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Biological Resources Management at Los Alamos National Laboratory

Chuck Hathcock, Wildlife Biologist

**Environmental Protection Division
Environmental Stewardship Group**

Our goal is to minimize impacts to sensitive species and their habitats and to ensure all activities and operations comply with federal and state regulatory requirements for biological resources protection.

My Background

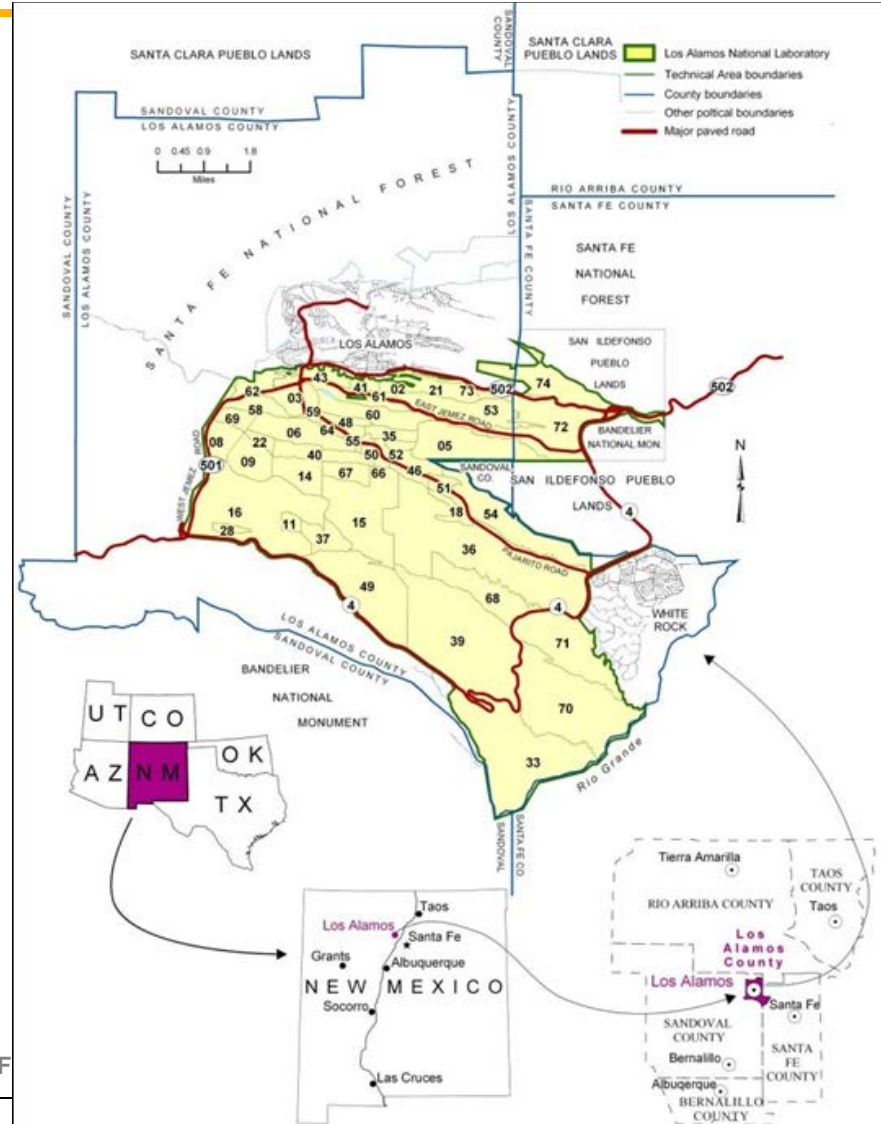
- **Undergraduate Degree from Arizona State University in 2000**
- **Master's Degree from NM Highlands University in 2003**
 - Master's thesis: Development of a Predictive Model For Habitat of the Mexican Spotted Owl in Northern New Mexico. *The Southwestern Naturalist* 53(1):34-38.
- **Currently a staff member on the Resources Compliance Team**

Location of LANL and Regional Stakeholders

Bordered by Pueblo de San Ildefonso, Santa Fe National Forest, Bandelier National Monument, and Los Alamos, Santa Fe, & Sandoval counties.

