

Rapid Watershed Assessment Lost Draw Watershed



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Overview

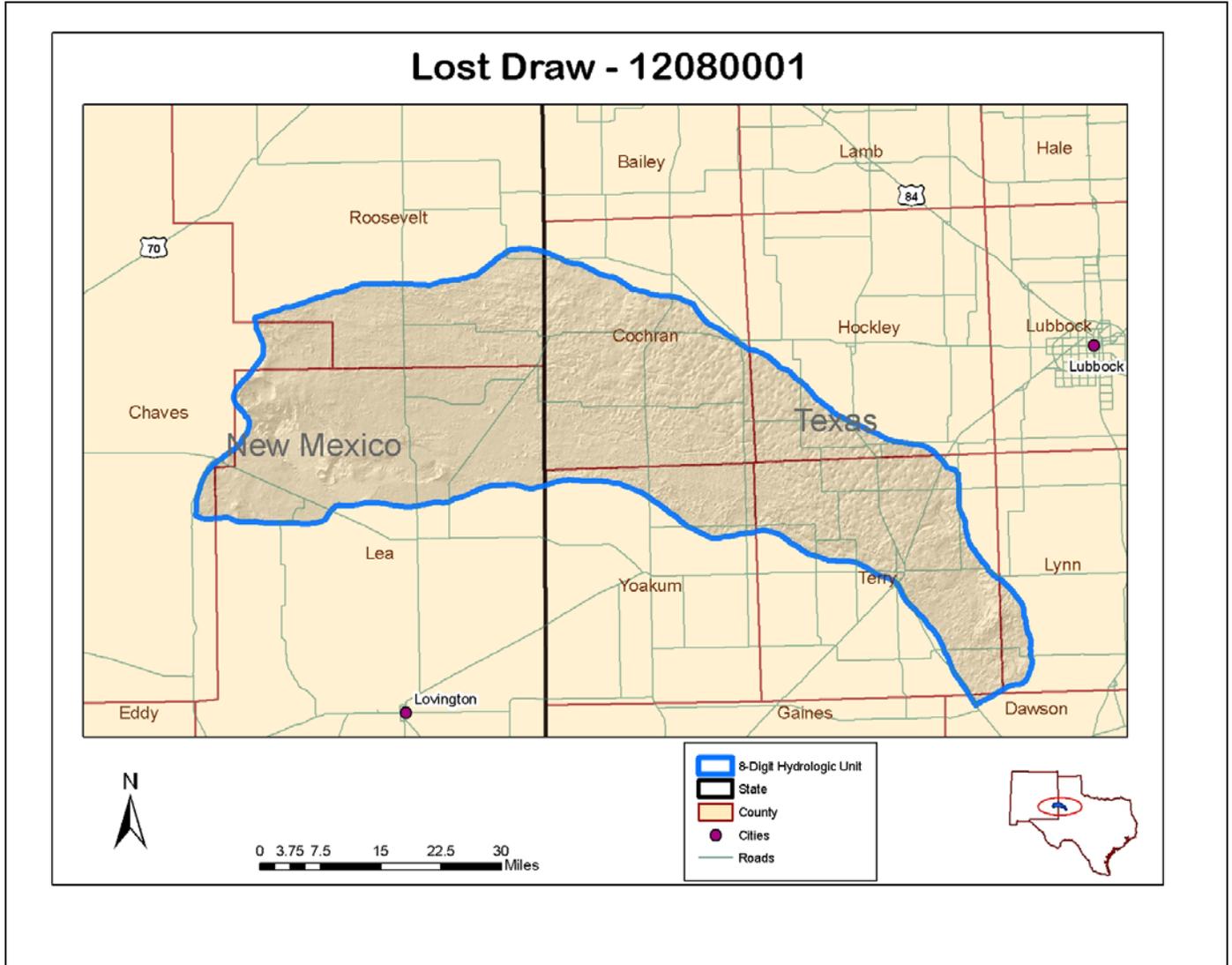


Figure 1. Lost Draw watershed regional overview.



Overview

Situated in the southeast portion of New Mexico, the Lost Draw watershed, Hydrologic Unit Code (HUC) 12080001, covers approximately 330,000 acres (1335 sq. km). The rest is in western Texas. Portions of the watershed extend into 3 counties with the majority falling in Roosevelt County. Table 1 summarizes the aerial distribution of the Lost Draw watershed in New Mexico.

County	Co. Acres Total	Acres in HUC	% Co. in HUC	% HUC in Co.
Lea	2,811,518	103,010	4	31
Roosevelt	1,570,664	198,913	13	60
Chaves	3,885,365	30,838	1	9
Sum (Σ)		332,761		100

Table 1. Lost Draw watershed acreage distribution.



General History of the Area:

The New Mexico portion of the watershed is mainly on the northern portions of Lea and the southern portion of Roosevelt counties. Five years after New Mexico was admitted to the union as a state, Lea County came to be a county. The region did not have railroads, running streams or rivers and no major city/towns. It was considered by most people in the early 1900's, as a desolate, semi-arid pastureland for cattle and sheep, on the high plains or Llano Estacado (*staked plain*). The term staked plain arose after Spanish conquistador Francisco Coronado (1541) and his troops encountered this "sea of grass". Coronado was the first European to traverse the Llano and to find their way out of the sea of tall prairie grass. The Spanish troops stacked rocks and drove wooden stakes, hence the name "LLANO ESTACADO". The region had very little to offer with its limited resources.

In the mid to late 1800's settlers from Missouri and Nebraska started to pass through the area. There were just a few settlements and an occasional wagon train going west. Chaves and Eddy counties were partitioned to create a rectangle that bordered Texas to the east and south. Lea County was created in 1917 and named for Captain Joseph Calloway Lea.

Little did anyone know of the vast riches that lay below the surface of the high plains of the Caprock. There "was more wealth in gas, oil and potash than had been known in all the centuries since the Spaniards had proclaimed the Kingdom of New Mexico. (Source: Lea, New Mexico's Last Frontier, by Gil Hinshaw)".

The first drilling hole was started sometime in September 1927 and by June 1929 "No. 1" was at 4,065 feet and producing 700 barrels of oil, per day on New Mexico state leased land. This was the start of the influx of developers, oil drillers, fortune seekers, and workers to the region. The area was once the oil drilling frontier and is better known as the "Black Gold Rush of 1927". The region had its second boom in the early 1950's when other oil reserves in the region were found. The production of oil drilling in the fields increased with the advanced technology in drilling equipment and geology.

Today the region and this watershed offers a multi cultural diversity all its own with a heritage rich in Hispanic, American Indian, and cowboy (farming/ranching families) cultures. The diversity of the people are the pride of the region and have deep roots in the farming, ranching, petroleum industry, and mining. Strong values and hard work are what drive the people.



Physical Setting

Geology:

Llano Estacado is a large mesa or tableland and is relatively flat over most of terrain. It is dotted with many small playa lakes or depressions that fill with water, and is an important source of water for the local habitat and bird flyways.

The 'bedrock' of the plain or tablelands is the petrocalcic or indurated caliche over the Ogallala Group. The indurated caliche layer is called the Caprock. This was formed when surface drying caused mineral-laden water to rise by capillary action to the surface. Evaporating, the minerals were left behind to cement the otherwise fairly loose sandy sediments of the Ogallala Group. The Caprock is generally covered by sands and soils that are derived by the eroded Triassic, and even Permian redbeds.

Soils:

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the Lost Draw Watershed are assigned to four groups (A, B, C, and D).



Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.



Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.



Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.





Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

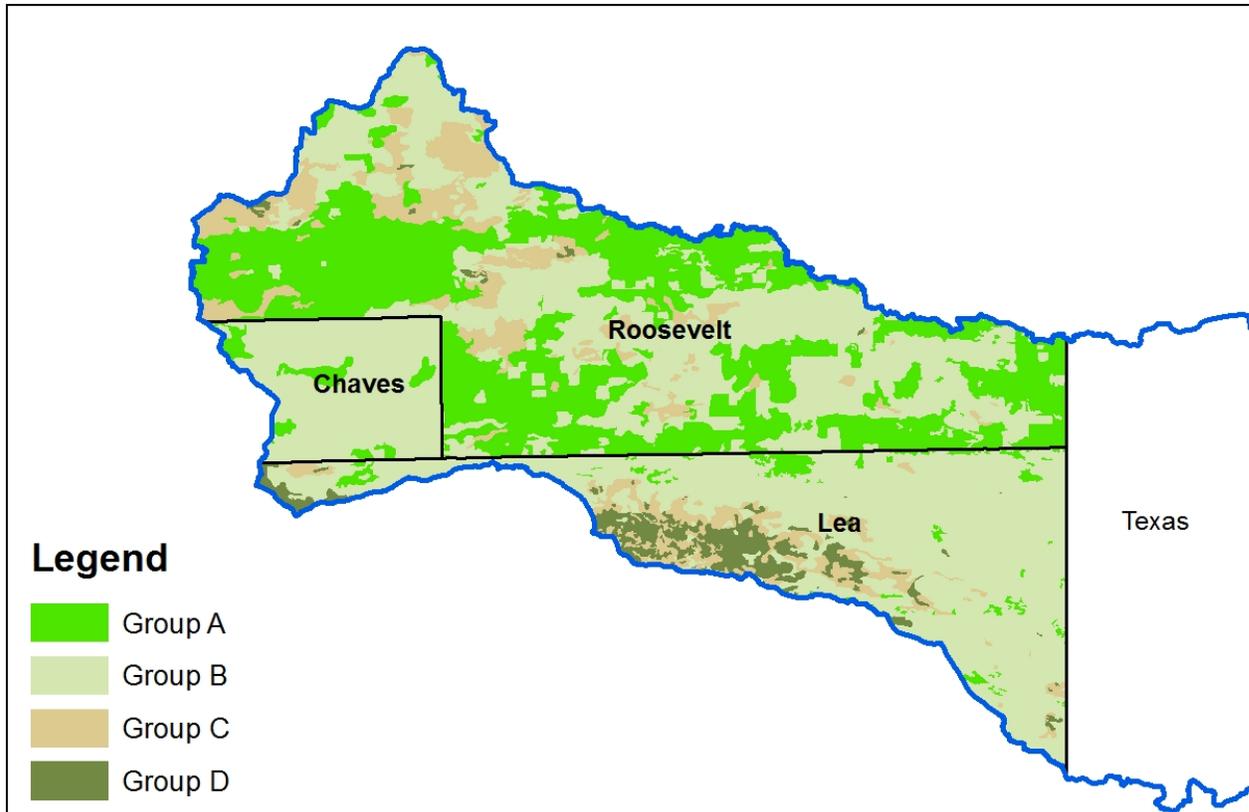


Figure 2. Hydrologic Soil Group



Physiography:

The Lost Draw Watershed is located in the High Plains Section of the Great Plains Physiographic Province and covers an area of approximately 40 square miles. The site is located on Tertiary outcrops of the Ogallala Formation. The Ogallala consists of alluvial and eolian deposits with petrocalcic soils of the southern High Plains. The watershed contains playas that receive precipitation from rain or snow events. The water infiltrates through the playas to recharge the Ogallala aquifer. This aquifer provides the water used by irrigators on the Great Plains.

