Cultural & Biological Survey of Caves at Ft. Leonard Wood

Assessing the Suitability of Caves for Military Training
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MANSCEN & Fort Leonard Wood
61,410 Acres

MANSCEN & FLW MISSIONS
Basic Combat Training
Engineer School & Training
Military Police School & Training
Chemical School & Training
ITRO Heavy Equipment Course

63 Caves (Known)
40 CENR’s/ENR’s
16 NAGPRA Sites

2 Endangered Species
6 Caves Sites
2 Gray Bat (Maternity)
4 Indiana Bat (Hibernacula)
Description and Goals of FLW Project

Identify Caves for Potential Military Training

Survey Caves from Biological & Cultural Standpoint

Establish Cave Management Plan

Protect Significant Biological Systems and Species

Protect Significant Cultural Sites

Coordinate Management Activities with other Federal, State & Tribal Agencies in order to Avoid Potential Compliance Issues
PROVIDE SPECIFIC APPROVED MILITARY CAVE SCENARIO TRAINING SITES

PARTICIPATING FLW UNITS
EN ANCOC’s Sapper Leader Course Robotics DARPA

CAVE TRAINING SCENARIOS
Cave Clearing Battle Drill Search & Destroy Frontal Assault Avenues of Approach
Lead DoD in Cave Training
FLW UNITS IN ACTION

SAPPER LEADER COURSE TRAINING

EN ANCOC’s AA BRIEF

URBOT IN TUNNEL
SURVEY RESULTS

• Invertebrate, Vertebrate and Vascular Plant surveys on 58 Caves Sites
• Multiple State & County Micro (Invertebrates) Fauna Records
• Multiple County Flora Records
• Over 100 (Invertebrate, Vertebrate) Taxa Recorded on Survey
• 220 Species of Vascular Plants Recorded - 50 Taxa Pending
• 9 Plant Community Associations Found in Proximity to Caves
• Four Cave Sites Considered Biologically Significant
FEDERAL ENDANGERED SPECIES SURVEY RESULTS

- 58 Cave Surveys Completed
- No New Endangered Species Found
- 1 Potential Gray Bat Site Found

EFFECTS ON FLW TRAINING/MISSION

- None (Potential Site in Close Proximity to Existing Gray Bat Cave)
STATE LISTED SPECIES SURVEY RESULTS

- No New State Species of Concern Found
- 1 New Site Found (Grotto salamander)
- 1 New Site Found (Missouri Cave Amphipod)

 ISSUES

- Invertebrate ID process longer than expected
- Numerous Cave Invertebrate taxa could easily be undescribed to science or have the potential to be new species (not uncommon in cave surveys)
SURVEY RESULTS

• 54 Caves Surveyed & Mapped
• 7 Potential CENR Sites
• 4 Potential NAGPRA Sites
• 2 Sites (Kerr & Martin) Mitigated With Additional DPW CRP Funds
• All Caves Sites Recorded in GIS Database (ArcMap) with Hot-linked Photos of Cultural, Biological & Map Information
• Established Positive Contact with 5 Tribal Groups
- 1 Cold War Site Discovered
- Martin Cave 572 Meters Long
- 25 Caves Have True Dark Zones
- 8 –10 Potential Paleontological Sites
- 72% of Caves Show Prehistoric Use
- FLW Caves Continual Use Pattern from Late Paleo (Dalton 8,000 BC) (Late Woodland AD 500 –1400) Period
Lead DoD in Natural/Cultural Resource Cave Management

Cave Data-Loggers

Cave Mapping

USFWS/MDC Surveys

DPW Cave Monitoring & Protection
FLW NAGPRA ISSUES & FUTURE

Continue Cave Gating at NAGPRA Sites

On-Going Consultation with Tribal Leaders Including Cultural Affiliation and Repatriation of Human Remains

Visitation by Tribal Leaders to FLW to Review CRMP Activities & Goals
Legacy & FLW Training/Natural/Cultural Resource
Cave Management Future Goals

Approved Training Cave Sites  Cave Management Plan
Cave Gates at NAGPRA Sites  Cave Data-loggers
Harden Cave Surfaces  Continue Monitoring

Develop Protocols for Other DoD Installations
Work With USFWS, MDC & Tribal Organizations
PROJECT COORDINATORS

Mr. Joe Proffitt
CEMML/FLW DPW

Dr. Richard Edging
CEMML/FLW DPW

Dr. Michael Hargrave
USACERL/ERDC

MANSCEN & Fort Leonard Wood, Missouri

ACKNOWLEDGEMENTS

Dr. Steve Ahler  Archeological Survey  ISM

Dr. Steve Taylor  Biological Survey  INHS

Photo Credits

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Dr. Steve Ahler
Mr. Michael Carter
Mr. Joe Proffitt