FLORA RESOURCES

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Introduction

The policy, goals and objectives coordinating the protection, use and development of plant resources on state forest lands are translated into guidelines through the "Flora Resources Section" of the State Forest Resource Management Plan.

Forests are complex ecosystems composed of animal and plant communities integrated with the physical environment. Trees are but a small number of the plant species found in the forest. A myriad of shrubs, herbs, ferns, fungi, mosses and lichens compose the forest under story and blanket the forest floor.

Ferns, herbs, shrubs, vines and trees are known as vascular plants. The current number of native vascular plant species in Pennsylvania is 2151. Fungi, bryophytes and lichens are often grouped together and termed "lower plants". Combined the number of "lower plants" total approximately 8,270 species. The majority of these species are fungi (7,447). Bryophytes comprise 469 species and lichen the remaining 351 species. Activities associated with these plant species are controlled by the Department of Conservation and Natural Resources through the provisions of the Wild Resource Conservation Act, P.L. 597, No. 170.

The Act states, "The Department of Conservation and Natural Resources shall with cooperation from taxonomists, biologists, botanists, and other interested persons conduct investigations on wild plants in order to ascertain information relating to population, distribution, habitat needs, limiting factors, and other biological and ecological data to classify plants and to determine management measures necessary for their continued ability to sustain themselves successfully." This provision creates a program that requires extensive research and management that will be supervised and conducted by the Bureau of Forestry.

A native species is one that occurred within the state before settlement by Europeans. Of the 2151 native species, 682 are classified as endangered, threatened, rare or undetermined in Title 17, Chapter 45, Conservation of Pennsylvania Native Wild Plants. (Plant List http://www.dcnr.state.pa.us/forestry/pndi/fullplants.asp) An additional three species (Goldenseal, Ginseng and Yellow-Lady's Slipper) are identified as vulnerable due to collection pressures. Reasons for classification are a decline in the number of populations in the state, due to habitat destruction and competition from invasive plant species. Over collecting certain species known for their medicinal or edible properties may also contribute to the decline of native plant populations. It is illegal to possess any plant or plant parts classified as Endangered or Threatened without a Wild Plant Management permit issued by the Bureau. State Forest Rules and Regulations (Title 17, Chapter 21) state that permission is needed from the district Forester to cut, pick, dig, damage or remove living or dead plant and plant part. One may gather edible wild plant or plant parts without authorization if used for personal or family consumption.

The Wild Resource Conservation Act also provides that the department may protect wild plant species that are in jeopardy of population decline by acquiring or designating areas previously acquired as public wild plant sanctuaries (Adobe PDF - 25 Kb). Any area of publicly owned land that supports a viable population of native plant species of special concern, or contains suitable habitat for viable growth of native plant species of special concern and is known to have historically supported such species, or the areas contains suitable habitat for viable growth and reproduction of native plant species of special concern which may be transplanted or the area supports an exemplary Pennsylvania native wild plant community may be nominated as a public wild plant sanctuary. To date 30 Public Wild Plant Sanctuaries have been nominated and will be designated on completion of the Resource Plan.

Invasive plant species have been identified as the second most serious threat to native plant populations. An "invasive species" is defined as a species that is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Executive Order 13112 February 3, 1999.
In 1998 the Bureau initiated the process of identifying the most serious invasive plant species that affect native plant communities. The Bureau met with Pennsylvania Department of Agriculture and Pennsylvania Landscape & Nursery Association to evaluate the species. The result is a list of 58 species published in 2000 in a brochure. Twenty-five species, including the Pennsylvania Department of Agriculture's Noxious Weeds, are identified as the worst offenders. Twenty-one additional species are listed as invaders of native plant communities and an additional 12 species are considered invasive species in southeastern Pennsylvania or invasive in particular situations. What is an Invasive Plant? (Adobe PDF - 25 Kb) State forests will exemplify conservation and education of native plant populations through inventory and management of floral resources as outlined in this section.

