3042

RECEIVED
MAR 1 0 2014
INDEPENDENT REGULATORY
REVIEW COMMISSION

Provisions for scenic, watershed and habitat conservation in utility and development right-of-ways

The landscape surrounding Pennsylvania communities represents several vital resources of irreplaceable value. First is the value of the scenery for spiritual and restorative recreational as well as property value; second is the capacity of the natural landscape to store, detain and cleanse storm water; third is the value of high quality habitat to maintain healthy ecosystems. Residents are drawn to the area for the scenery and rural lifestyle. Visitors explore the parks, forests and woodlands, navigate and fish the trout-rich waters, hunt in private forests and game lands, and hike or bike the numerous historic trails and byways.

Infrastructural right-of-ways, whether for natural gas, power lines, or roadways severely affect and disrupt the quality of the rural landscape enjoyed by residents and visitors. By reducing forest canopy and disturbing soils on steep slopes they decrease the land's capacity to recharge aquifers, increase run-off and flooding, and increase erosion and sediment. They provide pathways for invasive species and disrupt the movement and support habitat for critical and endangered species. The permanent gaps they create in forest canopy fragment habitat, and the loss of connectivity could threaten the survival of some species.

The past introduction of interstate gas and electrical transmission infrastructure has already impacted the forests and ridgelines that provide Pennsylvania with much of its natural heritage. The recent introduction of more expansive natural gas drilling with its pipeline infrastructure and wind turbines with access roads points to a future with ever more serious implications for our valued natural systems. Continued incremental erosion of the Pennsylvania landscape will result in significant economic loss and flooding damage to communities as well as irreparable damage to natural systems and scenic quality.

While current restoration practices mitigate some of the damage done during construction we suggest improvements to current regulations to require a greater degree of restoration to increase the performance of right-of-ways with respect to the concerns above: watershed protection, habitat protection and scenery protection. Modifying current practices and regulations to decrease the width of managed right-of-ways post construction, vary configuration of the vegetated edge of right-of-ways, create pockets of habitat within right-of-way openings, and design planting programs with enhance functional goals, the performance of the landscape impacted by this infrastructure can greatly improve.

Suggested Regulation Language:

Section 1: Definitions.

Unless otherwise specified, the terms indicated below shall have the following meaning:

"Right-Of-Way" shall mean any permanently maintained opening in the forest cover which allows for access and maintenance of infrastructure and roadways.

"Native" shall mean any species that originate naturally and are indigenous to Pennsylvania.

"Coverage" shall mean the amount of surface area covered by the vegetation's point of contact with the ground.

"Diversity" shall mean the number of species represented at a single instance.

"Width" shall mean the horizontal distance running perpendicular from the centerline of the right-of-way to the right-of-way's edge.

Section 2: General provisions.

Upon completion of construction the Right-Of-Way (ROW) must be restored to the following specifications:

A) The pipeline must initially be re-seeded with native grasses in accordance with the Conservation Reserve Enhancement Program (CREP) conservation program and in accordance with DEP erosion/sedimentation guidelines.

   a) Native grasses will be reseeded until a minimum of 70% coverage occurs.

B) To run concurrent with re-seeding of the site will be a re-vegetation plan that will be managed over a 5 year period which will adhere to the following guidelines of plantings per specific section of ROW:

   a) The first 5' on either side directly above the pipeline must be planted with a mixture of native herbaceous perennials and grasses to be maintained for inspection and repair purposes.

b) The next 20′ on either side of the pipeline will be planted with native shrubs and brush with roots not exceeding 3′ in depth.

