

Bat Habitat Use In New Mexico Abandoned Mines: Using GIS To Plan Monitoring

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Abandoned Mine Land Reclamation Program

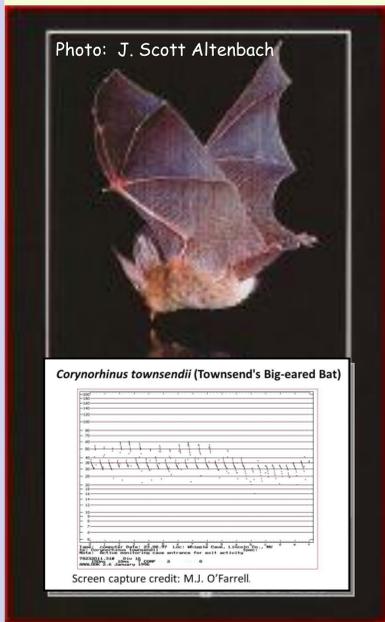
Abandoned mines pose safety threats and also provide valuable habitat for bats and other wildlife. The NM Abandoned Mine Land Program safeguards mine entrances with wildlife compatible closures when quality of habitat is warranted. Bat biologists that specialize in internal bat surveys identify mines that are significant bat habitat for roosting and maternity and hibernation habitat. We have a need to monitor continued use of bat compatible closures and population trends at significant bat use sites in order to contribute to bat conservation. Bats are important consumers of insect pests and make up a key role in our native biodiversity. Increasing pressures on bat survival include introduced pathogens that cause White-nose Syndrome, urban and energy development, and disturbance / vandalism.



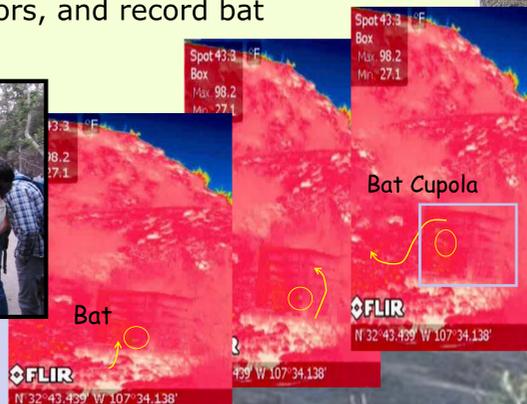
Mining & Minerals Division

Dillon & Dutchman Canyons were transformed by geomorphic reclamation creating sinuous channel reconstructions. Gob was buried between earth layers above water table. A revegetation zone along new water channel was planted with young cottonwood, willow poles, local shrubs and seeded with native grass / forbs.

Methods: We are using GIS to plan a bat monitoring program to prioritize visitation and track population trends and habitat use at abandoned mines and reclamation sites. We are using bat acoustic recorders and Near-Infrared and Thermal-Infrared (FLIR) video cameras to observe bat numbers, behaviors, and record bat species / guilds.

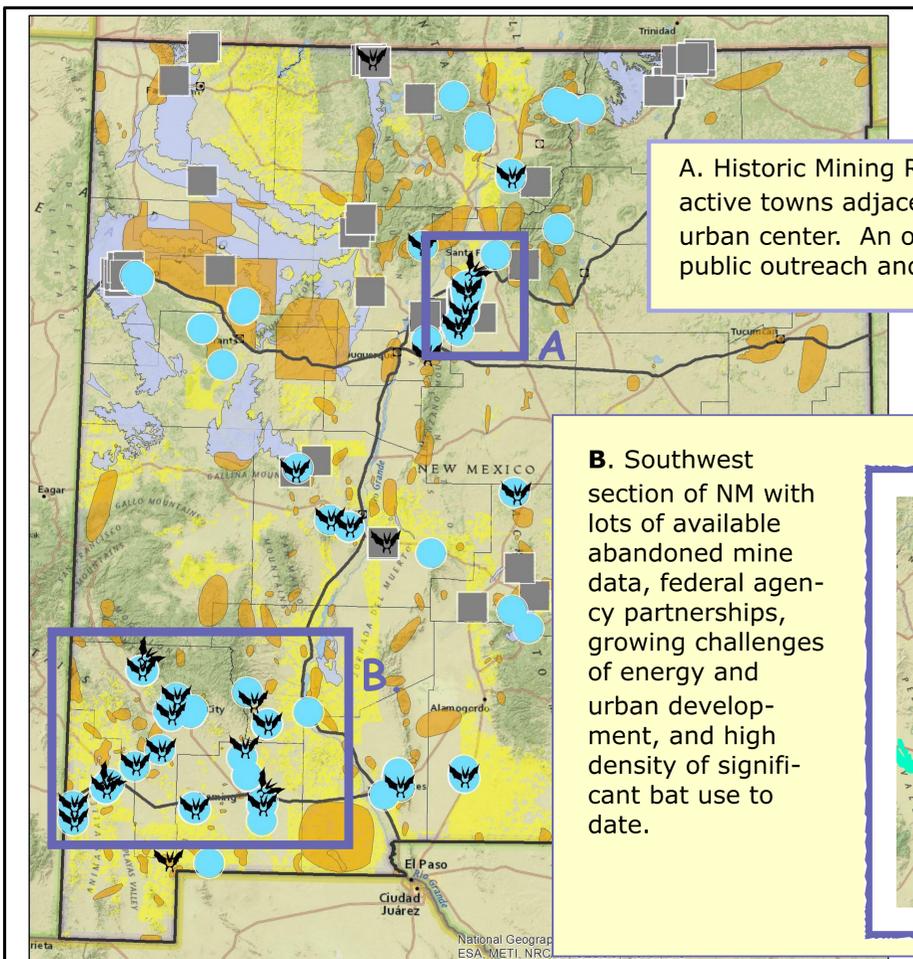


AnaBat Acoustic Detector and software are used to compare bat call sonograms and list possible bat guilds or species that may use a habitat or emerge from mine openings.