LANL is ~38 square miles

Of this, ~16% is developed, leaving over 20,000 acres undeveloped



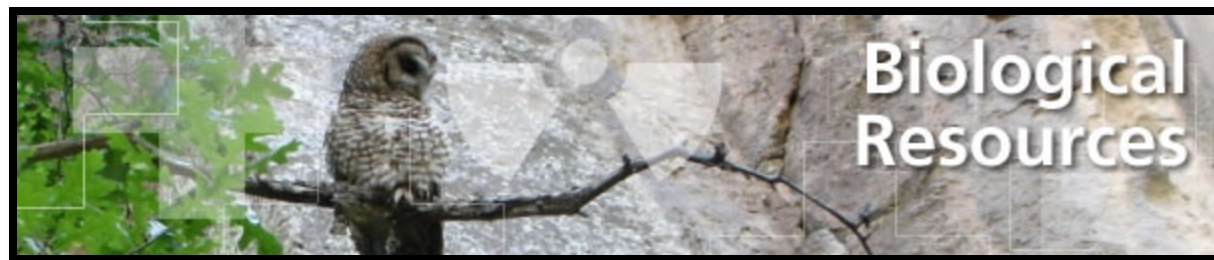
LANL Background

- **The Laboratory has more than 8,500 employees plus hundreds of contractor personnel and students**
- **Land area of ~ 38 square miles**
- **Annual budget is over \$2 billion**
 - 57% Weapons programs
 - 9% Nonproliferation programs
 - 7% Safeguards and Security
 - 8% Environmental Management
 - 4% DOE Office of Science
 - 4% Energy and other programs
 - 11% Work for Others
- **My division provides environmental compliance (Bio, Cultural, NEPA, Storm Water, Surface Water, Air, RCRA, etc., etc.)**

What Biological Resources Do We Manage

Our goal is to minimize impacts to sensitive species and their habitats and to ensure all activities and operations comply with federal and state regulatory requirements for biological resources protection

- Federally listed threatened or endangered (T&E) species
- Migratory birds
- State-listed or other sensitive species
- Wetlands and floodplains
- Promote ecological stewardship through programs such as the Long-Term Strategy



Some of the Biological Resources Drivers We Manage

- National Environmental Policy Act of 1969 (NEPA)
- Endangered Species Act of 1973 (ESA)
- Migratory Bird Treaty Act of 1918 (MBTA)
- Bald and Golden Eagle Protection Act of 1940
- New Mexico Wildlife Conservation Act
- New Mexico Endangered Plant Species Act
- Executive Order 11988, Floodplain Management (May 24, 1977)
- Executive Order 11990, Protection of Wetlands (May 24, 1977)
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001)
- Various DOE Orders and memorandums of understanding



Federally Protected Species That Occur at LANL

Mexican Spotted Owl
(*Strix occidentalis lucida*)

Federally listed as
“Threatened”



Southwestern Willow
Flycatcher

(*Empidonax traillii extimus*)
Federally listed as
“Endangered”



