



**Department of Defense  
US Army National Training Center  
Fort Irwin, CA**



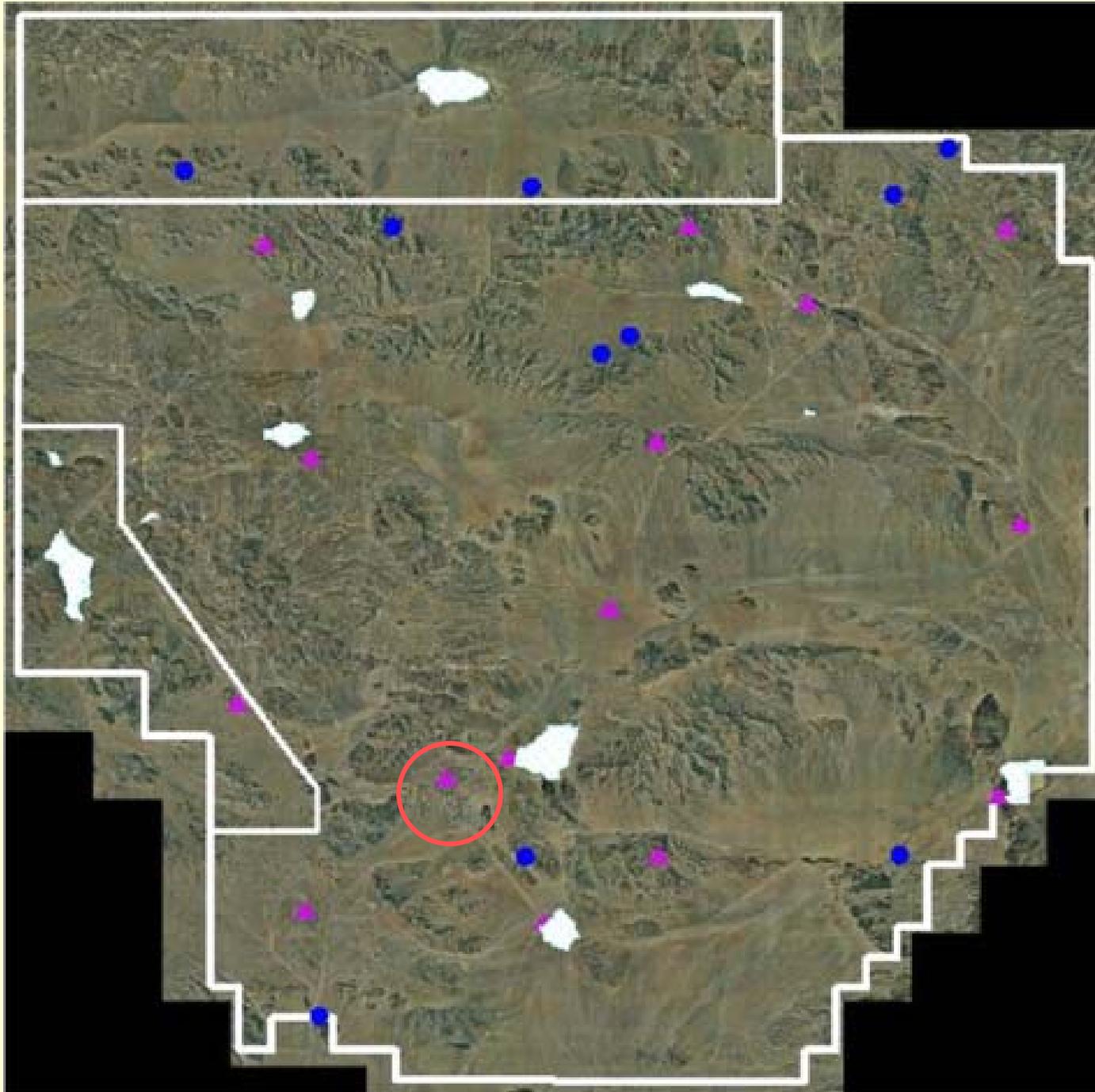
# Offices



- Directorate of Public Works
  - Environmental Division
    - *Natural Resources Section*