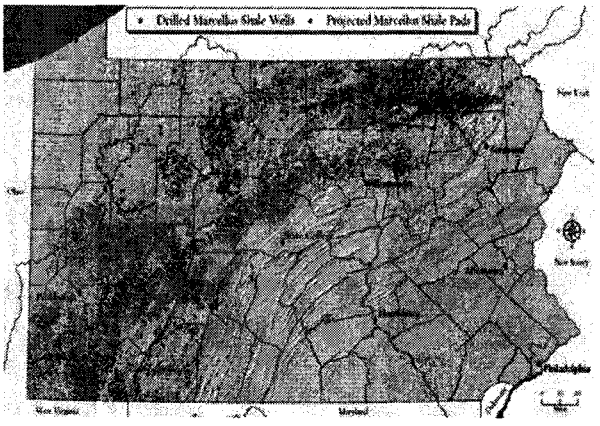
c) The area past the 25′ measurement from the pipeline will be planted to restore native hardwood tree regrowth.

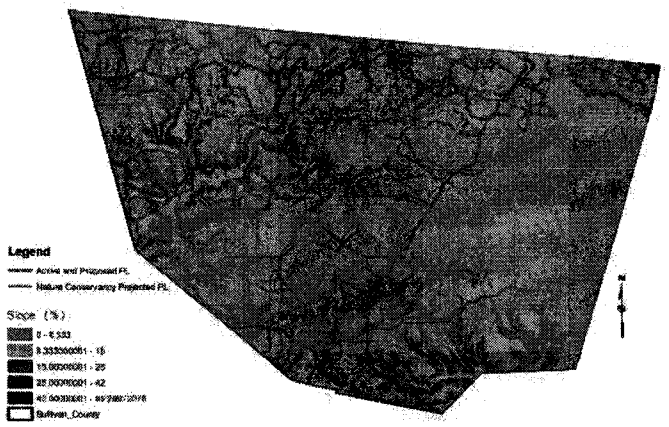
d) The horizontal planting depth at the edge of (b) and (c) will vary by 15 feet in width per 50 feet in distance to restore a varied edge of habitat along the extent of the ROW.

C) Shrub and tree plantings will be implemented following the CREP planting guidelines and within their species and diversity criteria.

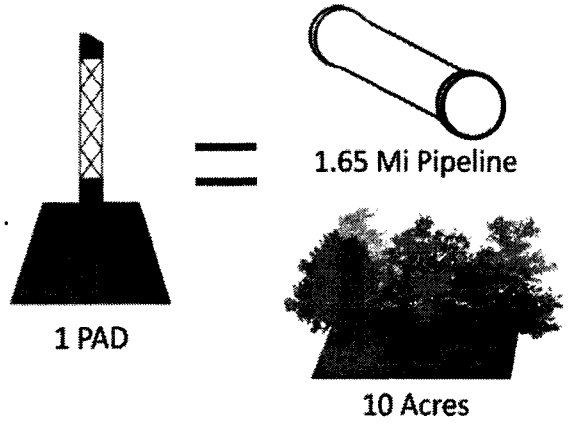
a) Planting maintenance will occur on a bi-annual basis (spring/fall) until a minimum of 75% of initial planting numbers have reached stable heights at a minimum of 50% of the originally planted species diversity.

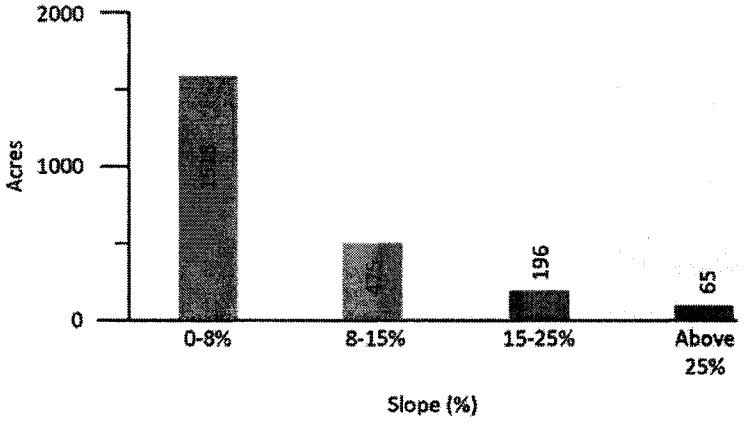
Supporting Figures:





Projected Marcellus well-pad locations in Pennsylvania and an example, in Sullivan County PA, of the extent and impact of existing (blue) and future (red) gathering lines



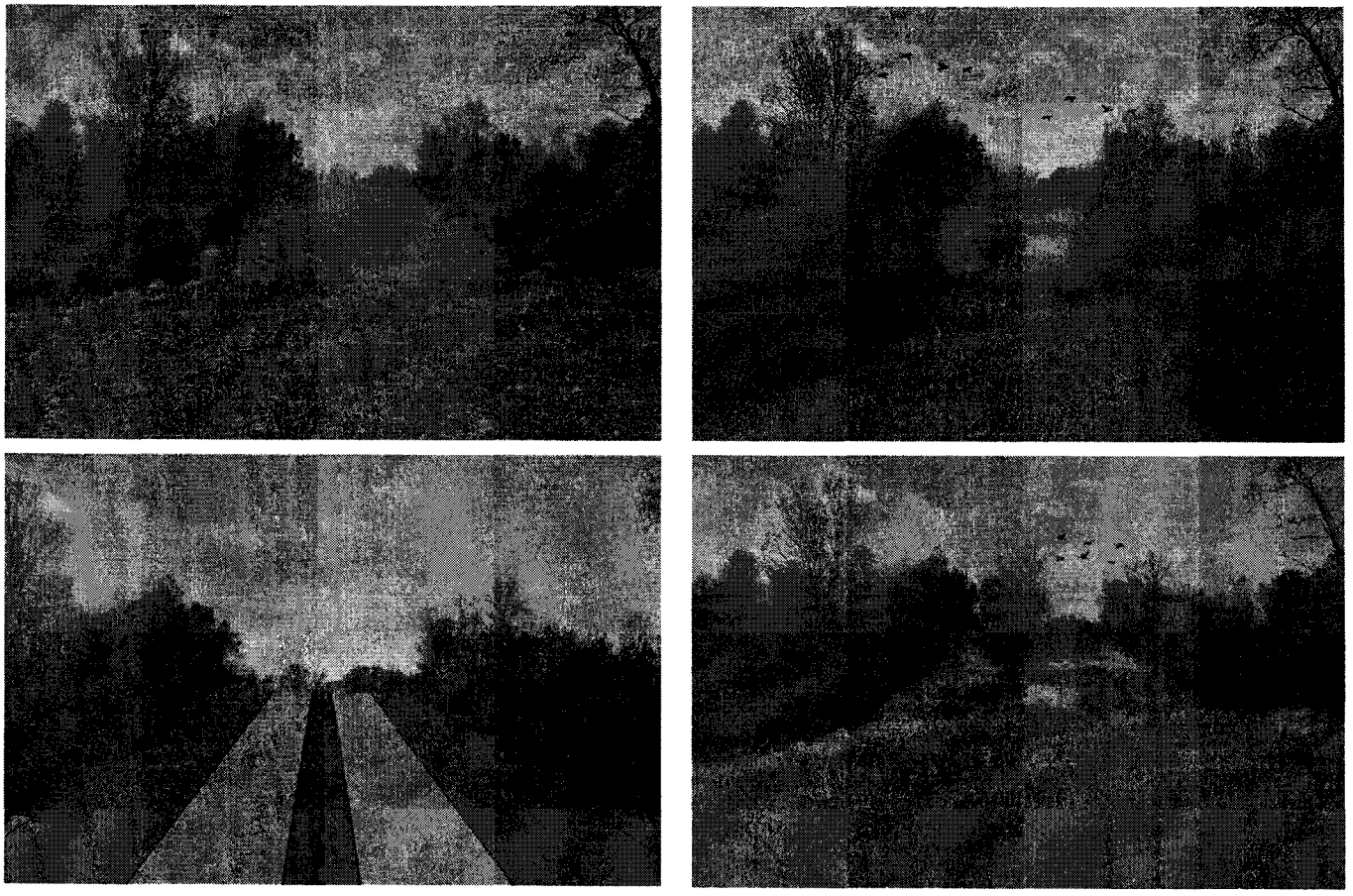


The projected Marcellus development in Pennsylvania is estimated to be more than 6,000 new well sites, which will require 10,000 miles of pipeline that will impact 60,000 acres. In Sullivan County the estimation of this impact's spread over the local topography implies erosion issues in mountainous areas.