**History**

The Department of Conservation and Natural Resources currently has responsibilities for the management and protection of Pennsylvania native wild plants. This authority was given to the Department in 1982 with the passage of public law # 157 cited as the Wild Resource Conservation Act (P.L. 597, No. 170) (32 P.S. 5301-5314). The Bureau of Forestry has administered the plant program according to provisions of the Act since 1983. Regulations titled, Conservation Of Pennsylvania Native Wild Plants (Title 17, Chapter 45) establish various programs to inventory, monitor, and manage plant species that occur naturally in the commonwealth. The regulations were updated in 1993.

**Inventory**

To date inventory efforts have focused on vascular plants. The Pennsylvania Natural Diversity Inventory (PNDI) maintains locational and biological information on vascular plant species listed as Pennsylvania Extirpated, Pennsylvania Endangered, Pennsylvania Threatened, Pennsylvania Rare, and Tentatively Undetermined. [www.dcnr.state.pa.us/forestry/pndi/pndiweb.htm](http://www.dcnr.state.pa.us/forestry/pndi/pndiweb.htm)

The Pennsylvania Flora Project at the Morris Arboretum, University of Pennsylvania has prepared dot maps from herbarium specimens of the vascular flora the database can be searched geographically or taxonomically. This information contains confirmed and historic locational information. [www.upenn.edu/paflora](http://www.upenn.edu/paflora)

The Bureau's Resource Inventory and Analysis Section has recorded vascular plant species on the inventory plots. Species lists exist for all forest districts. Species lists and locational information from all of these inventories has been combined to provide species lists on State Forest lands that can be specialized for either Districts or Ecoregions.

An inventory is never complete. Much information has been collected and compiled by these inventories however much more needs to be done. Specific groups such as lichens and mosses have been overlooked in the above inventories, for various reasons. Very little information exists on these groups of plants. Inventories for plants classified as Pennsylvania Vulnerable (Ginseng, *Panax quinquefolius*, Golden-Seal, *Hydrastis canadensis*, and Yellow Lady's Slipper, *Cypripedium pubescens*) need to be conducted in order to identify populations that can be managed for sustainable harvest.

**County Natural Area Inventories:**
Inventories of counties to identify and map locations of special concern resources. Conducted by professionals. Locations distributed to county & some information included in PNDI database. One time. See below for status of inventories and source of material.

Pennsylvania County Natural Area Inventories Completed to End of 2001


Note: An update to the original was completed in 2002.

- Copies of this document may be obtained from: Adams County Office of Planning and Development, 111-117 Baltimore Street, Gettysburg, PA 17325

**Allegheny:** 1994. *Allegheny County Natural Heritage Inventory*. Western Pennsylvania Conservancy, Pittsburgh, for Allegheny County Board of Commissioners, Pittsburgh. 229 pp.

**Beaver:** 1993. *Beaver County Natural Heritage Inventory*. Western Pennsylvania Conservancy, Pittsburgh. 189 pp.

**Bedford:** 1998. *Bedford County Natural Heritage Inventory*. Western Pennsylvania Conservancy, Pittsburgh, for Bedford County Planning Commission, Bedford, PA. 242 pp.


Note: An update to the original document was completed in 1998.

- Copies of these documents may be obtained from: The Berks County Planning Commission, Exide Building, 645 Penn St, Suite 203, Reading, PA 19601-3509

**Bradford:** *A Natural Areas Inventory of Bradford County, Pennsylvania*. The Nature Conservancy Pennsylvania Science Office, Middletown. The inventory for this county has not been completed.


