SALT LAKE COUNTY
Resource Management Plan

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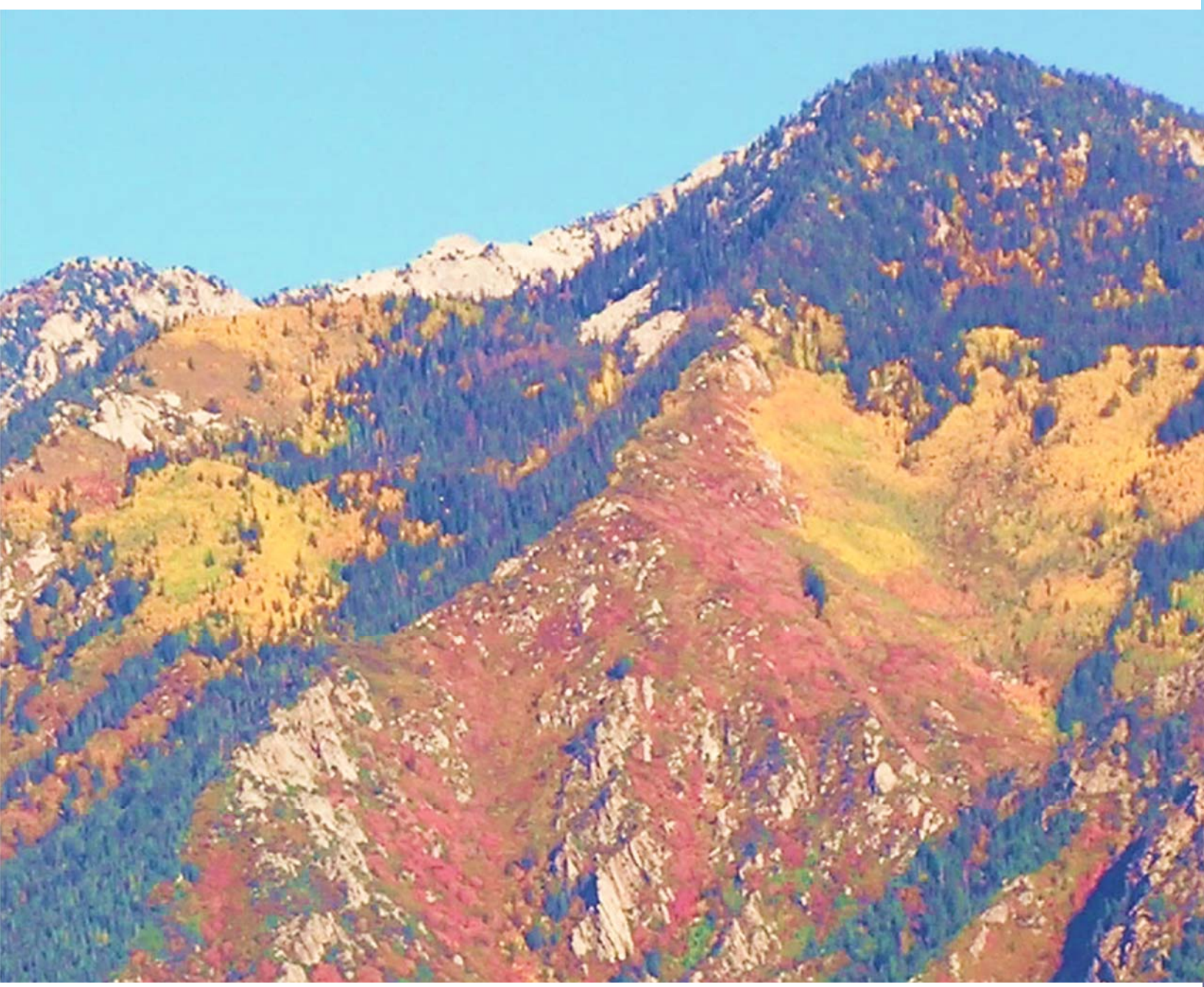

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TERMS AND ABBREVIATIONS

Areas of Critical Environmental Concern (ACECs)
Animal and Plant Health Inspection Service (APHIS)
animal unit months (AUMs)
Aquatic Invasive Species (AIS)
best management practices (BMPs)
Cooperative Weed Management Area (CWMA)
County Resource Management Plan (CRMP)
Endangered Species Act (ESA)
Federal Emergency Management Agency (FEMA)
Federal Land Policy and Management Act (FLPMA)
National Ambient Air Quality Standards (NAAQS)
National Environmental Policy Act (NEPA)
National Flood Hazard Layer (NFHL)
National Flood Insurance Program (NFIP)
National Forest Management Act (NFMA)
National Pollutant Discharge Elimination System (NPDES)
Natural Resources Conservation Service (NRCS)
Regional Advisory Councils (RACs)
resource management plan (RMP)
right-of-way (ROW)
State Wildlife Grants program (SWG)
US Army Corps of Engineers (USACE)
US Bureau of Land Management (BLM)
US Department of Defense (DOD)
US Department of Agriculture (USDA)
US Environmental Protection Agency (EPA)
US Forest Service (Forest Service)
US Geological Survey (USGS)
Utah Automated Geographic Reference Center (AGRC)
Utah Department of Environmental Quality (DEQ)
Utah Department of Natural Resources (DNR)
Utah Division of Air Quality (DAQ)
Utah Division of Indian Affairs (DIA)
Utah Division of Oil, Gas, and Mining (DOGM)
Utah Division of Water Quality (DWQ)
Utah Division of Water Rights (DWRi)
Utah Division of Wildlife Resources (DWR)
Utah Geological Survey (UGS)
Utah Forestry, Fire, and State Lands (FFSL)
Utah Pollution Discharge and Elimination System (UPDES)
Utah Renewable Energy Zone (UREZ)
Utah School and Institutional Trust Lands (SITLA)

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INTRODUCTION

This County Resource Management Plan (CRMP) is a planning document used to define policy, goals, and objectives for managing natural resources on public lands (defined in Utah Code §63L-6-103) within Salt Lake County. Traditionally, federal agencies (US Bureau of Land Management and US Forest Service) are responsible for completing resource management plans for much of the public land within Utah. But Utah State Code was amended in 2015 (and again in 2016) to require every county in Utah to complete a CRMP addressing all public lands within its jurisdiction. Utah Code §17-27a-4 defines 28 core resources that must be considered in the CRMP "to provide for the protection, conservation, development, and managed use of resources that are critical to the health, safety, and welfare of the citizens of the county and of the state".

This CRMP serves two important purposes. First, the planning process allowed Salt Lake County to assess natural resources that play important roles in the local economy and set goals and objectives for the protection and utilization of those resources. Second, the CRMP provides federal land managers local land use plans that they can consider in their planning processes of public lands. This plan does not supercede other local plans and incorporates the management objectives, policies, and guidelines of other local plans related to these resources on federal public lands. These plans are identified in Section 31 of this document. This CRMP is based on existing data and analyses performed for other planning purposes. No additional fieldwork was completed.

Elements of the Countywide Resource Management Plan

The resources included in this CRMP are examined and discussed from the same perspectives throughout the document. Each **Section** begins with a general description of the resource, which is followed by an examination of its present condition or status. Legal and administrative background and history are discussed. The section then discusses goals and objectives associated with each resources, and the section then concludes with strategies and procedures to reach the desired future conditions.

Subsections included in each section of this document are Context, Findings, Legal Context, Desired Future State, Management Objectives, and Policies and Guidelines. Each of these is explained below.

The **Context** subsection provides an overview of the resource as it pertains to public lands in Salt Lake County. Many resources occur on public lands and are managed directly by federal land managers, but not in all cases. If a resource does not occur on public lands (such as in the Agriculture Section), this paragraph will explain how policy goals and objectives for the resource applies to public lands.

The **Findings** subsection provides specific information about the resources in terms of types, acreage, and locations, as well as a map of the resource, if it is appropriate. The information provided in this subsection is the most current information available at the time of publication.

The **Legal Context** subsection provides specific federal and state laws that specifically apply to the resource, along with an overview of their implications for management. Most important here are the major legislation establishing procedures, determining authority, and specific regulations managers should consider for each resource. Federal laws are presented first, followed by state laws.

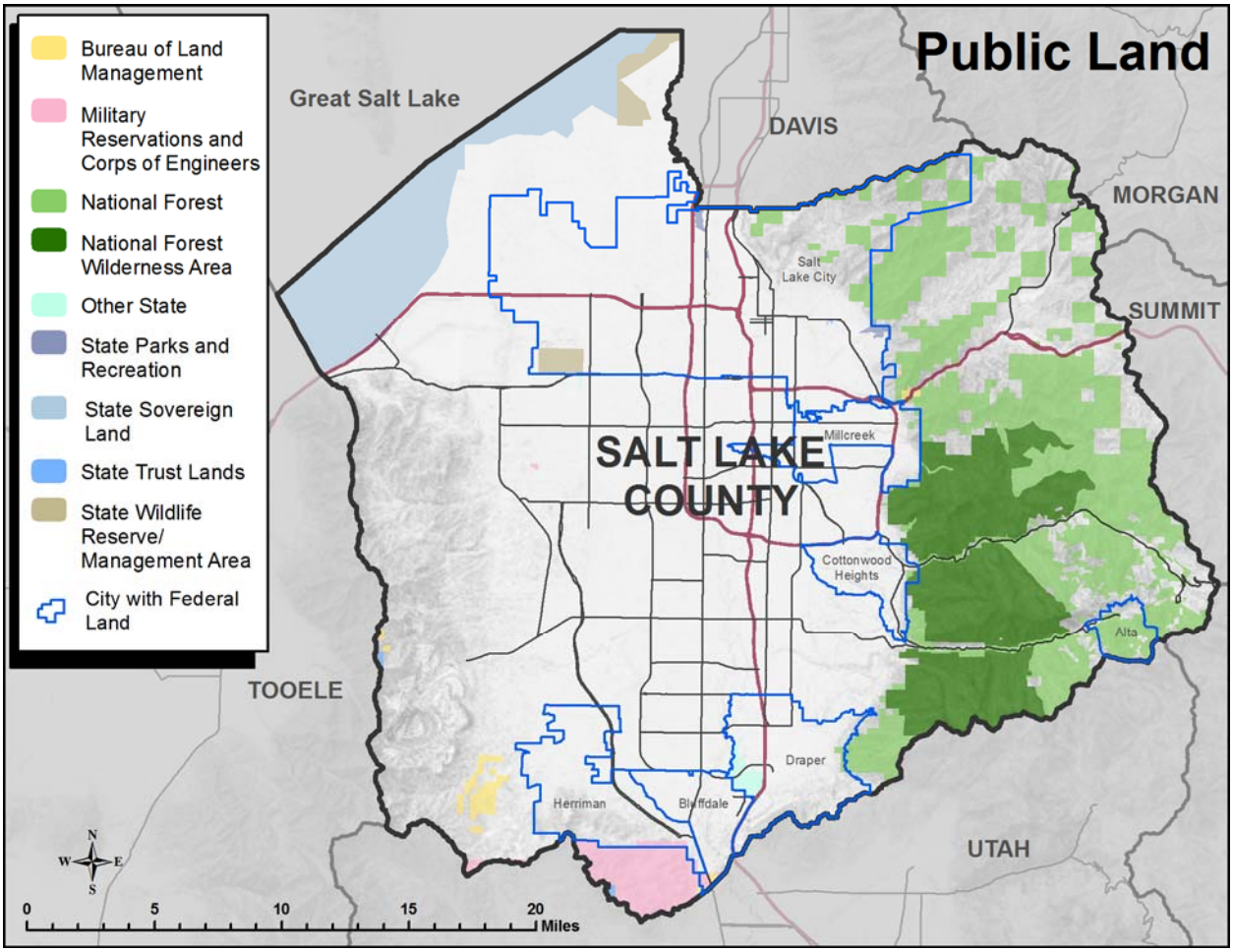
The **Desired Future State** subsection functions as an explanation of overall goals for each resource. The statement was first developed by summarizing existing objectives from federal, state, and local plans

relevant to Salt Lake County. Statements were refined after receiving public comment through a series of public meetings, a public online survey, and other stakeholder meetings.

Management Objectives are high-level management goals that will move Salt Lake County toward the Desired Future State. These objectives are broad policy statements used to organize specific policies and guidelines. Objectives were selected based on public and internal comments as well as survey responses.

Policies and Guidelines are specific actions and best management practices (BMPs) that can be used to achieve Management Objectives and Desired Future State. The policies and guidelines are derived from relevant scientific documents and existing plans.

The map below displays the current federal and state public lands. The management objectives cover resources within these public lands. Areas of public lands that are within city boundaries are excluded from this plan.



