

CENTRAL REGION USGS BLM SCIENCE PARTNERSHIP FUNDS
FY 02 Project/Activity Status Report
Due: November 29, 2002

Date: December 12, 2002
Project/Activity Title: Mancos Shale Landscapes
Account Number: (8928OFC)
Principal Investigator: Dick Grauch, Paul von Guerard, John Elliott,
Dave Catts, Steve Hamilton
Partners/Collaborators and Affiliation: Karen Tucker, Jim Ferguson, Amanda Clements,
Dennis Murphy/BLM
Total Funding Approved: FY02 :~\$100,000
Total Expenditures: ~\$100,000

Objective of Project/Activity: *(Provide short description of project/activity goals and list outcomes/products.)*

Information collected will be used in the Gunnison Gorge National Conservation Area (GGNCA) Plan to identify the uses and capacities for those uses which can be ecologically accommodated on these lands and to determine the best management practices to reduce erosion/salinity impacts, protect site values, restore/reclaim degraded areas. The primary product of this project in FY02 is for BLM and USGS personnel to develop and begin implementation of a plan to integrate coordinated-science activities in the NCA to support on the ground management of the area. The goals of coordinated-science activities are to identify best-management practices, methods for determining impacts, acceptable levels of surface disturbances relative to erosion and salinity issues, and methods for monitoring success. The product of the coordinated-science activities will provide the most successful and economically feasible techniques to restore/reclaim these areas and implement proper management for their sustainability.

Project/Activity Accomplishments: *(What outcomes/products were achieved including what benefits were derived and by whom?)*

Landscape Classification, Erosion Processes, and Threshold Determination
Task Leader -- John G. Elliott, USGS WRD

FY 2002

April -- Preliminary discussions of collaboration with BLM scientists and land managers. Reconnaissance of the Gunnison Gorge National Conservation Area (GGNCA) in Montrose County with BLM and USGS personnel. Represented the USGS and attended public meeting in Montrose where management issues were discussed by BLM, users groups, and the public at large.

June -- Mancos Shale Landscapes: Science and Management Workshop in Grand Junction. Made poster and oral presentations. Schmoozed with colleagues.

July -- Prepared narratives and preliminary budget for BASIS+ in collaboration with Project Leader Dick Grauch.

April through September -- Ongoing collaboration with David Catts (NMD) in the development of DEM data bases, maps, and visual products to be used in reconnaissance, in geomorphic analyses, and as spatial and digital references for coordination of several other Tasks.

FY 2003

October -- Follow-up discussions with BLM scientists in Montrose. On-site reconnaissance and selection of a few potential study sites in the GGNCA. Also visited the BLM's Fairview Natural Research Area with Jim Ferguson (BLM) and Jim Herring (USGS GD). On-site observation of soil structure and erosion characteristics in the GGNCA. Initial measurements of geomorphic variables at selected locations in the GGNCA. On-site verification and subsequent modification of GIS-derived watershed subbasins(Catts), known as Hydrologic Runoff Units (HRUs).

November -- Met with Dave Catts (NMD), Michele Tuttle (GD), Dennis Murphy, Jim Ferguson, Amanda Clements, and Jacek Blaszczyński (BLM) to discuss the GGNCA mission statement, goals, and objectives. Attended a briefing by Jacek Blaszczyński (BLM) summarizing his sediment yield research and potential applications with the Mancos Project's GIS development (Catts) and geomorphic research (Elliott).

October through present -- Ongoing collaboration with David Catts (NMD) in the development of DEM data bases, maps, and visual products to be used in reconnaissance, geomorphic analyses, and as spatial and digital references for coordination of several other Tasks.

Geography Discipline on Gunnison NCA/Mancos Shale Task Leader – Dave Catts USGS NMD

FY 2002 -

- Established temporary project web site for data exchange between participants URL: <http://rmmcnt7.cr.usgs.gov/mancos/>
- Acquired Landsat 7 Enhanced Thematic Mapper (TME+) for NCA region **
- Generated false color landcover image from TME+ imagery **
- Acquired BLM-provided dataset; including OHV roads and trails
- Generated nine 1:24,000 DEMs, Level 2, 10-meter * **
- Created mosaic of elevation model from (9) DEMs * **
- Scanned and posted field photography (April, June) *
- Scanned and masked plant specimens for visualization
- "Mancos Landscapes Workshop" presentation on visualization
- Delineated secondary watersheds for NCA area * **
- Delineated subbasins for secondary watersheds on western NCA region
- "Potential Impact of OHV Use": delineated areas of potential OHV access from existing road network *
- Created aspect and micro watershed field documents for Upper Elephant Skins subbasin *

FY 2003

- Created perspective visualization of NCA and Mancos Shale contact for briefings * **

- Generated graphic of preliminary topographic indices of terrain *
- Panelled National Diversity Information Source (NDIS) vegetation mapping for four primary watersheds
- Created graphic of panelled NDIS vegetation mapping * **
- Integrated foliage specimens with NDIS landcover and National Land Cover Data (NLCD)
- Created landscape visualization from NDIS vegetation mapping * **
- Acquired BLM delineation of focus study regions *
- Generated initial pediment topographic properties *

* these elements have been posted to the project web site

** these elements have generated datasets associated which has been made available to BLM Montrose

**– Biological Resources Discipline on Gunnison NCA/Mancos Shale
Task Leader – Steve Hamilton USGS BRD**

FY 2002

April -- Preliminary discussions of collaboration with BLM scientists and land managers.