---

[1] The Nature Conservancy. The Energy Equation: Marcellus Shale Gas (2010)
[2] The Nature Conservancy. Natural Gas Pipelines (2011)
[3] Graham, B.

Managing Right-of-way Width and Configuration:



On the left, the existing situation (top) and overlaid with pipeline planting zones (bottom). At right, alternative future configurations restore natural edge and island conditions.

Planting Zones

A 10 foot cleared right-of-way (red) is reserved for maintenance, yellow areas are suitable for shallow rooted shrub and brush cover, while the green can be re-established in hardwood forest. The re-introduction of these different plant types has implications across all the concerns listed.

Varied Edge

As illustrated, curving edges to right-of-way cuts provide for more natural breaks in forest cover, disrupting harsh visual edge as evident in current right-of-way cuts. A varied edge increases the variety of habitat available and in turn the diversity of wildlife present. Increasing shrub and herbaceous vegetation improves soil stability through better root structure, minimizing erosion and sedimentation.

Island Habitats

Re-establishing wildlife corridors across large, open right-of-ways is necessary to achieve connection between wildlife populations. Providing islands of vegetation within the right-of-way opening creates connections and ensures the availability of larger tracts of habitat for the conservation of Pennsylvania's biodiversity. Islands of vegetation improve visual quality through breaking and softening the impacts of human activity.

---

[1] Polonus, A.

[2] Odum, E.P. "Fundamentals of Ecology" (1971)

[3] Kunin, W.E. "Biodiversity at the edge: a test of the importance of spatial "mass effects" in the Rothamsted Park grass experiments. (1998)

Provisions for scenic, watershed and habitat conservation in utility and development right-of-ways

- Introduction
  - Description of Pennsylvania as a place of scenic, natural, and ecological value for its residents and visitors.
  - Impact of infrastructural right-of-ways on environment
    - Hydrologic implications – sedimentation, flooding, recharge
    - Habitat impact – lost connections, invasive introduction
    - Visual impact – break in forest cover, ridgeline disruption
  - Recent increase in energy development will continue to impact Pennsylvania's natural systems.
  - Current regulations address restoration but improved regulations focusing on the functional capabilities of restoration could improve upon the impacted systems previously detailed.
- Suggested regulation language
  - Section 1: Definitions – detailing terms specific to the example regulation proposed for restoration on right-of-ways.
  - Section 2: General Provisions – example regulation on right-of-way restoration practices.
    - A) Pipeline reseeded with grass mixture to prevent erosion and sedimentation
    - B) 5 Year vegetation management plan
      - Delineation of 3 planting zones
    - C) Species selection and diversity
- Supporting figures and images
  - Established and projected Pennsylvania well-pad locations.
  - Sullivan County current and projected pipeline development and topographic variation.
  - Graphic of well-pad development to pipeline distance and impacted acreage.
  - Chart of projected pipeline development impact on acreage across slope gradients in Sullivan County.
- Managing right of way width and configurations
  - Images
    - Existing Construction
    - Pipeline Planting Zones
    - Potential configuration – varied edge
    - Potential configuration – Island habitat connector
  - Pipeline Planting Zones – detailing the 3 planting zones and their vegetation types
  - Varied Edge – impact of planting program to vary the right-of-way vegetative edge
  - Island Habitat – impact of planting program to establish habitat connections across right-of-ways

Alex McCay
Pennsylvania State University