

Natural Resource Management of Pipeline Infrastructure



Dan Devlin

Director, Bureau of Forestry

www.dcnr.state.pa.us



Connection between Pipelines & DCNR

- **Commonwealth's forests**
 - Fragmentation or reduction in forest cover
- **Native Wild Plants**
 - Jurisdiction of Endangered & Threatened Plants
 - Invasive species—reduction of native plants
- **State Forest Land**
 - Largest landowner in PA: 2.2 million acres
- **State Park land**
- **LWCF & C2P2**
- **PNDI Tool**



Bureau of Forestry

Mission:

“Ensure the long-term health, viability and productivity of the Commonwealth’s forest and to conserve native wild plants.”



The Bureau accomplishes our mission by:

- Managing state forests under sound ecosystem management, to retain their wild character and maintain biological diversity while providing pure water, opportunities for low-density recreation, habitats for forest plants and animals, sustained yields of quality timber, and environmentally sound utilization of mineral resources.
- Protecting forestlands, public and private, from damage and/or destruction by fires, insects, diseases and other agents.
- Promoting forestry and the knowledge of forestry by advising and assisting other government agencies, communities, landowners, forest industry, and the general public in the wise stewardship and utilization of forest resources.
- Protecting and managing native wild flora resources by determining status, classifying, and conserving native wild plants.

Focus of Today's Presentation

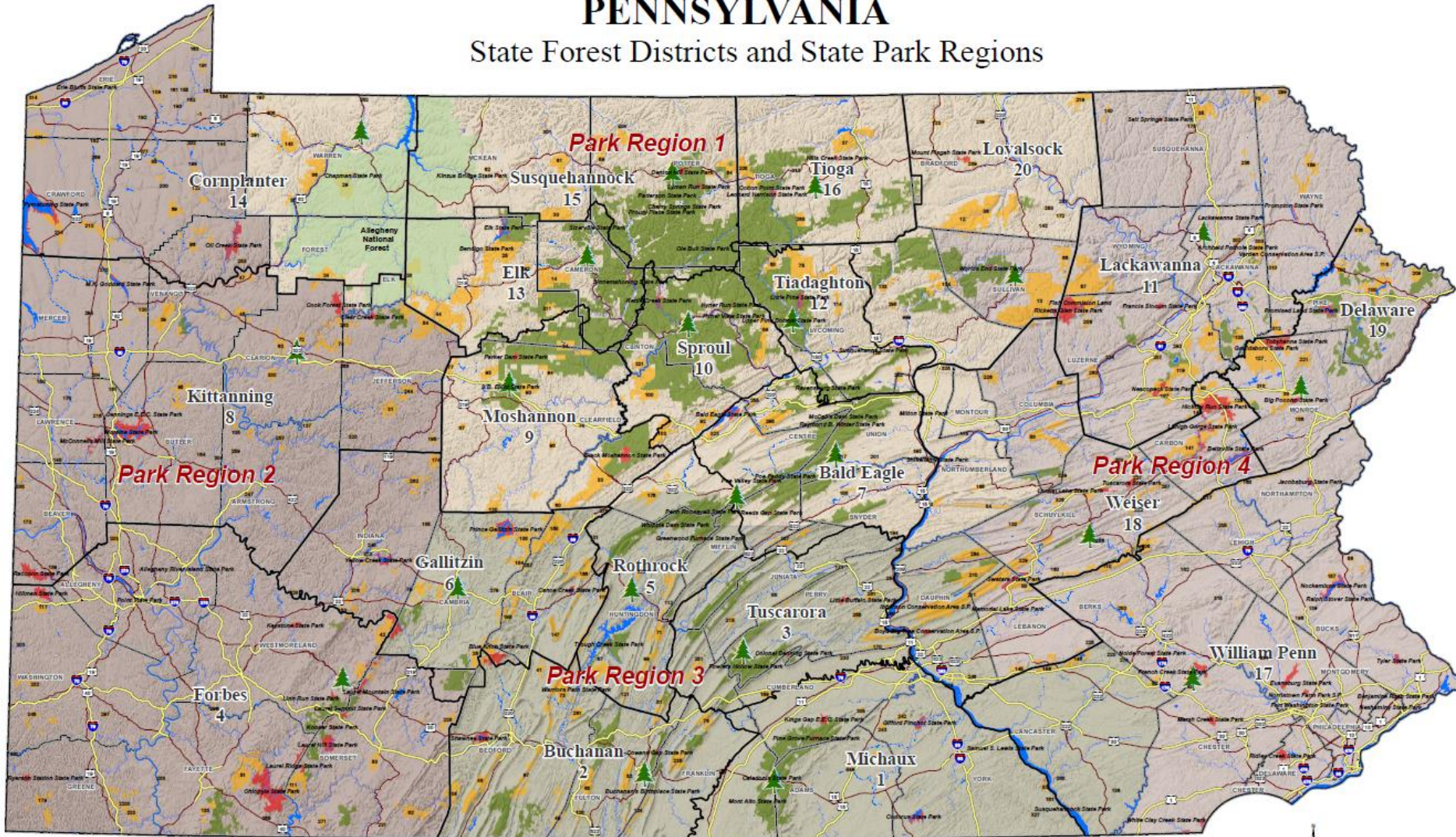
State Forest system

- Established in 1898
- 2.2 Million Acres
- 48 of 67 Counties
- Created for:
 - Continuous supply of timber & wood products
 - Protect watersheds & conserve the waters
 - Furnish opportunities for healthful recreation