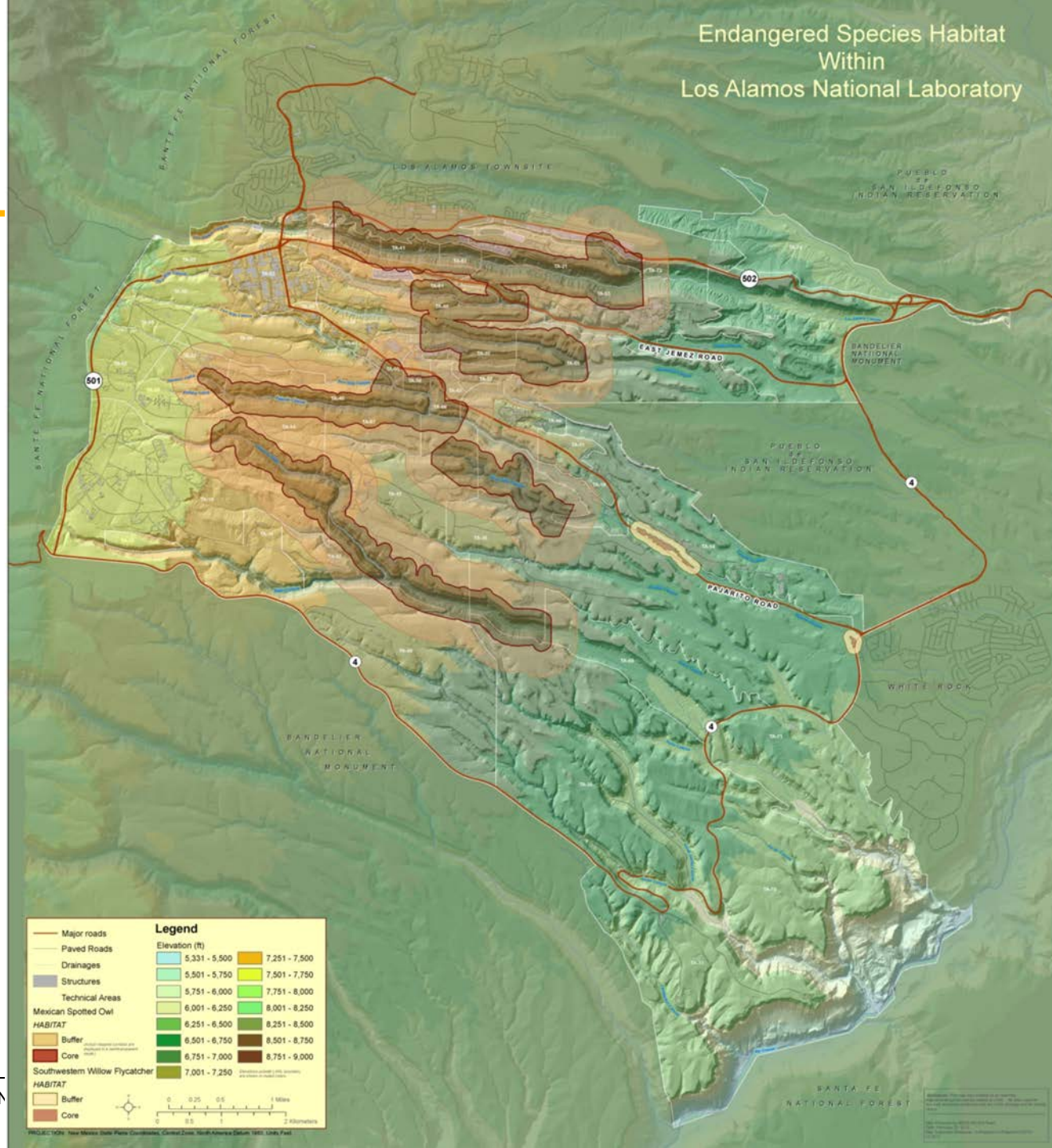
Jemez Mountains
Salamander

(*Plethodon neomexicanus*)
Federally listed as
“Endangered”



Threatened and Endangered Species Habitat at LANL

Endangered Species Habitat Within Los Alamos National Laboratory



Annual Mexican Spotted Owl Surveys

- **A federal U.S. Fish and Wildlife Service (USFWS) permit is required**
- **Each habitat must be surveyed a minimum of four times before it can be listed as unoccupied**
- **Broadcast surveys every half mile**



Confirmed Mexican Spotted Owl Breeding Most Years



Mexican Spotted Owls







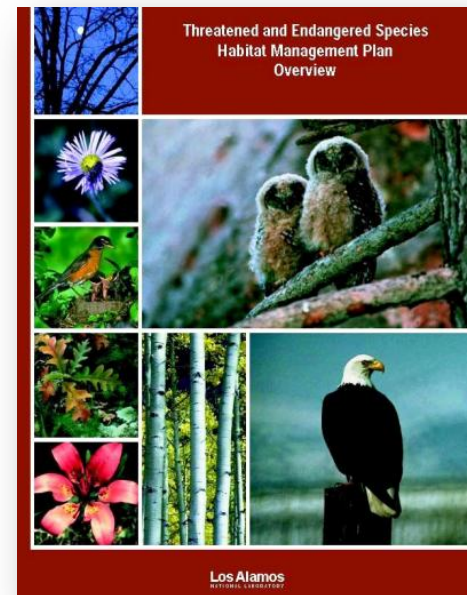
Responsibilities Under the Endangered Species Act

- 7(a)(1) Federal agencies shall carry out programs for the conservation of T&E species
- 7(a)(2) Federal agencies shall ensure that agency action is not likely to jeopardize the continued existence of any T&E species
- 7(a)(3) Federal agencies shall consult on any prospective action that will likely affect a T&E species or candidate species



Habitat Management Plan

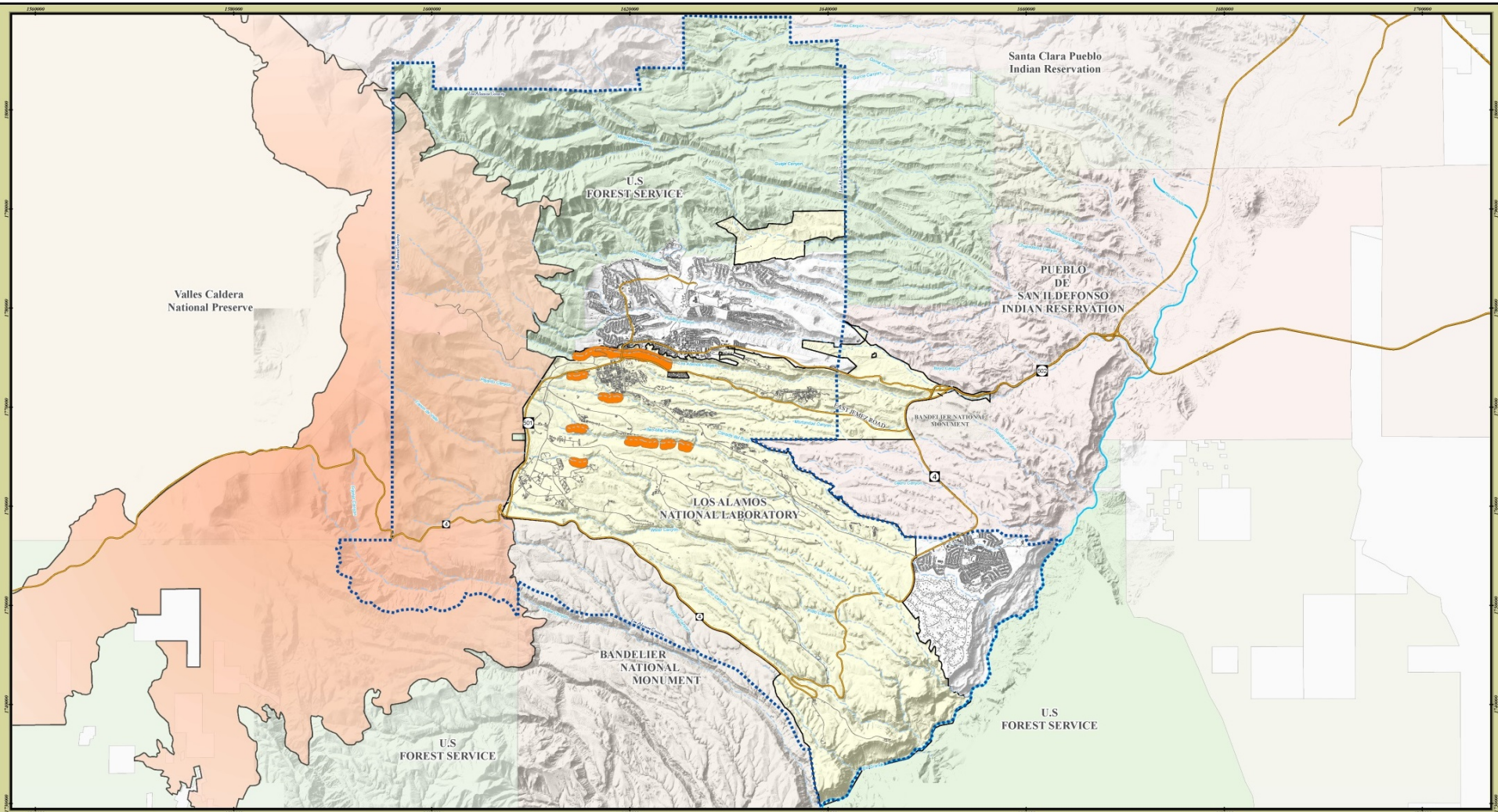
- Provides guidance by species for what, when, and where different types of activities are allowed without further review by the USFWS
 - All activities that are allowed in Habitat Management Plan (HMP) have already been reviewed and concurred with by the USFWS
- Received USFWS concurrence February 1999
- Updated in 2011