The Lost Draw watershed, sloping gently from west to east, is characterized by low relief. It is almost entirely less than 5 % slope and the majority of the area has no aspect. The elevation ranges from 3875 ft. (1182 m) to 4,540 ft. (1385 m), an elevation change of less than 700 ft.

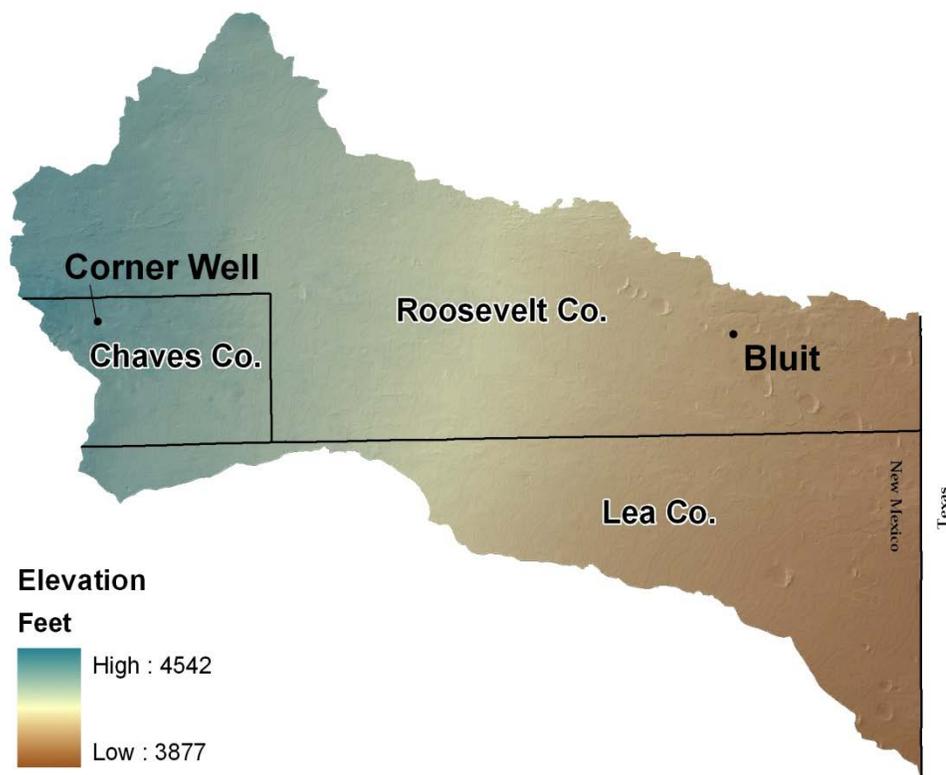


Figure 3. Lost Draw watershed shaded relief and geomorphic characteristics.



% Slope
0 - 5
5 - 10

% of HUC
99.8
0.2

Aspect
Flat
North
East
South
West

% of HUC
58
7
20
11
3

Precipitation ¹

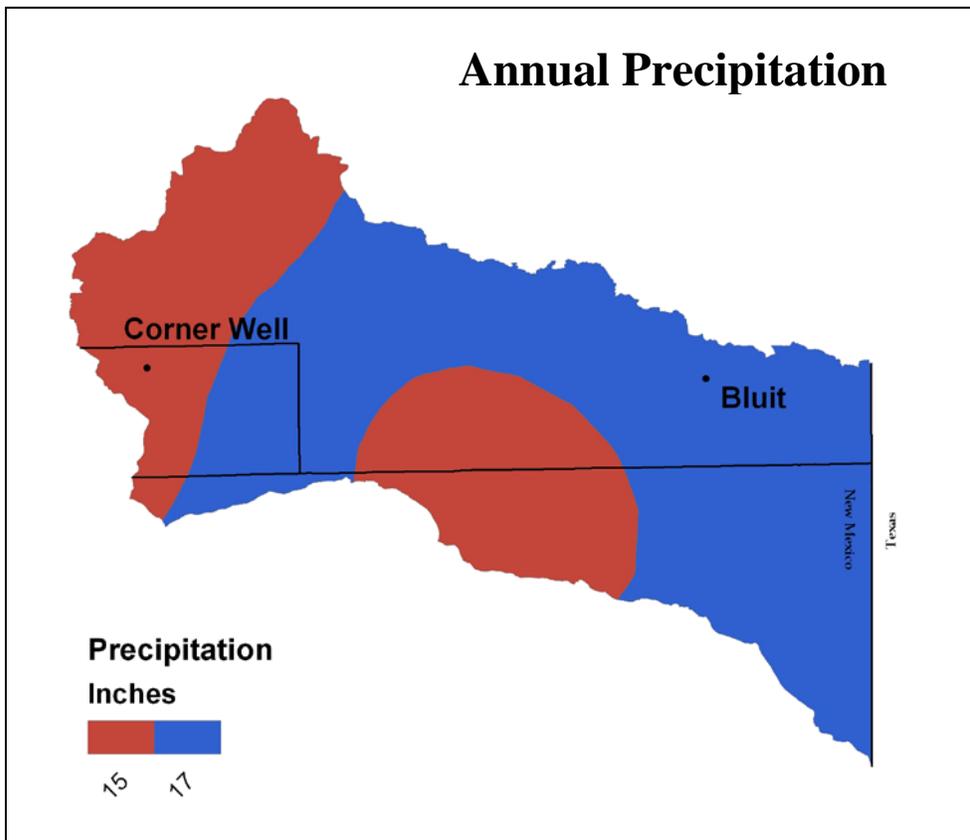


Figure 4. Annual precipitation.



Land Ownership ^U

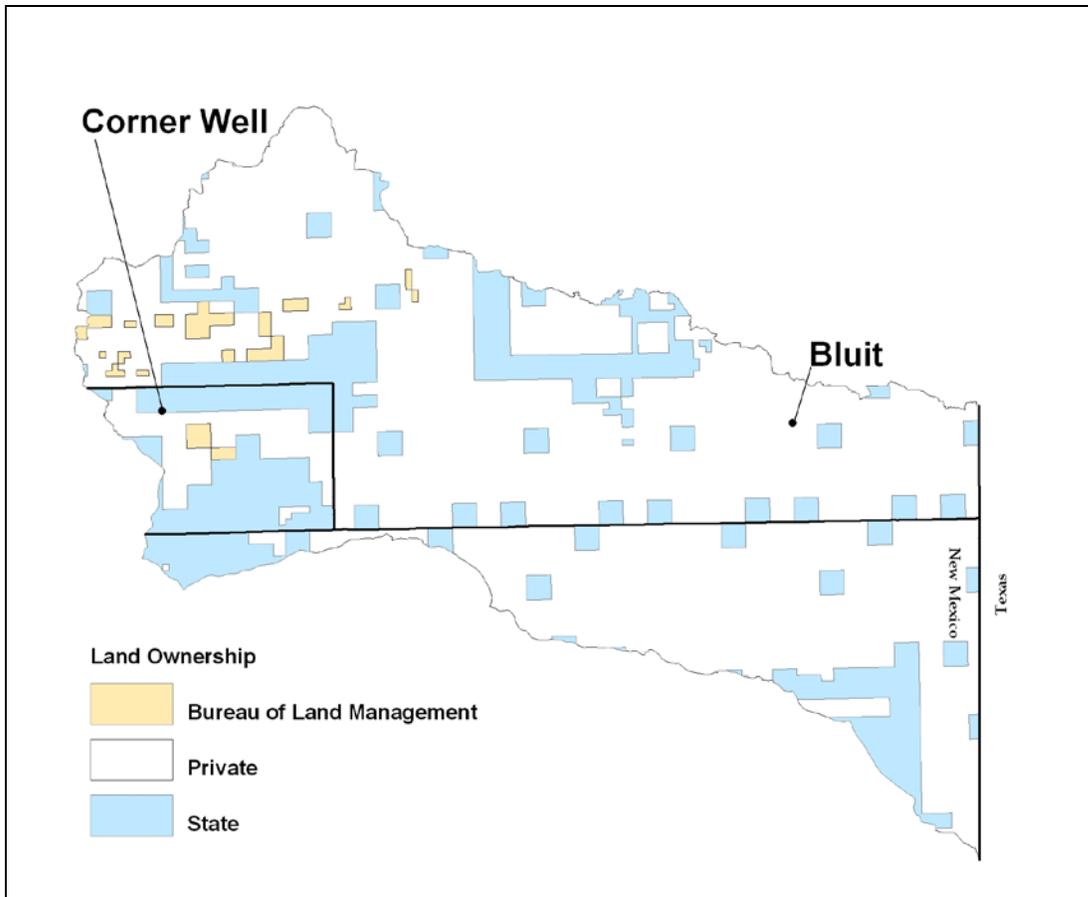


Figure 5. Land ownership.

	BLM	Private	State
Roosevelt Co.	4,100	157,400	37,500
Chaves Co.	900	12,000	17,900
Lea Co.	---	81,700	21,300
Sum (Σ)	5,039	251,059	76,627
% of HUC	2	75	23

Table 2. Land ownership acreage distribution. Reported to the nearest hundred acres.