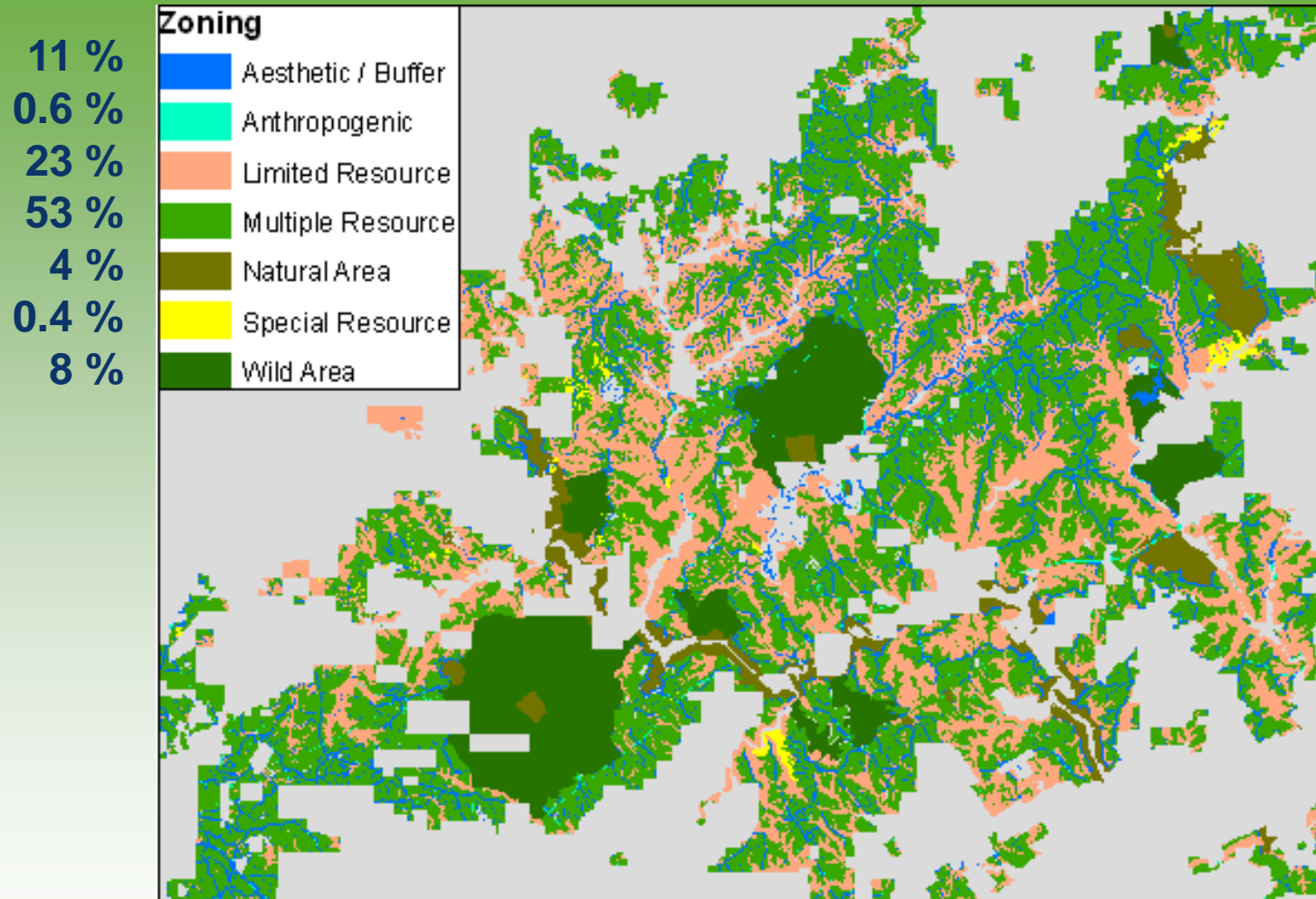


PENNSYLVANIA

State Forest Districts and State Park Regions



State Forest land Management Zoning



State Forest Values

Clean Water

over 5,000 miles of streams on SFL



www.dcnr.state.pa.us

State Forest Values

Wood products

14,000 acres harvested annually
producing nearly 80 million board feet of lumber and pulpwood



State Forest Values

Recreation & Tourism
over 5,000 miles of trails open for public use



www.dcnr.state.pa.us

State Forest Values

Habitat for thousands of plants and animals



State Forest Values

Scenic and aesthetic beauty



State Forest values

Energy

natural gas, biomass, firewood



Pipeline and Rights-of-Way Infrastructure on SF Lands

www.dcnr.state.pa.us



Pipeline Infrastructure on SF Lands

Types of Pipelines

Gathering: from well to transmission line

Transmission: from gathering line or storage facility to an oil or gas market, regulated by the Federal Energy Regulatory Commission (FERC)

Distribution: from transmission system directly to the customer, regulated by the Public Utility Commission (PUC)

ROW Infrastructure on SF Lands

Substances Pipelines Could Carry:

- Oil
- Gas
- Water
- Petroleum Products (gasoline, diesel, etc.)
- Natural Gas Liquids (propane, butane, etc.)
- Municipal Waste Water

Other ROW:

- Electric
- Telephone

ROW Infrastructure on SF Lands

~1,700 miles of ROW's on State Forest lands

Miles mostly pipelines

Of those miles...