Responsible for species management (TES, pest species) and management of non-training areas (cantonment, springs, etc)
- G3 (Training)
  - Integrated Training Area Management Program
    - *Land Condition Trend Analysis (LCTA) Component*

Responsible for monitoring and management of training lands



- spring
- meteorological stations
- cantonment

# Authority

- AR 200-3: Natural Resources – Land, Forest, and Wildlife Management
- AR 350-4: Integrated Training Area Management Program
- 1991 Biological Opinion for the U.S. Army's Current Mission at the NTC, Fort Irwin, CA
- 1995 Biological Opinion – Re-initiation of Consultation
- Integrated Natural Resource Management Plan 2001-2005

# History

- **1981:** Fort Irwin designated NTC
- **1981-1990:** Miscellaneous species surveys
- **1990:** LCTA program initiated (200 permanent transects)
- **1991:** Biological Opinion
- **1992:** Initiation of Surveys in Land Expansion Areas
- **1993-1997:** Inventories on NTC
- **1995:** Biological Opinion (updated)
- **1996:** LCTA moved from DPW to G3 (Training)
- **1998:** Re-evaluation of LCTA monitoring program
- **2000:** Re-establishment of original plots plus additional (230 total)
- **2001:** Initiation of supplemental sampling (soil characteristics)
- **2001:** INRMP

# Major Components

- Flora
  - Inventory (1993, additions as necessary)
  - Vegetation community mapping (1994-1996)
  - LCTA permanent monitoring plots (1990-1993, 2000-present)
  - Spring surveys/monitoring (1997/1998, 2002)
  - Lane Mountain Milkvetch surveys (1989, 1991, 1992/93, 2001/02)
- Fauna
  - Reptiles, mammals, birds, invertebrates surveyed in representative habitats (1994-1998)
  - Desert Tortoise (1989-present)
  - Bat survey (1994)
  - Bighorn Sheep (CDFG, 1989-present)
  - Mojave Ground Squirrel (1997)
  - Fringe-toed lizard (1997-present)
  - Panamint alligator lizard (2000-present)
- Soils
  - Soil Survey (NRCS, completed 1999)
  - Geomorphic mapping (USGS&DRI, ongoing)
  - Soil sampling at LCTA plots (in-house, 2001...)

# Goals - Flora

- **Inventory floral resources and monitor species or communities that are indicators of ecosystem integrity, habitat conditions, capability of lands to support military missions, status of sensitive species or communities, and other special interests**
  - Provide land managers and trainers with long-term assessments of changes in vegetative cover and species composition under varying levels and types of use. (LCTA)
  - Identify flora as part of the planning level surveys; update species list as new species are found during other studies.
  - Identify all populations of LMM and LMM habitat and establish baseline milkvetch population densities for each site; survey both on and off post.
  - Maintain a database on spring resources, periodically monitor spring conditions and use site-specific surveys to evaluate potential impacts.
  - Monitor other federal-listed or state-listed species of concern (*Calochortus striatus*, *Mimulus mohavensis*).

# Monitoring Methods – Vegetation

- LCTA plots (3-year rotation)
  - Methods: line intercept, belt transect, cover plots, low-level aerial photography
  - Parameters: density, species composition, percent perennial plant cover, shrub dimensions, ground cover
- Springs (once every 5 years)
  - Qualitative assessment (1997-1998)
  - USGS methodology (beginning FY02)
  - PFC evaluation (beginning FY02)

# Goals - Fauna

- **Inventory faunal resources and regularly monitor species that are indicators of ecosystem integrity, habitat conditions, capability of lands to support military missions, status of sensitive species or communities, and other special interests**
  - Periodically monitor for small mammals; continue working with CDFG to monitor bighorn sheep; survey bats at springs and mines.
  - Periodically monitor birds and update avian inventory as necessary; survey springs for migratory birds.
  - Periodically monitor reptiles and update inventory as necessary; determine the distribution and genetic structure of the Mojave fringe-toed lizard populations; map Panamint alligator lizard locations.
  - Continue to inventory invertebrate species and develop a more thorough species list.