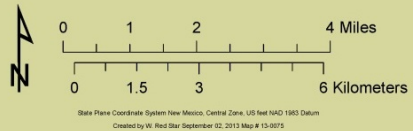
The Addition of a New Endangered Species at LANL, the Jemez Mountains Salamander

- On September 10, 2013, the U. S. Fish and Wildlife Service added the Jemez Mountains salamander (JMS) to the federal endangered species list.
- The final listing was prompted by the Los Conchas wildfire because of “destruction, modification, and curtailment of habitat” as defined by the Endangered Species Act.
- Because the species had been designated as “warranted but precluded” in 2010, the listing process went quickly.

Critical Habitat Designation



	Primary road		Los Alamos County
	Paved road		U.S. Fish and Wildlife Service Critical Habitat for the Jemez Mountains Salamander
	Rio Grande		Jemez Mountains Salamander Habitat Protected at Los Alamos National Laboratory
	Drainage		
	Structure		



DATA SOURCE:
 edgitzler.SRTM_NEWMEXICO; The National Center for Earth Resources Observation and Science (EROS).
 Published 30 March 2005.
 Structures, line feature data: Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
 Structures; County of Los Alamos, Information Services; as published 29 October 2007.
 Los Alamos County Boundary; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; Unknown publication date.
 LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 09 September 2007; as published 13 August 2010.
 Ownership Boundaries Around LANL Area; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.
 Primary roads; EARTH DATA ANALYSIS CENTER, ALBUQUERQUE (EDAC); Published 1155 WQH Drainage_arc; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; 1:24,000 Scale Data; 03 June 2003.

This map was created for work processes associated with the Environmental Stewardship Services. All other uses for this map should be confirmed with LANL ENV-ES staff.