Reconnaissance of the Gunnison Gorge National Conservation Area (GGNCA) in Montrose County with BLM and USGS personnel. Represented the USGS and attended public meeting in Montrose where management issues were discussed by BLM, users groups, and the public at large.

June -- Mancos Shale Landscapes: Science and Management Workshop in Grand Junction.

Presented three posters on selenium impacts on fisheries resources and gave two oral presentations (one a review of selenium impacts on biological resources and the other was an overview of the Contaminants Program of the USGS).

September – Discussed future activities with WRD and GD. From a BRD standpoint, BLM does not have any interests in animal-type (mammal, bird, fish, reptile, amphibian) efforts in part due to the barren landscape, but they have keen interests in control of exotic plants and rare plants. Toward this end, Dr. Geneva Chong of the Fort Collins Science Center has a research project with the BLM that will document plant distributions in the National Conservation Area. Dr. Chong has provided a status report to the Mancos Landscapes Project (i.e., Paul Vonguerard) on her efforts. At present, due to the lack of animal concerns on the NCA, the only other possible effort for BRD would be to write a white paper on the possible impacts on endangered and threatened fish in the upper Colorado River basin that might be caused by or related to salinity and selenium loss via erosion from Mancos Landscapes managed by BLM.

Geologic Discipline on Gunnison NCA/Mancos Shale

Task Leader – Richard Grauch USGS GD MRP

FY 2002

January through June – worked with USGS, BLM, BOR to plan, organize and run the Workshop on Mancos Landscapes: Science and Management. Presented overview of Mancos geology and selenium mineralogy in marine shale.

January through September – worked with USGS science colleagues and managers to develop an umbrella project, “Mancos Shale Landscapes: Science and Management of Black Shale Terrains (a Regional Partnership Project)”, that incorporates the BLM-USGS cooperative effort on the GGNCA within a framework of Cretaceous marine shale in the upper Colorado River Drainage. The project has been accepted and is being funded as a multidisciplinary, multiagency effort.

April - discussions of collaboration with BLM scientists and land managers. Reconnaissance of the Gunnison Gorge National Conservation Area (GGNCA) in Montrose County with BLM and USGS personnel. Attended public meeting in Montrose where management issues were discussed by BLM, users groups, and the public at large.

August through September – briefed various USGS, BLM, and OMB personnel regarding both the umbrella project and GGNCA tasks that are contained within it.

FY 2003

October – held first coordination meeting of the entire project. Continued discussions with BLM counterparts regarding GGNCA objectives.

November through December – compiled (1) preliminary database of published material on the Mancos Shale, (2) preliminary database of locations of oil and gas exploration wells that penetrated the Mancos Shale in the upper Colorado River drainage basin, and (3) partial geologic base for the GGNCA and surrounding area. Conducted on-site reconnaissance sampling of soils in an area that will probably become a primary study site. Completed an on-site set of experiments designed to define future sampling techniques.

Results: (Describe status of project to date if not complete)

Project objectives are being refined in cooperation with BLM/NCA staff. Anticipated funding for FY2003 ~\$60,000 from USGS Central Region, ~\$440,00 from USGS Minerals Program, ~\$30,000 from USGS National Cooperative Mapping Program; at least 0.75 FTE and ? OE from USGS NRP; 0.5 FTE and ? OE from NMD, 0.5 FTE and ? OE from BRD; ~\$60,000 from BLM; and in-kind cooperation (up to ~0.1 FTE) from BOR will be applied to the following tasks (task leaders are also listed):

- Coordination of Mancos Shale Project Activities with Local, State, and Federal Entities: Paul von Guerard and Dick Grauch
- Landscape Classification, Erosion Processes, and Threshold Determination: John Elliott
- Topographic and Ecological Modeling – Landscape Visualization (LVIS): Dave Catts
- Toxicological Studies: Steve Hamilton
- Framework Geochemical Analysis, Lithochemical Characterization, and Geoenvironmental Considerations: Jim Herring
- Soil Development, Trace Element Mobility, and Salinity in the Mancos Shale: Michele Tuttle

- Metal Balance in the Cretaceous Seaway: Poul Emsbo
- Regional Distribution of the Mancos Shale (remote sensing and stratigraphic mapping): Eric Livo
- Detailed Mapping and Stratigraphic Studies of the Mancos Shale: Dave Sawyer
- Paragenetic/Mineralogic Framework of the Mancos Shale: Dick Grauch
- Clay Mineralogy of the Mancos Shale: Denny Eberl
- Project Administration: Dick Grauch
- Emeritus Scientists: Dick Grauch