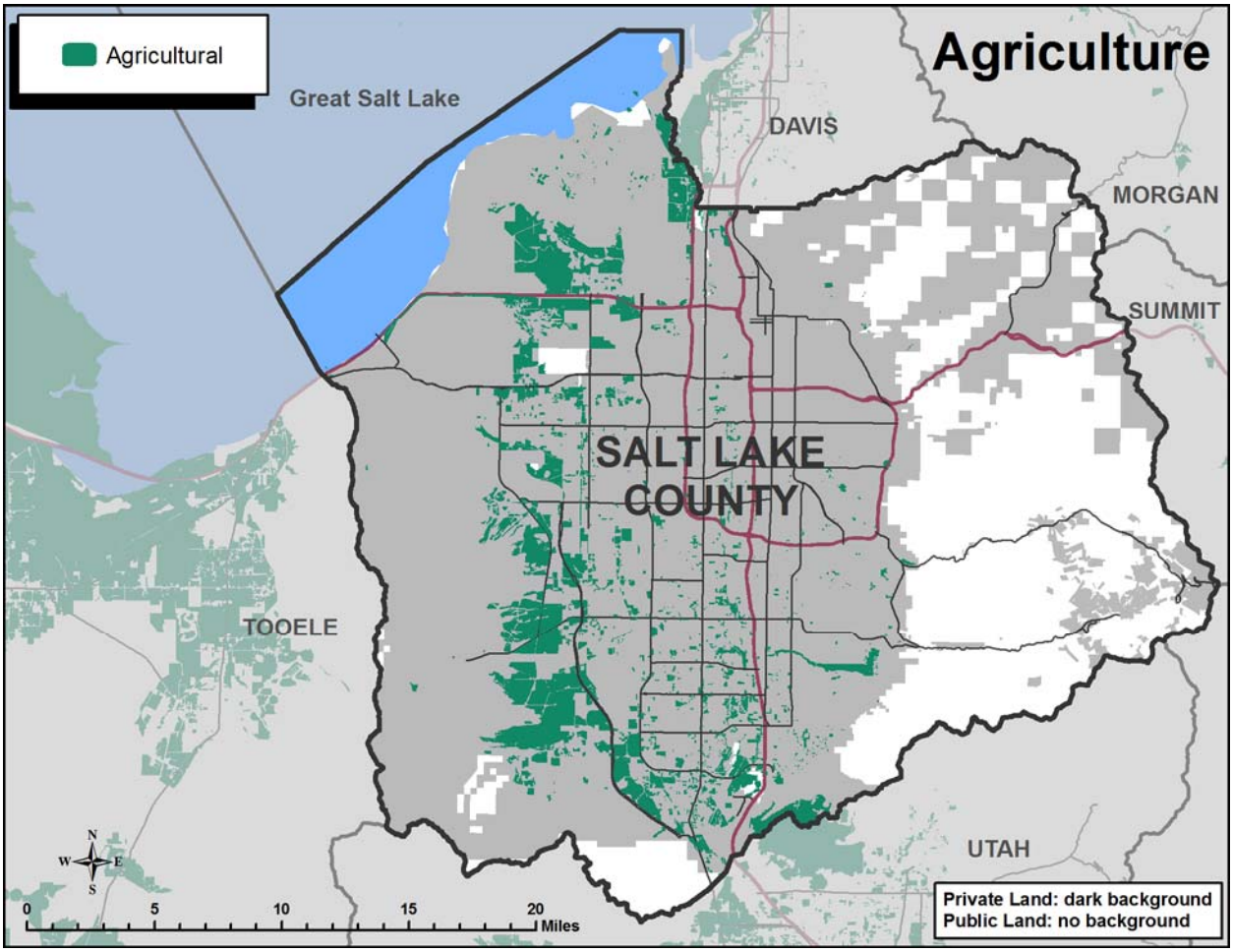
Data Source: Land Ownership, Updated as needed, Utah School and Institutional Trust Lands, Access via Utah Automated Geographic Reference Center.

1. AGRICULTURE

Agriculture is the activity of converting natural resources into food and material goods in support of both regional and national economic production, and it is an activity fundamental to establishing food security. With the advent of the pioneer settlement in Utah, agriculture became an integral endeavor in Salt Lake County and surrounding areas. Agriculture was not new to the western United States, but the intensity and scale of crop production significantly increased due to the demand created by the pioneer settlers. Crops including fruits, vegetables, and grains are all grown in Utah's soils, though livestock feed crops make up much of the state's production. Additionally, many materials used for technological purposes are derived from crops, such as building materials and medical supplies. Although Utah does not have as much agricultural production as other states, Utah's agriculture contributes to the local, regional and national food security, as well as the economy.

Related resources:

- Livestock and Grazing
- Irrigation
- Ditches and Canals



Data Source: Water Related Land Use, Updated yearly, Utah Division of Water Resources, Access via Utah Automated Geographic Reference Center.

1.1 Management Setting

Context

Agricultural activities occur primarily on privately held land in Salt Lake County, lands that are not addressed in this plan. The acreage dedicated to farming in Salt Lake County has decreased since 2002. Salt Lake County's public lands serve as the water source to support agriculture activities in the valley.

Findings

The number of farms in Salt Lake County and the acres of land occupied by farming activities has varied in the past. The US Department of Agriculture releases a census report on agriculture every five years. The 2002, 2007, 2012 reports are summarized in Table 1.1. Because natural resources such as water and soil are necessary for farming and ranching, judicious use of these resources is required, especially with ever-increasing pressures resulting from development of agricultural land for more urban uses. Water supply and quality, soil quality, air quality, invasive species and weeds, and plant and animal disease all add to the challenges faced by those who practice agriculture. The expansion of cities and suburbs often affects agricultural lands through pressures such as (but not limited to): loss and fragmentation of productive fields and pastures within irrigation service areas, redevelopment of transportation routes needed to move agricultural products and equipment, and interference (intentional or otherwise) created by the urban environment that affects irrigation water management, crop and livestock production, and agricultural land viability.

Table 1.1. Number and size of farms in Salt Lake County from 2002, 2007, and 2012.

FARM DATA	2002	2007	2012
Number of Farms	712	587	630
Land in Farms	82,267	107,477	78,162

Source: US Department of Agriculture National Agricultural Statistics Service.[1,2,3]

Legal Context

Applicable Laws include the Clean Water Act (Federal Water Pollution Control Act) (33 USC §1251 et seq. [1972]), the Utah Water Quality Act (Utah Code §19-5), the Clean Air Act (42 USC §7401 et seq. [1970 amended 1990]), and the Utah Air Conservation Act (Utah Code §19-2).

1.2 Desired Future State

Salt Lake County wishes to protect the economic viability of working lands within the valley through the proper management of air and water on public lands.

1.3 Management Objectives and Associated Policies and Guidelines

1.3.1 Management Objective

Support proper management of air and water resources on public lands to help protect the viability of agricultural land.

Policies and Guidelines

The preservation of agricultural lands requires stewardship of the air, water, and soil.[4] Coordinate with state and federal agencies in land management activities to ensure sufficient water, water quality, and air quality are available for agriculture.

1.4 References

[1] USDA: National Agricultural Statistics Services. 2002. County Summary Highlights. https://www.agcensus.usda.gov/Publications/2002/Volume_1,_Chapter_2_County_Level/Utah/st49_2_001_001.pdf (accessed March 23, 2017)

[2] USDA: National Agricultural Statistics Services. 2007. County Summary Highlights. https://agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Utah/st49_2_001_001.pdf (accessed March 23, 2017).

[3] USDA: National Agricultural Statistics Services. 2012. County Summary Highlights. https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Utah/st49_2_001_001.pdf (accessed March 23, 2017).

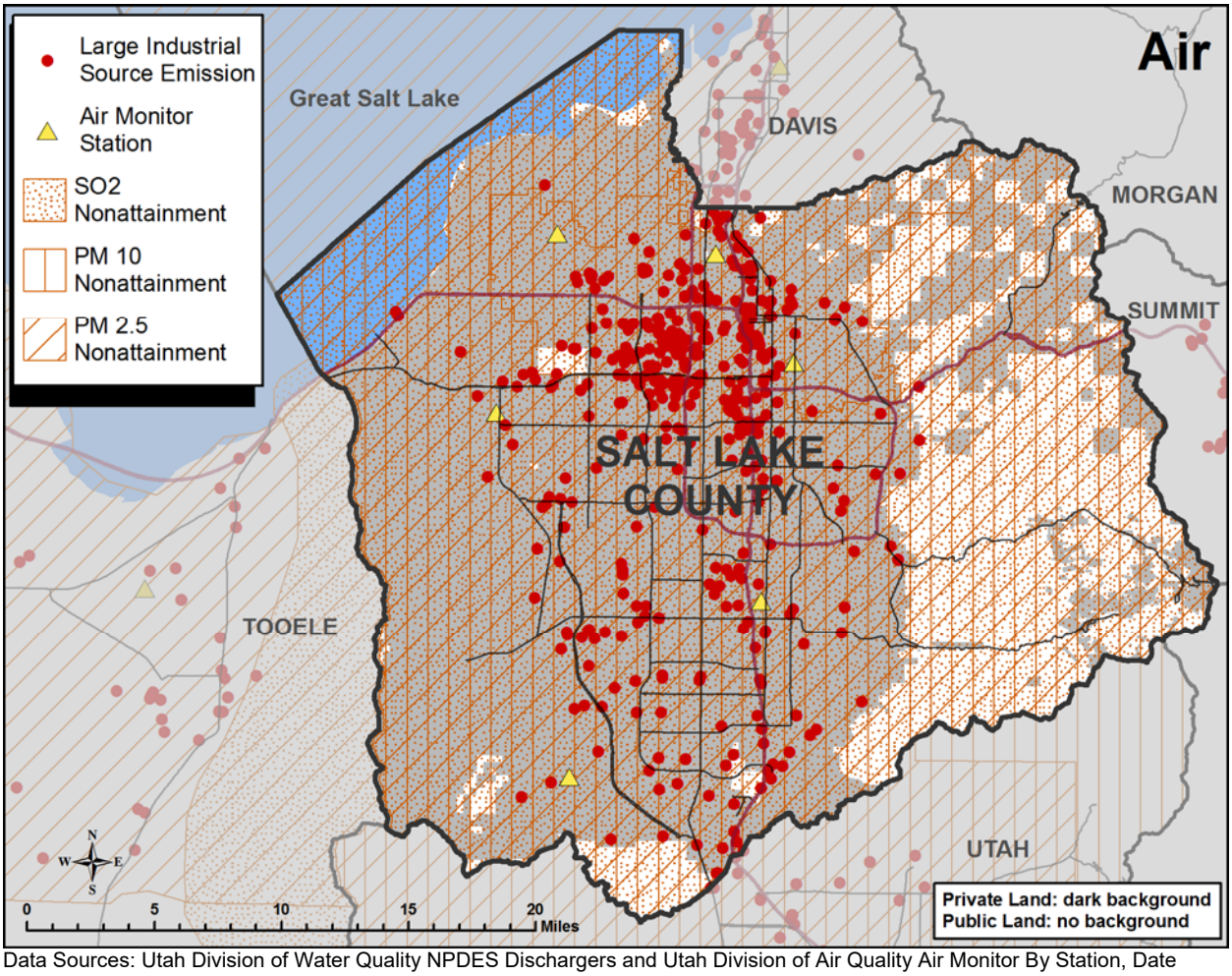
[4] USDA. Natural Resource Conservation Service. Salt Lake County Resource Assessment, . https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_032555.pdf (accessed February 18, 2016).

2. AIR

The term “air quality” refers to the degree to which ambient (outdoor) air is free of pollution. Air pollutants are those substances present in ambient air that negatively affect human health and welfare, animal and plant life, property, and the enjoyment of life or use of property. Ambient pollutant concentrations result from interaction between meteorology and pollutant emissions. Because meteorology can’t be controlled, emissions must be managed to control pollutant concentrations.

Related resources:

- Fire Management
- Forest Resources



Data Sources: Utah Division of Water Quality NPDES Dischargers and Utah Division of Air Quality Air Monitor By Station, Date unknown; Utah Department of Environmental Quality, Access interactive map https://enviro.deq.utah.gov.

2.1 Management Setting

Context

The Clean Air Act of 1970 and its amendments set the laws and regulations regarding air quality, give authority to the US Environmental Protection Agency (EPA) to set standards and rules, and delegate regulatory authority to individual states with EPA oversight, provided certain criteria are met. The

purpose of air quality conformity regulations, enforced by the EPA and the Utah Division of Air Quality (DAQ) in Utah, is to protect public health and welfare by lowering pollutant concentrations through a reduction in emissions.

The Clean Air Act Amendment of 1990 established three designations for areas based on how ambient air quality conditions compare to the National Ambient Air Quality Standards (NAAQS): nonattainment areas, maintenance areas, and attainment areas. Attainment and nonattainmentareas are those with air quality better or worse than the NAAQS (respectively). If an area is designated nonattainment, the relevant air quality management agency must create and implement a plan for emissions and reduce concentrations below the NAAQS. The air quality management agency must maintain the plan used to meet the NAAQS and prepare a maintenance plan to keep the air clean for the next 20 (or more) years. A maintenance area is one that was in nonattainment but reduced emissions sufficiently to meet the NAAQS. It must maintain those rules/actions that reduced emissions for a period of 10 years.

Air quality is influenced by activities on private and public lands. Activities on public lands that impact air quality include:

- Recreation users driving to public lands to visit.
- Recreation users driving on dirt roads within public land boundaries.
- Controlled-burn activities to manage vegetation and wildfires within public land boundaries.
- Permitted extractive activities, such as mining, on public lands.

Some activities that impact air quality are out of the control of land managers. These impacts include particulates from wildfires and dust storms.

Findings

Salt Lake County is designated as nonattainment for large particulate matter (PM10) and small particulate matter (PM 2.5) as well as sulfur dioxide pollution. Salt Lake County is designated as a maintenance area for ozone and for carbon monoxide.

Legal Context

Applicable Laws

The Clean Air Act of 1970 (42 USC §7401 et seq. amended 1990) places control of local air quality at the state level with federal oversight provided certain criteria are met. The act also requires state and local ambient air quality standards be equal to or lower in concentration than the NAAQS. Utah laws (Utah Air Conservation Act [Utah Code §19-2]) and rules regarding air quality set the state standards equal to the NAAQS. The local air quality management agency for Salt Lake County is the DAQ. Rules and policies pertaining to air quality activities and plans to achieve NAAQS attainment are set by the Utah Air Quality Board. The DAQ conducts statewide air quality monitoring, air quality research, air emissions permitting, air quality compliance monitoring, air quality compliance planning activities, public education, public outreach, and other support programs. The DAQ also supports the Air Quality Board in fulfilling its purposes.

2.2 Desired Future State

Salt Lake County desires to improve air quality to protect and improve public health, environmental health, and scenic visibility.

2.3 Management Objectives and Associated Policies and Guidelines

2.3.1 Management Objective

Salt Lake County is moved from nonattainment to maintenance for all NAAQS-monitored pollutants. Management actions on public land will be designed to protect against air quality deterioration.

Policies and Guidelines

- Support management activities that meet state and federal air-quality standards and comply with state and federal air quality regulations and requirements.

- Coordinate with DAQ to evaluate emissions of all criteria pollutants associated with proposed projects and work with DAQ to identify appropriate mitigation strategies to offset major emissions.[1]

- Support mitigation efforts that limit airborne particulates from human-made disturbances such as requiring dust-control measures and revegetation for all ground-disturbing projects.