- Copies of this document can be obtained from the Bucks County Planning Commission
Carbon: The inventory for this county has not been conducted.
Centre: *Centre County Natural Heritage Inventory*. Western Pennsylvania Conservancy, Pittsburgh. 215 pp.
Note: An update to the original document was completed in 2000.
- Copies of these documents can be obtained by contacting the Chester County Planning Commission; Government Services Center, Suite 270; 601 Westtown Road; West Chester, PA 19382

Columbia: *A Natural Areas Inventory of Columbia County, Pennsylvania*. The Nature Conservancy Pennsylvania Science Office, Middletown. The inventory for this county has not been completed.
- Copies of this document may be obtained from: The Tri County Regional Planning Commission, Dauphin County Veterans Memorial Office Building, 112 Market Street, Seventh Floor, Harrisburg, PA 17101-2015

Dauphin (see Cumberland)
Note: An update to the original document was completed in 1998.
- Copies of this document may be obtained from: Delaware County Planning Department, Toal Building, Second and Orange Streets, Media, PA 19063

Franklin: The inventory for this county is currently being conducted by The Nature Conservancy. The inventory is expected to be completed in late 2003.
Juniata: The inventory for this county has not been conducted.
- Copies of this document can be obtained from the Lackawanna Heritage Valley Authority; 1300 Old Plank Road; Mayfield, PA 18433

Note: An update to the original document was completed in 1998.
Lebanon: The inventory for this county is currently being conducted by The Nature Conservancy. The inventory is expected to be completed in late 2003 or 2004.

- Copies of these documents can be obtained from the Lancaster County Planning Commission.


- Copies of this document may be obtained from: Lehigh Valley Planning Commission, 961 Marcon Boulevard, Suite 310, Allentown, PA 18103-0307


- Copies of this document may be obtained from: Luzerne County Office of Community Development, 54 West Union Street, Wilkes-Barre, PA 18711


Note: An update to the original document was completed in 2000.

- Copies of these documents may be obtained from: Lycoming County Planning Commission, 48 West Third Street, Williamsport, PA 17701

Mifflin: The inventory for this county has not been conducted.


Note: An update to the original document was completed in 1999.

- Copies of these documents can be obtained through the Monroe County Planning Commission; Monroe County Courthouse; Stroudsburg, PA 18360


Note: An update to the original document was completed in 1999.

- Copies of these documents may be obtained from: Montgomery County Planning Commission, One Montgomery Plaza, Suite 201, Swede & Airy Streets, Norristown, PA 19404-0311

Montour: The inventory for this county has not been conducted.

Northampton: (see Lehigh)

Perry: (see Cumberland)

Philadelphia: The inventory for this county has not been conducted.


- Copies of this document can be obtained from the PA Science Office of The Nature Conservancy, 208 Airport Drive, Middletown, PA 17057
Snyder: The inventory for this county has not been conducted.

Schuylkill: The inventory for this county is currently being conducted by The Nature Conservancy. The inventory is expected to be completed in late 2003 or 2004.


Note: An update to the original document was completed in 2001.

- Copies of this document may be obtained from: Sullivan County Office of Planning and Development, Sullivan County Courthouse, Laporte, PA 17057

Susquehanna: *A Natural Areas Inventory of Susquehanna County, Pennsylvania*. The Nature Conservancy, Middletown. The inventory for this county has not been completed.

Tioga: *A Natural Areas Inventory of Tioga County, Pennsylvania*. The Nature Conservancy, Middletown. The inventory for this county has not been completed.


Note: An update to the original document was completed in 2000.

- Copies of these documents may be obtained from: Union County Planning Department, 1610 Industrial Blvd., Suite 100, Lewisburg, PA 17837


- Copies of this document can be obtained from the PA Science Office of The Nature Conservancy, 208 Airport Drive, Middletown, PA 17057


Note: An update to the original document was completed in 2001.

- Copies of this document may be obtained from: Wyoming County Planning Commission, One Courthouse Square, Tunkhannock, PA 18657


Note: An update to this document is currently being written and will be completed in early 2002.

- Copies of this document may be obtained from: York County Planning Commission, One West Market Street, York, PA 17401

**Policy Statement**
State forest lands serve as examples in promoting the conservation of native wild flora and are managed to provide habitats that support a diversity of native plant communities and species.

