a. For insurance purposes, volunteers (both GNPS members and non-GNPS members) should sign a GNPS Waiver form each time they work on the project. The project manager should record the number of volunteers and volunteer hours.
 - b. You will need to show that objectives of the project have been met. This will require documentation before, during implementation, and after the project is completed (captioned photos, measurements, inspections, etc.).
 - c. In addition to taking necessary measurements, any necessary revisions to tasks and/or objectives should be promptly identified as work on the project progresses.
6. Take steps to protect the project site against damage.
7. Implement post-implementation maintenance/management. Define and implement adaptive management procedures as needed.

8. Congratulations! Apply for GNPS Native Habitat Certification (if eligible) to show that the project is complete and has moved into the maintenance phase. Apply for other native habitat certification, as desired and appropriate. These may include the State Botanical Garden Connect to Protect, Georgia Audubon Backyard Habitat, National Wildlife Federation Wildlife Habitat, Rosalynn Carter Butterfly Trail, and others.

Provide progress reports to the GNPS Liaison as requested, quarterly, at a minimum.

III: Evaluation

Project Annual Report is required for the GNPS Restoration site to remain in good standing. For insurance purposes, the report will include the number of volunteers, and volunteer hours. This will ensure access to support resources like additional plant materials and funds, if available, and inclusion on the GNPS website. Reports are submitted in June by the project manager to the GNPS liaison and Restoration Subcommittee.

Project Progress Reports should include a narrative of project progress towards short and long-term goals with supporting documentation such as photos.

References

Edwards, L., Ambrose, J., & Kirkman, L. K. (2013). *The Natural Communities of Georgia*. Athens: University of Georgia Press.

Miller, James H.; Manning, Steven T.; Enloe, Stephen F. 2013. A management guide for invasive plants in southern forests. (slightly revised 2013 and 2015). General Technical Report SRS–131. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 120 pp. [Download here](#).

Appendix I: Site Assessment (for project manager)

To do an appropriate habitat restoration, you must know what habitats are, or were at one time, at the site. Remember that any one site may have multiple habitats. Complete a written site assessment using the following categories. Your GNPS liaison can be a resource for assisting with this assessment.

Region: There are five primary physiographic regions in Georgia: the Cumberland Plateau, the Ridge and Valley area, the Blue Ridge, the Piedmont, and the Coastal Plain. Some of these are further subdivided in more specific regions (Edwards, *et al.* pp. 2-3).

Topography: On a map, identify the site's significant topographical features and the topography of the area around the site. Common topographical features are mountain, ridge, slope, valley, field, cove, rock outcrops, river, stream, creek, bog, swamp, lake, pond etc.

Aspect: Identify the direction the site(s) faces, i.e., facing North, South, East or West.

Water: There are three primary distinctions to make with respect to the amount of water at any location: wet, mesic (sometimes wet/sometimes dry), and dry (xeric). You should remember that your observation is occurring at a particular point in time. Because the amount of water at a location is determined by factors such as weather, season, etc., you may need to make several observations over the course of a year (or in some cases over several years) to make an accurate observation. Remember that sites evolve over time.

If a location is predominantly wet, it is a wetland. Wetland sites need special consideration. https://www.nrcs.usda.gov/wps/PA_NRCSCConsumption/download?cid=stelprdb1250401&ext=pdf

Soil: Soil types are very complex and beyond the scope of this overview. Try to make a basic determination of the soil characteristics (e.g. sand, clay, or loam). The following app is useful. Web Soil Survey: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Vegetation: There are six general types of vegetation: trees, shrubs, herbaceous plants, vines, grasses, ferns. You will need to place the species found at your site in these categories.

Structure: When doing a site assessment, you need to determine the vegetation structure of the site. How many layers of vegetation are there at the site? The typical layers are canopy, sub canopy, shrub, herbaceous, vines, and epiphytes. When making this determination, start at the very highest layer and work your way down.

There are several general natural community types in Georgia. These include forests, woodlands, flatwoods, savanna, prairie, glades, and barrens. (Edwards *et al.* pp. 4-5)

Non-native invasive plant species: Consult the Georgia Exotic Pest Plant Council list of non-native invasive species to determine if these are on your project site (see Appendix II). Additional information including management recommendations can be found in "A management guide for invasive plants in southern forests" (Miller *et al.* 2013).