- Support the control of wildfire through forest vegetation management activities, prescribed burning, and other management actions.

- Support multi-modal access to recreation activities.

- Promote efforts to improve air quality such as the Choose Clean Air program, residential wood burning control, Utah Clean Fuels Program, and urban forestry.

2.4 References

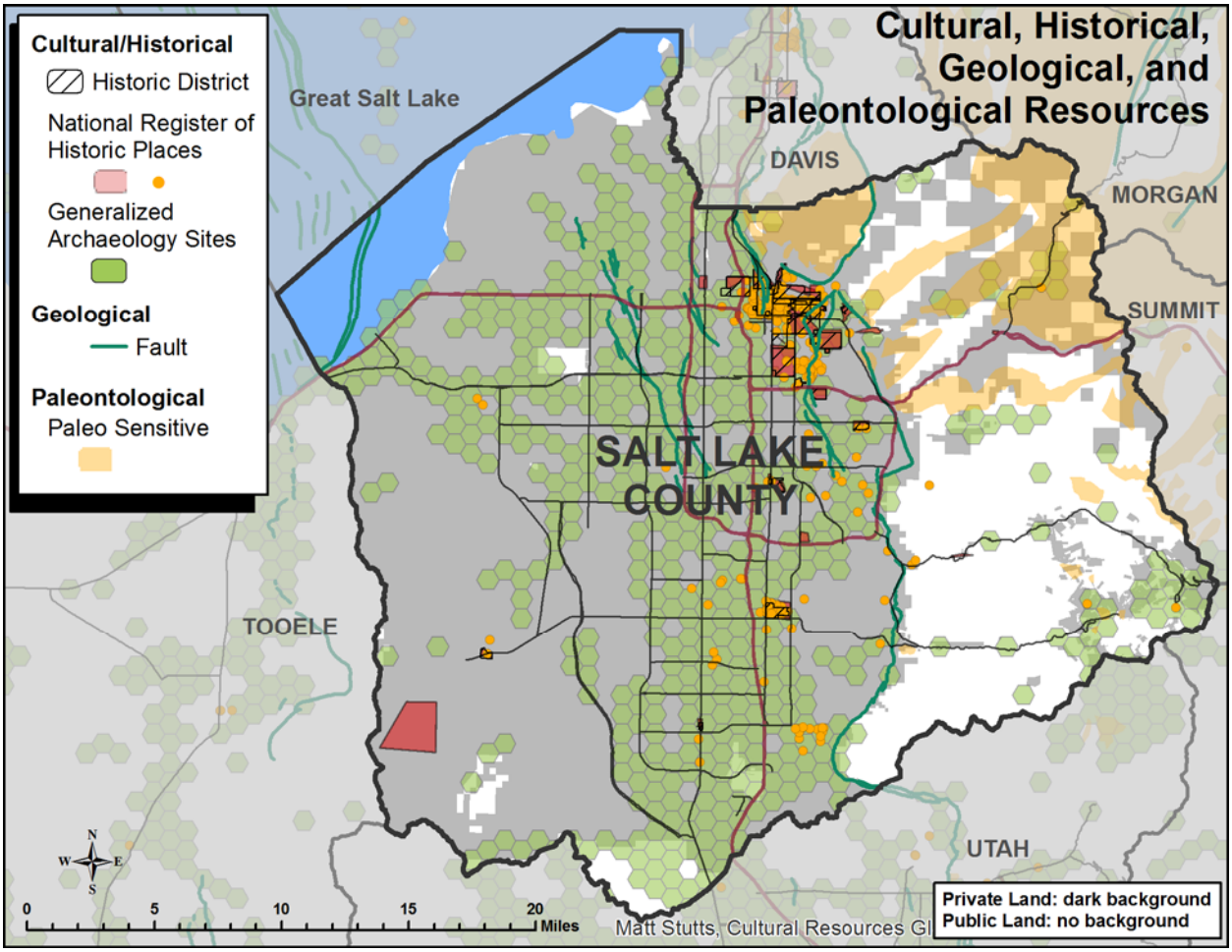
[1] Utah Division of Forestry, Fire, and State Lands. 2013. Final Great Salt Lake Comprehensive Management Plan and Record of Decision. Utah Department of Natural Resources.

3. CULTURAL, HISTORICAL, GEOLOGICAL, AND PALEONTOLOGICAL RESOURCES

These resources have intrinsic value based on their age, heritage, scientific importance, or other intangible significance. However, these resources also highlight the unique character of the local setting and may contribute to attracting business and tourism. Geology is an important planning component within the region because of its unique geologic features and sites, as well as potential hazards to development such as faults, landslides, rock falls, and soil liquefaction.

Related resources:

- Recreation and Tourism
- Land Use



Data Sources: Quaternary Faults, 26 January 2017, Utah Geological Survey. Historic Districts, March 2014, Compiled by Utah Automated Geographic Reference Center. Archaeology Sites, updated as needed, Utah State Historic Preservation Office. UT Utah State and Institutional Trust Lands Mineral Paleo-Sensitivity Area, Date unknown, Utah Geological Survey. Access via Utah Automated Geographic Reference Center. Also, nris public, Current properties listed on National Register of Historic Places, National Park Service.

3.1 Management Setting

Context

Cultural and Historical Resources

Cultural resources include archaeological sites, standing structures (e.g., buildings and bridges), and even places of importance that are over 50 years old. Many historical and cultural resources are very sensitive and protected by law; however, it is important to remember that not all cultural sites are important or significant, and that those not considered as such would not be adversely affected by any planned projects.

Paleontological Resources

These resources are defined as the remains, traces, or imprints of ancient organisms preserved in or on the earth's crust, providing information about the history of life on earth. There are some geologic units in Salt Lake County that are likely to yield fossils, though these resources are much more abundant in other parts of the state.

Geological Resources

Each canyon in Salt Lake County has unique geology and, therefore, unique scenery and potential for geologic hazards associated with seismic hazards (surface fault rupture, liquefaction, landslides, rock fall, flooding, debris flows, ground shaking, avalanche, and shallow groundwater).

Findings

Cultural Resources

When considering plans for alterations to the landscape, it is important to remember that there can be archaeological sites, historic sites, and standing structures in those locations that may be of importance to many people. This is true despite the fact that the resource may not look interesting, may be in disrepair, or even in ruins. The history and importance of a location cannot always be easily interpreted.

Undeveloped Rural (including Desert and Mountain) Settings

In places such as the West Desert, in high mountains, and even along the Great Salt Lake, archaeological sites will be the most prominent of all cultural resources. Depending upon the presence of fresh water sources and other resources that were of value to both historic and prehistoric peoples, a variety of sites can be expected, which can be categorized into prehistoric sites and historic sites.

Prehistoric sites in undeveloped rural/desert/mountain settings may include:

- Lithic scatters or chipping stations
- Campsites
- Villages
- Rock art
- Processing sites
- Quarry sites (where rock materials were acquired for making tools)

Historic sites in undeveloped rural/desert/mountain settings may include:

- Cabins
- Mines
- Railroads
- Industrial sites
- Roads/trails
- Bridges
- Irrigation infrastructure
- Small, isolated town sites
- Transmission, telephone, and telegraph lines
- Pipelines for water, gas, or petroleum products

Developed Rural Settings

This type of setting includes rural areas where existing and former small towns exist, where subdivisions may be planned, where developed recreation sites may exist, and where orchards or other agricultural activities take place.

Prehistoric sites in rural settings may include:

- Sites similar to those listed above
- Even larger village sites if permanent water sources are present and elevation is not high

Historic sites in rural settings may include:

- Sites similar to those listed above
- Town sites
- Agricultural activity sites
- Canals and ditches
- Farmsteads
- Fences
- Orchards and associated buildings and other features

Urban Settings

In these locations a wide variety of sites can be found and, depending upon their age, history and integrity, they may be quite important. In urban settings, buildings, structures, historic landscapes, and urban detail might be expected. Although remnants of agricultural elements from earlier time periods might also be present. Linear sites, such as old transmission lines and pipelines, would be reduced in number or not visible.

Prehistoric sites in urban settings may include sites similar to those listed above, though usually highly disturbed, destroyed, or obscured.

Historic sites in urban settings may include:

- Dense occupation with both commercial and multifamily residential structures in downtown areas and single-family residential structures in suburban areas (though sometimes remnants remain in downtown areas)
- Industrial sites, sometimes densely spaced
- Remnant farmsteads, fences, orchards, other agricultural features
- Railroads
- Considerable infrastructure features including sidewalks, traffic signals, street lights, power lines, fire hydrants, and many other visible features

Cultural resource locations are generally sensitive and are therefore not released publicly. The total number of cultural resources in Salt Lake County is unknown. As described above, the best way to address these resources is to begin discussions with specialists early during any planning process.

Historical resources are more easily assessed than cultural resources. According to spatial data acquired from the Utah Automated Geographic Reference Center, there are 24 historic districts in Salt Lake County (Table 3.1). The National Register of Historic Places lists 303 buildings, sites, structures and objects significant in American history, architecture, archaeology, engineering and culture within the county.[1]

Table 3.1. Historic districts in Salt Lake County.

Avenues Historic District	Fort Douglas Historic District	Salt Lake City Northwest Historic District
Capitol Hill Historic District	Gilmer Park Historic District	Salt Lake City Warehouse Historic District
Central City Historic District	Highland Park Historic District	Sandy Historic District
City Creek Historic District	Liberty Wells Historic District	South Temple University Neighborhood Historic District
Copperton Historic District	Murray Downtown Historic District	University of Utah Circle Historic District
Evergreen Avenue Historic District	Murray Downtown Residential Historic District	Utah State Fairgrounds Historic District
Exchange Place Historic District	Riverton Historic District	Westmoreland Historic District
Forest Dale Historic District	Salt Lake City East Side Historic District	Yalecrest Historic District

Source: Utah Automated Geographic Reference Center, Historic Districts.

Historical Resources—Salt Lake County History

The initial European-American migration into the current State of Utah occurred in 1776 when members of the Dominguez-Escalante Expedition traveled down the Spanish Fork River and entered Utah Valley. This expedition was led by two Franciscan fathers, who were searching for a favorable route from Santa Fe, in what is now New Mexico, to the Spanish mission in what is now Monterey, California. Members of the expedition provided the first detailed account of the Timpanagos Indians they encountered in the area surrounding Utah Lake.[1] After the expedition left the area, apparently no European-Americans entered the area until the fur trade sparked interest in the Utah Valley.

The fur trade developed in earnest during the 1820s when entrepreneurs formed companies to exploit the vast supply of beaver in the rivers and streams of the North American West. The Lewis and Clark Expedition of 1804–1806 had revealed in the west an abundance of beaver, an animal in high demand for making fur hats.[2] By 1824, the fur trade in present-day Utah had begun from three main sources: (1) traders from Taos and Santa Fe, New Mexico, licensed by the Mexican government; (2) the Canadian Hudson Bay Company with outposts in Oregon; and (3) American interests based in St. Louis.[3] Jedediah Smith of the St. Louis-based Rocky Mountain Fur Company and Etienne Proust out of Taos were among the first to trap in the Utah Valley during the 1820s.[4] Smith led a party of trappers though the area in the mid-1820s.

Trappers were the first European-Americans in the Salt Lake Valley, frequenting the area from the 1820s into the early 1840s. The numerous streams emanating from the western slopes of the Wasatch Mountains provided fertile hunting grounds for those attempting to exploit the resources of the valley. Trappers and explorers Jedediah Smith, John Fremont, and Jim Clyman, among others, are known to have traveled in the vicinity of the current project area.[5]

The first permanent nonnative American settlers to arrive in the Salt Lake Valley were members of the Church of Jesus Christ of Latter-day Saints (also known as “Mormons”). Mormon pioneers led by Brigham Young entered the Salt Lake Valley through Emigration Canyon in 1847. Young organized each of the arriving companies into groups or “committees”.[6] These committees were assigned different tasks, such as planting, surveying and laying out city blocks, building a fort wall, constructing cabins, and exploring the surrounding valleys for natural resources. The first homes in the area were simple rectangular-shaped one- or two-story structures constructed with adobe and logs with red sandstone foundations.[7] The construction of canals became an absolute necessity for the new agriculturalists during this period.

As the populations of the various sections of Salt Lake County increased, numerous small markets, groceries, blacksmiths, and butcher shops were established, and by 1850, the population of Salt Lake County rose to 6,157 inhabitants.[8] During this time, Salt Lake City continued to grow in population and importance. The city developed as an important economic hub for the region, as a pioneer religious capitol, and as a center of government.

Salt Lake County and northern Utah in general have often been referred to as the Crossroads of the West. In this section of the west, migrations of Eastern peoples dispersed along the various routes and trails leading farther west, as well as south and north. By 1857, a decade after their arrival in the Salt Lake Valley, Mormon settlements were spread out along the valleys and mountains of the Wasatch Front. Their settlements extended from Ogden to Las Vegas and from Fort Bridger to Carson Valley.[9]

By the 1860s, with the ongoing arrival or Mormons from Europe and the Eastern United states, agriculture began to expand rapidly. The arrival of the railroad in Salt Lake County in 1870, opened up new markets for crops and livestock produced by local residents. Other factors also contributed to increased agricultural productivity. Successful production of sugar beets was another significant agricultural development during this period. Agricultural and economic success led to increasing populations. From 1860 to 1890, Salt Lake County population rose from 11,295 to 58,457 inhabitants (Powell 1994:432).[8]

Along with the arrival of the steel rails and steam trains to Salt Lake City, came hundreds to thousands of railroad workers. Many of these workers were non-English speaking of various ethnic affiliations, such as Chinese, Japanese, Slavic, Italian, Syrian, Greek, and Hispanic. As with most immigrants from a similar culture, these immigrants formed their own ethnic communities, such as Swedetown, Little Syria, and the Greek Ghetto within the larger towns and cities. With the opening of ethnic restaurants, markets, and groceries, these neighborhoods took on the culture of the residents' country of origin.[10]

Salt Lake City underwent significant changes during the late 1890s and early 1900s. In 1896, following half a century of conflict over religious freedom and the issue of polygamy, the Utah Territory was granted statehood.