Land Use / Land Cover ^{3.4}

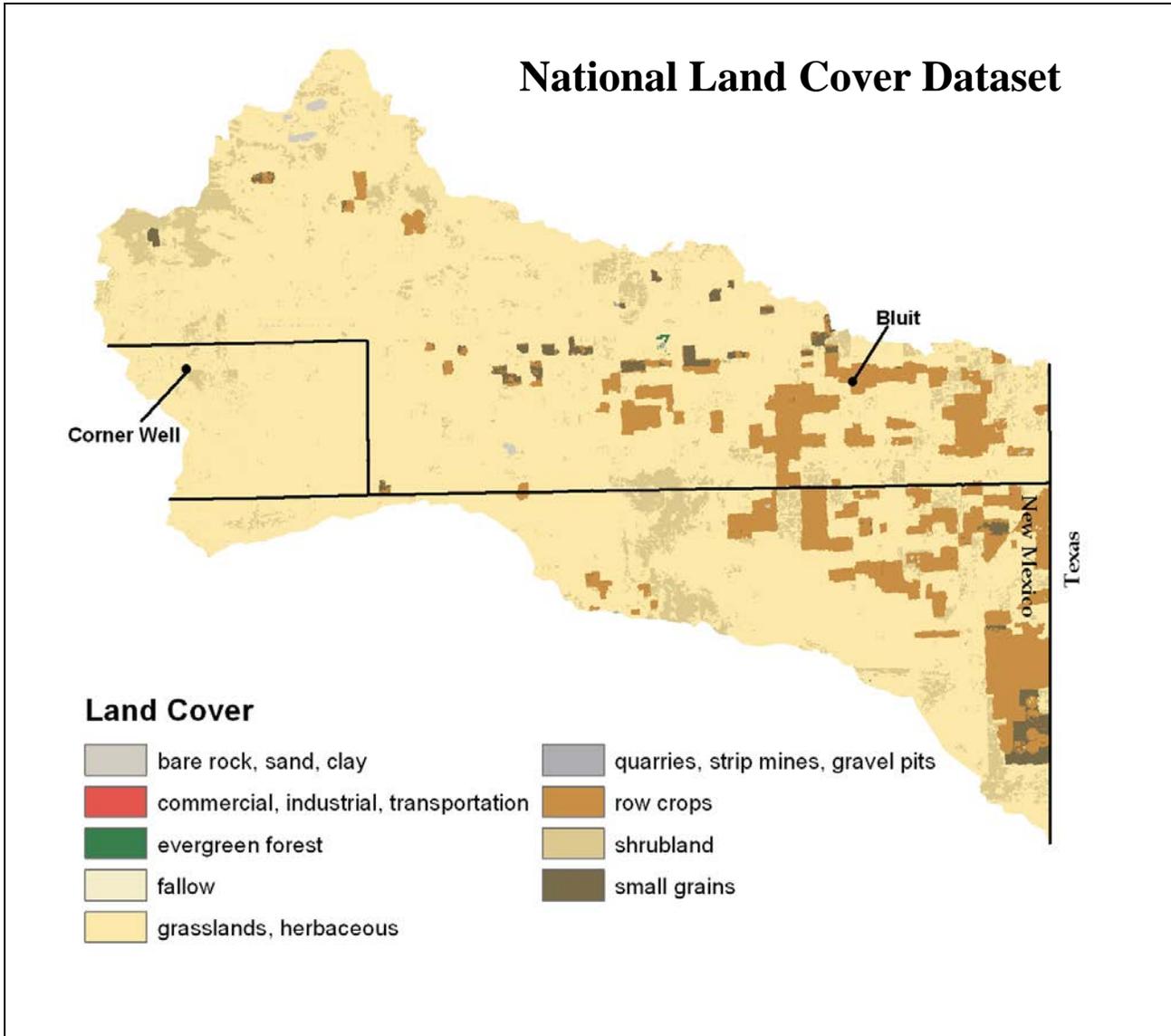


Figure 6. Subset of the NLCD over the Lost Draw watershed.



Land Use / Land Cover

The U.S. Geological Survey (USGS) produced the National Land Cover Dataset (NLCD) as part of a cooperative project between the USGS and the U.S. Environmental Protection Agency (USEPA). The goal of this project was to produce a consistent land cover data layer for the conterminous United States. The Multiresolution Land Characterization (MRLC) Consortium collected the data used to compile the NLCD. The MRLC Consortium is a partnership of Federal agencies that produce or use land cover data; partners include the UNITED STATES GEOLOGICAL SURVEY (National Mapping, Biological Resources, and Water Resources Divisions), USEPA, the U.S. Forest Service, and the National Oceanic and Atmospheric Administration.

Land Cover	Acres	% of Watershed
bare rock, sand, clay	800	<1
quarries, strip mines, gravel pits	100	<1
evergreen forest	100	<1
shrubland	27,500	8
grasslands, herbaceous	265,500	80
row crops	35,200	11
small grains	4,400	1

Table 3. Extent of NLCD classes. Reported to the nearest hundred acres.



Land Use / Land Cover

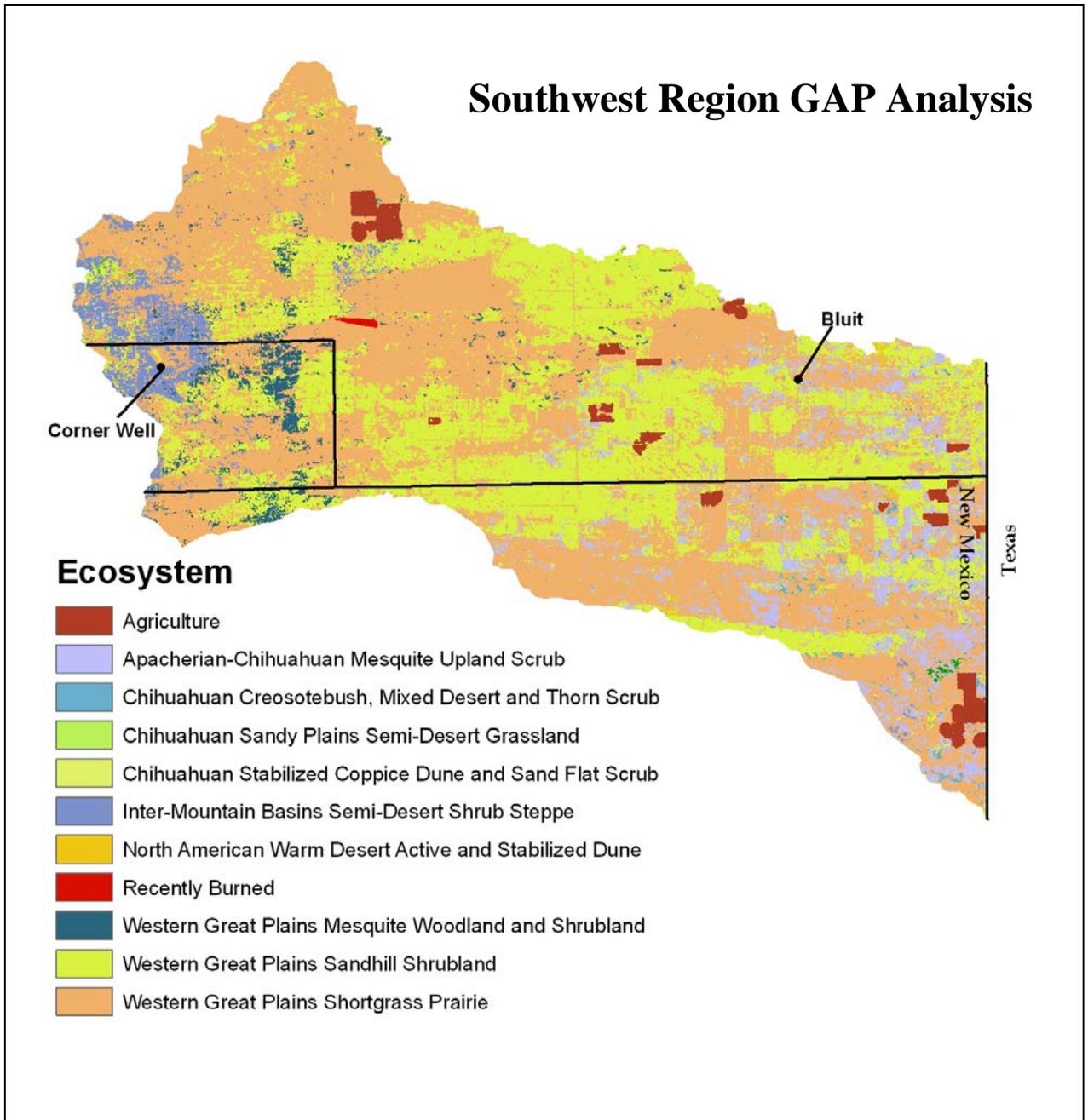


Figure 7. Subset of the SWReGAP. The 11 dominant classes are shown in the legend.



Land Use / Land Cover

The land cover mapping effort for the Southwest Region Gap Analysis Project (SWReGAP) was a coordinated multi-institution endeavor. This dataset was created for regional terrestrial biodiversity assessment. Additional objectives were to establish a coordinated mapping approach to create detailed, seamless maps of land cover, all native terrestrial vertebrate species, land stewardship, and management status, and to analyze this information to identify those biotic elements that are underrepresented on lands managed for their long term conservation.

Ecosystem	Acres	% of Watershed
Western Great Plains Shortgrass Prairie	172,300	52
Western Great Plains Sandhill Shrubland	109,300	33
Apacherian-Chihuahuan Mesquite Upland Scrub	22,900	7
Inter-Mountain Basins Semi-Desert Shrub Steppe	11,100	3
Western Great Plains Mesquite Woodland and Shrubland	7,000	2
Agriculture	6,900	2
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	1,500	<1
North American Warm Desert Active and Stabilized Dune	900	<1
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	400	<1
Chihuahuan Sandy Plains Semi-Desert Grassland	300	<1
Recently Burned	300	<1
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	200	<1
Western Great Plains Cliff and Outcrop	200	<1
Madrean Pinyon-Juniper Woodland	100	<1
North American Warm Desert Playa	100	<1

Table 4. Extent of the SWReAP ecosystems. Reported to the nearest hundred acres.