Physical condition: Determine if there are any physical conditions that would inhibit the restoration of the site (e.g., erosion, hydrological alteration, compaction, contamination).

Appendix II: Nonnative Invasive Plant Control

- A management guide for invasive plants in southern forests (Miller et al. 2013). Available online <https://www.srs.fs.usda.gov/pubs/36915> or as a smartphone app.
- Cooperative Invasive Species Management Area <https://www.invasive.org/cisma/> Check to see if you have a CISMA near you as a resource.
- Coastal Georgia Cooperative Invasive Species Management Area – Non-native invasive species priority list.
<https://bugwoodcloud.org/mura/cogacisma/assets/File/Educational/Priority%20Lists/DescriptiveCG-CISMAInvasivespeciesprioritylistJuly2013.pdf>
- Georgia Exotic Pest Plant Council. Non-native invasive species priority list.
<https://www.gaepcc.org/list/>
- Georgia Invasive Species Strategy (2009) – Non-native invasive species list starts on page 40.
<https://georgiawildlife.com/sites/default/files/wrd/pdf/management/GeorgiaInvasiveSpeciesStrategy.pdf>
- Plant Conservation Alliance, Bureau of Land Management (2002) - An introduction to using native plants in restoration projects. 2002.
https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/intronatplant.pdf

Appendix III: Other Resources

General site assessment information:

- Determining Reference Ecosystem Conditions (Journal of Forestry October/November 2005)
 - https://www.fws.gov/bmt/documents/joff_article_goebel_etal_05.pdf
- Society for Ecological Restoration International, Primer on Ecological Restoration
 - https://cdn.ymaws.com/www.ser.org/resource/resmgr/custompages/publications/SER_Primer/ser_primer.pdf
- Plant Conservation Alliance, Bureau of Land Management (2002) - An introduction to using native plants in restoration projects. 2002.
 - https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/intronatplant.pdf

Further plant materials sourcing considerations:

- Seed Transfer Zones
 - <https://conference.ifas.ufl.edu/ncer2018/presentations/Salon%20A&B/Wednesday/1340%20Walker.pdf>
 - US Forest Service and Clemson University researchers who focus on restoration of the longleaf pine ecosystem have developed maps of provisional seed transfer zones. These zones encompass larger geographic areas and suggest collection and restoration within these larger areas will still lead to restoration success.
- A Monthly Guide to Georgia Native Plants
 - <http://georgianatives.net/>
 - This website consists mostly of native plants as found in the wild (straight species) but also contains photos of some plants that are cultivars which are becoming more readily available at nurseries. Each photo is identified as follows: Straight species plants have the scientific name such as *Phlox paniculata* while cultivars have a name in single quotes that follow: *Phlox paniculata* 'David'; a hybrid cultivar should include an 'x' in the name to denote that two species were crossed: *Phlox* x 'Wanda.' The website also shows photos of plants that are common in our area but that are not native and those are identified as NOT NATIVE but are provided to help in identifying plants people might see on a property.

Cultivars should not be used in Georgia restoration projects/areas. Straight species, preferably sourced from regional Georgia populations (local ecotypes), should be used.

- GNPS Statement on Cultivars of Native Plants.
 - <https://gnps.org/gnps-statement-on-cultivars-of-native-plants/>

- Consideration of Straight Species vs Cultivars
 - <https://piedmontmastergardeners.org/article/native-species-or-cultivars-of-native-plants-does-it-matter/>
- Local Ecotype Guidelines & Genetic Considerations in selecting plant materials. (WildOnes 2019 Position Statements) & (U.F. Forest Service)
 - <https://wildones.org/wp-content/images/Local-Ecotype-Guidelines-Rev-2019-07.pdf>
 - https://www.fs.fed.us/wildflowers/Native_Plant_Materials/Native_Gardening/genetics.shtml

GLOSSARY

Adaptive Management Procedures – a systematic approach for improving resource management by learning from management outcomes. Adaptive management is useful when there is substantial uncertainty regarding the most appropriate strategy for managing natural resources.