The wartime economy generated by World War I boosted the local metals industries and facilitated the establishment of fabricators and foundries within the Salt Lake Valley. Understandably, new warehouses and storage facilities were always a common site in the area.[11] By the close of the war overseas, the Industrial Zone included several large industrial complexes such as the May Foundry and Machine Shop and the Utah Oil Refining Company. Similarly railroad-related industries continued to provide steadily increasing employment and income for the area until the Great Depression of the late 1920s and early 1930s.

The strong economic growth that had been enjoyed by local residents for decades came to an abrupt halt with the stock market crash in the east. The loss of jobs by hundreds of local smelter and railroad employees during the Great Depression plunged the communities into a period of industrial decline which resulted in the closure of several of the smelters as well as numerous other businesses.[12] Economic conditions for agriculturalists worsened during the 1920s, as the Great Depression was felt across the state and prices for many agricultural products dropped precipitously. Between 1920 and 1921 the price of sugar beets fell from $12.03 to $5.47 per ton.[13]

A variety of local, state, and federal programs provided some relief to residents. However, full economic recovery from the Great Depression did not come until the massive mobilization effort brought on by American involvement in World War II, when employment in the area dramatically increased due to large federal projects including an increased need for petroleum products and metal industries. Salt Lake City's population continued to grow during this period from 116,110 in 1920 to 149,934 in 1940.[8]

Like other counties along the Wasatch Front, Salt Lake County continued to grow in the years following World War II. The development of new residential subdivisions along the I-15 corridor allowed for commuter travel for workers into the city. Midvale, Murray, Bennion, Taylorsville, West Jordan, and South Jordan grew and modernized throughout the Post War Period. With the completion of two major highway systems, Interstate 15 and Interstate 215, they have become "bedroom communities" for the rapidly growing number of people who are employed in Salt Lake City.

With the coming of highways and road systems connecting the area to urban centers, growth promises to continue at a steady rate. The intensive residential and commercial development of the past few decades has served to physically join the various communities in the area, effectively blurring corporate boundary lines. These expanded and continuous communities are a stark contrast to the tiny, somewhat isolated settlements of the early pioneer period.

Paleontological Resources

After becoming acquainted with how fossil resources are regulated within the state, it is important to consult with paleontologists at the Utah Geological Survey (UGS). This will help determine whether there is potential for paleontological resources within a proposed project or planning area and to provide information about state laws and regulations regarding paleontological resources and how to proceed. In some cases, it may not be necessary to do further work. However, depending upon the situation and location of a particular project, hiring a professional paleontologist may be required to negotiate the process.

Types of paleontological localities include:

- Invertebrate localities, which are fossil remnants of multi-celled lifeforms without vertebral columns, backbones, vertebrae, or full-length notochord.
- Vertebrate localities, which include fossil remnants of lifeforms with some form of vertebrae. This may include mammals, dinosaurs, fish, birds, and reptiles.
- Floral localities, which are remnants of plants.
- Trace fossils, which may include skin impressions, track sites, and remnants of burrows or borings.

Potential Fossil Yield Classification System [14]

Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

Using the Potential Fossil Yield Classification system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. It is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The Potential Fossil Yield Classification System is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions.

The descriptions for the classes below are written to serve as guidelines rather than as strict definitions. Knowledge of the geology and the paleontological potential for individual units or preservational conditions should be considered when determining the appropriate class assignment. Assignments are

best made by collaboration between land managers and knowledgeable researchers.

Class 1 – Very Low. Geologic units that are not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units.
- Units that are Precambrian in age or older.

1. Management concern for paleontological resources in Class 1 units is usually negligible or not applicable.

2. Assessment or mitigation is usually unnecessary except in very rare or isolated circumstances.

The probability for impacting any fossils is negligible. Assessment or mitigation of paleontological resources is usually unnecessary. The occurrence of significant fossils is non-existent or extremely rare.

Class 2 – Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare.
- Units that are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

1. Management concern for paleontological resources is generally low.

2. Assessment or mitigation is usually unnecessary except in rare or isolated circumstances.

The probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Assessment or mitigation of paleontological resources is not likely to be necessary. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.

Class 3 – Moderate or Unknown. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

- Often marine in origin with sporadic known occurrences of vertebrate fossils.

- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low.

(or)

- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Class 3a – Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant non-vertebrate fossils, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – Unknown Potential. Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.

1. Management concern for paleontological resources is moderate; or cannot be determined from existing data.

2. Surface-disturbing activities may require field assessment to determine appropriate course of action.

This classification includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units of moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options as well, and could include pre-disturbance surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. These units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.

Class 4 – High. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

Class 4a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.

Class 4b – These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.

- Areas of exposed outcrop are smaller than two contiguous acres.

- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.

- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

1. Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action.

2. A field survey by a qualified paleontologist is often needed to assess local conditions.

3. Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered.

4. Class 4 and Class 5 units may be combined as Class 5 for broad applications, such as planning efforts or preliminary assessments, when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations are similar at this level of analysis, and impacts and alternatives can be addressed at a level appropriate to the application.

The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access resulting in greater looting potential. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.

Class 5 – Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Class 5a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Class 5b – These are areas underlain by geologic units with very high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.

- Areas of exposed outcrop are smaller than two contiguous acres.

- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.

- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

1. Management concern for paleontological resources in Class 5 areas is high to very high.

2. A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities or land tenure adjustments. Mitigation will often be necessary before and/or during these actions.

3. Official designation of areas of avoidance, special interest, and concern may be appropriate.

The probability for impacting significant fossils is high. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

Geologic Hazards

The UGS provides technical information and assistance regarding earthquakes and geologic hazards. Geologic maps from UGS outline 381 historic landslide areas in Salt Lake County.

Legal Context

Applicable Laws

Cultural Resources

Because the application of the laws and regulations for cultural resources are complex and can be difficult to understand, it is usually a good idea to consult with a professional archaeologist or architectural historian concerning how to proceed with a particular project.

Federal laws must be considered if project plans include federal land. The same is true if federal licensing or federal funds are involved. In accordance with federal laws and regulations, project undertakings must take into account their effects upon potential historic properties. The following federal legislation and direction is the most pertinent:

- Antiquities Act: 16 USC §431 et seq. (1906)
- Historic Sites Act: 16 USC §461 et seq. (1935)
- National Historic Preservation Act: §16 USC 47 et seq. (1966)
- National Environmental Policy Act: 42 USC §4321 et seq. (1969)
- Executive Order 11593: Protection and Enhancement of the Cultural Environment (1971)
- Executive Order 13007: Indian Sacred Sites (1997)
- Archaeological and Historical Conservation Act: §16 USC 469 et seq. (1974)
- Archaeological Resources Protection Act: 16 USC §470 et seq. (1979)
- American Indian Religious Freedom Act: 42 USC §1996 et seq. (1978)
- Native American Graves and Repatriation Act: 25 USC §3001 et seq. (1990)
- Omnibus Public Land Management Act, Subtitle D – Paleontological Resources Preservation: 16 USC 470aaa (2009)

The State of Utah also has several laws with implementing regulations, which may be applicable to project planning and undertakings including:

- Utah Antiquities Protection Act: Utah Code §9-8-101-806
- Abuse or Desecration of a Dead Human Body: Utah Code §76-9-704

Paleontological Resources

There are no state requirements for paleontological resources on private lands. Should the State Paleontologist identify a particular area as sensitive for such resources that lie on state lands or federal lands, it will likely be necessary to hire a professional paleontologist to assist in the project. The State of Utah maintains a list of paleontologists with permits for state lands in Utah, and the BLM maintains a list of paleontologists with permits for BLM lands. These professionals are not only qualified to work on federal lands, but on most any project undertaken in Salt Lake County.

There are federal and state laws and regulations protecting significant paleontological resources as follows: Antiquities Act (16 USC §432, 433 et seq. [1906]) and NEPA (42 USC §4321-4327[1969]). However, the most recent and most important law protecting paleontological resources on federal lands (except Indian Reservations) is the Omnibus Public Land Management Act, Subtitle D – Paleontological Resources Preservation (P.L. 111-011; 123 Stat. 1172; 16 USC 470aaa). In addition, BLM has developed regulations for the protection of paleontological resources on lands administered by their field offices. Applicable Utah State legislation consists of the Antiquities Protection Act (Utah Code §9-8-101-806).

Geologic Resources

Utah Code §17-27a-401-2-e (County) and 10-9a-401-2-e (Municipal) require general plans to "promote health, safety, and welfare" through the protection of urban development. State statutes allow local jurisdictions to address geologic hazards through zoning districts and ordinance to regulate land used in floodplains and potential geologic hazard areas (Utah Code §17-27a-505-1-c (County) and 10-9a-505-1-c (Municipal). Utah Code §17-27a-703 (County) and 10-9a-703 (Municipal) defines a process for private property owners within counties and municipalities to appeal land use decisions restricting development in areas defined as geologic hazards.

3.2 Desired Future State

Salt Lake County desires to preserve and strengthen its historical and prehistoric resources such as, places of heritage and archaeological sites, where they exist on public lands.

Salt Lake County desires to manage paleontological resources to safeguard their scientific and educational values as well as to promote public benefit and enjoyment. The county also desires to protect its existing unique and scenic geologic resources on public lands. This includes the objective of ensuring that land use activities on public lands do not increase the risk of geologic hazards. To protect life and property, Salt Lake County will prohibit development in hazardous locations.

3.3 Management Objectives and Associated Policies and Guidelines

3.3.1 Management Objective

Take proactive measures to preserve and strengthen cultural, historical, heritage, prehistoric, and archaeological sites and resources.

Policies and Guidelines

- Support public education efforts on the values of preserving their historic and prehistoric heritage.
- Support efforts to incorporate the resources area's natural and cultural history into designs for riverfront features, public art, education, and signage.
- Support the inventory, evaluation, protection, and enhancement of resources areas.
- Encourage the consultation with professional archaeologist or architectural historian in early project planning phase to identify potential issues within the resource area.
- Encourage coordination with the Utah State Historic Preservation Office for information about whether there are known or expected cultural resources existing within a project area.

- Consult the Utah Division of Indian Affairs and US Bureau of Indian Affairs to facilitate contact with Native American Tribes.

- Support development of a monitoring plan for the resource area. This plan should present a systematic scheme for examining significant sites over time to determine causal agents and deterioration or damage of sites. Steps should then be taken to protect the sites.

3.3.2 Management Objective

Take proactive measures to manage Salt Lake County's paleontological resources to safeguard their scientific and educational values.

Policies and Guidelines

- Discourage illegal collection activities.

- Support preservation of locations of scientifically important paleontological resources on public lands.

- Support coordination with the Utah Geological Survey State Paleontologist to assess potential for paleontological resources with a project or planning area.

3.3.3 Management Objective

Protect Salt Lake County's unique and scenic resources.

Policies and Guidelines

Support efforts that protect unique and scenic resources.

3.3.4 Management Objective

Ensure that Salt Lake County land use activities on public lands do not increase risks from geologic hazards.

Policies and Guidelines

Coordinate with state and federal agencies on the management of all land use activities on public lands.

3.3.5 Management Objective

Protect life and property by prohibiting development in hazardous locations.

Policies and Guidelines

- Support policies to fit new development to existing terrain to prevent or reduce adverse impacts in hazardous areas.

- Discourage development on slopes greater than 30% through zoning.

- Require the avoidance or mitigation of environmental hazards such as flooding, landslides, and subsidence or fissure zones as part of the development review process.

3.4 References

[1] Warner, Ted J. The Dominquez-Escalante Journal: Their Expedition through Colorado, Utah, Arizona and New Mexico in 1776. Translated by Fray Angelico Chavez. Provo: Brigham Young University Press, 1976.

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[6] Arrington, Leonard J. Great Basin Kingdom: An Economic History of the Latter-day Saints. Lincoln, NE: University of Nebraska Press, 1966.

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[10] Cooper, Wallace, and Allen Roberts. Salt Lake City West Side Reconnaissance Survey. Salt Lake City: Cooper/Roberts Architects, 1992.

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[13] Alexander, Thomas G., and David E. Miller. “From War to Depression.” In Utah’s History, edited by Eugene E. Campbell, 463–80. Logan, UT: Utah State University Press, 1989.