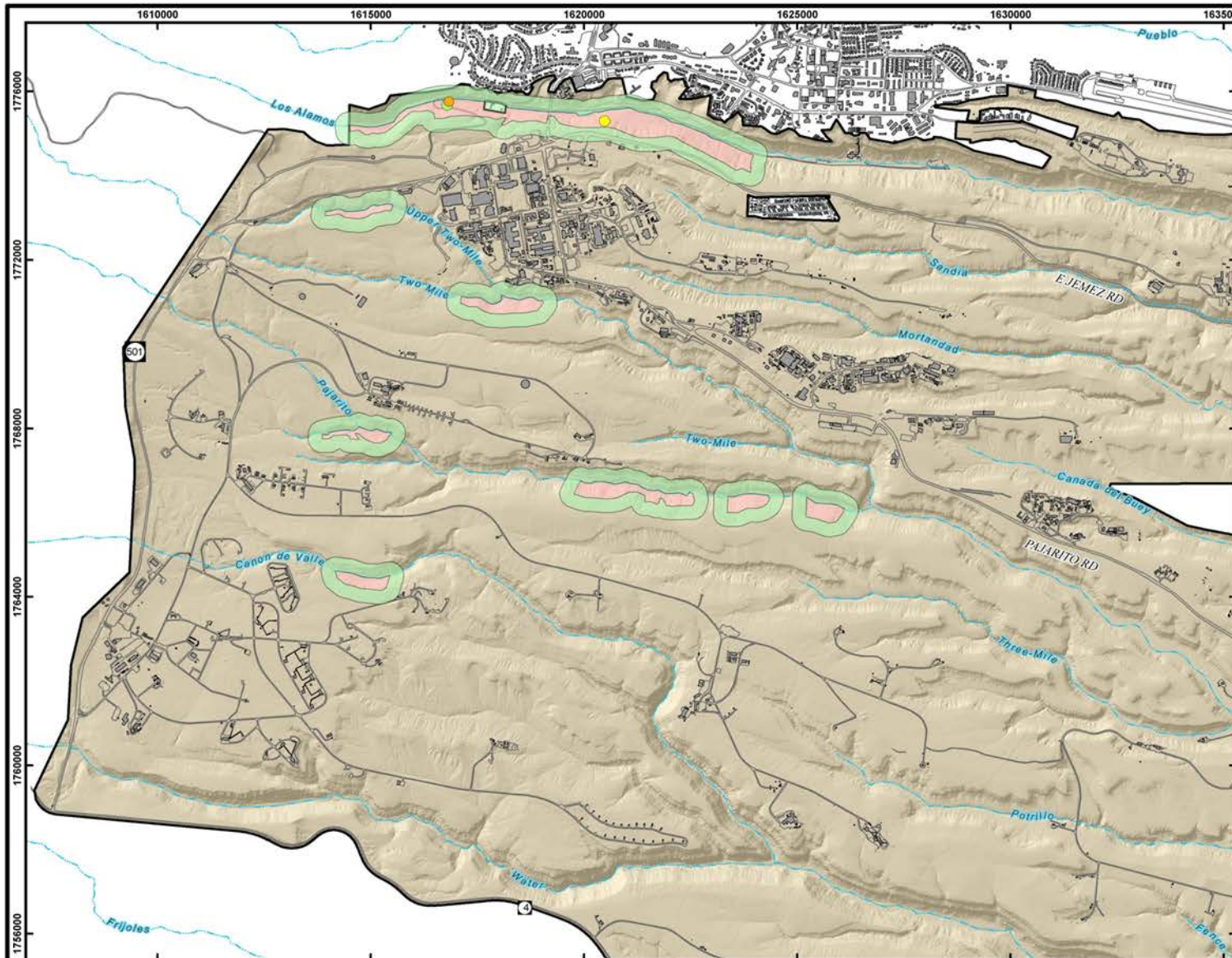
Modeling Habitat at LANL

- Under the Laboratory's Habitat Management Plan, we delineate the critical habitat for our federally-listed species based on modeling and habitat assessments.
- Plethodontid salamanders, which lack both lungs and gills, breathe through the mucous membranes in their mouth and throat and through their moist skin. The JMS is completely terrestrial and does not use standing surface water for any life stage. Present in its habitat year-round, the JMS spends most of its life underground, but can be found on the surface when conditions are warm and wet, approximately July through September.

Modeling Habitat at LANL

- With LANL being the low end of the JMS elevational range, our modeling focused on trying to identify cool moist microclimates.
- The first step in identifying potential JMS at LANL was to use a geographic information system (GIS) to model habitat. The following parameters were modeled in the GIS:
 - Elevation: 7000 feet (2150 meters) and above
 - Slope: Greater than 20 degrees
 - Aspect: north-facing +/- 20 degrees
 - Land cover: Mixed conifer
 - Land use: Undeveloped
 - Modeled habitat is only selected if it is greater than five contiguous 30m x 30m pixels in size

Final Habitat Boundaries



Jemez Mountains Salamander Core and Buffer Habitat Boundaries at LANL

Jemez Mountains Salamander Locations

- May 25, 1985
- July 31, 2007
- July 28, 2008

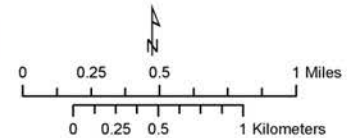
2013 Jemez Mountains Salamander Habitat

- Core
- Buffer

Drainages

Paved Roads

LANL Boundary



State Plane Coordinate System, New Mexico Central Zone
 1983 North American Datum. Created By: W. Red Star
 Date Produced: JUNE-5-2013
 Map#13-0038-03

