



May 12, 2014

Honorable Ellen Ferretti  
Secretary, DCNR

Dear Secretary Ferretti,

I am writing on behalf of the Pennsylvania Biological Survey (PABS) to provide comment on the recently released “Shale Gas Monitoring Report.” PABS is a nonprofit organization whose purpose is to increase the knowledge of, and foster the perpetuation of, the natural biological diversity of the Commonwealth of Pennsylvania. Our membership includes professional scientists, representatives of state and federal agencies concerned with natural resource management, and representatives of non-profit conservation organizations.

Specifically, the members of PABS are concerned about the potential environmental damage caused by natural gas extraction from the various shale rock formations underlying the Keystone State, including the Marcellus, Burket, and other Devonian shales. Despite this initial monitoring report, much remains unknown about drilling in these shale formations, possibly the third largest gas reserve in the world. We are unaware of what peer-review process this report went through (either the study design or the report itself) but we provide our comments in hopes of improving the understanding of the effects of shale gas extraction on natural resources and in hopes of improving the report product itself. These hopes come in the face of proposals to expand shale gas extraction on our publicly owned lands in Pennsylvania. Our specific comments follow.

Overall, the shale gas report contains comprehensive goals and we applaud the attempt to examine a variety of resources and values. In addition, the format of the report makes the findings accessible to a diverse reader base. The tables and figures provided are clear and present important information on the extent and location of shale gas extraction in Pennsylvania.

Our overarching question regarding this report is what is the purpose of monitoring? In a scientific sense monitoring is done to document trends in resource condition that will inform management decisions and actions. However, the report does not list any potential management decisions or actions that would be taken in response to the monitoring findings. Potential actions should be included. In addition, the report provides no response thresholds. For example, how much decline in resources or other indicators will be permitted prior to any response? These are hard questions but they need to be addressed prior to starting any monitoring program. Otherwise it will merely document the changes.

An adequate framework for monitoring the effects of shale gas extraction on animals is lacking. We note research partnerships with Penn State to examine the effects of shale gas extraction on bird communities and rattlesnakes but other faunal groups are poorly represented. We urge the state to make better use of existing data sets including Important Bird Area (IBA) data, Important Mammal Area (IMA) data, the Pennsylvania Herp Atlas, Pennsylvania's Wildlife Action Plan, and data that scientists throughout Pennsylvania have collected via individual research projects.

Monitoring of water quality components also is limited. For example, there are no references to water quantity monitoring or examining water chemistry in relation to fracking fluids. We urge further partnerships and efforts to ascertain the composition of fracking fluid chemicals and their percentages so researchers know what chemicals should be monitored. Impacts from the millions of gallons of water needed to drill each well need to be monitored and ways to treat the high concentration of chloride in the wastewater need to be found. Toxicity of products used in the drilling process and potential radioactivity of hydraulic fracturing wastes (e.g., from uranium, strontium, and selenium) also should be monitored and remediated.

We commend the vegetation baseline monitoring that is occurring adjacent to well pads, forest roads, and in areas not yet affected by shale gas extraction. However, other vegetation monitoring and restoration practices raise concerns. For example, the continued use of non-native species (many of which are listed as noxious, invasive species in Pennsylvania and neighboring states) for erosion control and restoration of well pads and other disturbed areas is troubling. Species mentioned in the report (e.g., orchard grass, red clover) are native to Europe and Asia and should not be used for erosion control or restoration. We should be using native species in these roles. We have the expertise available in Pennsylvania to find better solutions. We also note that these species are not listed in the invasive plant monitoring section—they should be. A well pad that is contoured and planted with red clover, trefoil, and orchard grass is not a restored site.

We note that in addition to well pads, retention ponds and pipeline rights-of-way represent significant categories of converted land. We urge that the effects of retention ponds, including fracking fluid impoundments, on wildlife be studied. For instance, what mammals, herps, birds, and invertebrates are using these ponds and are they experiencing adverse effects? Retention ponds potentially are contaminated with toxins that directly affect wildlife. A 2012 scientific study published in the journal *Risk Analysis* (Rozell and Reavan, vol. 32) outlines many of these risks to human and animal health. Cleared utility rights-of-way cause forest fragmentation, promote dispersal of invasive plants, and can be barriers to movement for some wildlife species. The study of their impacts is a crucial part of shale gas monitoring.

The portion of the report on “improved” state forest roads also illustrates the need for further study. Modified roads decrease the backcountry character of the state forest landscape and may well have adverse effects on wildlife movement. Because modified roads are existing roads, their effects may not show up in a fragmentation analysis but the widened corridors could affect wildlife movements and potentially increase road-kill.

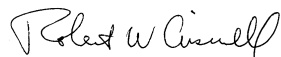
Finally, we recommend a few editorial changes that you may want to incorporate into the report prior to further distribution. These may appear minor but they will improve the acceptance of

the report by scientific and policy readers. The term *data* is plural; throughout the report the phrase “this data” should be changed to “these data.” In addition, in technical reports, figures are labeled at the bottom and tables are labeled at the top. Most importantly, the executive summary—probably the most-read portion of your report—lacks specifics. For example, it states that certain actions have impacts without stating what those impacts are (e.g., What are impacts to hiking trails? What changes in recreational use are occurring?).

We are concerned about the rapid development occurring in the areas that contain the Marcellus Shale formation prior to a full understanding of all the environmental effects to soil, water, plants and wildlife. There is a strong need for independent, peer-reviewed science to ensure proper siting and management of Marcellus Shale drilling activities—especially on public lands. The “Shale Gas Monitoring Report” purports to help us gain an understanding of these effects. However, much more clarity and robust science are needed.

Our members acknowledge the economic incentives for Marcellus Shale drilling in our state. However, we should not sacrifice the legacy of Pennsylvania’s natural resources for short-term economic gain lest future taxpayers be burdened with the costs of restoring clean water and healthy forests, treating health consequences, or compensating for losses of ecosystem services. This is especially true for our public lands. We have very serious concerns regarding additional development of gas resources on these lands until we know much more about the impacts and then, and only then, if those impacts are acceptable to the public. The PABS membership stands willing to work with you and members of the General Assembly to find the best solutions to protect our natural resources.

Sincerely,



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