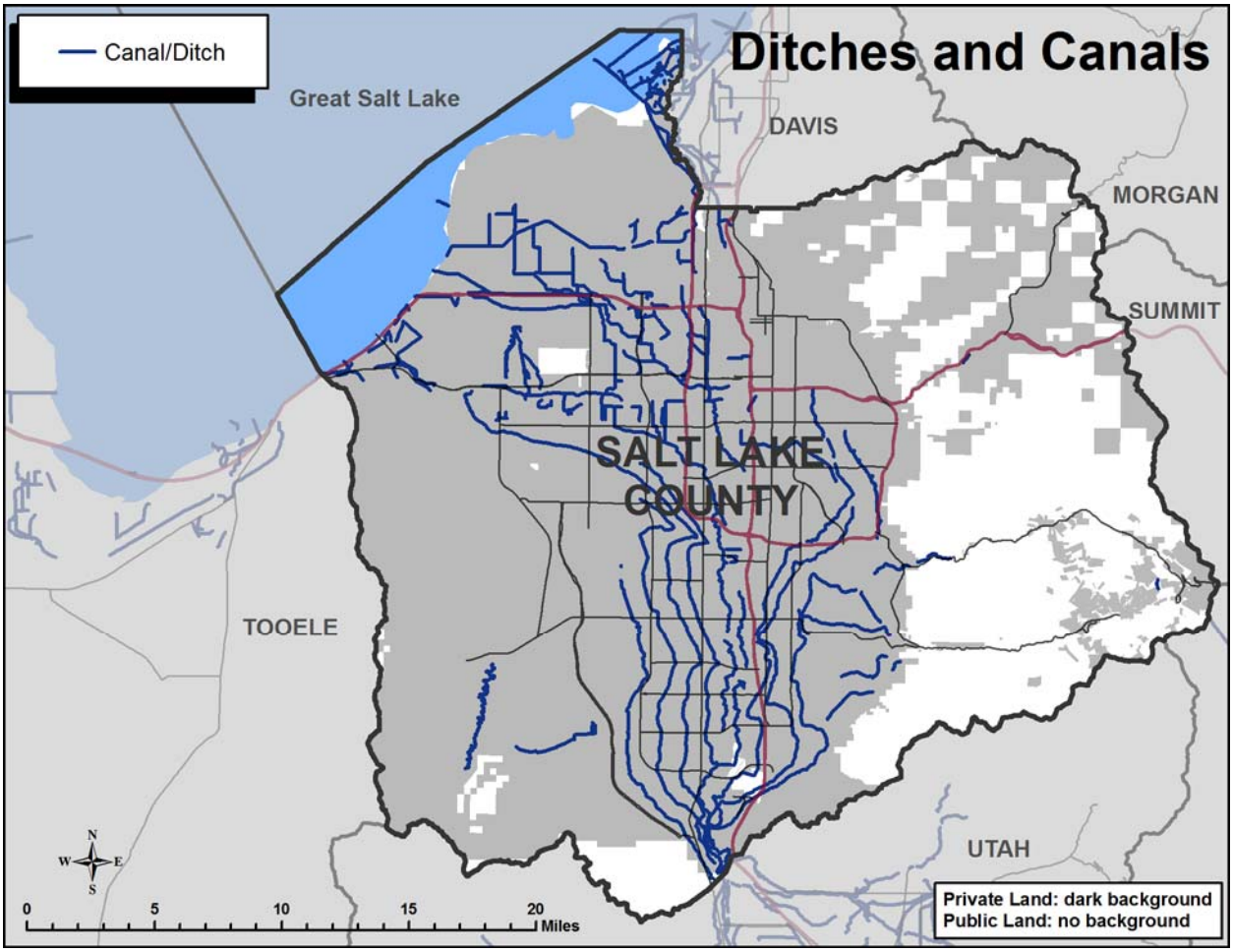
[14] US Department of Interior, Bureau of Land Management. 2016. Potential Fossil Yield Classification System. https://www.blm.gov/sites/blm.gov/files/uploads/IM2016-124_att1.pdf (Accessed May 19, 2017).

4. DITCHES AND CANALS

Ditches, canals, and pipelines are used to convey diverted water from the source to the location where its beneficial use is taken. The term "conveyance" is used to describe the movement of water from source to application. Water pipelines are used to convey water when open channels are not suitable, such as for drinking water. Much of Salt Lake County's water conveyance network is part of that constructed throughout the Wasatch Region, which made agriculture possible despite the dry climate and sustained the influx of pioneer settlers.

Related resources:

- Irrigation
- Water Rights
- Agriculture



Data Source: Streams National Hydrology Data, Date unknown, Dataset, Access via Utah Automated Geographic Reference Center.

4.1 Management Setting

Context

Salt Lake County's public lands serve as the water source supplying some irrigation systems in the valley. Irrigation systems are an integral element for agricultural viability in Salt Lake County. The use, upgrade, and maintenance of the Utah's network of canals, ditches, and dams continues today. Many of the canals and ditches remain open, but over time many have been lined or piped to improve operational efficiency and for safety reasons.

Dams, diversions, canals, and pipelines are constructed to take advantage of the topography of each watershed and redistribute water from rivers and streams outward to lower elevation lands, which are more suitable for crop production. Ditch and canal systems are an integral element for agricultural viability in Salt Lake County and may also be relied upon for urban landscape watering and gardens.

Findings

While there are no ditches or canals on public lands in Salt Lake County, public lands are the watersheds that produce water supplies for many irrigation systems. Salt Lake County Flood Control partners with most major canals companies to convey local municipal storm water downstream. These canals serve as major drainage system facilities and act as trunk lines to deliver storm water to a natural tributary or final destination. A potential threat to the counties irrigation and storm water infrastructure is the introduction of Aquatic Nuisance Species, especially quagga and zebra mussels. A single localized infestation has the potential to spread across the entire county though the interconnected network used to deliver water.

Legal Context

The rights of the county in and to canals and drains are limited to those included in specific agreements for their use with the owners of such facilities. Water is appropriated to water users downstream based on state regulations spelled out in Utah Code Title 73, Water and Irrigation. Point of Diversion data, stream alteration data, place of use data, and adjudication areas data can be used by Salt Lake County to help determine areas of the county that may have complex water rights issues. See CRMP Section 26, Water Rights, for more information regarding water rights in Salt Lake County.

Other applicable laws include the Clean Water Act (Federal Water Pollution Control Act) (33 USC §1251 et seq. [1972]) and the Utah Water Quality Act (Utah Code §19-5).

4.2 Desired Future State

Salt Lake County desires to protect existing water conveyance systems.

4.3 Management Objectives and Associated Policies and Guidelines

4.3.1 Management Objective

Support efforts that protect existing water conveyance systems.

Policies and Guidelines

- Continue cooperative relations with irrigation companies to assist with resolving public safety concerns. Also, counties often have outdated information on canal modifications; encouraging canal companies to provide updated mapping information, and/or having a central repository of canal infrastructure would be helpful for planning.

- Many canals in the county are relied upon for flood control and stormwater management. The County will continue to work closely with irrigation companies to ensure canal maintenance and flow capacity.

- Canal companies must have a safety-management plan; counties can help promote awareness of Utah's Canal Safety Program and Canal Inventory, including available funding to assist in developing a safety management plan. Consider establishing recreation trails along irrigation corridors as a means of strengthening the need to keep the corridor.

5. ECONOMIC CONSIDERATIONS

Salt Lake County has a diverse and robust economy with a large and rapidly growing population. The close proximity and easy access to public lands in Salt Lake County is an incredible asset to the residents and visitors alike. The overall economy of the county is best served by prioritizing protective land uses and management objectives over resource development and extraction.

Related resources:

- Recreation and Tourism
- Land Use

5.1 Management Setting

Context

Salt Lake County has a diverse and robust economy supported by the close proximity and easy access to public lands.

Findings

Salt Lake County, with its 17 incorporated communities, five metro townships, and 1,029,655 residents (2010 US Census), is the largest county in Utah by population and the 39th most populous county in the United States. People are one of Salt Lake County's great assets. Developing the labor force occurs within the county at the University of Utah, Salt Lake Community College, LDS Business College, BYU Salt Lake Center, Westminster College, and a handful of other learning institutions.

Salt Lake County contains valuable natural resources. Sales from mineral resources amount to $417.5 million in 2013. On the east side of the county, the Wasatch Mountain Range is home to four world-class ski resorts: Snowbird, Alta, Solitude, and Brighton. The Jordan River runs the length of Salt Lake County and empties into the Great Salt Lake. The numberless tributary streams make the river rich in minerals, benefiting wildlife and agricultural pursuits such as alfalfa and winter wheat production. In 2012 the county had 630 farms covering 78,162 acres. The total market value sold that year was $21.5 million.[1]

Significant sales are generated from ski areas and resorts in the Canyons of Salt Lake County. Table 5.1 provides taxable sales for the Canyons.

Table 5.1. Taxable sale for 2015 and 2016 in the Canyons.

Zip Code	General Location	Total Taxable Sales 2015[1]	Total Taxable Sales 2016[1]
84092	Sandy/Little Cottonwood Canyon	$ 202,630,995	$212,610,390
84108	Emigration Canyon	$ 175,507,680	$181,690,529
84109	Mill Creek/Mill Creek Canyon	$ 264,309,337	$277,577,827
84121	Cottonwood Heights/Alta/Big Cottonwood	$ 508,991,328	$517,803,969
84124	Holladay/ Mill Creek Canyon	$ 138,587,293	$138,647,030

1 Total Taxable Sales: Utah State Tax Commission, Calendar Year Taxable Sales, Zip Code Level by NAICS. http://www.tax.utah.gov/econstats/sales/yearly

The Salt Lake City International Airport supports the county's thriving tourism industry. In 2013, 4.2 million skiers visited Utah. Of the state's 15 ski resorts, 11 of them are within one hour of Salt Lake City International Airport. In addition to enjoying the county's natural resources, visitors typically make their

way to Temple Square, theme and water parks, aquariums, museums, and national monuments. In 2014 Salt Lake County had 53,646 leisure and hospitality-related jobs.[2,3]

The Uinta-Wasatch-Cache National Forest receives significant visitation from residents and visitors. Each year millions of people visit its ski resorts, campgrounds, trails, and backcountry sites. Tables 20.1 and 20.2 in CRMP Section 20, Recreation and Tourism provide a breakdown of visitation estimates.

Water resources and a healthy watershed are also important to the economic viability of the Salt Lake Valley. About 60 percent of the Salt Lake Valley's watershed is federal land managed by the Forest Service. The Forest Service, Salt Lake City, and Salt Lake County all recognize the importance of the watershed to the communities of the Salt Lake Valley. These entities all share jurisdictional authority and have planning objectives for protecting water quality in the watershed.

Legal Context

Applicable Laws

The US Forest Service (Forest Service) manages land use decisions, including recreation by developing land and resource management plans , also known as Forest Plans, under the National Forest Management Act (16 USC §1600 et seq. [1976]). The Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]) mandates the US Bureau of Land Management to manage lands, including recreational uses, under multiple-use philosophy. Both federal land managers set recreation policy following planning procedures specified by the National Environmental Policy Act (42 USC §4321 et seq. [1969]).

State laws applicable to recreation and tourism include the Transient Room Tax enabled by Utah Code §59-12-3 et seq., which allows counties to levy a tax up to 4.25% on hotel accommodations. The Tourism, Recreation, Cultural, Convention, and Airport Facilities Tax Act, Utah Code: §59-12-6 et seq. (2008) allows counties to levy a tax up to 4% on short-term motor vehicle rentals. Funds collected under this law may be used for the development, operation, and maintenance of cultural, recreational, or tourist facilities. Utah Code §17-31-8 requires all counties which levy either taxes to form an advisory board to represent industries being taxed. Utah Code §63N-7-1 created the Board of Tourism, which advises the Governor's Office of Economic Development on "planning, policies, and strategies and on trends and opportunities for tourism development."

5.2 Desired Future State

Salt Lake County desires to continue to support the industries and resources on public lands that sustain the county's economy while maintaining water quality, air quality, wildlife, and habitat. Proximity to high-quality public lands with diverse recreation opportunities is a key amenity to the location of new and existing businesses in Salt Lake County.

5.3 Management Objectives and Associated Policies and Guidelines

5.3.1 Management Objective

Support projects that contribute to the economy in ways that maintain or improve water quality, air quality, and wildlife habitat.

Policies and Guidelines

- Support efforts that encourage new and existing industries to reduce air and water pollution or create and maintain wildlife habitat.

5.3.2 Management Objective

Support efforts that provide high-quality diverse recreation opportunities on public lands.

Policies and Guidelines

- Work cooperatively across agencies and local governments to manage public lands with the greatest public interest.

- Support diverse recreation opportunities on public lands and provide facilities and maintenance necessary to support those opportunities.

5.4 References

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[2] Kem C. Gardner Policy Institute, University of Utah. 2015. Utah Travel and Tourism Profile, State and Counties 2013-2014. http://gardner.utah.edu/wp-content/uploads/2015/09/CombinedTourismProfiles.pdf (accessed March 26, 2017).

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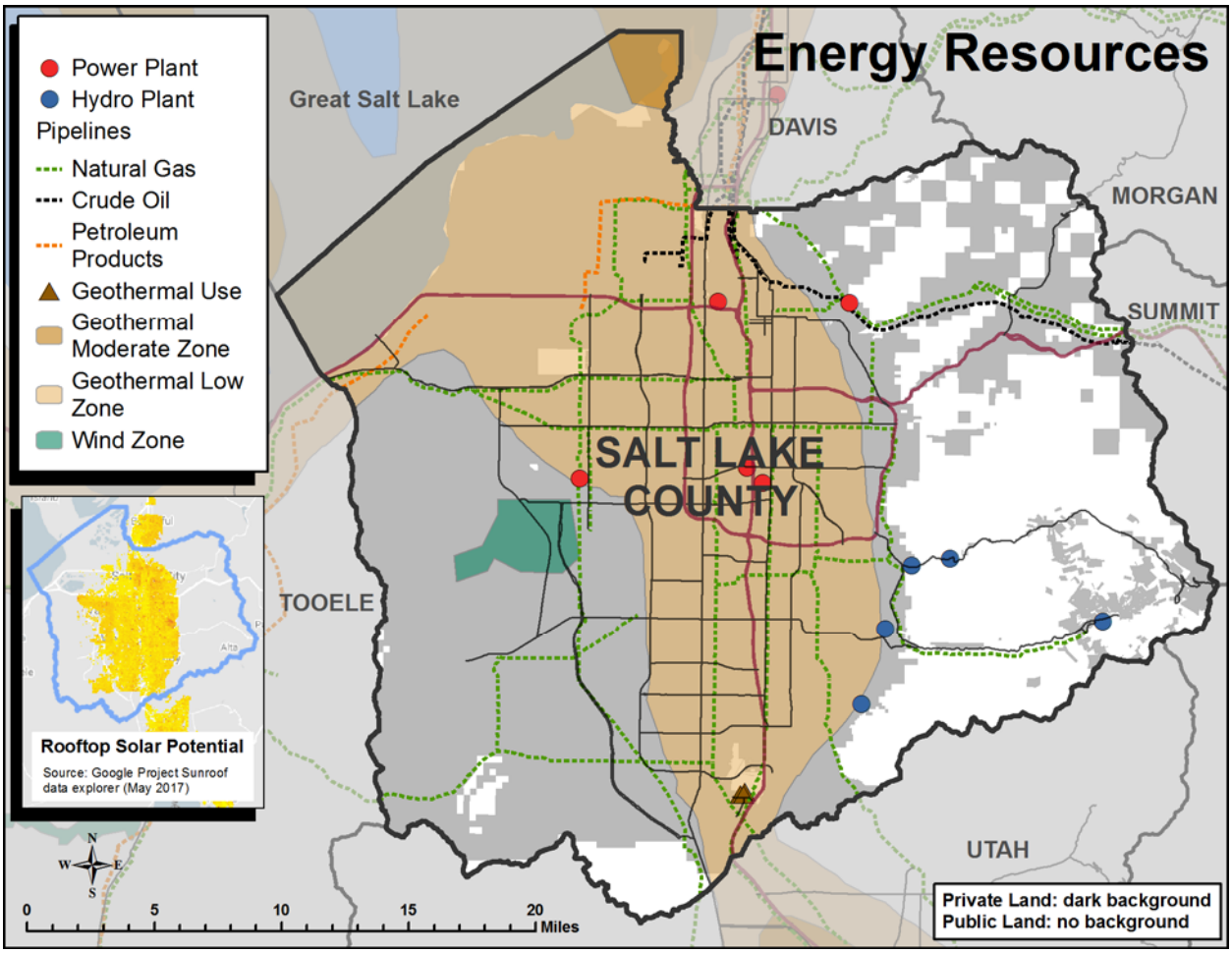
6. ENERGY RESOURCES

Public and private utilities draw upon Utah's renewable and nonrenewable resources to provide electricity and fuel (natural gas, propane, oil, gasoline, coal) energy supplies.