~**1,100 miles** of ROW's assoc. with BOF license for ROW agreements

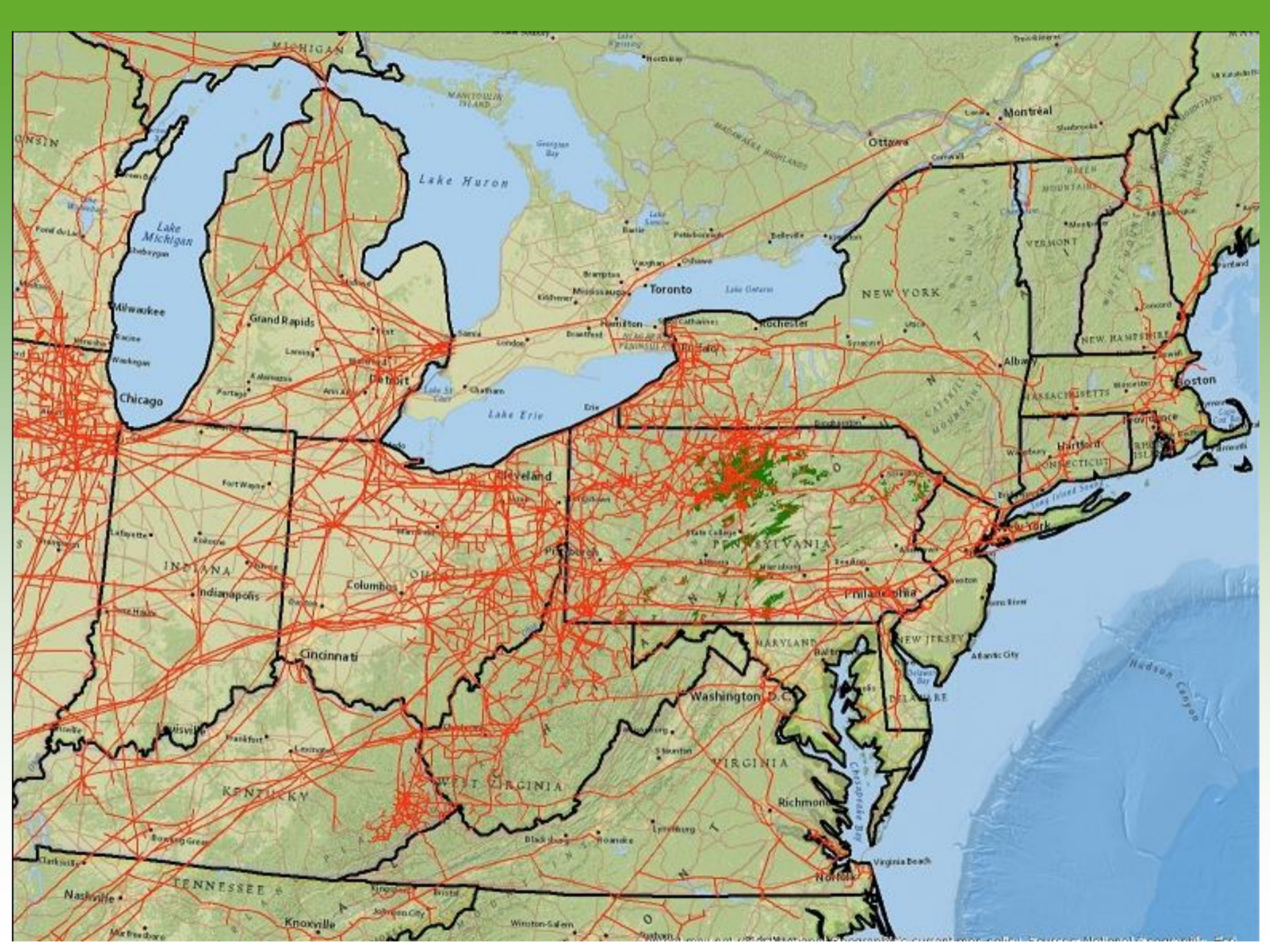
~**500 miles** pipelines on gas leases or severed rights

~**60** transmission lines (20-36 in; most over 24)