**Goals and Objectives**

**Goal 1:** To provide habitats for a diversity of native wild plants and plant communities.

Objectives:

- Continually conduct inventories of plant species groups including mosses, liverworts, and lichens within the Commonwealth of Pennsylvania including state forest lands.
- Monitor collecting of edible and medicinal plant and fungi populations in order to determine sustainability.
- Continue inventory of vascular plants on state forest lands and determine what other information can be reasonably collected.
- Monitor impacts of deer browse on vascular and non-vascular plant species.

**Goal 2:** Designate appropriate areas on State forest lands as state forest public plant sanctuaries.

Objectives:

- Inventory state forest lands for areas containing plant species of special concern and areas of exemplary plant populations that may be appropriate for public plant sanctuary designation.
- Evaluate candidate areas and designate appropriate areas as public plant sanctuaries.
- Develop site-specific management plans for all state forest public plant sanctuaries.

**Goal 3:** Identify and manage floral resources on state forest lands that are imperiled by invasive plant species.

Objectives:

- Inventory state forest lands for significant populations of invasive plant species that are established and negatively affecting native plant populations.
- Develop a plan for removal of significant populations of invasive plants that are negatively affecting native plant populations.
- Eliminate the planting of non-native invasive plant species on state forest lands.
- Develop and implement guidelines for preventing further significant infestations of non-native invasive plants.
- Train district staff in the identification and control of invasive species.
- Establish species-specific “zero tolerance” areas where particular species with proven potential to disrupt ecosystem processes are not yet established.
- Make eradication of these species in these “zero tolerance” areas and their control in the surrounding areas a management priority.
- Work with willing landowners to control significant populations of invasive species where populations on private land serve as sources for invasion onto state forest land.

**Goal 4:** Protect federal and state listed plant species and habitats critical to their survival.
Objectives:

- Support inventories on state forest lands for populations of plant species of special concern.
- Monitor the known populations of plant species of special concern.
- Develop management plans to ensure protection of these species.

Goal 5: Educate Bureau staff and public about identification, regulation, ecology and conservation of native and invasive plants.

Objectives:

- Conduct Bureau field and enforcement staff trainings on native plant identification.
- Increase information on website regarding different aspects of the Wild Plant Management Program.
- Work with Bureau field and enforcement staff to explain ginseng harvesting rules and regulations.
- Train Bureau field staff on identification and management of invasive species.

Goal 6: Use native plant species for revegetation activities.

Objectives:

- Work with Penn Nursery and private nurseries to develop native plant seeds and plants for use on State Forest land
- Create lists by ecoregion of appropriate alternative native species to use instead of non-natives.
- Establish protocol for seed collection, propagation at the Bureau's nursery and replanting by region or district.
- Avoid planting large areas with genetically identical individuals.

Guidelines

Public Wild Plant Sanctuaries

The Wild Resource Conservation Act (P.L. 597, No. 170) establishes the authority for the conservation of native wild plants within the Commonwealth. The responsibility for implementing and enforcing that portion of the Act has been assigned to the (DCNR) Bureau of Forestry. Section 10 of the Act allows the Department to acquire or designate public wild plant sanctuaries “when deemed necessary to protect wild plant species afforded consideration under this act...” Use of these areas for scientific or educational purposes is encouraged.

The Department proposes to designate suitable sites on lands for which it has management authority, namely State Forest and State Park lands. Other public land management agencies at all levels are strongly encouraged to utilize the sanctuary designation procedure for appropriate lands under their jurisdiction.

Designation Criteria
Any area of publicly owned land may be nominated by the responsible management authority for designation as a public wild plant sanctuary under the Department's program. If the Department then finds that the area meets one or more of the following criteria, a sanctuary will be officially designated provided the necessary requirements and procedures listed below are followed.

1. The area supports a viable population of native plant species of special concern as classified by the Department; or
2. The area contains suitable habitat for viable growth of native plant species of special concern and is known to have historically supported such species as documented by specimen records; or
3. The area contains suitable habitat for viable growth and reproduction of native plant species of special concern which may be transplanted from sites in jeopardy of being destroyed; or
4. The area supports an exemplary Pennsylvania native wild plant community as determined by the Department.