Related resources:

- Utilities
- Air Quality
- Mining
- Mineral Resources



Data Source: PowerPlants_CO2, July 2008, Compiled by Utah Automated Geographic Reference Center. Geothermal Power Production Potential, Geothermal Use, and Pipelines, Date unknown, Utah Geological Survey. UREZPhase1_WindZones, Date unknown, Utah Renewable Energy Zone. Access via Utah Automated Geographic Reference Center. Note: Data source for solar potential beyond rooftops did not include areas identified within Salt Lake County.

6.1 Management Setting

Context

Energy resources includes the development and production of energy (fossil fuel and renewable) as well as the transmission of energy across public lands (powerlines, pipelines, etc.). Energy transmission

projects on public lands may affect sensitive wildlife, drinking water source areas, and other resources. The use and development of renewable energy in Salt Lake County is a boon to Utah's economy.

Findings

Several refineries in the Salt Lake Valley process crude oil produced in other locations in Utah and elsewhere. Though coal is present on US Forest Service (Forest Service) property within Salt Lake County, and several unproductive and test wells have been drilled in the past, currently there is no oil, coal, or natural gas production in the county.[1] Energy transmission via pipelines and powerlines occurs, though precise counts and locations are not available. According to a 2008 Utah Automated Geographic Reference Center spatial dataset of power plants in Utah, there are five natural gas power plants operating in Salt Lake County.[2]

Potential exists for renewable energy production in Salt Lake County. A 2009 report completed by the Utah Renewable Energy Zone (UREZ) task force identified wind drainage sites at the mouth of Parleys and Emigration Canyons.[3] This same report identifies the entire Salt Lake Valley as having potential for geothermal energy production.

Legal Context

Applicable Laws

The Mineral Leasing Act of 1920, as amended (30 USC §§181 et seq.) is the major Federal law governing oil, gas, coal, and other hydrocarbons on public lands. This act instructs the US Department of Interior via the US Bureau of Land Management (BLM) to lease extraction rights for energy production on lands managed by the BLM and Forest Service. The Geothermal Steam Act of 1970 (30 USC §§1001 et seq.) authorizes the US Department of Interior via the BLM to lease extraction rights for geothermal resource production on lands managed by the BLM and Forest Service.

Applicable state laws include Utah Code §40-6-1 et seq. (1983) established the Utah Division of Oil, Gas, and Mining (DOGM) within the Utah Department of Natural Resources (DNR) with authority to regulate oil and gas mining as well as promote the development and production of oil and gas. In 1982 DOGM obtained primacy from the Environmental Protection Agency for regulation of Class II Water Injection Wells; this program regulates disposal of produced water from oil and gas wells, and reinjection of fluids for pressure maintenance and secondary recovery operations in oil and gas fields.

6.2 Desired Future State

Salt Lake County does not have a history of fossil fuel development and desires to limit future fossil fuel energy development. Energy transmission is a necessity for modern society, but new energy transmission routes across public lands should be directed to previously disturbed and fragmented areas.

Salt Lake County promotes the conservation of energy used to support public lands facilities, operations, and transportation. The county supports renewable energy development on public lands, but proposed projects should be screened for potential visual and natural resource impacts.

6.3 Management Objectives and Associated Policies and Guidelines

6.3.1 Management Objective

Limit new fossil fuel energy development within Salt Lake County.

Policies and Guidelines

- Participate in public land planning efforts to promote measures that limit new fossil fuel development.
-
- Promote non-fossil fuel energy sources as viable alternatives to meet energy needs within the county.

6.3.2 Management Objective

Locate new energy transmission across public lands within Salt Lake County to previously disturbed and fragmented areas.

Policies and Guidelines

Help identify previously disturbed and fragmented areas that may serve as new energy transmission corridors.

6.3.3 Management Objective

Review all renewable energy development and transmission proposals across public lands within Salt Lake County for potential visual and natural resource impacts.

Policies and Guidelines

Coordinate and participate with state and federal agencies to review all renewable energy development and transmission projects on public lands for potential visual and natural resource impacts.

6.3.4 Management Objective

Promote conservation of energy within Salt Lake County.

Policies and Guidelines

Support public education efforts that promote energy conservation.

6.4 References

[1] Utah Department of Natural Resources, Oil, Gas, and Mining Division. 2013. Oil and Gas Wells, spatial data. https://gis.utah.gov/data/energy/oil-gas/

[2] Utah Automated Geographic Reference Center. 2008. Power Plants (CO2), spatial data. https://gis.utah.gov/data/energy/energy-generation/

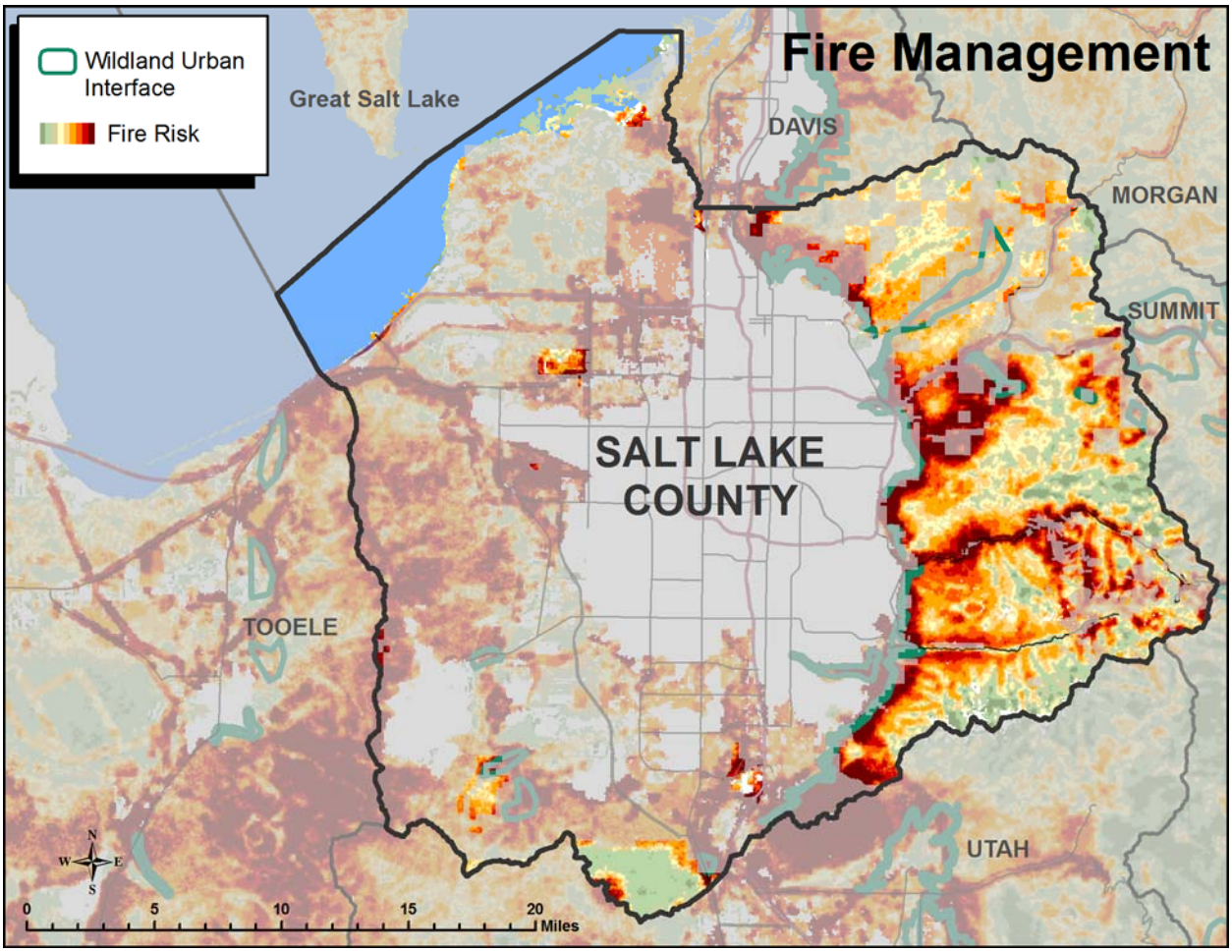
[3] Berry, Jason et.al. 2009. Utah Renewable Energy Zones Task Force Phase I Report, Utah Geological Survey, Department of Natural Resources. https://energy.utah.gov/wp-content/uploads/UREZ-Phase-I.pdf

7. FIRE MANAGEMENT

Fire management refers to the principles and actions to control, extinguish, use, or influence fire for the protection or enhancement of resources as it pertains to wildlands. It involves a multiple-objective approach strategy including ecosystem restoration, community preparedness, and wildfire response.

Related resources:

- Forest Management
- Noxious Weeds
- Air Quality



Data Source: Urban Interface Areas, 1999, Compiler unknown, Access via Utah Automated Geographic Reference Center. Utah Fire Risk Index, 2013, West Wide Risk Assessment, Utah Division of Forestry, Fire, and State Lands.

7.1 Management Setting

Context

Wildfire is the most prevalent disturbance to natural resources in the state of Utah. The threat of wildfire in Salt Lake County is greatest on its public lands. The wildland-urban interface (the residential and developed areas bordering open space and public lands) surrounds Salt Lake Valley and is the area that contains development and infrastructure most at risk in the event of a wildfire on public lands. The wildland-urban interface requires its own unique fire management considerations because of the following factors:

- High density of structures (both residential and outbuildings)
- Higher density of utilities that could be impacted
- More complex evacuations procedures
- Concentrated air-quality issues and effects
- Impact to drinking water sources

Fire suppression is expensive to taxpayers. With climate change and expected increase in temperatures variation in precipitation patterns, and longer drought periods, fire-suppression costs are projected to rise. Effective fire management includes elements of wildfire prevention, mitigation, and preparedness.

Findings

Wildfire is the most prevalent natural disturbance in the state of Utah, and it affects biotic communities statewide. It is an integral component of our forest, range, and desert lands and affects thousands of acres on an annual basis. Below is a compilation of Salt Lake County wildland fire statistics since 2001 (Table 7.1).[1]

Table 7.1. Nationally reported wildland fires and acreage burned in Salt Lake County since 2001.

YEAR	NUMBER OF FIRES	ACREAGE BURNED
2001	2	8,503
2002	2	384
2008	3	907
2010	2	2,326
2011	1	79
2012	2	1,674
2016	1	8.25

Source: Geospatial Multi-Agency Coordination Group (GeoMAC) fire perimeter data.

Legal Context

Response to fire incidents relies on proper oversight, guidance, and partnership among a variety of trained professional organizations. Establishing a fire management system is a critical step in protecting communities both urban and rural. Fire management refers to the principles and actions to control, extinguish, use, or influence fire for the protection or enhancement of resources as it pertains to wildlands. It involves a multiple-objective approach strategy including ecosystem restoration, community

preparedness, and wildfire response.[2] Wildfires do not adhere to political boundaries, and cooperation among different agencies and jurisdictions covering federal, state, county, municipal, and rural/ volunteer fire departments is essential for successful fire management response. In Utah the state legislature tasked the Utah Division of Forestry, Fire, and State Land (FFSL) to devise a Comprehensive Statewide Wildland Fire Prevention, Preparedness, and Suppression policy known as SB-56.[3] Under this plan a master cooperative wildland fire management and Stafford Disaster Relief and Emergency Assistance Act (42 USC §5187 et seq. [1988]) response agreement is signed each year between numerous federal land management agencies and the State of Utah for cooperation during wildland fire incidents that occur throughout the state.[4]

Utah Code §11-7-1(1) requires counties and municipalities to provide fire protection within their boundaries and coordinate with adjacent counties and public land management agencies to conduct fire suppression. Utah Code §65a-8-202(4) requires counties (not municipalities) to be responsible for cost of fire suppression.

The applicable fire management planning document for the state is the Utah Forest Action Plan, published by FFSL in 2016.[5]

7.2 Desired Future State

Salt Lake County supports controlled wildland fire use and prescribed fire on public lands to provide for ecosystem maintenance and restoration consistent with land uses and historic fire regimes where it does not threaten adjacent development. Salt Lake County supports fire suppression activities for public and firefighter safety and protection of other federal, state and private property and natural resources. Salt Lake County also supports hazardous fuel management to reduce risk of property damage and large fires.

7.3 Management Objectives and Associated Policies and Guidelines

7.3.1 Management Objective

Support controlled wildland fire use and prescribed fire on public lands to provide for ecosystem maintenance and restoration consistent with land uses and historic fire regimes where it does not threaten adjacent development.

Policies and Guidelines

Coordinate with state and federal land management agencies and wildland firefighting entities to use controlled wildland fire use and prescribed fire on public lands where it does not threaten adjacent development or culinary water supply.

7.3.2 Management Objective

Salt Lake County supports the Utah Wildland Fire Policy management objectives of prevention, preparedness, and suppression outlined by Forestry, Fire and State Lands.[3]

Policies and Guidelines

Wildland Fire Prevention and Preparedness

- Support defensible space initiatives and programs that maintain ecosystem health and lessen the wildfire dangers to public safety.