Hydrology

Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes, are required to develop lists of impaired waters. These are waters for which technology-based regulations and other required controls are not stringent enough to meet the water quality standards set by states. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs), for these waters. A TMDL is a calculation of the maximum amount of a pollutant a water body can receive and still safely meet water quality standards.

The New Mexico Water Quality Control Commission (NMWQCC) is the issuing agency of water quality standards for interstate and intrastate waters. In this role, it is the responsibility of the NMWQCC to assess the waters in New Mexico for compliance with the Clean Water Act. No waters within the Lost Draw watershed are evaluated for section 303(d).

A declared groundwater basin is an area of the state proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source. There are three declared groundwater basins within the Lost Draw watershed covering 100% of the area.

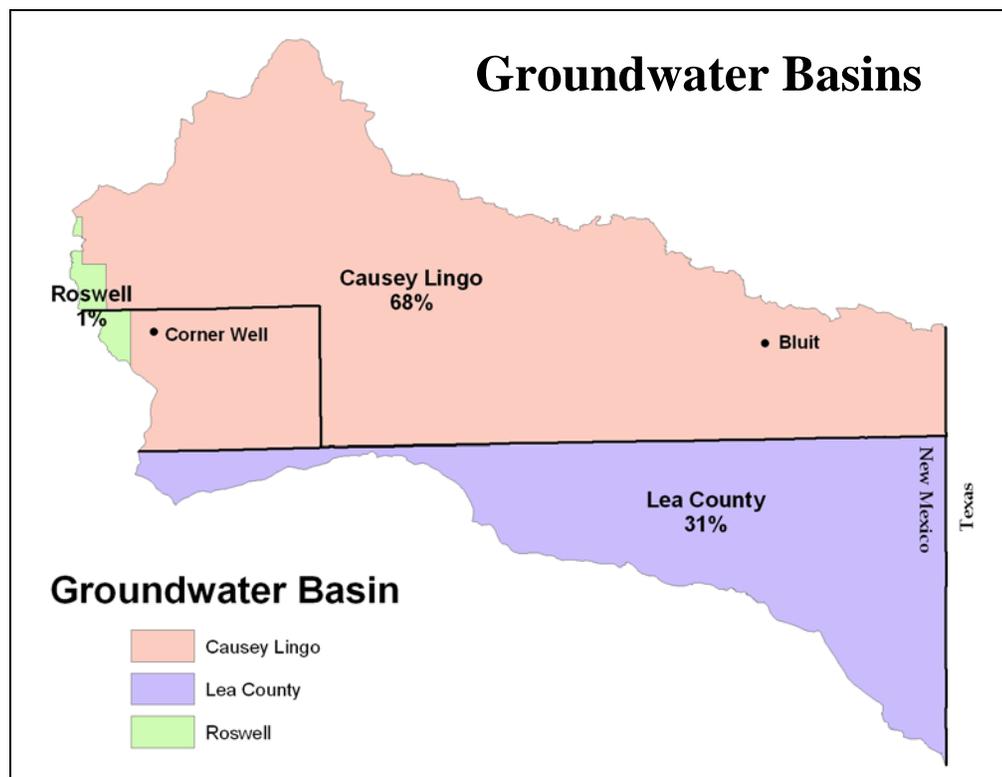


Figure 8. Groundwater Basins and their extent.



Threatened and Endangered Species ^{5,6,7,8}

Endangered species are those that are at risk of extinction throughout all or a significant portion of its native range. A threatened species is one that is likely to become endangered in the foreseeable future. The New Mexico Natural Heritage Program (NMNH), a division of the Museum of Southwestern Biology, collects data on the biology, status and location of the New Mexico's biological resources. In addition, NMNH keeps track of any legal or informal status applied to biological resources with respect to rarity or conservation priority by both governmental and non-governmental agencies. As such, NMNH maintains a tracking list of about 600 Threatened, Endangered, and Sensitive (TES) animal and plant species of particular concern or sensitivity in New Mexico. Table 5 lists those species which are currently listed and tracked in the watershed.

Common Name	Scientific Name	Fed Status	State Status	Global Rank	State Rank
Lesser Prairie-chicken	Tympanuchus pallidicinctus	C		G3	S2B,S2N
Long-billed Curlew	Numenius americanus			G5	S3B,S4N
Sandhill Goosefoot	Chenopodium cycloides			G3G4	S2
Sand Dune Lizard	Sceloporus arenicolus	C	E	G2	S1

Table 5. NMNH tracked plant and animal species. For field descriptions see [Appendix A](#).



Threatened and Endangered Species

Of the many plant and animal species currently on the NMNH tracking list, two species in the Lost Draw watershed have received significant attention in recent years. These species are the lesser-prairie chicken (*Tympanuchus pallidicinctus*) and the sand dune lizard (*Sceloporus arenicolus*). As indicated in Table 5, both of these species have a federal 'Candidate' status for protection under the Endangered Species Act of 1973.

The lesser-prairie chicken is second only to the Gunnison sage-grouse (*Centrocercus minimus*) with respect to the smallest habitat area and population size of North American Grouse species. Prime lesser-prairie chicken environments are found within habitats dominated by sand sagebrush (*Artemisia filifolia*) and shin-oak (*Quercus havardii*). The lesser-prairie chicken prefers to nest under these shrubs, particularly when there are adjacent tall bunchgrasses serving as protective cover from predation. The native range of the lesser-prairie chicken is believed to have declined over 90% since the settlement of the western United States began in the 19th century. Causes believed to have contributed to their decline include drought, improper grazing management, rangeland conversion to cropland, and chemical control of sand sagebrush and shin-oak. Combinations of these land management practices and conditions have led to a highly fragmented habitat in which the lesser-prairie chicken struggles to maintain sustaining populations.

The sand dune lizard, native to New Mexico and Texas, is endemic to the sand-shinnery-oak ecosystem. Unlike other lizards that share this habitat, the sand dune lizard can't survive outside this ecosystem. The sand dune lizard requires the wind-eroded blowouts of the shin-oak dunes where they forage and burrow within deep sand. Similar to the lesser-prairie chicken, shrub eradication, cropland conversion, and poor grazing management have contributed to a declining population of the lizard.

Painter and Pierce (2000) made a rough delineation of the contiguous areas thought to be the best suitable habitat for the sand dune lizard (Figure 8). This area covered approximately 590,000 acres (2,380 sq. km) including lands in both New Mexico and Texas. Additionally, the New Mexico Department of Game and Fish has inventoried known and probable sand dune lizard occurrences in order to fulfill the mission of protecting New Mexico's biological diversity (Figure 8). A total of 643 occurrences have been cataloged and 200 (31%) are located in the Lost Draw watershed, or within 20 miles.



Threatened and Endangered Species

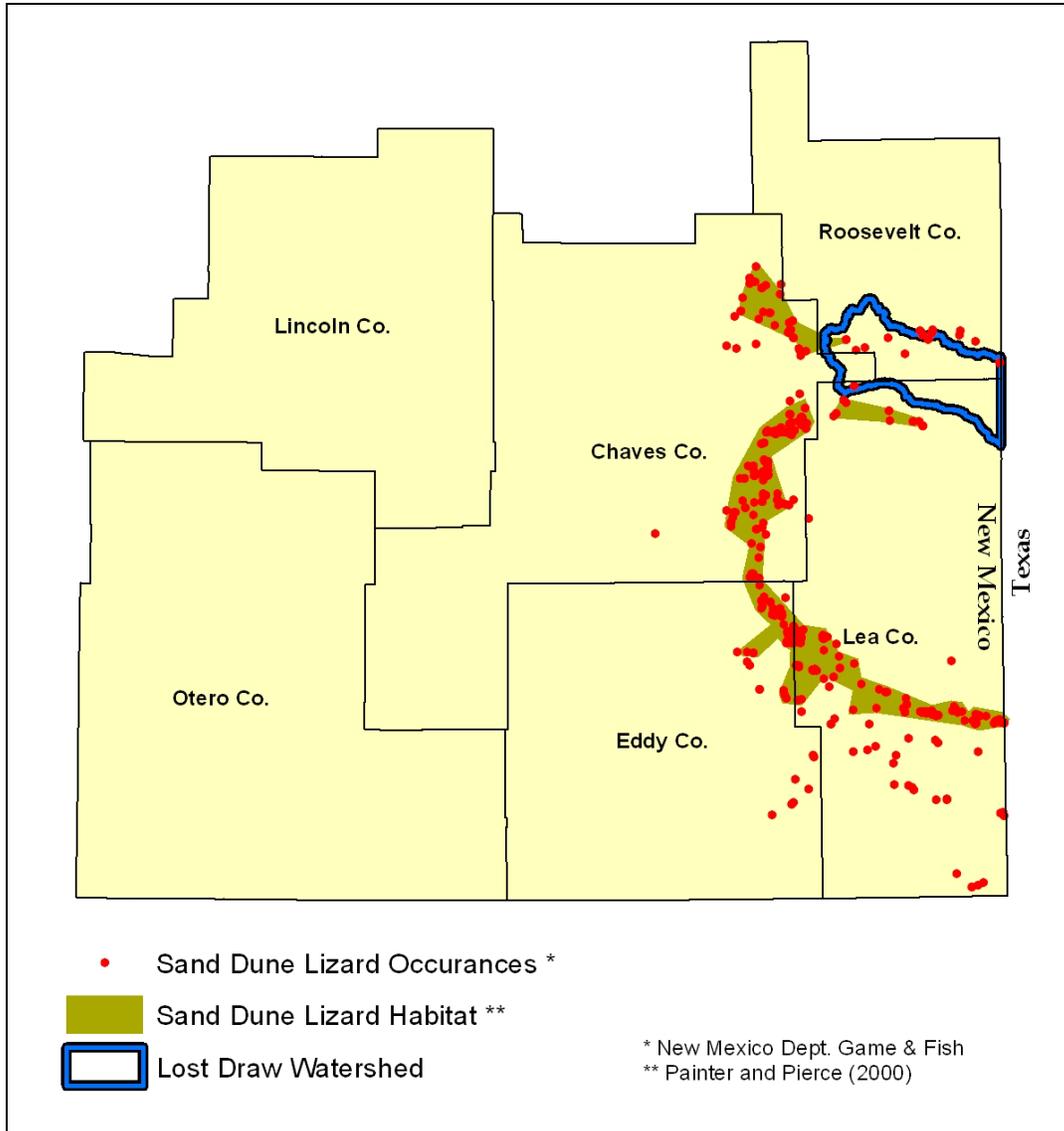


Figure 9. Sand Dune Lizard habitat.