Requirements and Procedures for Nominating and Designating DCNR Lands

1. Nominations for designation of State Forest lands must be submitted through the District Forester to the State Forester. Nominations for designation of State Park lands must be submitted by the Park Manager, through the Regional Park Manager and Resources Management Section, to the Director's Office for approval and final submission to the State Forester. Nominations must include a description of the area, which designation criteria is/are met, which special concern species is/are involved, and location and site maps.
2. The State Forester will review the proposal and determine whether the area meets the criteria for public wild plant sanctuary designation. If the criteria are not met, the nominator will be notified stating the deficiency.
3. Upon approval for designation by the State Forester, the responsible management authority must provide, within one year, a management plan that meets the State Forester's approval.
4. Management plans for public wild plant sanctuaries on State Forest lands will be written by the appropriate Forest District staff and Ecological Services Section. The District Forester will review and approve the management plan before it is submitted to the State Forester for final approval. Upon request, the Bureau of Forestry will assist the Bureau of State Parks with the development of management plans.
5. Recommendations for removal of State Forest lands from public wild plant sanctuary designation will be reviewed by the State Forester to determine the appropriateness and impact of the removal. The State Forester will approve/disapprove the requests concerning State Forest lands. Written requests from the Director of the Bureau of State Parks for removal of State Park lands from the sanctuary program will be approved by the State Forester on receipt.
6. The Department may revoke sanctuary designation if the site is degraded such that it no longer complies with the designation criteria, or is used in a manner deemed by the Department to be inconsistent with the purposes of the sanctuary program.

Management Plan Guidelines

The plan must include, but is not limited to, the following:

- Property boundaries and sanctuary boundaries including their relationship to each other;
- A detailed description of the sanctuary area including:
  - size of area in acres;
  - plant communities present; and
  - state and/or federally listed species present, or, if none, those for which suitable habitat is present.
- land use history and protection needs;
- monitoring design(s) for listed species that are present;
- management prescriptions necessary to sustain or enhance those species for which the area is designated; and
- provisions to periodically update the plan as appropriate.
- When developing the plan, activities that may disrupt the integrity of the sanctuary should be considered and, if necessary, addressed. Examples include, but are not limited to, use of herbicides or pesticides, planting or seeding non-native species, motorized vehicle access, right-of-way development, timber management, mineral development, and high impact recreational activities such as camping, horseback riding and mountain bike use.

Invasive Plant Species

"Invasive plant" is really another name for an introduced species that has become an environmental weed pest, that is, a plant that grows aggressively, spreads, and displaces other plants. Invasive plants tend to appear on disturbed ground, and the most aggressive can actually invade existing ecosystems. Invasive plants, like weeds, are generally undesirable because they are difficult to control, can escape from cultivation, and can dominate whole areas. In short, invasive plant infestations can be extremely expensive to control, as well as environmentally destructive.

A small number of invasives are "native," meaning they occurred in Pennsylvania before settlement by Europeans but became aggressive after the landscape was altered. Most invasive plants, however, are brought in from other continents, and are called variously "exotic," "alien," "introduced," or "non-native" invasives. An aggressive plant, freed from its environmental, pest, and disease limits can become an invader of other ecosystems. However, not all exotic, non-native, or introduced species are invasive. This brochure lists the most troublesome invasive plants that occur in Pennsylvania and impact native plant communities. A more complete list of invasive plants is available from the Ecological Services Section, (DCNR)-Bureau of Forestry (BOF).

Characteristics of invasive plants

Invasive plants are noted for their ability to grow and spread aggressively. Invasive plants can be trees, shrubs, vines, grasses, or flowers and they can reproduce rapidly by roots, seeds, shoots, or all three. Invasive plants tend to:

- not be native to North America,
- spread, reproducing by roots or shoots,
- mature quickly,
- if spread by seed, produce numerous seeds that disperse and sprout easily,
- be generalists that can grow in many different conditions,
- be exploiters and colonizers of disturbed ground.