- Encourage increased use of fire to return fire-dependent ecosystems to proper functioning condition and to reduce hazardous fuels in locations where it does not threaten adjacent development.

- Support public education programs that promote wildfire prevention while also educating on the benefits of fire, when properly managed, to improve watershed health, wildlife habitat, and reduce hazardous fuels.

- Support active management of vegetation to reduce components or factors that promote risk of catastrophic fire, such as cheatgrass, excessive conifer encroachment, or unnaturally large stands of mature Gambel oak.

Wildland Fire Suppression

- Salt Lake County supports the following activities related to wildland fire suppression
    - Firefighter training,
    - Adequate equipment and resources
    - Utilization of the incident command system
    - Pre-identified fire response staging areas and camp areas
    - Interagency and governmental cooperation and communication
    - Government and leader support
    - Proper emergency and evacuation plans
    - Flexibility to match the best firefighting strategies and tactics to a fire situation
    - Implementing proper airspace restrictions to safely execute aerial firefighting response
    - Public outreach on closing roads, trails to better assist and safeguard firefighting personnel

7.3.3 Management Objective

Reduce the risk of fire and potential damages in case of fire in wildland-urban interface areas.

Policies and Guidelines

- Support wildland urban interface risk assessments and risk reduction efforts.[6]

- As appropriate update the Foothills and Canyons Overlay Zone[7] ordinance to include wildfire mitigation principles.

- Support creating fire-adapted communities[6] through the following:

    1. Development of a Community Wildfire Protection Plan or equivalent plan to help larger communities identify key values at risk and ways to mitigate fire risk.

    2. Implementation of vegetation management and ignition-resistant homes on private lands.

    3. Local responder understanding of the complexities of preparing for and dealing with wildfire.

    4. Fuels treatments on public and private lands in and around communities to reduce hazardous fuels and create fuel buffers.

    5. Codes, covenants, and ordinances to foster development in the wildland-urban interface that minimizes fire risk.

    6. Cooperation between jurisdictional authorities.

7.4 References

[1] National Interagency Fire Center. 2016. National Report of Wildland Fires and Acres Burned by State. https://www.nifc.gov/fireInfo/fireInfo_statistics.html (accessed January 8, 2016).

[2] US Forest Service. 2016. Wildland Fire Touches Every Part of the Nation. Managing Wildland Fires. https://www.fs.fed.us/fire/management/index.html (accessed February 6, 2016).

[3] Utah Department of Natural Resources, Utah Division of Forestry, Fire, and State Lands. 2015. Utah Wildland Fire Policy. http://le.utah.gov/interim/2015/pdf/00005301.pdf (accessed February 2, 2016).

[4] Utah Department of Natural Resources, Utah Division of Forestry, Fire, and State Lands. 2013. Master Cooperative Wildland Fire Management and Stafford Act Response Agreement. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5409791.pdf (accessed February 2, 2016).

[5] Utah Department of Natural Resources, Utah Division of Forestry, Fire, and State Lands. 2016. Utah Forest Action Plan 2016. http://www.ffsl.utah.gov/images/forestry/stateassessment/UtahFAP-2016-HighRes-dnd.pdf (accessed March 24, 2017).

[6] Wildland Urban Interface Wildfire Mitigation Desk Reference Guide, PMS 051, National Wildfire Coordinating Group. August 2014. https://www.nwcg.gov/sites/default/files/products/pms051.pdf Accessed 23 March 2017.

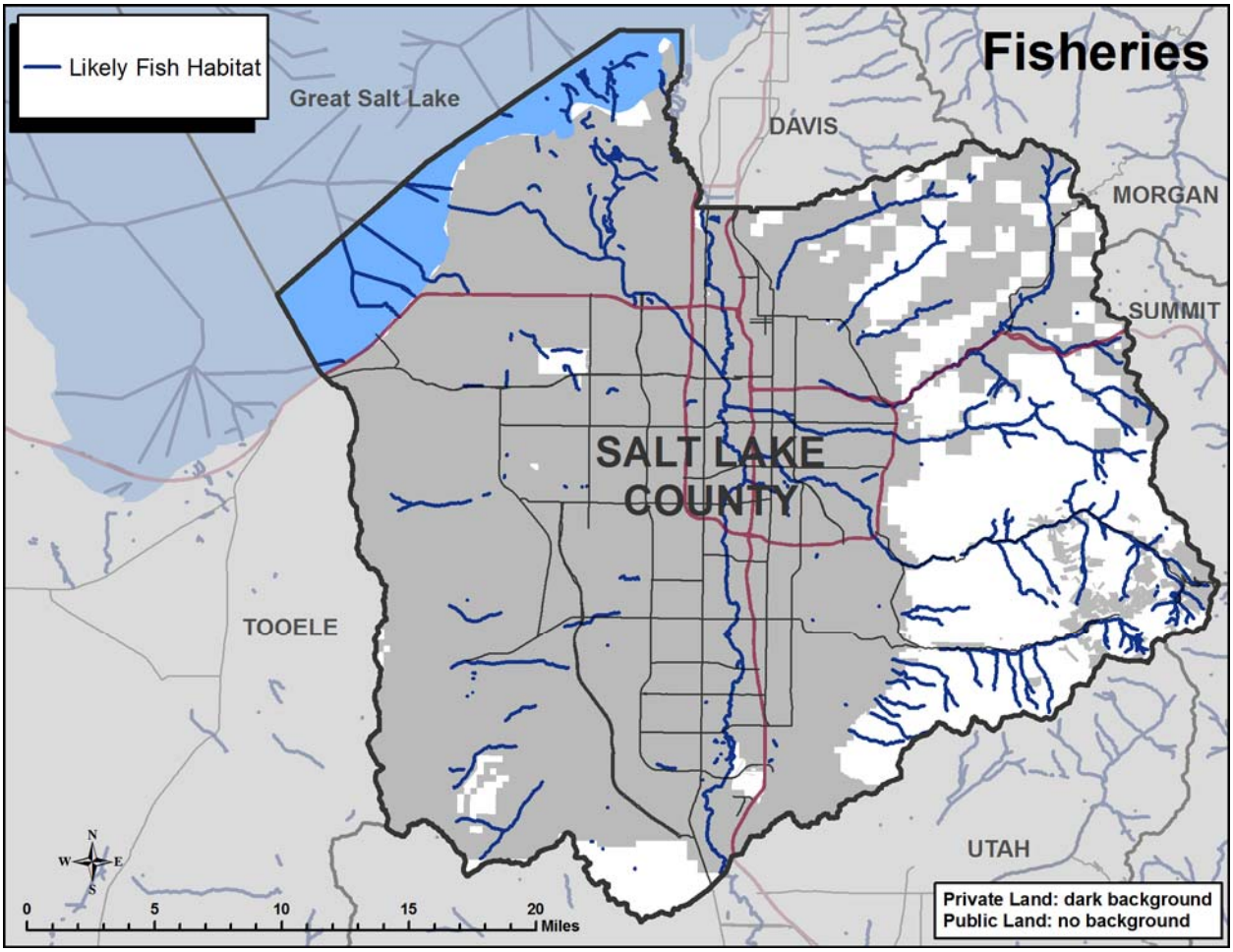
[7] Salt Lake County Ordinances, Chapter 19.72 Foothills and Canyons Overlay Zone. https://slco.org/uploadedFiles/depot/fTownships/FCOZ%20Current%20Title%2019%20Final%20Draft.pdf Accessed 23 March 2017.

8. FISHERIES

A fishery is an aquatic system that includes a target organism, a community of species on which that organism depends, the habitat in which they reside, and the humans that affect or utilize the resource within the ecosystem.

Related resources:

- Water Quality and Hydrology
- Threatened, Endangered, and Sensitive Species



Data Source: Streams NHD High-Res, Date unknown, National Hydrologic Dataset, Access via Utah Automated Geographic Reference Center.

8.1 Management Setting

Context

Fishing and fisheries provide education and introduction to natural resources and their management. Sport fishing has significant, positive economic impact in Utah through retail and tourism. Brine shrimp fishing in the Great Salt Lake is a multimillion-dollar industry in Utah.

The primary concerns regarding fisheries in Salt Lake County are:

- Sport fisheries
- Aquatic invasive species (AIS)
- Brine shrimp

Findings

The Utah Division of Wildlife Resources (DWR) is responsible for managing fisheries in Utah with a primary resource goal of providing quality recreational fishing opportunities.[1] Assisting the DWR in decision making and establishing management priorities is the Utah Wildlife Board and five Regional Advisory Councils (RACs) who provide local input on fishing related issues. Each RAC consists of a diverse group of interest group representatives, including agriculture, sportsmen, federal land agencies, general public, and elected officials. Meeting schedules and agendas can be found on the RAC website.

Aquatic invasive species (AIS) or aquatic nuisance species are defined by the DWR as nonnative species of aquatic plants and animals that cause harm to natural systems or human infrastructure. Not all nonnative species are considered AIS, as many nonnative fish species are desirable for sport fishing. These may include nonnative rainbow trout, brown trout, bass, and catfish.

The primary AIS threats in Utah are related to *Dreissenid* spp. mussels, such as quagga mussel, zebra mussel, and dark falsemussel. Invasive mussels in Utah waters have no natural competitors, and once they are established, they spread quickly, growing on nearly all underwater surfaces. The prolific mussels often clog water and power infrastructure, harm aquatic recreational equipment, and outcompete native species for nutrients, which can have profound effects on sportfish populations higher in the food chain.

Dreissenid spp. have infested several waterbodies of southern Utah and possibly Deer Creek Reservoir in Wasatch County. On January 15, 2016, the DWR posted notice of the detection of quagga mussel veligers (juvenile mussels) in the reservoir. While not in Salt Lake County, Deer Creek Reservoir is close enough to Salt Lake County to warrant concern about the spread of *Dreissenid* into local waters.

Legal Context

All wildlife, including fish, are the property of the State of Utah and managed by the DWR.

Applicable Laws

Utah Code §23-13-3 provides that wildlife not held by private ownership is considered property of the state. Utah Code §23-15-2 establishes that the state has jurisdiction of all wildlife in the state, including aquatic wildlife, whether on public or private land. Utah Code §4-23-2 declares that preserving the wildlife resources of the state is important to the economy of the state. Utah Code §23-14-2.6 establishes the organization and function of RACs, which advise the state Wildlife Board regarding wildlife management issues.

8.2 Desired Future State

Salt Lake County desires to protect and enhance fisheries within the county to support native fish, sport fishing, and tourism. Efforts conducted to restore riparian and in-stream habitats where degraded are supported. Best management practices conducted to improve water quality and aquatic habitat on public lands as well as downstream and in the Great Salt Lake are supported. These efforts should be informed and guided by Salt Lake County Watershed Planning and Restoration Department, which actively works to on watershed issues throughout the county.

Salt Lake County also desires to prevent AIS from entering its waterways with support from DWR public education efforts on the transmission and impacts of AIS and proper equipment cleaning protocols. Salt Lake County will work to control and prevent the spread of AIS where they may already be present, including water bodies, rivers, streams, canals and ditches.

8.3 Management Objectives and Associated Policies and Guidelines

8.3.1 Management Objective

Restore riparian and in-stream habitats on public lands where degraded to support native fish, sport fishing, and tourism.

Policies and Guidelines

- Support restoration of natural water and sediment flow regimes.[2]
- Support reduction of inappropriate grazing by domestic livestock and wildlife in riparian and aquatic habitat.
- Support reduction of inappropriate siting of roads in riparian zones.
- Support the increase of cover and extent of riparian vegetation by restoring beavers on the landscape, where social and environmental factors permit (per Beaver Restoration Assessment Tool).[2]
- Support the removal of in-stream barriers where practical and the creation of selective fish passage structures around barriers which cannot be removed.[2]
- Support reduction of artificially channelized or straightened stream miles.[2]

8.3.2 Management Objective

Improve water quality to benefit native fish, sport fishing, and tourism.

Policies and Guidelines

- Support land management activities that improve water quality and aquatic habitat.
- Participate in the state water quality standards, beneficial use, and impaired waterbody rule-making processes to preserve and enhance watershed and area-wide water quality.[3]
- Support the acquisition and conversion of water rights for in-stream flows. Work with the Department of Water Rights, as necessary, to modify water right beneficial use to allow in-stream flows. [3]

- Support development of water leasing program to hold in-stream flows.

- Support utilization of existing monitoring data to assess water quality issues .[3,4]

- Engage coordination with water management authorities and water user groups to find flexibility within existing water laws and policies for meeting wildlife conservation objectives.[2,3]

8.3.3 Management Objective

Support water quality BMPs on public lands to improve water quality downstream and in the Great Salt Lake.

Policies and Guidelines

Support land management activities that improve water quality downstream and in the Great Salt Lake.

8.3.4 Management Objective

Encourage the prevention and establishment of AIS from all waterways and waterbodies in Salt Lake County.

Policies and Guidelines

Support the DWR Aquatic Invasive Species Management Plan and public education efforts on the transmission and impacts of AIS and proper equipment cleaning protocols.[5,6]

8.4 References

[1] Utah Department of Natural Resources, Division of Wildlife Resources. 2015. "Goals and Objectives". https://wildlife.utah.gov/about/goals.php (accessed February 4, 2016).

[2] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2015. Utah Wildlife Action Plan, Draft Version 6-4-2015. https://wildlife.utah.gov/wap/wap2015draft.pdf (accessed March 14, 2017).

[3] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

[4] Salt Lake County. 2017. SCLo Watershed: Stream and Rain Gauging Program. Website. https://rain-flow.slco.org/home.php (accessed April 18, 2017).

[5] Utah Department of Natural Resources, Utah Division of Wildlife Resources, Utah Aquatic Invasive Species Task Force. 2009. Utah Aquatic Invasive Species Management Plan, Publication No. 08-34.

