Ryan Swan

Department of Defense Legacy I Initiative and Bat Conservation in Utah

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Overall Introduction

A total of 18 species of bat are known to occur in Utah; 6 are considered Utah Species of Concern or Tier II State Wildlife Action Plan (WAP) species. Very little information is known about the distribution or population status of bats in the state. Prior to this project, bat inventory data for Utah was scattered within private, state, and federal holdings and were not collectively available for resource managers. Lack of such information makes it difficult to identify and address statewide management issues related to the conservation of bats. With five Department of Defense (DoD) facilities in Utah, whose management authority extends over 1.8 million acres, it was crucial to identify distribution and frequency of occurrence to prevent encroachment and listing issues related to the lack of conservation management of bat species in Utah. The Legacy Initiative, in three phases, seeks to create a collaborative platform for comprehensive management of bat species on DoD lands and throughout Utah through the implementation of the DoD Integrated Natural Resources Management Plans (INRMPs) and the State WAP. This three year effort led by U.S. Army Dugway Proving Ground (DPG) and the Utah Division of Wildlife Resources (UDWR) partnered with 14 different state, federal, and private stakeholders through the Utah Bat Conservation Cooperative to proactively and sustainably manage bats into the foreseeable future.

Joel Diamond

Legacy I (07-346): Data Consolidation and Modeling

This phase focuses on consolidation of bat data collected throughout Utah with two primary goals as follows:

1) Identify what is already known in Utah.
2) Create a web-based geodatabase to allow entry, storage, and queries of all old, new, and future data.

Data Consolidation

Methods

- Conducted an exhaustive search for Utah bat records (federal and state agencies, universities, local contractors, private researchers, and non-profit groups).
- Entered all data sets into the Utah BatBase database (see example below).
- Database is characterized by data masks and filters to ensure data quality, has customizable user queries to facilitate data sorting and extraction, and is web enabled.
- Completed database is housed and maintained by the UDWR's Utah Natural Heritage Program.

Results

Table 1. Number of individual bats and events recorded by each of 16 collection entity types.

Date Source	Events	Individual Bats
Bureau of Land Management (BLM)	2	2
Certificate or Registration (COR)	302	280
Consultants	57	645
Department of Defense (DoD)	20	54
Brad Lengas	7191	7191
Mine and Cave Surveys (Mine/Cave)	151	2664
Museum Records	38	38
National Park Service (NPS)	2260	2118
Publications	596	3113
Southern Nevada Water Authority (SNWA)	36	0
Southern Utah University	249	560
Utah Division of Wildlife Resources	2209	7221
Utah Natural History Program	439	4076
U.S. Forest Service (USFS)	286	586
Utah State University	6	34
Weber State University	34	10
Unknown	19	37
Total	**13,895**	**28,629**

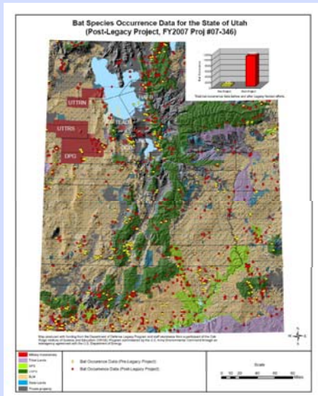

Fig 1. Number of bat data points before and after BatBase data consolidation project.

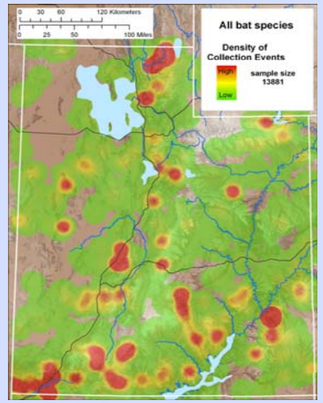

Fig 2. Distribution of all bat species in Utah. Red represents high density while green is low. Density is also a result of sampling intensity across 103 years. Spatial representation of data was obtained from the BatBase data consolidation project.

Discussion

- Expanded current bat knowledge from **just over 2,300 records to currently over 28,000 bat records, a 1000% increase**.
- Data from 16 federal, state, and private stakeholders creates a unique opportunity for bat management in Utah.
- BatBase, the web-based data management system, allows for the consolidation of past, present and future data.
- Provides a foundation for future bat conservation efforts in Utah and a context for historical datasets collected across a diversity of temporal and spatial scales.
- Will allow for large scale management of Utah bat species and foster a greater understanding of species distribution.

Web-Based Geodatabase

Methods

The web-based geodatabase, while in the process of going through several revisions, is in final draft form. The data entry portion of the database was designed around the existing Utah Bat Conservation Cooperative data sheet. A second data entry portion of the web-based database was created around a bat monitoring protocol described in Legacy III.

Results

Fig 3. The BatBase home page, above, can be found at https://www.utahbats.org/

Fig 4. Accessing BatBase queries page on website can only be done when logged in.

Fig 5. Data use agreement form for BatBase access. Persons are granted access by permission of the Utah Bat Conservation Cooperative only and must sign these forms.

Discussion

This database, although a functional product on its own, can serve a much greater function with an analysis of its content [funded Fiscal Year (FY) 2008 Legacy Proposal project]. This analysis will provide direction to bat management and allow for the greater use and applicability of the database. The webpage portion of the project is in continuous development. The web page portion will ultimately meet Legacy project lead's design requirements and be the instrument for web-based entry and retrieval.

Important Bat Habitat Model

Methods

With five DoD facilities in Utah, it remains crucial to prioritize efforts to identify important bat habitat to direct conservation management within DoD installations. As a critical element of a statewide Bat Conservation Strategy, UDWR and The Nature Conservancy (TNC) developed an algorithmic-based habitat suitability model to identify important bat habitat in Utah. Experts from the Utah Bat Conservation Cooperative were integral parts of this process.

Results

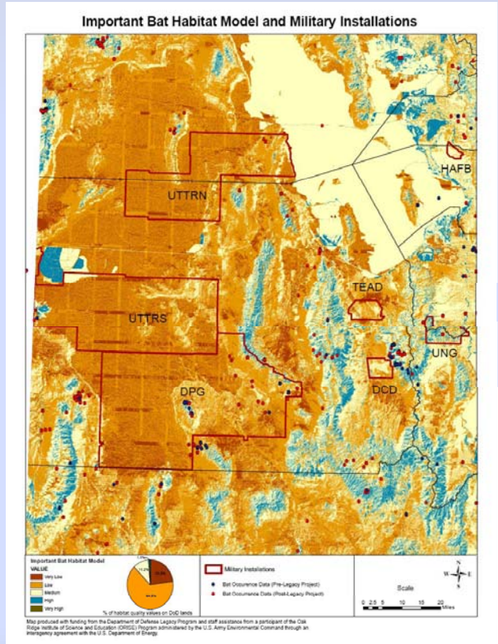

Fig 6. Utah military installation habitat.

Discussion

This model:

- Identifies distribution, quantity, and quality of suitable bat habitat in Utah.
- Allows federal, state, and military land managers to identify landscape characteristics that promote or limit potential use by bats.
- Serves as a foundation for future cooperative bat research and management efforts in the state.
- Provides a process template other Western states can implement to identify and manage their important bat habitat.