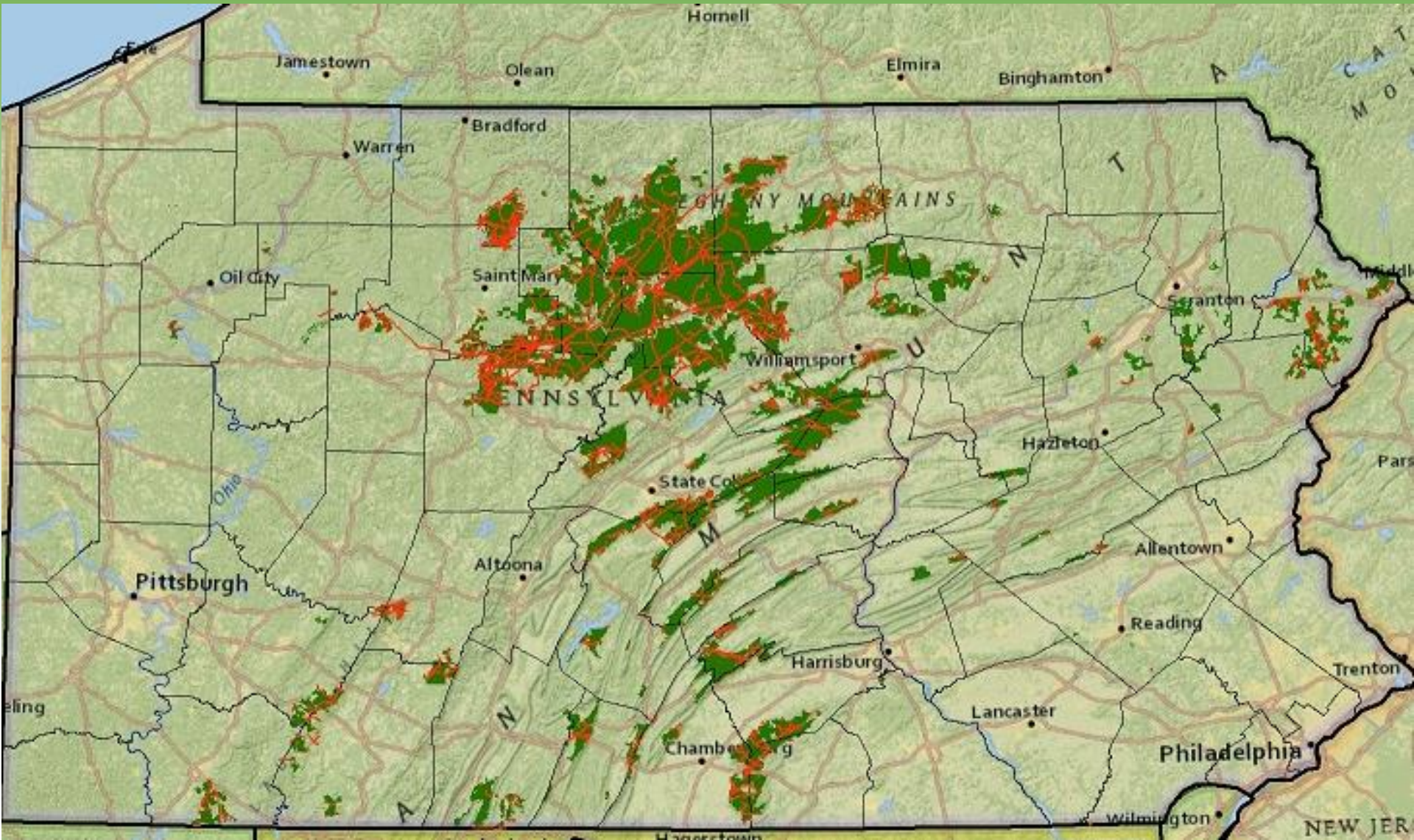
~**3** gas storage areas: Wharton, Leidy and Greenlick

Pipeline Infrastructure on SF Lands

- Gas Monitoring Program
 - 2008-2012 data collected
 - 7 Forest Districts in gas play (core forest area)
- Acres converted to non-forest by infrastructure:
 - Well Pad: 786 acres (53%)
 - Pipeline: 459 acres (31%)
 - Road: 242 acres (16%)



A closer Look – Existing Agreements



Management Challenges

All pipelines have an impact

- Surface disturbance
- Forest fragmentation
- Habitat loss & species impacts
- Invasive plants spread
- Loss of wild character
- Soil Erosion & Sedimentation



Management Challenges

Most Impacts Considered Negative...but are Positive as well

- Provide energy to citizens of PA
- Less truck traffic transporting
- Wildlife openings
- Recreation Opportunities

Management

**Given Challenges and Potential Impacts,
our analysis take into account the mantra:**

- **Avoid**
- **Minimize**
- **Mitigate**
- **Monitor**



Avoid



Comprehensive Planning and Review

- Evaluate Alignment Alternatives (whole project scope)
- Learn & understand company and project objectives
- Use Existing Disturbances
- Overview of sensitive areas to avoid
- Endangered & Threatened Species (PNDI)
- Parks, Wild & Natural Areas, and High Use Recreation Areas