Impact of invasive plants

The biggest reason to not plant or seed invasives is because they are degrading our native environments. In fact, they are a major cause of the extinction and loss of native plants. Plants like Kudzu, Purple Loosestrife, and Garlic Mustard are displacing native plants and degrading habitat for native insects, birds, and animals. Endangered, rare, and threatened native species of plants and animals are especially at risk because they often occur in such small populations that make them particularly vulnerable.

Another reason to avoid invasives is that invasive plants, even when grown in a cultivated yard, can spread, escape, and cause landscape maintenance weeding problems for years to come. In urban and suburban areas there is a good chance that the worse weeds on your property are escaped plants, like Japanese Honeysuckle, Multiflora Rose, Japanese Knotweed, and Oriental Bittersweet. In yards, gardens, fields, and parks these plants are very expensive to control.
Guidelines

- The best insurance against future problems is to avoid the use of known invasive plants and educate others about the problems of invasives. In some cases, invasive plants have been marketed as very desirable landscape plants. Plants on the BOF invasive plant list should be avoided because they can escape and aggressively move into surrounding ecosystems. One way to avoid invasives is to choose plants that are native to the area. Natives often are adapted to a specific environmental niche, and have natural controls that keep them in balance.
- Minimize soil disturbance. Invasive plants thrive on bare soil and disturbed ground where the native plant community has been displaced. The key to controlling invasives is to protect healthy native plant communities.
- Limit use of fertilizers. High nitrogen levels sometimes give an advantage to weedy species that are better adapted to using plentiful nutrients for explosive growth.
- Develop a land management plan for maintenance over time. Meadows in Pennsylvania may need to be mowed every year. Woodlands are probably the lowest-maintenance landscape; but they too will need to be monitored and invasive plants controlled where feasible.
- Scout continuously for invasives or other problems. The best way to control invasives is prevention, and prevention can only happen through vigilance.
- Remove invasives before they are a problem. Effective scouting or monitoring means that problems are found while they are still small and easily controllable. For instance, do not let invasive plants go to seed. Mechanical removal through digging or cutting is preferred. Large populations of invasives may need to be stopped chemically with spot applications of herbicide by trained individuals or by following label instructions.
- Replace invasive plants with native species. Invasives are weeds; good at exploiting bare soil and empty niches. When you remove an invasive plant, unless there is another plant substituted, the invasive will tend to come right back. What grows in the future depends, to a large extent, on what is there now, so it is important to fill that niche with a plant that will provide seed for the future.
- Remove invasives first when their densities are low. This gives the most immediate success because invasive plant control works best where there is a functioning native plant community still in place that can move right into the empty niche.

1. Do not use known invasive plants
2. Minimize soil disturbance
3. Protect healthy native plant communities
4. Limit use of fertilizers
5. Plan for maintenance over time
6. Monitor (and keep scouting)
7. Remove invasives before they become a problem
8. Replace invasive plants with native species
9. Remove invasives first when their densities are low.
10.

For more information

Printed resources

Internet

Brooklyn Botanic Garden, Invasive Plants, [www.bbg.org](http://www.bbg.org)
Morris Arboretum PA Flora Project, [www.upenn.edu/paflora](http://www.upenn.edu/paflora)
Natural Areas Association, [www.naturalarea.org](http://www.naturalarea.org)
Pennsylvania DCNR, Bureau of Forestry, [www.dcnr.state.pa.us/forestry/pndi/pndiweb.htm](http://www.dcnr.state.pa.us/forestry/pndi/pndiweb.htm)
VA Dept. of Conservation and Recreation list of invasive plants, [www.state.va.us/~dcr/dnh/invproj.htm](http://www.state.va.us/~dcr/dnh/invproj.htm)

Species of Special Concern

The Pennsylvania Natural Diversity Inventory (PNDI) is Pennsylvania's natural heritage program. PNDI's primary purpose is to monitor the status and map the location of plants and animals in Pennsylvania that are threatened or endangered, on the decline, or little understood. PNDI also identifies the best examples of natural communities in the state, and provides information on outstanding geologic features. Natural communities include a diverse array of habitats, such as grasslands, wetlands, shrub lands, forests, and aquatic systems. Outstanding geologic features include a variety of unique examples of Pennsylvania geology. The collection and management of this information is accomplished through a partnership between the Department of Conservation and Natural Resources, The Nature Conservancy, and the Western Pennsylvania Conservancy.

