Energy Development in Appalachia

The Impacts of Shale Gas Development on Forested Landscapes

U.S. Department of Agriculture
Forest Service
Northeastern Area State and Private Forestry

Description: Forty-two percent of Appalachia's population is rural. Once highly dependent on mining, forestry, agriculture, chemical industries, and heavy industry, the region's economy is becoming more diverse. Technological developments in the oil and gas industry, known as *hydraulic fracturing*, now allow the drilling of deeper wells to tap previously unreachable gas deposits in the Marcellus and Utica shale region of Appalachia, as well as other parts of the United States (and globally). This development of unconventional gas and oil extraction has been a major economic growth sector for the Appalachian region, and is expected to continue to expand in regional and national importance for the foreseeable future.

A number of States across the Northeast and Midwest have commercially viable natural gas/oil shale deposits, particularly Pennsylvania, West Virginia, Ohio, New York, Maryland, Michigan, Indiana, and Illinois. Other States are and will be affected by natural gas pipelines, shipping of raw materials such as sands used in fracturing, or industrial businesses from across the U.S. that support these activities.

According to a recent U.S. Geological Survey/Department of Energy report (August 2013, OFR 2013-1137):

> *While the Nation seeks greater energy independence and greener sources of energy, Federal agencies with environmental responsibilities, state and local regulators and water-resource agencies, and citizens throughout areas of unconventional shale gas development have concerns about the environmental effects of high volume hydraulic fracturing (HVHF)…Environmental concerns posing critical challenges include the availability and use of surface water and groundwater for hydraulic fracturing; the migration of stray gas and potential effects on overlying aquifers; the potential for…wastes to contaminate surface water and groundwater; and the effects from drill pads, roads, and pipeline infrastructure on land disturbance in small watersheds and headwater streams.*
> http://pubs.usgs.gov/fs/2012/3075/fs2012-3075.pdf

Among Northeast and Midwest States in Appalachia with Marcellus/Utica deposits, what follows is a brief update on each State's approach to unconventional gas and oil extraction:

New York. The State has a moratorium on hydraulic fracturing. A *Supplemental Generic Environmental Impact Statement* and corresponding regulations on natural gas development involving hydraulic fracturing are being reviewed. The documents would prohibit drilling in the New York City and Syracuse watersheds, primary aquifers, and on all State lands.

West Virginia. The State has significant hydraulic fracturing on private lands, with very limited activity on State lands. The State has authority to lease State lands on a competitive basis for horizontal drilling, but there has been little industry interest for a variety of reasons. The State Cooperative Extension Service provides guidance for forest landowners on how to mitigate forest impacts.

Pennsylvania. The State has significant natural gas development using hydraulic fracturing on private lands. Pennsylvania State University – Cooperative Extension Service provides guidance for forest landowners on how to mitigate forest impacts. Pennsylvania has an active program of natural gas development on State forests/parks, and supporting legislation. The Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry has an extensive and publically available set of guidelines: *Guidelines for Administering Oil and Gas Activity on State Forest Lands.*

Ohio. The State has significant hydraulic fracturing on private lands. Ohio State University – Cooperative Extension Service provides guidance for forest landowners on how to mitigate forest impacts. Ohio has an active program of natural gas development on State forests/parks, and supporting legislation. The Ohio Department of Natural Resources has an extensive and publically available set of guidelines/Best Management Practices (BMPs) related to this activity.

Maryland. The State has a moratorium on hydraulic fracturing and is currently going through a public process of developing regulations and BMPs for this activity.

Key Issues:

- Hydraulic fracturing by the oil and gas industry is a major economic/energy production activity in many Appalachian States, with both national and global implications.
- All aspects of this relatively new and sweeping economic activity—regulatory, technological, social, political, economic, and environmental—are evolving relatively quickly.
- This industrial activity often occurs on forested lands, creating legitimate concerns about a variety of environmental impacts.
- All Appalachian States are taking a different approach to mitigating the impacts on forests for State or private lands, from having Cooperative Extension provide information to landowners, to moratoriums on all hydraulic fracturing, to development of natural gas resources on State forests and parks with associated BMPs.

Project Status:

In 2012 and early 2013, the Northeastern Area State and Private Forestry (NA S&PF) provided several comprehensive briefings to its leadership and staff, a number of Appalachian State Foresters, U.S. Forest Service Region 8 and 9 staffs, and the Northeastern Area Association of State Foresters Utilization Committee. NA S&PF has also provided advice and technical assistance to the Delaware River Basin Commission, U.S. Geological Survey, and other groups as they perform assessments and engage in planning efforts related to unconventional shale gas development.

Future Direction:

From a technical assistance standpoint, NA S&PF continues to actively monitor this complex and growing issue and to engage with other involved public agencies.

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