Minimize

- Reduce Earth Disturbance
 - Reduce ROW width/disturbance
 - Collocate infrastructure
- Appropriately Site on the Ground
 - Early Planning followed by Field Assessment
- Employ Proper Wetland/Water Crossing Techniques
- Buffer Resources (social & ecological)
- Timing Restrictions
 - Recreation
 - Wildlife
 - Spring Mud



Mitigate--enhancements



- Wetland Enhancements
- Species Habitat Enhancements
- Invasive Species Removal
- Trail Re-routes



Mitigate--Restoration



Reclamation and Restoration

- Larger landscape-level plan and management
- Provide Clear Objectives to Operator early in process
- Enhance areas for target species or habitat
 - Shrub plantings
 - Feathering
 - Pollinator



Monitor



Monitoring Important in Adaptive Resource Mgmt

- Gas Monitoring Program
- Administrative lease/agreement provisions
- Monitor for:
 - Planting Success
 - Use of Different Plantings
 - Erosion or Sedimentation issues
 - ROW Maintenance

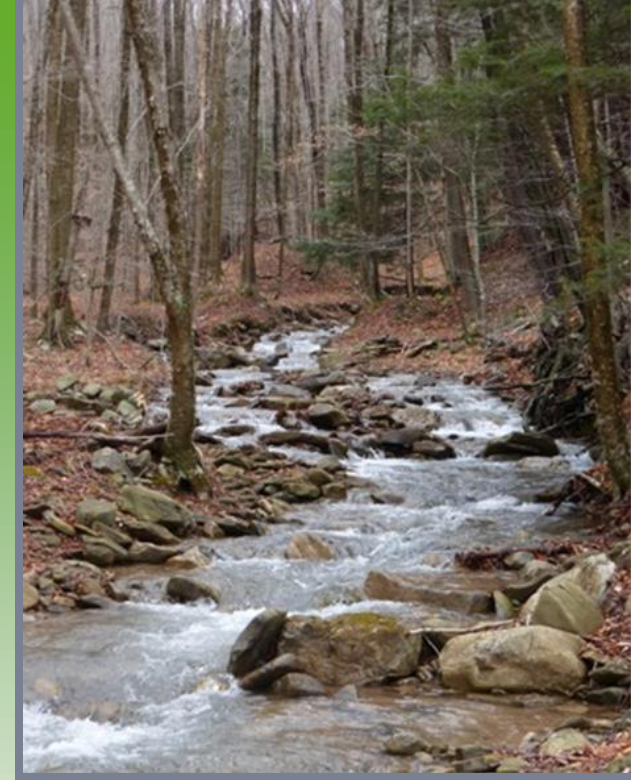


How do we implement Avoid, Minimize, Mitigate, Monitor?

- Resource Management, Non-Regulatory
- Systems Approach to Analysis
 - Holistic
 - Comprehensive
 - Ecosystem Management