Threatened and Endangered Species

A 2005 NMNH study of the lesser-prairie chicken habitat in southeastern New Mexico sought to identify primary habitat areas across the existing range. The study covered ~ 2,239,000 acres (9,100 sq. km) in parts of Roosevelt, Lea, Chaves, and Eddy counties. Table 6 lists the vegetation communities that were identified in this study. These units were further aggregated into landscape units for the purposes of conservation planning, population assessment, and restoration. These designations are identified as A, B, C, and B-C. Group A units are considered occupied or suitable habitat and are indicate areas where shin-oak or sand sagebrush are dominant, with minor to no honey mesquite. Areas in Group B are considered to be seasonal-use to transitional areas and are dominated by mid- or tall-grasses or grasslands with minor shin-oak components. Extensive areas of relatively homogeneous grasslands in Group B suggest that shrubs have been removed either mechanically or chemically. Areas in Group C and B-C are classified as potential restoration habitat. They contain altered vegetation types that were originally suitable habitat and areas that have been impacted by invasive species but still contain enough suitable vegetation for restoration. All other map units are considered unsuitable habitat.

Vegetation Community	Group	Acres	% of Study Area	Lost Draw Acres	% of Lost Draw
Shin-Oak/Mixed Mid-Grass & Tall-Grass Duneland	A	212,961	10	18,211	5
Shin-Oak/Sparse Duneland	A	189,063	8	10,162	3
Shin-Oak/Mixed Mid-Grass & Tall-Grass Shrubland	A	65,258	3	21,638	7
Shin-Oak/Mixed Mid-Grass & Short-Grass Shrubland	A	353,372	16	124,470	37
Shin-Oak/Sparse Shrubland	A	52,429	2	689	< 1
Honey Mesquite-Shin-Oak/Short-Grass Shrubland	C	88,542	4	5,103	2
Sand Sagebrush Shrubland	A	22,681	1	27	< 1
Honey Mesquite Shrubland		137,771	6	7,781	2
Escarpment-Footslope Shrubland		6,266	0	2	< 1
Tall-Grass Grassland	B-C	13,776	1	447	< 1
Honey Mesquite/Sparse Shrubland		138,325	6	409	< 1
Shin-Oak-Sand Sagebrush Shrubland	A	7,287	0	708	< 1
Short-Grass Grassland		365,964	16	61,119	18
CRP Fields		40,215	2	5,012	2
Agricultural Fields		72,956	3	5,004	2
Mid-Grass Grassland	B-C	54,194	2	11,647	3
Mixed Grasses/Shin-Oak Grassland	B-C	63,433	3	17,723	5
Short-Grass/Honey Mesquite Grassland		152,785	7	13,595	4
Playa Lakebed		5,638	0	9	< 1
Barren/Sparsely Vegetated/Manmade Disturbance		195,615	9	29,123	9

Table 6. Lesser-prairie chicken vegetation communities.



Threatened and Endangered Species

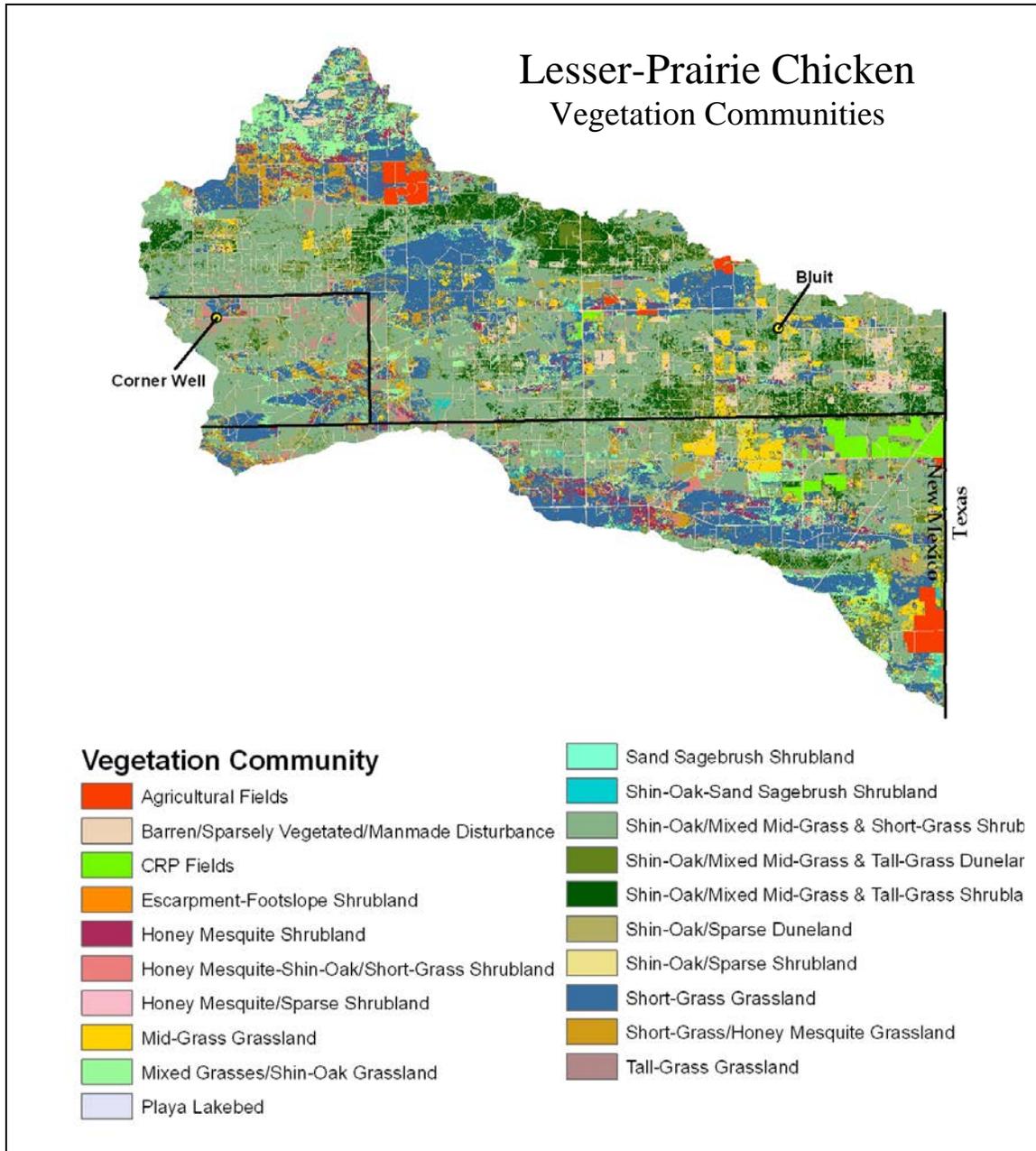


Figure 10. Lesser-prairie chicken study habitats.



Threatened and Endangered Species

The NMNH study covered the entire 332,000 acres in the Lost Draw watershed, representing 15% of the total study area. Of the area in the Lost Draw watershed, over half is designated as group A, areas with exceptional habitat for the lesser-prairie chicken. Table 7 summarizes the results of this study as applied to the watershed.

Group	Acres	% Of Watershed
A	175,904	53
B	29,817	9
C	5,103	2
Unsuitable	122,054	37

Table 7. Summary of lesser-prairies chicken habitat study.

Research has suggested both 8,000 and 18,000 contiguous acres as minimum areas to maintain healthy populations of the lesser-prairie chicken. These areas represent distances over which the species will travel for reproduction. The NMNH study considered group A vegetation communities as those suited to meet these area / distance requirements. Within the Lost Draw watershed, there are approximately 82,000 acres which are greater than 8,000 contiguous acres of group A vegetation (Figure 10). Most of these areas extend beyond the boundaries of the watershed connecting to a total of 123,000 ac.

Additionally the study identified areas where restoration was an option. Areas from Group C and B-C were chosen as they contain altered vegetation types that were originally lesser-prairie chicken habitat and areas that have been impacted by invasive species but still contain enough suitable vegetation for restoration. Figure 11 shows areas within the watershed suitable for potential restoration.



