

ECOLOGICAL HEALTH

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Photo courtesy of PA DCNR



Landscape Change Issues

- **The ways in which OGD is changing in the 21st Century may have some landscape change benefits:**
 - Horizontal drilling enables developers to increase spacing between well pads, and
 - Concentrate larger numbers of wells on each pad
 - Open rocky sites may provide new habitat to some species
- **OGD can lead to a variety of adverse landscape changes**
 - Core forest habitat conversion has been greater than overall forest conversion
 - Interactions among stressors such as habitat fragmentation, noise and light pollution may be important
 - Changes in water quantity, quality, and cycles
 - Restoration more challenging and limited to date





Photos courtesy of PA DCNR



Research Question

Do the short- and long-term landscape changes associated with OGD affect terrestrial and aquatic habitats and present risks to ecological health?

Cross-cutting themes:

Background conditions

Temporal and spatial variability

OGD facility variability

Interplay between benefits and impacts

Relationship to ongoing research: Would build on the ongoing work of others (e.g., The Nature Conservancy, Brittingham et al. 2014, Souther et al. 2014, Vengosh et al. 2014)

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Research Goals and Examples of Research Activities

- **Goals:** (1) Quantify the contributions of OGD to changes in physical habitats and sensory stressors and (2) assess any ecological risks that result from these changes.
- **Research Examples**
 - The research would involve measuring and modeling various indicators of ecosystem health, such as:
 - Structure and composition of ecological communities
 - Demographics of representative and threatened/endangered species
 - Changing interspecies relationships
 - Ecological risk assessment would likely require the selection of model or representative systems or species for which detailed measurements can be made in areas affected by OGD and in areas where OGD is not occurring.

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