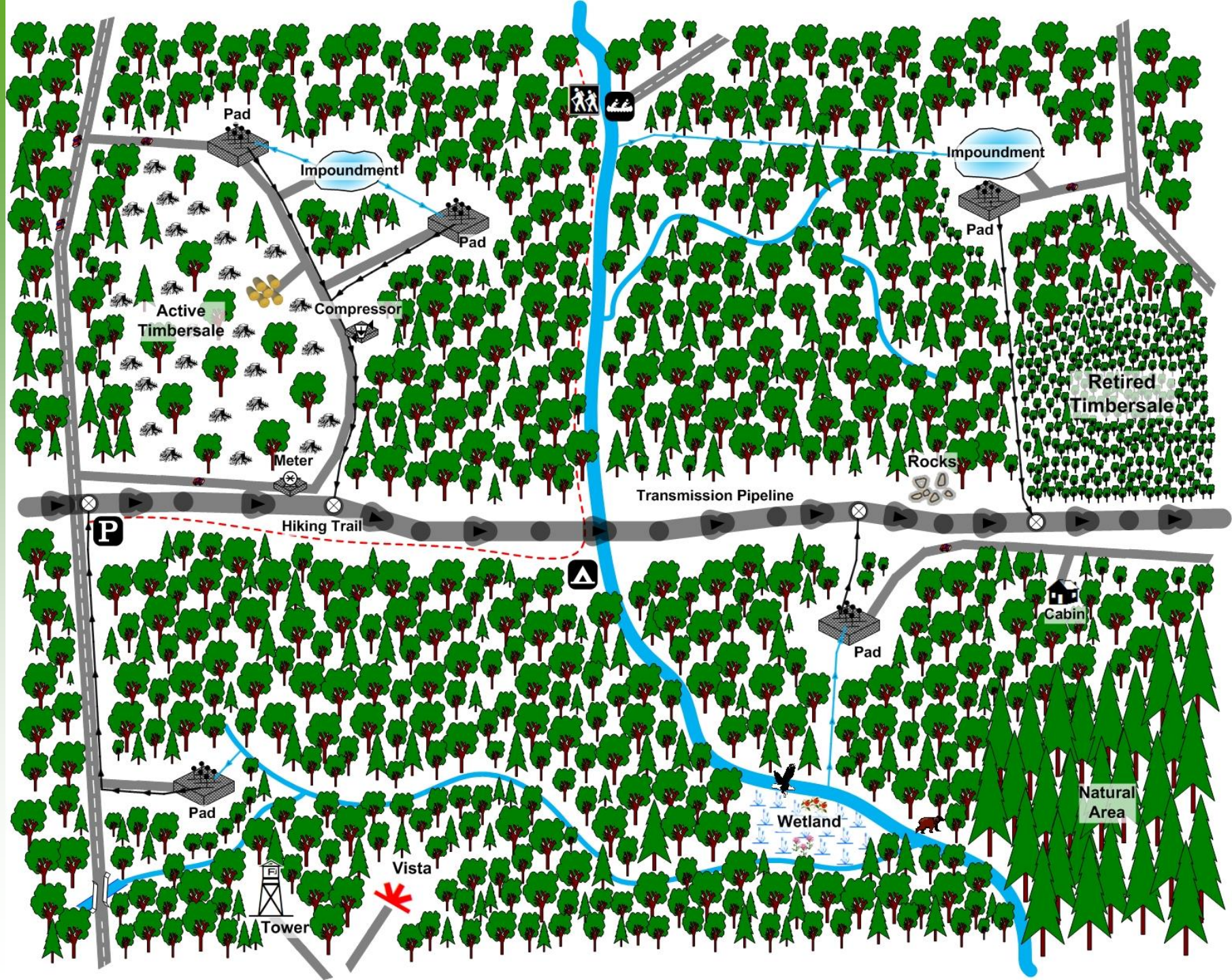


Landscape Analysis



When assessing impacts: Landscape Approach

- Look at Entire Project *Connected* with Pipeline
 - Well Pad, Compression, Other Pipelines
 - Trails, T&E habitat, Core Forests etc.
- Reason for Pipeline
- Alternate Routes



GIS Analysis— many available for analysis

Forest Resource layers:

- SF Zoning,
- Forest stands/typing,
- Community Classifications
- Roads
- Trails



GIS Analysis— many available for analysis

Special Resources & Areas

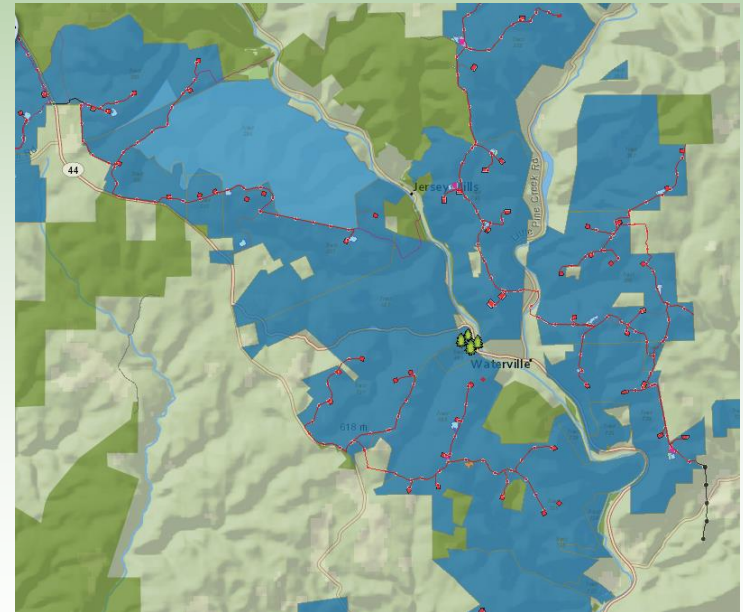
- Threatened and Endangered Species (PNDI)
- High Conservation Value Forests
- Important Bird & Mammal Areas
- Parks
- Wild & Natural Areas
- TNC Forest Patches and Blocks
- Natural Heritage Areas
- Viewsheds



GIS Analysis— many available for analysis

Gas/Energy Infrastructure

- Well Pads
- Access Routes
- Compression
- Existing Pipelines/ROW's
- Water storage



Management Approach

- Staffing (ROW Team, GMT)
 - Rights of Way team
 - Gas Management Team
 - Professionals—foresters, biologists, geologists
- Surface Use Agreements
- Rights-of-Way Agreements
 - License, Road-Use
 - Encumbered Easements



[DOH Home](#) - [Forestry](#) - [Right Of Ways](#)

Requesting Right-Of-Ways on State Forest Lands

With the current boom in the energy industry, infrastructure and capacity are expanding across the nation to keep up with production activity. The rising interest in energy resources has generated an increase in right-of-way (ROW) requests across Pennsylvania's 2.1 million acres of state forest land.

The Bureau of Forestry (BOF) has legal authority to issue ROW's across it's lands. In an effort to handle the increased volume of requests, and to clarify the request process, the BOF has developed criteria and procedures required in obtaining a ROW agreement.

[Background](#) [Guidelines and Siting Criteria](#) [How to Apply](#)



The Bureau of Forestry has developed a proactive process to evaluate and administer right-of-way requests. All applicants must familiarize themselves with the documentation on this web site before proceeding to contact the Bureau regarding application.