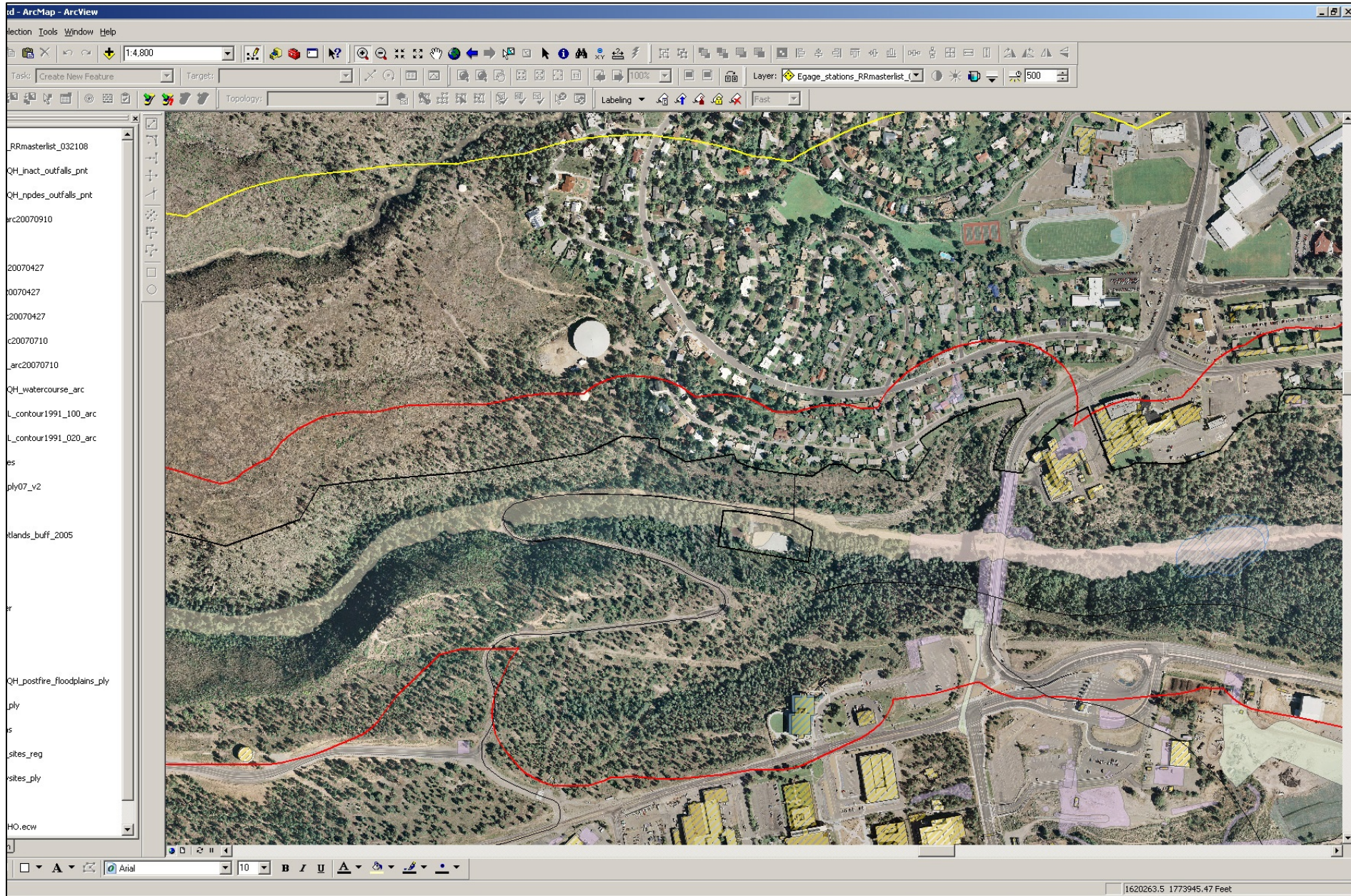


DISCLAIMER: This map was produced as a "Draft Working Map" to identify potential habitat for Jemez Mountains Salamander. The habitat model was developed as a screening tool to identify habitat for field survey. All other uses of this map are discouraged. It is the user's responsibility to evaluate the fitness of this map for their purposes.

How Do We Review Projects?

- **Using maps and the scope of work for a project, we determine how much of which habitat will be affected and when it will be affected**
- **Annually on average > 1000 projects are reviewed in our project review process**
- **Examples that may be given to a project:**
 - Trees > 9 inches dbh cannot be removed in Mexican Spotted Owl core habitat
 - Noise generating equipment that raises noise levels > 6 decibels above background is restricted in Mexican Spotted Owl core habitat during the breeding season which is March 1st – Aug 31st , but this is lifted in most areas by mid-May

GIS Is an Important Tool



What Happens if the HMP Guidelines Can't Be Followed?

- **Biological Assessment:** A document prepared for the Section 7 process under the ESA to determine whether a proposed major construction activity under the authority of a Federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.
- **Informal Consultation:** whenever an action may affect but is unlikely to adversely affect a T&E species, 30-90 day USFWS review period
- **Formal Consultation:** whenever an action may adversely affect a T&E species, 90-180 day USFWS review period

World Migratory Bird Day
Migratory birds and people – together through time

2012

12-13 MAY



Migratory Birds at LANL

- Migratory Bird Treaty Act of 1918 (MBTA)
- Bald and Golden Eagle Protection Act (1940)
- Executive Order 13186, (2001) Responsibilities of Federal Agencies to Protect Migratory Birds
- MOU (2006 & 2013) between the DOE and the USFWS regarding the implementation of the Migratory Bird Treaty Act at DOE facilities

Definitions

- **For the sake of the MBTA, migratory birds are defined as all species covered by the four bilateral treaties. Generally, this includes all native birds in the U.S., except those non-migratory species such as quail and turkey that are managed by individual states.**
- **Under the provisions of the MBTA, it is unlawful “by any means or manner to pursue, hunt, take, capture [or] kill” any migratory birds except as permitted by regulations issued by the USFWS.**

Habitat Loss Impacting Migratory Birds in North America

- Of the 836 species of birds protected under the MBTA, about a quarter are known to be in trouble.
- The greatest threat to birds, and all wildlife, continues to be loss and/or degradation of habitat due to human development and disturbance.



