CGG VERITAS
BROOKSIDE AND CENTRE 3D SEISMIC SURVEY

CGG Veritas commissioned WHM Consulting, Inc. (WHM) to conduct several environmental surveys for the Centre and Brookside 3D Seismic Testing Projects. The majority of the work was conducted within commonwealth lands which included State Game Lands (SGL) 100 and SGL 75, along with Sproul State Forest (SF), Tiadaghton SF and Moshannon SF. The studies included wetlands, and threatened and endangered plants and animal species under direction of the Pennsylvania Natural Diversity Index (PNDI). All studies were conducted by qualified wetlands scientists, botanists and biologists.

(Photo: View of Summerson Mountain near Renovo)

In July of 2010, WHM conducted a botanical survey within Area of Concern 11 (AOC 11), which involved searching the potential habitat within AOC 11 for *Platanthera ciliaris* (yellow fringed-orchid). *Platanthera ciliaris* was not found within the area of concern, but the known population near the project area was identified and photographed during the blooming period.

In August of 2010, WHM performed a botanical survey in Sproul SF within AOC's 4 and 5, in search of *Scirpus ancistrochaetus* and *Lupinus perennis* (Northeastern bulrush and wild lupine). During the survey three distinct populations of *Scirpus ancistrochaetus* were identided within AOC 4, while no populations of *Lupinus perennis* were found in either AOC. WHM also conducted a wetland habitat avoidance survey, in which consultants traversed the seismic lines, moving source points and temporary access routes out of wetlands and water resources. WHM performed a similar task in SGL 100, by assisting CGG Veritas to avoid rocky outcrops and ledges that provide potential habitat for *Neotoma magister* (Allegheny woodrat) and *Myotis leibii* (Eastern small-footed myotis).

WHM performed another A. woodrat/Small-footed bat survey with a more innovative and efficient approach for scouring a vast tract of land in Tiadaghton SF. This approach involved a helicopter survey during leaf off conditions during the fall of 2010. Potential rocky habitat areas were observed and marked with a GPS unit. The GPS points were then brought into GIS software and overlaid with LiDAR data and aerial imagery. By using the data sources, rocky habitat areas were identified and a boundary delineation was traced in GIS. CGG used the created shapefiles and a 300' buffer to avoid impacts to the potential habitat. The Pennsylvania Game Commission was involved with the study and approved the innovative approach.

In 2011, WHM performed wetland habitat avoidance surveys within SGL 75 for the Brookside 3D project. WHM also performed an A. woodrat/Small-footed bat habitat survey, near Renovo in August of 2011 for the Centre 3D project. Also in August of 2011 WHM performed a botanical survey of AOC 16 near Clinton Cliffs in Renovo, combing the potential habitat for *Chenopodium foggii* (Fogg's Goosefoot) and *Helianthemum bicknellii* (Bicknell's hoary rockrose), no rare plants were documented during this survey.