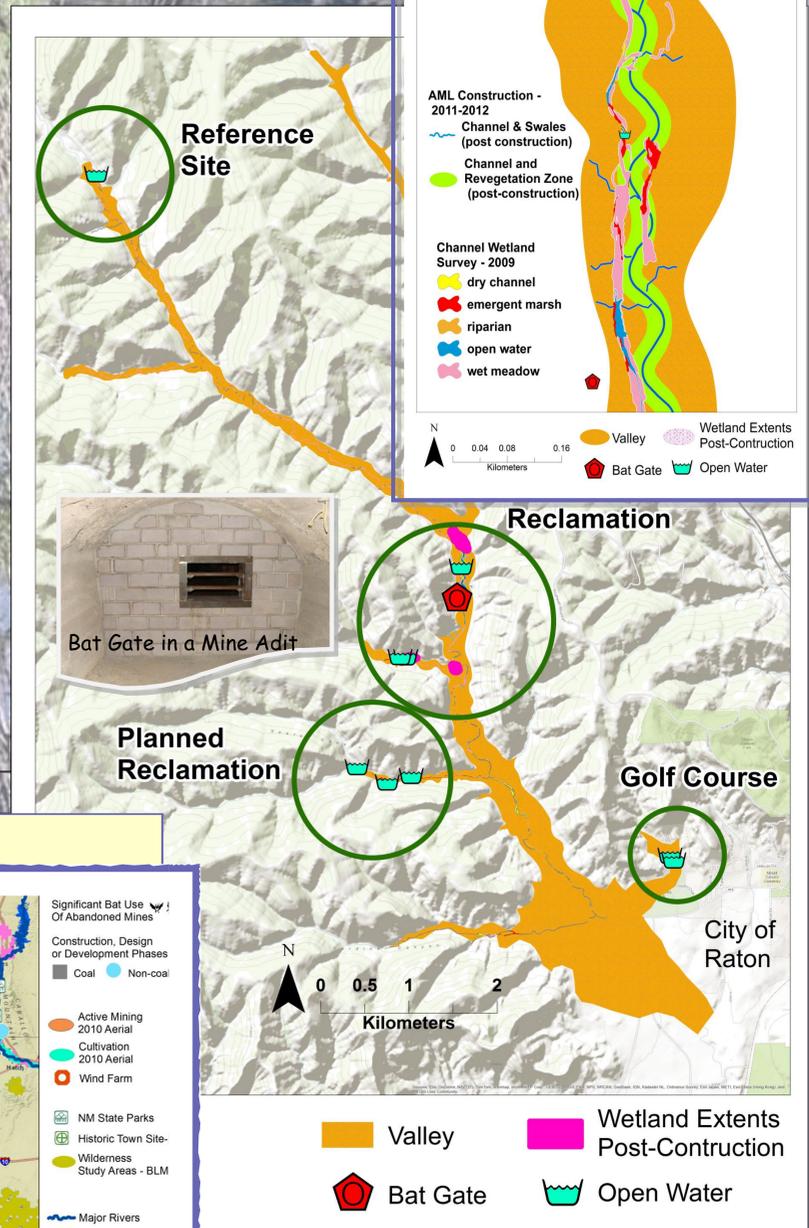
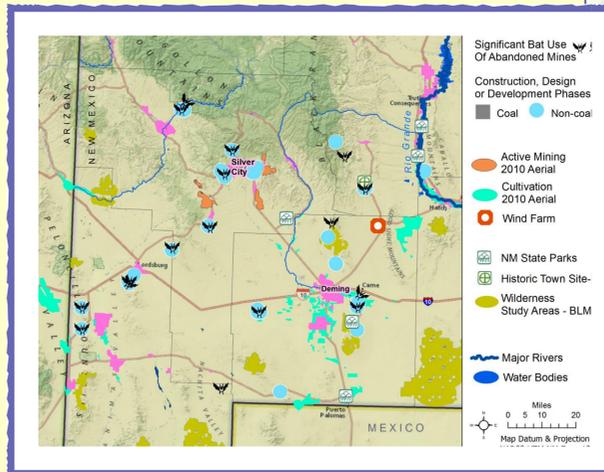
Bat Monitoring Plans at Geomorphic Reclamation and Revegetation Zones. How are bats using foraging and water drinking resources? How does bat activity and richness compare between reference, pre- and post-reclamation?

Current distribution of significant bat use at abandoned mines previously surveyed by internal bat use checks and expert opinion (J. Scott Altenbach). Below are two priority monitoring regions.



A. Historic Mining Region of active towns adjacent to a large urban center. An opportunity for public outreach and bat education.

B. Southwest section of NM with lots of available abandoned mine data, federal agency partnerships, growing challenges of energy and urban development, and high density of significant bat use to date.



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Additional Equipment Sources: DOI Office Enforcement OSMRE/ Technical Innovation and Professional Services TIPS provided AnaBat SD2 Acoustic Recorder & FLIR Video Camera—P660 and Digital Globe WorldView2 images. Data sources: Water & Earth Technologies/Habitat Management Inc.; Thomas Mann & Associates (Survey/Photogrammetry); NM Abandoned Mine Land Program; RGIS NM Resource Geographic Information System Program; ESRI ArcGIS Online Data service. Software: Esri ArcGIS 10.1