Threatened and Endangered Species

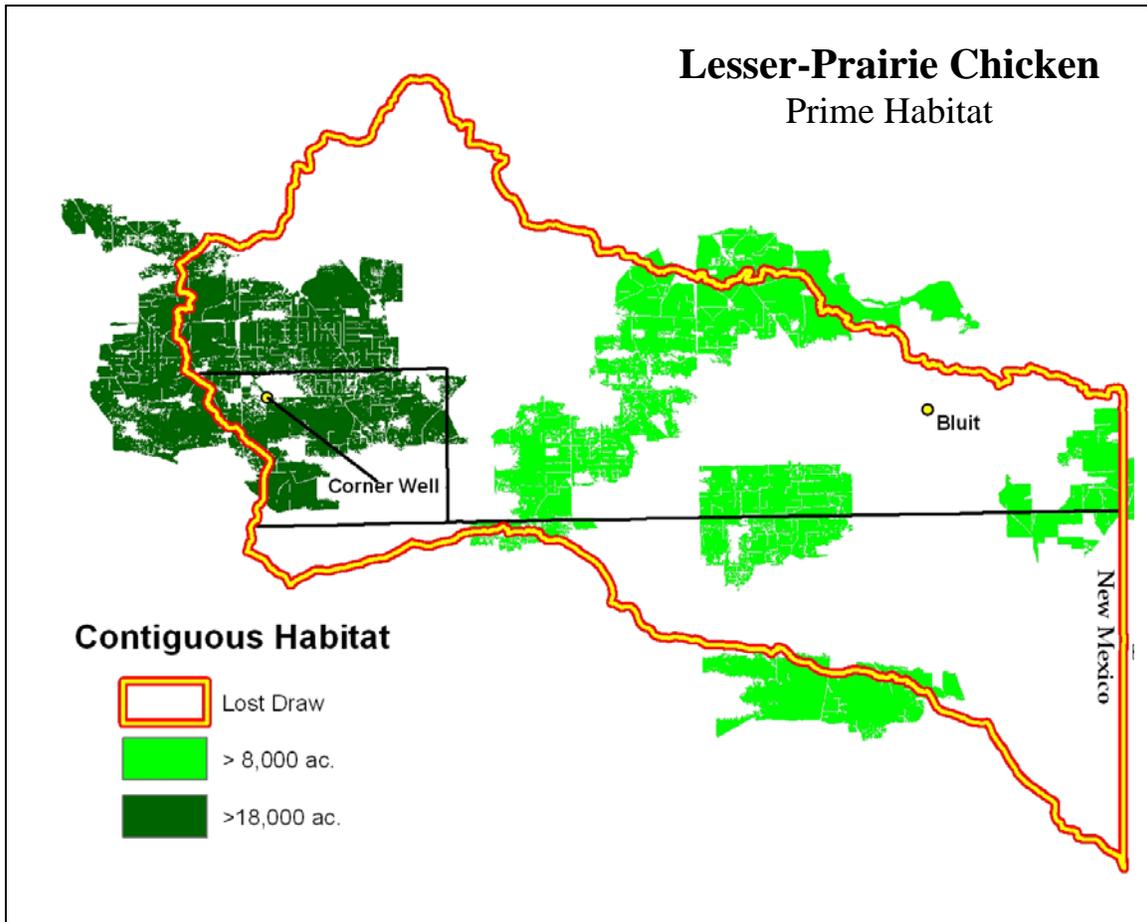
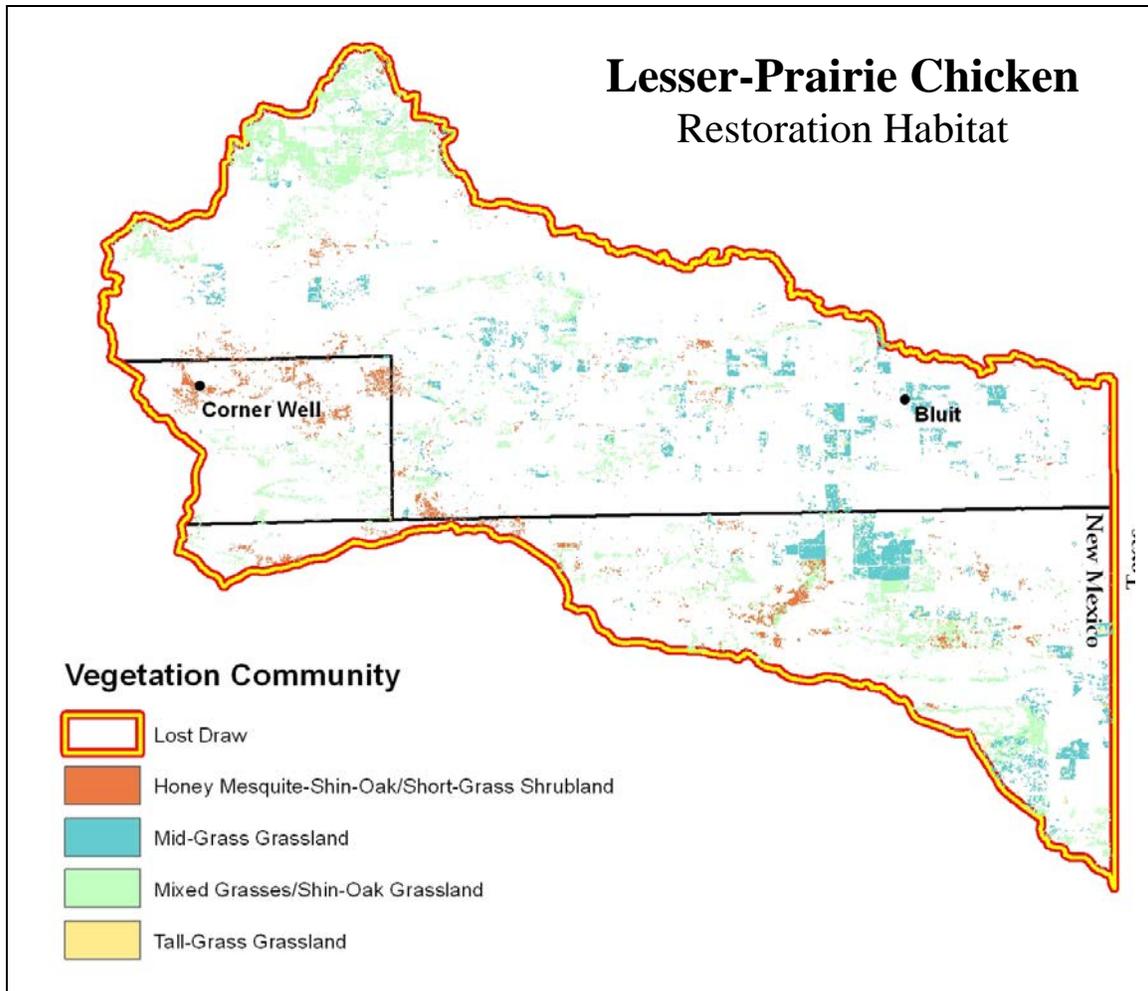


Figure 11. Prime Lesser-prairie chicken habitat.



Threatened and Endangered Species



Vegetation Community	Acres
Honey Mesquite-Shin-Oak/Short-Grass Shrubland	5,103
Tall-Grass Grassland	447
Mid-Grass Grassland	11,647
Mixed Grasses/Shin-Oak Grassland	17,723
Sum (Σ)	34,921

Figure 12. Potential Lesser-prairie chicken habitat restoration.



Invasive Species ⁹

Invasive species are those which have been introduced into a region or ecosystem and have the ability to out-compete native species for resources (i.e. water, nutrients, sunlight, etc.) The Southwest Exotic Plant Mapping Program (SWEMP) is a collaborative effort between the United States Geological Survey and federal, tribal, state, county and non-government organization partners in the southwest which maintains ongoing efforts to compile and distribute regional data on the occurrence of non-native invasive plants in the southwestern United States. These species are defined as non-native by the USDA PLANTS database. While no species have been cataloged within the Lost Draw watershed, Table 8 lists those which are found within 20 miles.

Scientific Name	Common Name
Eragrostis curvula	weeping lovegrass
Acroptilon repens	hardheads
Tamarix species	tamarisk

Table 8. SWEMP invasive plant species.



Common Resource Areas

A Common Resource Area (CRA) is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) designation. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area.

Each Common Resource Area will have multiple Conservation System Guides associated with it. A Conservation System Guide associates, for a given CRA and land use, different components of Resource Management Systems and their individual effect on conserving soil and water resources.

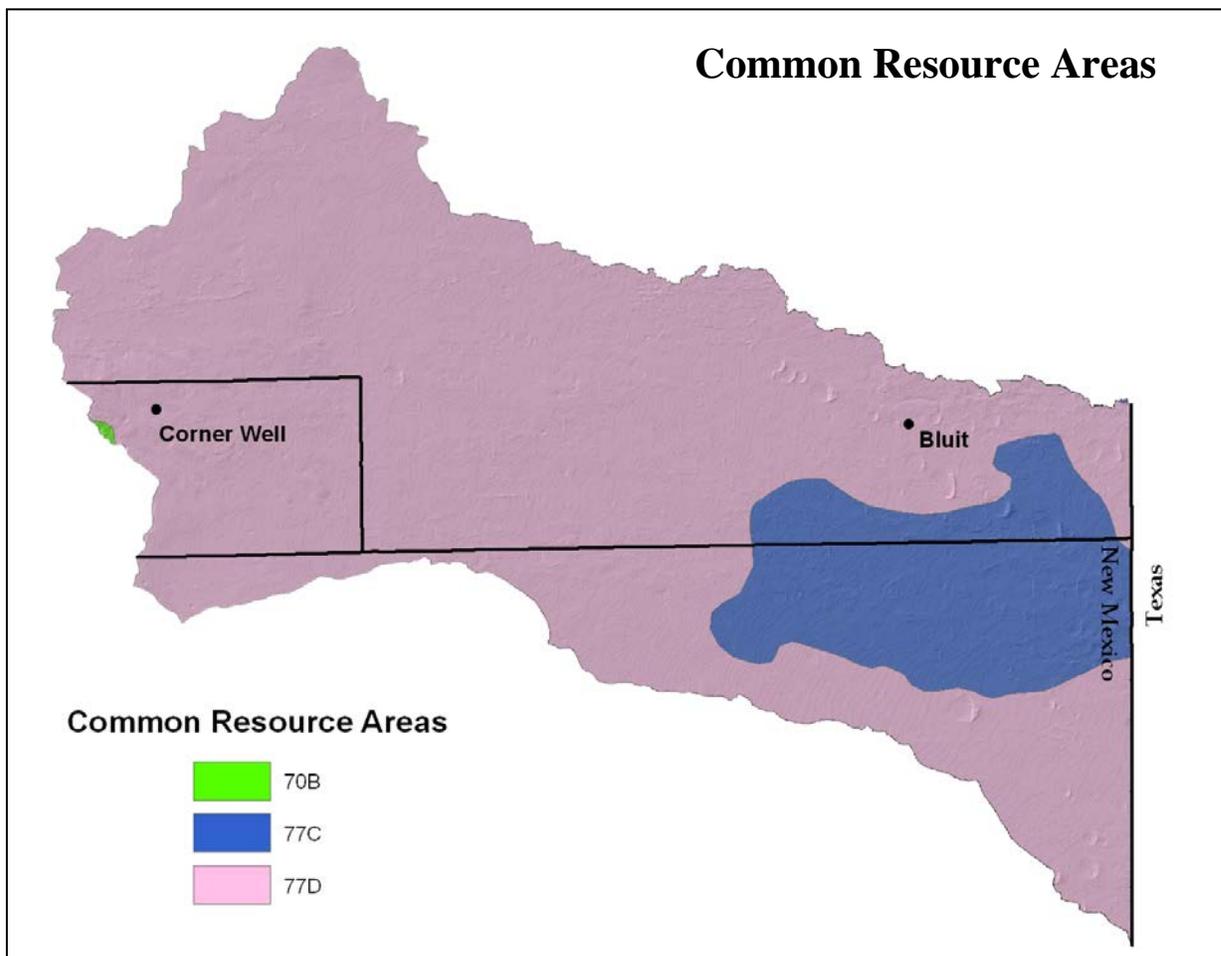


Figure 13. Common Resource Areas.