Other Threats to Migratory Birds in North America

Erickson et al. (2005) estimate that from 500 million to possibly over 1 billion birds are killed annually in the United States because of anthropogenic sources, including:

--collisions with human-made structures such as vehicles, buildings and windows, power lines, communication towers, and wind turbines

--electrocutions

--oil spills and other contaminants

--pesticides

--cat predation

--and commercial fishing by-catch

Erickson, W.P., G.D. Johnson, and D.P. Young. 2005. A summary and comparison of bird mortality from anthropogenic causes with an emphasis on collisions. General Technical Report PSW-GTR-191. Pacific Southwest Research Station, Albany, CA.

Risks to Migratory Birds at LANL

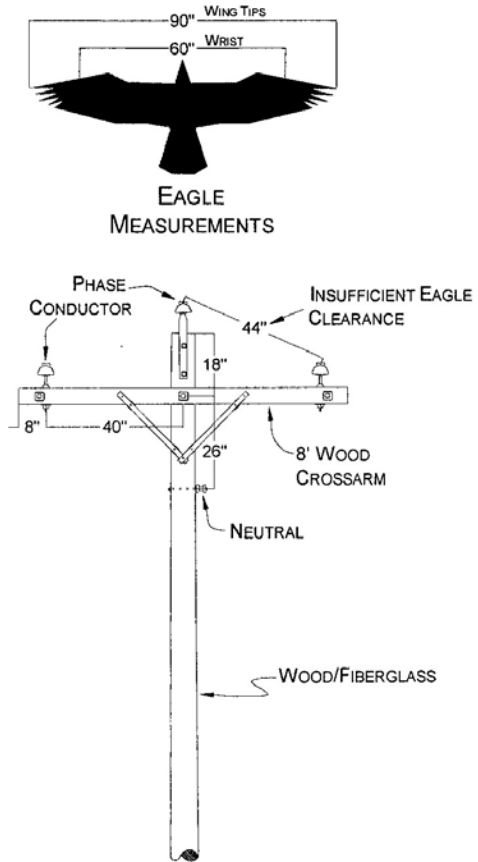
For LANL lands, the most significant risks to migratory birds include:

- loss, alteration, or fragmentation of habitat
- **the potential take of eggs and nestlings during operations that disturb vegetation during the breeding season**
- mortality resulting from collisions with building windows and guyed towers
- collisions and electrocutions on power lines
- and exposure of birds to contaminants, particularly in ponded or wetland environments

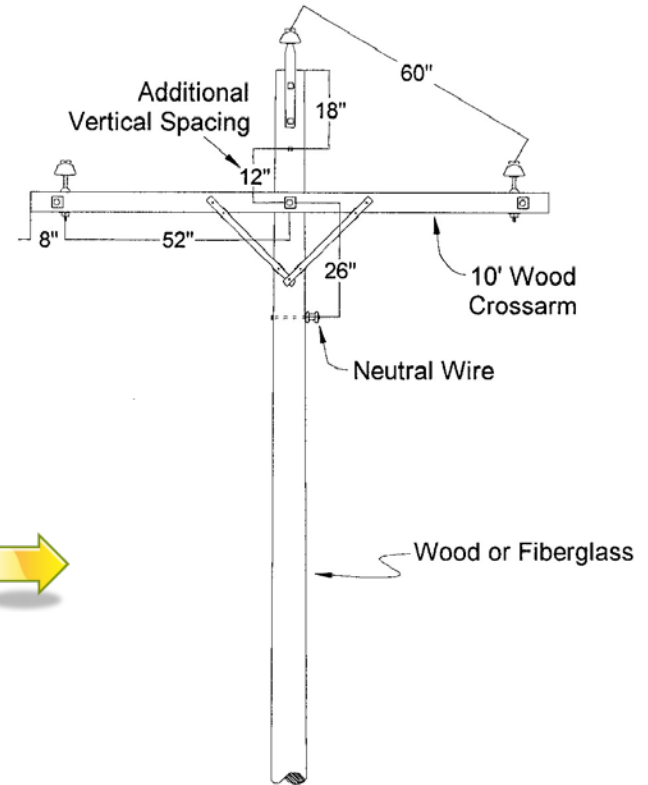
Migratory Bird Management at LANL

- **We have written a Migratory Bird Best Management Practices Document that details how to mitigate impacts to migratory birds at LANL.**
 - ❑ Example: Thinning work around LANL and protecting nesting migratory birds
- **We have incorporated migratory bird concerns into the project review process.**
- **We have incorporated raptor friendly power pole designs into LANL engineering standards**