[Illustration of Application Process - \(PDF\)](#)

[How to apply for ROW on State Forest Land - \(PDF\)](#) - This document describes the project thresholds and procedures that will be used to evaluate requests for ROW.

[Request for Access to a Preliminary Right of Way Area - \(PDF\)](#) - This form shall be submitted by a ROW applicant requesting permission to conduct project reconnaissance on State Forest Lands prior to submitting a formal request.

[Application for ROW - \(PDF\)](#) - This form shall be submitted to the Department as part of a formal application for ROW.



Management Approach



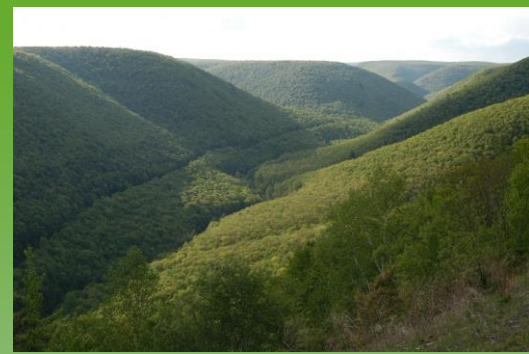
- Guidelines and BMPs
- Gas Guidelines are our BMP's
 - Planning, Buffers, Siting, Planting, Monitoring
 - Adaptive Management
- Monitoring Program
 - Infrastructure
 - Plants and Wildlife
 - Water
- Threatened & Endangered Species—PNDI Tool

Management Approach

Work Closely with Company

- Mutual understanding of needs, objectives and concerns
- Lots internal work/research on concerns and issues
- Work with company so they understand concerns and how plans and work can be modified

Management of ROW's



- Bureau has over 75 years experience
- Application and Review Process
 - Communicate alignment/route concerns early
 - Discuss future management plans—makes easier down line
- Siting Guidelines
 - Route Planning: alternatives, collocation/parallel
 - Special Protection Areas
- Restoration/Revegetation
 - Herbaceous/Tree plantings
 - Invasive Management

Management Successes

- One landowner
 - Flexibility and adaptive measures to facilitate best possible solution (for resources and pipeline)
- Work Closely with Company
 - Mutual understanding of needs
- Co-location
 - Electric/Gas cooperation (shared utility corridors)
 - Use existing disturbances: collocate or parallel
- Minimizing impacts
 - New Technologies



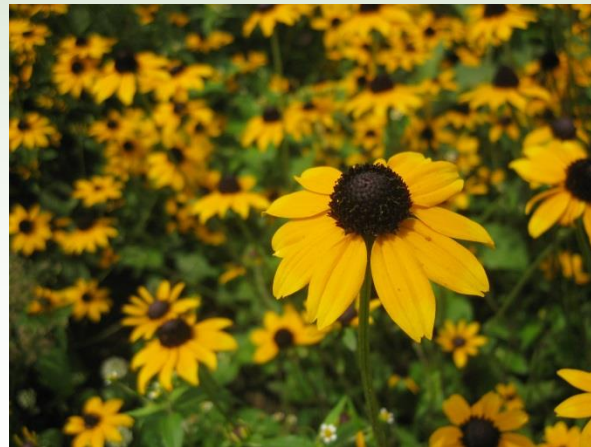
Management Successes

- Land Management Tradeoffs/Enhancements
 - Forest Road system improvements
 - Wildlife Habitat Enhancements
 - Elk
 - Woodrat
 - Trail head parking
- Recreation
 - Snowmobile Trails



Management Successes

- Invasive Plant Management
 - New techniques for treatment
 - Awareness increase
 - Effective Plantings to decrease spread
 - Invasive Species Removal



Management Successes



The screenshot displays the Pennsylvania Natural Heritage Program (PNHP) website. At the top, the PNHP logo and name are visible, along with navigation links for Home, Map, Terms & Conditions, Contact Us, and Help. The main content area is titled "Pennsylvania Conservation Explorer" and includes a sub-header "Conservation Planning and PNDI Environmental Review". Below this, there is a row of five small images: an owl, a yellow bird, a white flower, a raccoon, and a pink flower. The text below the images reads: "Welcome to **Pennsylvania Conservation Explorer**—for conservation planning and PNDI environmental reviews. The web-mapping tool allows anyone to perform online searches for potential impacts to threatened, endangered, special concern species and natural heritage resources." There are three main sections with icons: "Conservation Planning" (with a falcon icon), "Environmental Review" (with a butterfly icon), and "News & Updates" (with a raccoon icon). The "Environmental Review" section includes the text: "Anyone can view and create maps of natural heritage areas by clicking the [Map](#) tab. You will need create an account to view environmental review polygons and generate a PNDI receipt for pre-permitting. You must be a registered user to view known locations of threatened, endangered, and special concern species and/or submit a project site for review. Note: Your project may require avoidance measures, conservation measures, or agency-specific response(s). To register, click on [Create new account](#)." The "News & Updates" section includes the text: "The latest edition of PNHP Quarterly Newsletter is available. This issue includes articles on Beaver and Chester Natural Heritage County updates and the Natural Communities and Heritage of Raccoon Creek State Park. [View the issue here.](#)" On the right side of the page, there is a "User login" box with fields for "E-mail" and "Password", and links for "Create new account" and "Request new password". A "Log in" button is located below the fields.