# Monitoring Methods - Fauna

- **Mammals (once every 5 years)**
  - Trapping units (4 600m x 75m grids) in representative habitats
- **Birds (once every 5 years)**
  - 1000m walking transects in representative habitats
  - 20mi driving transects (USFWS Breeding Bird Survey)
  - Spot birding in unique habitats
- **Reptiles (once every 5 years)**
  - 1000m x 30m walking transects in representative habitats
  - Pitfall traps
- **Invertebrates (once every 5 years)**
  - Pitfall traps
  - Sweeps
  - Night-lighting

# Goals – Federal and State-listed Species

- **Desert tortoise**
  - Identify all populations of desert tortoises and desert tortoise habitat on post.
  - Establish baseline densities for management areas.
  - Determine long-term population trends.
- **Mojave Ground Squirrel**
  - Identify all population of the MGS and MGS habitat on the NTC and establish a current baseline population density for the various management areas.
- **Willow Flycatcher**
  - Identify all populations of willow/southwestern willow flycatchers, their habitat, and areas of potential use during migration.
  - Determine if this species is nesting on the NTC or only utilizing areas for brief periods during migration.
- **Least Bell's Vireo**
  - Identify all populations of Least Bell's Vireo, their habitat, and areas of potential use during migration.
  - Determine if this species is nesting on the NTC or only utilizing areas for brief periods during migration.
- **California Black Rail**
  - Determine the degree of use of the installation by this species

# Monitoring Methods – Desert Tortoise

- **Woodman (1989-1991) – presence/absence throughout the NTC**
- **Chambers Group (1994) – BLM triangular transects**
- **USGS/BRD (annually 1997- present) – permanent plots of varying sizes**
- **Karl (1998) – mark/recapture**
- **Line-distance sampling (annually 2001-2006)**

# Goals - Soils

- **Use soil parameters to improve land-use planning, protect soil stability, rehabilitate training lands, and conserve wildlife habitat**
  - Identify key soil parameters that determine vulnerability and recoverability of landforms and soil types.
  - Use soil sampling on LCTA plots to supplement and refine soil inventory data.
  - Establish site-specific soil sampling protocols for rehabilitation project planning.
  - Continue developing lithologic and geomorphic data layers.

# Monitoring Methods – Soils

## (3-year rotation)

- **Soil texture** – samples from upper horizons sieved to separate gravel, sand, silt/clay components.
- **Soil stability** – field technique developed by ARS Jornada Experiment Station.
- **Bulk density** – index to soil compaction; determined from mass and volume of sample holes.
- **Hydraulic conductivity** – infiltration rate using minidisk infiltrometer.
- **Surface roughness** – standard deviation of measurements along a relief meter at five points along the 100m transect.
- **Degree of dissection** – width, depth and length of rills and gullies crossing the 100m transect.
- **Disturbance** – presence/absence of anthropogenic disturbance or bioturbation at meter intervals along the 100m transect.

# Software/Analysis

- **DPW Plant and Wildlife Population Data**

- Tortoise data to be archived and accessed through Univ. of Redlands spatial database
- Tortoise line-distance sampling data entered and analyzed on a regional basis.
- Summary statistics provided in report format for individual survey projects

- **LCTA Vegetation and Soils Data**

- ACCESS database for all plot information
- Summary statistics and ANOVA to compare training areas, etc
- Land Condition Module (LCM) software developed by AEC to predict land condition under estimated training loads
- Spatial analysis to produce raster maps of vegetation parameters and perform change detection

# POCs

- **Natural Resources Section**

- Mickey Quillman – Head Biologist
  - 760-380-3740
  - [quillmam@irwin.army.mil](mailto:quillmam@irwin.army.mil)
- Mark Massar - Ecologist
  - 760-380-6438
  - [massarm@irwin.army.mil](mailto:massarm@irwin.army.mil)

- **Integrated Training Area Management Program**

- Ruth Sparks – Project Coordinator
  - 760-380-5903
  - [sparksr@irwin.army.mil](mailto:sparksr@irwin.army.mil)
- Brian Croft – LCTA Coordinator
  - 760-380-5202
  - [croftb@irwin.army.mil](mailto:croftb@irwin.army.mil)