Environmental Review

Protection of the Commonwealth's State Forests can be accomplished in harmony with the sustainable use of our natural resources. Since 1984, PNDI data has been a component of environmental assessments on State Forest land. These evaluations help to prevent damage to valuable ecological areas and can save planning and development costs by identifying potential land use conflicts in the early stages of proposed projects. The Bureau of Forestry conducts environmental reviews for species of special concern for projects (e.g. timber sales or hiking trials) that are initiated on lands managed by the Bureau of Forestry. The PNDI Internet Database, which may be found through the IntraForestry Website, is accessible to Bureau of Forestry employees and other approved agency staff. Searches are conducted by logging into the database and entering the project type, acreage of project, and either the latitude/longitude or inches up and over on a given USGS Topographical Quadrangle map. The system,
using the database, creates a receipt/results page that may be printed out and used for reference. The PNDI Internet Database Search Results page tells the person conducting the search the next step that they may have to take. First, the search may result in no conflict with the project area. If this result is received then no further action is required. Second, the search may result in potential conflict or conflicts with the project site. In the case of a potential conflict a listing of agencies or persons will be provided for one to contact for consultation.

**Flora**

Any project that results in a potential conflict to a plant species falls into the jurisdiction of the Department of Conservation and Natural Resources and, therefore, should be faxed to the environmental review specialist of the Ecological Services Section in the Bureau of Forestry. A GIS program will be used to determine the extent, if any, of the anticipated impact to the listed species. If no impact is anticipated then a response stating: "No Impact On Plants or Natural Communities Anticipated" is sent. If a project is found to have potential impact to a species or ecological feature, then it is sent for further review. The environmental review botanist will initiate a more detailed review that may require phone and e-mail conversation to understand the logistics of the project. The botanist may conduct a plant survey, help with land mitigation to avoid impact, or clear the project. No further work will commence until consultation with the Ecological Services Section is complete.

- New occurrences of federal and state listed plant species of concern on State Forest land will be identified by scientists through inventory and recorded in the Pennsylvania Natural Diversity Inventory (PNDI) database.
- Where a federal and/or state-listed species of concern or unique species is known to occur on State Forest land, appropriate measures will be taken to insure against adverse human-made or natural (e.g., deer browse, invasive species) disturbances to the species and habitats critical to their survival.
- Existing and historic occurrences in the PNDI database for species of special concern will be periodically field visited and monitored.
- Training will be provided to district staff on species of special concern natural history and identification. If the district staff locates new locations for species of special concern, they will contact the BOF, Ecological Services Section to report the information.

**Ginseng**

Non-Timber Forest Section
Pennsylvania Natural Diversity Inventory

**Native Wild Plant Species**

Link to Landscaping with Native Plants brochure
Link to EMAC genetics policy

- Contact Wild Plant Program Manager before introducing any questionable species.

**Monitoring**

**Indicators:**

- Number of forest dependent species.
- Population levels of representative species from diverse habitats monitored across their range.
- Annual removal of non-timber forest products (e.g. medicinal plants, berries) compared to the level determined to be sustainable.
- Number of public plant sanctuaries on state forest land.
- Area and percent of forest affected by invasive plant species beyond the range of historic variation.
- Number of forest dependent species that occupy a small portion of their former range in Pennsylvania.

**Research Needs**

- Monitor collecting of edible and medicinal plant populations in order to develop guidelines for sustaining their populations.
- Information on actual collection and use of medicinal plants and other non-timber forest products.
- Impacts of deer browsing on native wild plant populations.
- Basic biology and habitat requirements of state listed plant species on State Forest Land.
- Effects of forestry management (silviculture, recreation, hands-off management, and mineral extraction) on vascular and non-vascular plants.