PA Conservation Explorer: PNDI Tool

- Effective for large project and ROW planning
- New tool incorporating conservation planning and PNDI environmental review



Electric and Gas Co-location

Timber rattlesnake Enhancement Area





a and b



a) Underground Water pipeline

b) Surface Use as a Snowmobile Trail

**Water Pipeline:
underground**

**Snowmobile trail:
on surface**



Shrub and Wildflower Planting on ROW

Shared-Use: ROW and Road Separates to allow for canopy closure & narrow ROW



Tree Buffer left in place

Reduces footprint and visual impact





Pipe Installation in Ditch Line



Feathered Edges of Corridor Slight Bends in Line—Reduces Visible Distance



Websites



DCNR Home : Forestry

Bureau of Forestry

Conserving Penn's Woods



Our Mission and What We Do

Learn more about our mission of conserving Pennsylvania's forests and wild plant communities. Download a [factsheet](#). Read our strategic plan, "[Penn's Woods: Sustaining our Forests](#)."



Timber Product Output Survey

A report of timber harvested and processed by Pennsylvania's primary wood products industry including wood species, volumes, and residue utilization from the 2012 production year. Download [the full report](#) or a [two-page summary](#).



PA Fire Wardens 100th Anniversary

Celebrate the centennial of the Pennsylvania Fire Wardens program



Hemlock Conservation Plan

DCNR-Bureau of Forestry has developed a conservation plan for eastern hemlock. Public and private land managers can review the plan and email comments & questions to ra-nreasternhemlock@pa.gov by December 15.



Natural Gas Drilling on State Forests

DCNR manages state forests for the environmentally sound utilization of mineral resources.



News & Events

Check out the latest news and information about forests and the Bureau of Forestry. To find State Forest events in your area go to the [State Forest Events Calendar](#)



Shale Gas Monitoring Program

DCNR has established a shale-gas monitoring



Deer Management Assistance Program (DMAP)



DCNR Home : Forestry : Right Of Ways

Requesting Right-Of-Ways on State Forest Lands

With the current boom in the energy industry, infrastructure and capacity are expanding across the nation to keep up with production activity. The rising interest in energy resources has generated an increase in right-of-way (ROW) requests across Pennsylvania's 2.1 million acres of state forest land.

The Bureau of Forestry (BOF) has legal authority to issue ROW's across its lands. In an effort to handle the increased volume of requests, and to clarify the request process, the BOF has developed criteria and procedures required in obtaining a ROW agreement.

Background Guidelines and Siting Criteria How to Apply

The criteria and procedures used by the PA Department of Conservation and Natural Resources for rights-of-way on State Forest and State Park lands were developed in cooperation with agency partners and stakeholders.

Stakeholder groups involved included:

- DCNR Conservation and Natural Resources Advisory Council (CNRAC)
- DCNR Ecosystem Management Advisory Committee (EMAC)
- Federal Energy Regulatory Commission – Office of Energy Projects
- Independent Oil & Gas Association of PA (IOGA of PA)
- Marcellus Shale Committee
- National Park Service
- PA Game Commission
- PA Oil & Gas Association (POGAM)
- PA Public Utility Commission (PUC)



DCNR Home : Forestry : Wild Plants : Invasive Plants

Invasive Plants

Invasive plants are plants which grow quickly and aggressively, spreading and displacing other plants. Invasive plants are usually introduced by people either accidentally or on purpose, into a region far from their native habitat. Invasive plants are often referred to as "exotic," "alien," introduced" or "non-native" species. In their natural range, these species are limited by environmental, pest or disease conditions, keeping these species in balance within their ecosystem. When introduced into an area where these limitations are absent, some species have the ability to become invasive. These are the species we are concerned about in conservation.

[Download a list of invasive plant species threatening Pennsylvania natural lands here.](#)

Recognition of the problem of invasive plants is growing, at the same time as damage to native ecosystems is mounting. Identifying invasive plants and understanding the potential damage they can cause is essential to stopping their spread and protecting native vegetation. Invasive plants tend to appear on disturbed ground. The most aggressive can actually invade existing ecosystems. Invasive plants are generally undesirable because they are difficult to control, can escape from cultivation, and can dominate large areas. In short, invasive plant infestations can be extremely expensive to control, as well as environmentally destructive.



Invasive Plant Management Tutorial

Find information to identify, prevent and control invasive plants.



Invasive Plant Database Search

Use this tool to identify invasive plants on your property based on their physical characteristics.

Take Home Messages

- ✓ **Pipelines have impacts**
- ✓ **Proposed development should be viewed holistically**
- ✓ **Management strategies differ depending on scale**
- ✓ **Some impacts can be avoided, minimized and/or mitigated**
- ✓ **Tradeoffs are usually necessary in resource management decision making (different than environmental protection)**

Working towards a balance of...

- Contiguous forests
- Wetlands
- Plants and animals
- Wild character
- Recreation
- Water quality
- Responsible development



Thank You