Example: Power Pole Designs & Retrofitting



Raptor friendly →



Monitoring of Migratory Birds at LANL

- **Summer Bird Banding – Monitoring Avian Population and Survivorship (MAPS)**
- **Summer BBS – Breeding bird surveys in 4 habitat types at LANL and breeding bird surveys at several open detonation sites to support permitting requirements**
- **Fall Bird Banding – Banding operations to monitor use of LANL lands by fall migrants**





2013 Lessons Learned Regarding Migratory Bird Mortalities at LANL

- **While conducting routine water-level work in Mortandad Canyon, a field worker heard frantic flapping noises emanating from a protective bollard around a well. A mirror was positioned to look inside the opening at the top. The flapping noise was from a small bird, which was stuck at the bottom of the 4-inch diameter bollard and unable to spread its wings to fly out. The field team constructed a wire platform for the bird and slowly fished the bird out of the bollard.**

- **About a week later, the field worker removed a bollard from another well pad in Mortandad Canyon in order to back up a trailer. Upon removal, the worker noticed five small birds, all dead, wedged in the bottom of the bollard post. The worker realized the potential for multiple bird mortalities at each well location (over 100) with uncovered bollard posts, and quickly contacted his manager to report his findings.**

What is a Bollard??



What were our reporting requirements?



Lessons Learned

- It was determined that the well designs called for covered bollards, but this detail was not followed during well installation by the subcontractor at some of the well sites.
- Over 40 migratory bird deaths have been documented so far. If the bird carcasses are salvageable, they will be accessioned to the ornithology collections at the Museum of Southwestern Biology at UNM.
- In practice, loss of migratory birds through negligence is the key compliance issue under the MBTA for the Laboratory.
- After this reporting, LANL biologists began to check open pipes used as gate or fence mounting posts around the site, where they also observed many bird mortalities.

How Are Gates Killing Birds?



UNCLASSIFIED

Slide 36

Larger Diameter Pipes Are Worse



Lessons Learned – Actions Taken

- Permanently cap all open bollards and open pipes on fences.
- Raise awareness of the MBTA with LANL staff and contractors. This law protects hundreds of migratory bird species at LANL. Causing migratory bird mortalities, including eggs in active nests, is a federal offense that can bring criminal prosecution for both the Lab and the individual.
- Raise awareness about when to stop work.

- What can you do?

Other Sensitive Species at LANL

- New Mexico Wildlife Conservation Act
- New Mexico Endangered Plant Species Act

State-listed and Other Sensitive Species

- **Federal Candidate - USFWS**
- **Federal Species of Concern - USFWS**
- **New Mexico Endangered - NMDGF**
- **New Mexico Threatened - NMDGF**
- **New Mexico Sensitive - NMDGF**
- **Critically Imperiled in New Mexico - NHNM**

Current Sensitive Species List

Rio Grande Chub

American Peregrine Falcon

Arctic Peregrine Falcon

Bald Eagle

Broad-billed Hummingbird

Northern Goshawk

Yellow-billed Cuckoo

Loggerhead Shrike

Gray Vireo

White-faced Ibis

Western small-footed Myotis

Long-legged Bat

Spotted Bat

Townsend's Pale Big-eared Bat

Big Free-tailed Bat

Ringtail

Red Fox

Gunnison's Prairie Dog

Goat Peak Pika

NM Meadow Jumping Mouse

Wood Lily

Greater Yellow Lady's Slipper

New Mexico Silverspot Butterfly

*Red color indicates that this species has been documented at LANL

Sensitive Species Management at LANL

- **We have written a Sensitive Species Best Management Practices Document that details how to mitigate impacts to sensitive species at LANL.**
- **We have incorporated sensitive species concerns into the project review process as needed.**
- **We conduct surveys on sensitive species and map habitat in the event that these species are Federally listed in the future.**

Wetlands at LANL

- Clean Water Act
- Executive Order 11988, Floodplain Management (May 24, 1977)
- Executive Order 11990, Protection of Wetlands (May 24, 1977)

Important Wetland Functions

At LANL, some wetlands are recognized habitat for the Southwestern Willow Flycatcher

Wetlands are a natural sediment trap, containing contaminants on-site



Other Projects – Large Game Monitoring



Bushnell

08-29-2013 08:03:14



Bushnell

054°F



08-05-2013 07:13:15

Slide 45



Other Projects – Honeybees As Bio-indicators



Honeybees can be thought of as mobile samplers that efficiently cover a large sample area and then return to a central location.

Other Projects – Avian Nestbox Monitoring

The main objective of the avian nest box monitoring network is to investigate population level parameters such as survival, nest productivity, and return rates or recruitment into the population.

These data are used in a population viability analysis that can determine the status of the population and monitor the biological health of bird populations in different areas of the laboratory.



Questions? and Contact Information

Environmental Protection Division

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