Common Resource Areas

70B - Central Pecos Valleys and Plains

This unit is characterized by broad, rolling piedmonts, plains, and tablelands broken by drainageways and tributaries of the Pecos River. Native vegetation is mid- to short-grass prairie species in the lowlands, with pinyon and juniper in the higher elevations and on steeper north-facing slopes. Current land use is predominantly livestock grazing. The soils formed in material weathered from sedimentary rocks of Cretaceous age.

77C - High Plains, Cotton Belt

This unit is characterized by nearly level plains with numerous playa depressions, moderately sloping breaks along drainageways, and a steep escarpment along the eastern margin. Soils are generally deep with sandy or loamy surface textures and loamy subsoils. Soil temperature regime is thermic and soil moisture regime is ustic bordering on aridic. Current land use is dominantly cropland. Major crops are cotton and grain sorghum.

This area is the nearly level to gently rolling Southern High Plains. Elevation is 4,000 to 4,800 feet and precipitation is 15 to 17 inches. The soil temperature regime is thermic to mesic and the moisture regime is ustic. Winter wheat, sorghum, corn, peanuts, and alfalfa are the major crops in areas over the Ogallala Aquifer. Native rangeland supports livestock grazing in area not cultivated. Bluestems, Indiangrass, grama grass, and sagebrush occur on sandier soils and increasing amounts of galleta, little bluestem, grama grass and western wheatgrass occur on the loamy to clayey soils. (Old HP-2)

77D - High Plains, Southwestern Part

This area is characterized by nearly level to gently undulating plains with scattered playa depressions. Soil temperature regime is thermic and soil moisture regime is aridic bordering on ustic. Sandy and loamy soils are generally well drained and range from shallow to deep and medium- to coarse-textured. Native vegetation is short- to mid-grasses and sandy sites support tall-grasses with sand shin oak and mesquite. Current land use is mainly rangeland, although irrigated cropland is expanding.

This area is the nearly level southwestern part of the Southern High Plains. Elevation is 3,500 to 4,300 feet and precipitation is 14 to 18 inches. The soil temperature regime is thermic and the moisture regime is aridic to ustic. Cotton, sorghum, and alfalfa are the major crops grown over the Ogallala aquifer. Native vegetation supports livestock grazing on mid- to short-grass prairie of sideoats, blue, and black grama, and tobosa. Sandy soils support mixtures of mid- and tall-grass prairie having bluestems, Indiangrass, giant dropseed, sand shinnery oak and sand sage. (Old HP-3)



Conservation

The USDA-Natural Resources Conservation Service (NRCS) focuses on the development and delivery of high quality products and services that enable agricultural producers to be good stewards of our Nation's soil, water, and related natural resources on non-Federal lands. The Natural Resources Conservation Service's conservation programs aid producers in their efforts to reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty.

In fiscal year 2008, over 230 planned conservation practices addressed resource concerns on more than 135,000 acres in the Lost Draw Jose watershed. These programs were administered from the Lovington and Portales USDA-NRCS Service Centers. Tables 9 and 10 summarize these practices.

Conservation Practice	Lea	Roosevelt
Brush Management	2,719	1,040
Conservation Cover	2,568	2,535
Prescribed Grazing	48,264	13,163
Restoration and Management of Rare and Declining Habitats	662	2,109
Upland Wildlife Habitat Management	47,601	11,368
Use Exclusion	2,568	2,848
Sum (Σ)	104,382	33,062

Table 9. 2008 planned conservation practices. Reported in acres.



Conservation

Table 10 lists planned conservation practices that are location specific (one dimensional) within the Lost Draw watershed.

	Conservation Practice	Lea	Roosevelt	Total
Distance Practices	Fence	34,396 ft.	15,900 ft.	50,296 ft.
	Pipeline	---	200 ft.	200 ft.
Count Practices	Pumping Plant	3	2	5
	Water Well	3	2	5
	Watering Facility	4	3	7

Table 10. Location specific 2008 planned conservation practices.



Soil Resource Inventory

The entire Lost Draw watershed has a certified Soil Survey Geographic Database - National Cooperative Soil Survey (NCSS) inventory. NCSS soil resource inventories have been conducted on 3 distinct regions including lands managed by the Bureau of Land Management and the State of New Mexico, as well as those that are privately held.

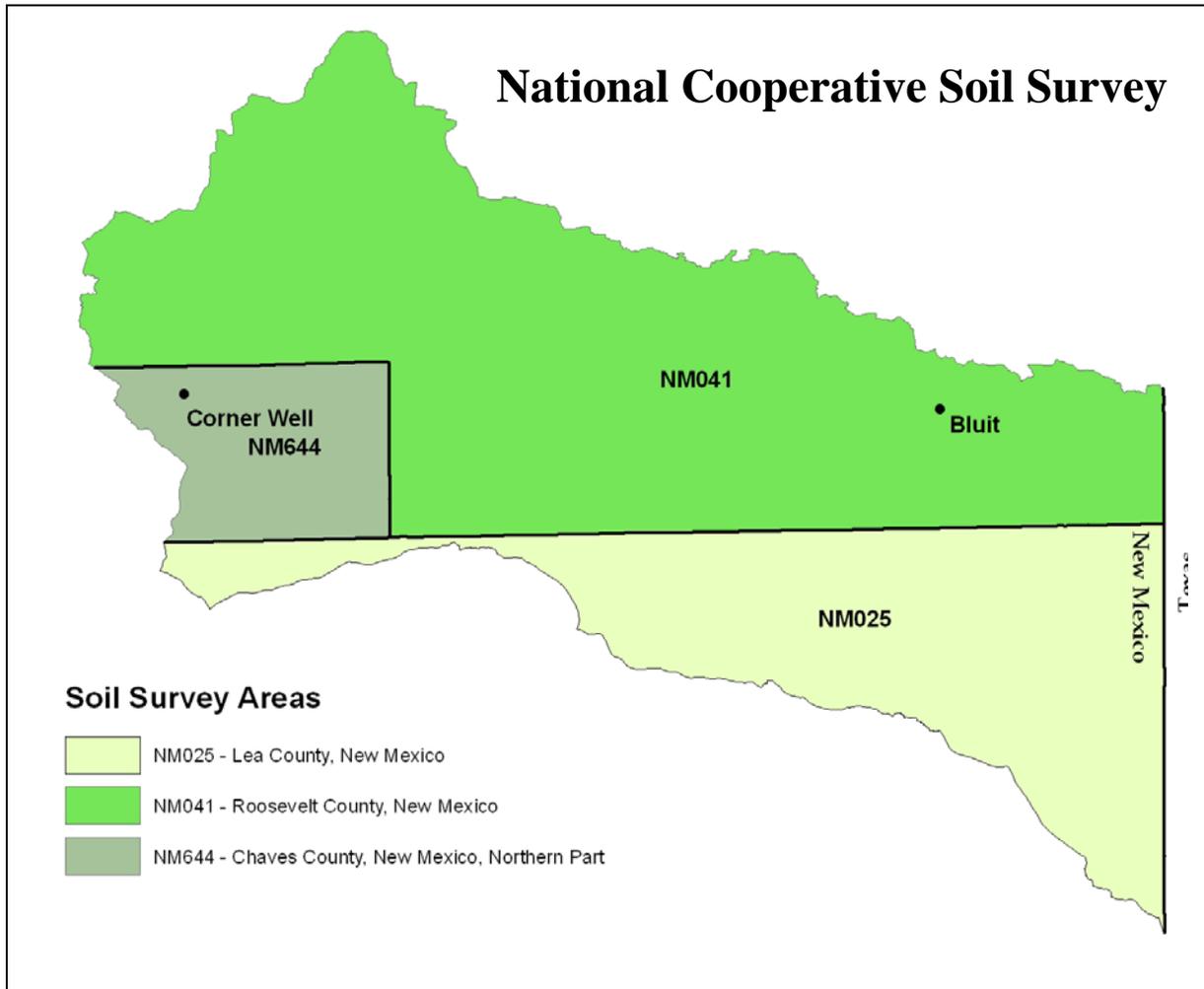


Figure 14. National Cooperative Soil Survey coverage.



Soil Resource Inventory

In order to evaluate the susceptibility of erosion within the Lost Draw watershed, a model was developed using Soil Survey Geographic Database (SSURGO) information. The soil properties saturated hydraulic conductivity, soil loss tolerance, and wind erodibility group were used in conjunction with slope to assess soil mapunit potential for erosion. Saturated hydraulic conductivity and slope are reported in SSURGO databases as interval/ratio data whereas wind erodibility and soil loss tolerance are ordinal data. Data transformations for the model are listed -

SSURGO Value	Nominal Description	Model Rank
Saturated Hydraulic Conductivity		
$\mu\text{m} / \text{s}$		
705.0 - 100.0	Very High	0
100.0 - 10.0	High	1
10.0 - 1.0	Moderately High	2
1.0 - 0.1	Moderately Low	3
0.1 - 0.01	Low	4
Slope %		
0 - 5		0
5 - 10		1
10 - 15		2
15 - 25		3
> 25		4
Soil Loss Tolerance		
5	High Tolerance For loss	0
4	↓	1
3	↓	2
2	↓	3
1	Low Tolerance For Loss	4
Wind Erodibility Group		
1	Very High	4
2	Very High	4
3	High	3
4	High	3
4L	High	3
5	Moderate	2
6	Moderate	2
7	Moderate	1
8	Slight	0

Table 11. Soil erosion model criteria.