Forests – Tree dominated communities with canopy coverage greater than 80%

Woodland – Tree dominated communities where the canopy is 50-80%; these are open stands where the crowns are not usually touching. In addition, stands of markedly stunted trees are treated as woodlands.

Flatwoods – Forests or woodlands that occur on a low, flat, or mildly depressional site, with moist to hydric soils.

Glades – A community with extensive rock outcrops and patchy vegetation dominated by herbaceous species and shallow, rocky soil.

Barrens – A community where no mature trees are present, ground cover is not complete, and the site has thin, gravelly soils. Barrens are often intermixed with glades on the landscape and referred to as “glades and barrens.”

Savanna – A community dominated by herbaceous vegetation, where mature trees are widely spaced and the canopy is at least 50% open, supporting a dense herbaceous ground cover similar to a prairie.

Prairie – A community dominated by herbaceous vegetation. No mature trees are present, herbaceous ground cover is complete, and exposed gravelly soils or large expanses of rock outcrop are lacking (e.g., soils are deeper than those of barrens).

Cultivar - is a selection of a plant that has been patented or propagated through cultivation such as selected seeds but most often through cuttings, division, or tissue culture and sometimes selected seeds usually through controlled selective pollination of the parent plant. To preserve the traits for which they were selected, most cultivars are clones of the original plant. For native plants, some people refer to these as ‘nativars’ but they are the same concept as the broader term ‘cultivar.’ Cultivars can be hybrids or they can be selections of the species found in a population of plants.

Straight Species – plants as they are originally found in the wild.

Local Ecotype – plant material that originates in and is native to your geographic region. Plants from these sites should have the same or similar environmental conditions as the site of planting. These regions have ecological, not political boundaries. These regions are often termed ecoregions. Check out the [US Ecoregions Map](#). (adapted from WildOnes [Local Ecotype Guidelines](#))

Reference Ecosystem

1. A natural plant community with minimal anthropogenic disturbance situated in a location with similar conditions (soil type, moisture regime, aspect, elevation, etc.) and exposed to similar environmental factors as the proposed restoration site. This ecosystem should reflect the compositional and structural attributes that have developed after natural disturbances, and the most useful reference conditions are often those that represent the range of “natural” variability associated with the ecosystem. This ecosystem would serve as a guide for planning your restoration project as well as a benchmark for evaluation project success and influencing adaptive management as needed. (Adapted from https://www.fws.gov/bmt/documents/joff_article_goebel_etal_05.pdf)

2. A "community of organisms able to act as a model or benchmark for restoration." [1][2][3] Reference ecosystems usually include remnant natural areas which have not been degraded by human activities such as agriculture, logging, development, fire suppression, or non-native species invasion. Reference ecosystems are ideally complete with natural flora, fauna, abiotic elements, and ecological functions, processes, and successional states. Multiple reference ecosystems may be pieced together to form the model upon which an ecological restoration project may be based. (Wikipedia).

Non-Native Invasive species - Species that have been introduced, either intentionally or accidentally, into areas outside their natural ranges and that cause economic or environmental harm or impacts to human health. (Georgia Invasive Species Strategy 2009)

Natural Ecosystems (for Georgia) – an assemblage of native plant and animal species, considered together with the physical environment and associated ecological processes, which usually recurs on the landscape. A community is considered “natural” when the native species predominate and are distributed across the landscape in response to disturbance factors such as fire frequency, flood regimes, wind disturbances, or physical attributes such as landforms, soil nutrients, or moisture. (Edwards *et al.* p 1)

Project manager – the lead or champion of the proposed restoration project. This person is responsible for completing the application and seeing the project through all the phases if the project is approved. This person is encouraged but is not required to be a GNPS member. If they are not, the project manager should seek out a GNPS member to serve as a liaison.

GNPS liaison – this individual has agreed to partner on a restoration project that has a Project manager who is not a GNPS member. The GNPS liaison will help the project manager in finding resources within GNPS to assist the project.

Rehabilitation – as a type of ecosystem restoration it is the repair and replacement of essential ecosystem structures or functions in a degraded plant community. A definition in the context of this application can be found on page 2.

Restoration – is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Thus, there are many types or levels of input potentially needed to restore an ecosystem. This could entail the enhancement, creation, or re-creation of habitats. A definition in the context of this application can be found on page 3.