Soil Resource Inventory

For each soil map unit (discrete delineation), the soil properties (named above) of the dominant soil type was used as the condition to be evaluated in the susceptibility to erosion model. Miscellaneous areas such as gravel pits, water, riverwash, etc. were excluded from evaluation. Possible range of values for each map unit are 0 – 16. Increasing values represent a higher susceptibility to soil erosion.

Soil Erosion Susceptibility

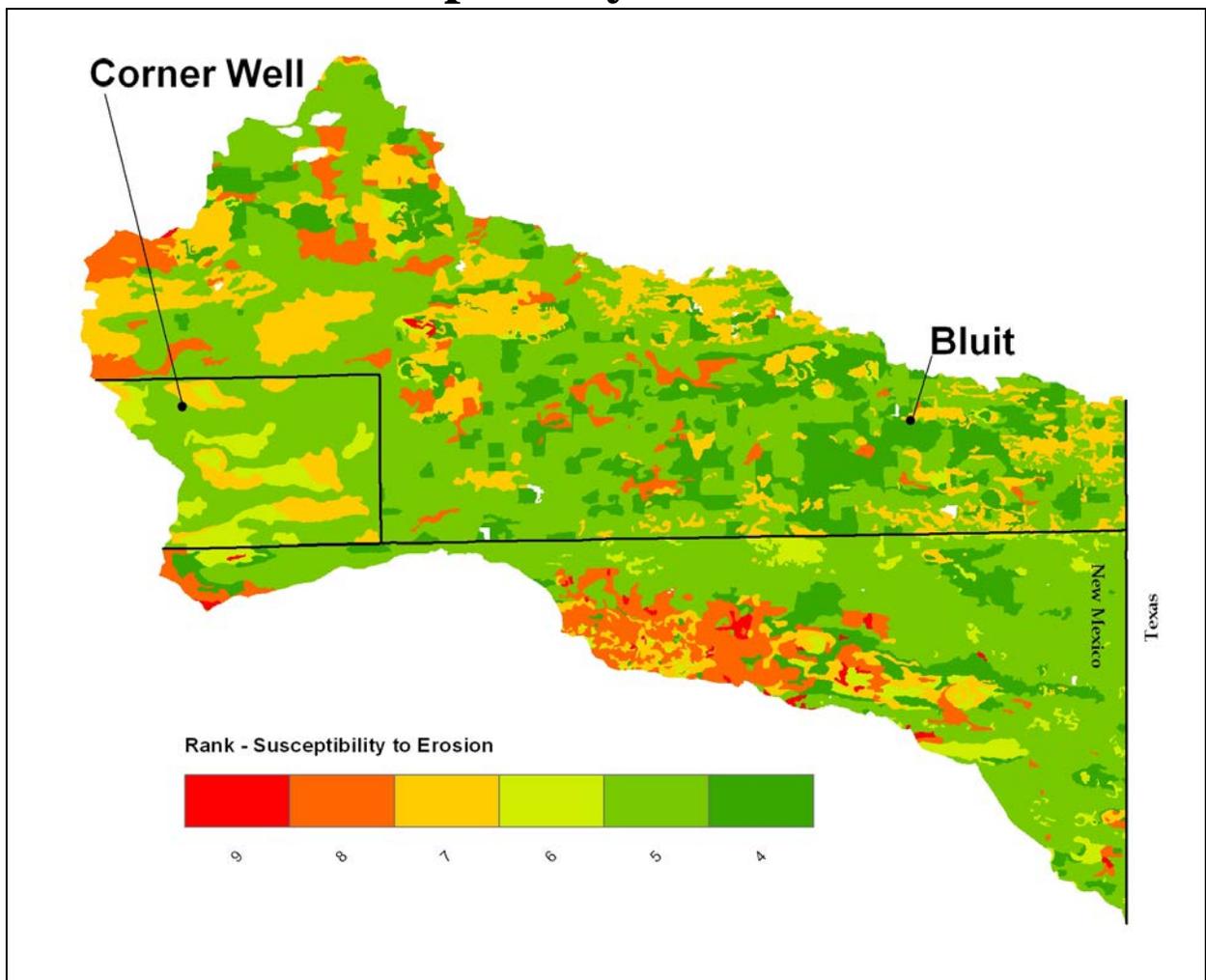


Figure 15. Susceptibility to erosion model.



Soil Resource Inventory

Rank	Acres	% of Watershed
4	51,324	16
5	183,570	55
6	16,801	5
7	50,239	15
8	27,807	8
9	1,604	1

Table 12. Susceptibility to erosion model results.



Socioeconomic Data¹⁰

Geography	Population: all	pop. Urban	pop. Rural	pop. Rural Farm	pop. Rural Nonfarm	pop. Hispanic or Latino	pop. White	pop. Black or African American	pop. American Indian and Alaska Native	pop. Asian	pop. Native Hawaiian and Other Pacific Islander	pop. Some other race	pop. Two or more races	Families Median family income in 1999
Chaves Co.	61,382	47,158	14,224	1,044	13,180	27,016	44,175	1,226	621	387	50	12,810	2,113	32,532
Lea Co.	55,511	43,665	11,846	377	11,469	21,973	37,284	2,440	536	217	19	13,359	1,656	34,665
Roosevelt Co.	18,018	11,524	6,494	1,050	5,444	6,057	13,384	347	146	79	9	3,535	518	31,813

Table 13. Socioeconomic data of counties within the Lost Draw watershed.



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<http://www.invasiveweeds.com/mapping/welcome.html>

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Appendix A

BASIC FEDERAL STATUS DESIGNATIONS

LE = Listed Endangered

Species for which a final rule has been published in the Federal Register to list the species as endangered. Species is legally protected by the Endangered Species Act.

LT = Listed Threatened

Species for which a final rule has been published in the Federal Register to list the species as threatened. Species is legally protected by the Endangered Species Act.

PE = Proposed Endangered

Species for which a proposed rule has been published in the Federal Register to list the species as endangered

PT = Proposed Threatened

Species for which a proposed rule has been published in the Federal Register to list the species as threatened.

C or CN = Candidate for Listing

Substantial information exists in U.S. Fish and Wildlife Service files on biological vulnerability to support proposals to list as endangered or threatened.

SC = Species of Concern

The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

PDL = Proposal for delisting

Species for which a final rule has been published in the Federal Register to delist the species.

XN = Non-essential Experimental Population

Species for which a population has been artificially established in the wild which is not essential to the survival of the species in the wild.

T(S/A) = Listed as Threatened Due to Similarity of Appearance



Appendix A

STATE STATUS DESIGNATIONS FOR ANIMALS

E = Endangered

Any species or subspecies whose prospects of survival or recruitment in New Mexico are in jeopardy.

T = Threatened

Any species or subspecies that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in New Mexico.

STATE STATUS DESIGNATIONS FOR PLANTS

E = Endangered - The taxon is listed as threatened or endangered under the provisions of the Federal Endangered Species Act (16 U.S.C. Sections 1531 et seq.), or is considered proposed under the tenets of the act [10-29-85,]; or the taxon is a rare plant across its range within the state, and of such limited distribution and population size that unregulated taking could adversely impact it and jeopardize its survival in New Mexico. [10-29-85, 8-31-95]

SoC = Species of Concern - A New Mexico plant species, which should be protected from land use impacts when possible because it is a unique and limited component of the regional flora.



Appendix A

BASIC GLOBAL RANKS

GX = Presumed Extinct

Believed to be extinct throughout its range. Not located despite intensive searches and virtually no likelihood that it will be rediscovered.

GH = Possibly Extinct

Known only from historical occurrences. Still some hope of rediscovery.

G1 = Critically Imperiled

Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

G2 = Imperiled

Imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

G3 = Vulnerable

Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations) , or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals

G4 = Apparently Secure

Uncommon but not rare, and usually widespread. Possibly cause for longterm concern. Typically more than 100 occurrences globally or more than 10,000 individuals.

G5 = Secure

Common, typically widespread and abundant.



Appendix A

BASIC STATE RANKS

SX = Presumed Extirpated

Believed to be extirpated. Not located despite intensive searches and virtually no likelihood that it will be rediscovered.

SH = Possibly Extirpated

Known only from historical occurrences. Still some hope of rediscovery.

S1 = Critically Imperiled

Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

S2 = Imperiled

Imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

S3 = Vulnerable

Vulnerable in the state either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations) , or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals

S4 = Apparently Secure

Uncommon but not rare, and usually widespread. Possibly cause for longterm concern. Typically more than 100 occurrences in the state or more than 10,000 individuals.

S5 = Secure

Common, typically widespread and abundant.

VARIANT STATE RANKS

S#S# = Range Rank

A numeric range rank (e.g., S2S3) is used to indicate uncertainty about the exact status of a taxon.

SA = Accidental

Accidental or casual in NM. In other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location.



Appendix A

SE = Exotic

An exotic established in state; may be native elsewhere in North America; includes fish native to NM but introduced into watersheds where the species is non-native. An exotic established in NM may be assigned a numeric rank (e.g. SE2) to indicate its status, as defined for S1 through S5.

SU = Unrankable

Currently unrankable due to lack of available information about status or trends.

HYB = Hybrid

SRF = False Report

Element reported in NM but the report is known to be invalid.

SNR = Not Ranked

State conservation status not yet assessed.

S? = Unranked

Rank not yet assessed.

RANK QUALIFIERS

? = Inexact numeric rank

Denotes inexact numeric rank.

Q = Questionable taxonomy

Taxonomic status is questionable; numeric rank may change with taxonomy.

C = Captive or cultivated only

Taxon at present is extant only in captivity or cultivation, or as a reintroduced population not yet established.

B = Breeding

The associated rank refers to breeding occurrences of mobile animals.

N = Non-breeding

The associated rank refers to non-breeding occurrences of mobile animals.

Z = Moving

Occurs in the state, but as a diffuse, usually moving population; difficult or impossible to map static occurrences.