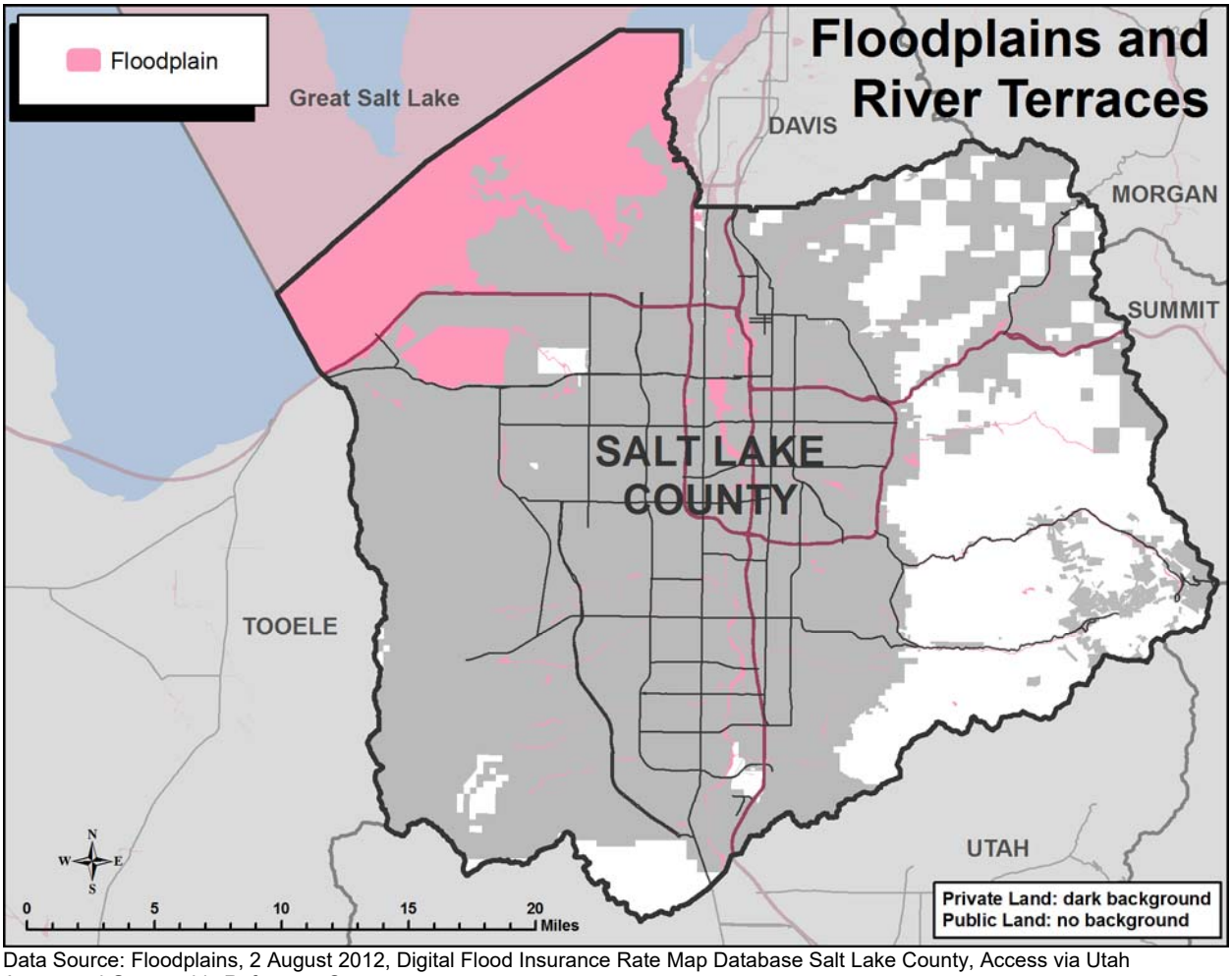
[6] US Department of the Interior, Bureau of Reclamation. 2012. Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species. Technical Memorandum No. 86-68220-07-05.

9. FLOODPLAINS AND RIVER TERRACES

Floodplains are the low-lying, flood-prone areas adjacent to a river. River terraces are the bench or stepped areas that extend along river valleys. River terraces usually represent former levels and paths of floodplains of a stream or river. Rivers are dynamic systems. They can migrate laterally as a result of bank erosion and deposition, and move vertically as a result of bed aggradation or degradation. Floodplains and terraces are formed during these channel migration processes. Therefore, floodplains and terraces are essentials parts of the river system.

Related resources:

- Riparian Areas
- Wetlands
- Water Quality and Hydrology
- Irrigation



Data Source: Floodplains, 2 August 2012, Digital Flood Insurance Rate Map Database Salt Lake County, Access via Utah Automated Geographic Reference Center.

9.1 Management Setting

Context

Several creeks and water courses exist on public lands within Salt Lake County, which contribute to the Jordan River in the center of the Salt Lake Valley.

Waterways in Salt Lake County support the Great Salt Lake and the health of its surrounding wetlands.

Findings

Floods occur when the river channel reaches its maximum capacity and water overflows streambanks into nearby areas that would otherwise be dry. Floods are caused by heavy rains or snowmelt delivering water at a rate faster than the soils can absorb it, or when a dam, landslide, or other impoundment gives way and rapidly releases large amounts of water. For the most part, flooding is a natural process that contributes to channel maintenance, ecological processes, and riparian vegetation. Natural flooding usually occurs during peak flows or periods of high-water discharge.[1] Nevertheless, floods can cause severe impacts and therefore must be mitigated.

The Federal Emergency Management Agency (FEMA) provides flood data that classifies areas based on flood hazards mapped through the National Flood Hazard Layer (NFHL). This enables community officials, emergency responders, and the public to be informed and plan accordingly to avoid or reduce impacts from floods. The FEMA and NFHL also guide development and reduce risk by excluding flood hazard areas. The NFHL maps the probability of flooding at specific areas using historical data and prediction models. Floodplains are classified based on the probability of a specific flood event happening in that area. For example, a 100-year floodplain means that a flood event that can inundate the specific area has a probability of happening once in 100 years. This does not mean that the area would be inundated once every 100 years; a 100-year floodplain can be inundated 2 years in a row. Rather, this means that every year there would be a 1% probability of a 100-year flood happening in that area (Table 9.1). Salt Lake County has been digitally mapped by NFHL, most recently in August of 2015.

Table 9.1. Acreage of Salt Lake County in 100-year floodplain.

FLOOD ZONE	ACRES
100-year flood zone	8,391
100-year flood zone (Great Salt Lake)	50,407
Outside flood zone	453,618

Source: Federal Emergency Management Agency National Flood Hazard Layer.

Legal Context

Applicable Laws

Executive Order 11988 Floodplain Management (1977) as summarized on the FEMA website instructs Federal Agencies to do the following:[2]

- Assert leadership in reducing flood losses and losses to environmental values served by floodplains.
- Avoid actions located in or adversely affecting floodplains unless there is no practicable alternative.

- Take action to mitigate losses if avoidance is not practicable.

- Establish a process for flood hazard evaluation based upon the 100-year base flood standard of the National Flood Insurance Program.

The Executive Order also directs federal agencies to issue implementing procedures, provides a consultation mechanism for developing the implementing procedures, and provides oversight mechanisms.

Utah Code §17-27a-401-2-e (County) and 10-9a-401-2-e (Municipal) require general plans to "promote health, safety, and welfare" through the protection of urban development. State statutes allow local jurisdictions to address geologic hazards through zoning districts and ordinance to regulate land used in floodplains and potential geologic hazard areas (Utah Code §17-27a-505-1-c (County) and 10-9a-505-1-c (Municipal).

Utah Code §73-3-29-1 requires all state, county, municipal or private landowner to acquire a permit from the state engineer to "relocate any natural stream channel or alter the beds and banks of any natural stream without first obtaining the written approval of the state engineer." Among other purposes, this law is designed to prevent stream alteration which might "unreasonably or unnecessarily diminish the natural channel's ability to conduct high flows."

9.2 Desired Future State

Salt Lake County desires to promote a healthy hydrological system that encourages efficient flood control and water conveyance, while providing clean water, wildlife habitat, and recreational uses.

9.3 Management Objectives and Associated Policies and Guidelines

9.3.1 Management Objective

Protect life and property from the risks of flooding through application of stream setbacks, FEMA flood zone requirements, and careful review of development along streams and at the mouths of drainages.

Policies and Guidelines

- Work to establish protocols for determining appropriate buffers, land use zones, and accompanying-use regulations to meet water-quality objectives.

- The Salt Lake County Flood Control Division will provide for ongoing maintenance program and direct the cleaning and maintenance of natural channels, ditches, open drains and storm drains which are included in the storm drainage and flood control system. Work in open natural channels and creeks shall be limited to that necessary to remove immediate threats of flooding and existing rights shall be protected as specified in County Code Section 17.08.050.

- The Salt Lake County Flood Control Division will establish criteria, engineering and otherwise, whereby applicants for building permits may be aware of, and plan for, the drainage requirements which must be met as a condition to receiving the County Flood Control Division's approval for such permit.

9.3.2 Management Objective

Encourage management actions within floodplains and wetlands which include measures to preserve, protect, and if necessary, restore their natural functions.

Policies and Guidelines

Establish protocols for determining appropriate buffers to meet floodplain, wildlife habitat, target species habitat, and wildlife migration or dispersal functions related to specific landowner wildlife conservation objectives.[3,4]

9.4 References

[1] Jordan River Commission. 2013. Best Practices for Riverfront Communities. http://jordanrivercommission.com/wp-content/uploads/BP-high-res-for-web.pdf (accessed March 23, 2017).

[2] Federal Emergency Management Agency. ND. Executive Order 11988. https://www.fema.gov/executive-order-11988 (accessed March 23, 2017).

[3] Riparian Buffer Design Guidelines, USDA, General Technical Report RMRS-GTR-203, January 2008. https://www.fs.fed.us/rm/pubs/rmrs_gtr203.pdf (accessed March 16, 2017).

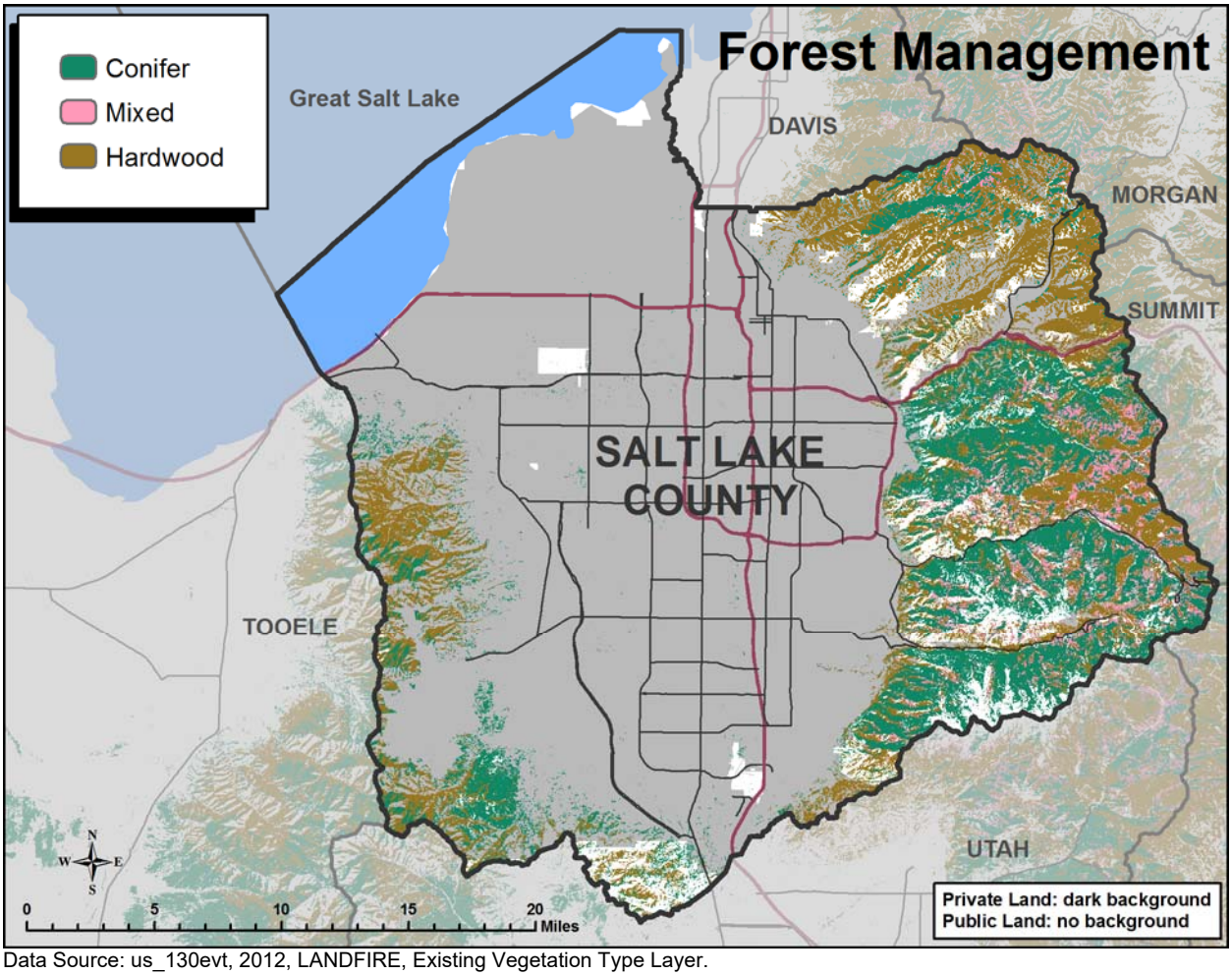
[4] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

10. FOREST MANAGEMENT

Forest management consists of the principles and actions for the regeneration, use, and conservation of forests. Forests, woodlands, and urban forests add to the quality of life.

Related resources:

- Fire Management
- Noxious Weeds



Data Source: us_130evt, 2012, LANDFIRE, Existing Vegetation Type Layer.

10.1 Management Setting

Context

Forests in Salt Lake County consist of oak-maple forests in low elevations, pinyon-juniper forests low-to-mid elevations, Douglas-fir forests in mid elevations, aspen forests in low-to-high elevations, and urban forests within cities. Good forest management is a benefit to water quality, wildlife habitat, recreation, aesthetics, and the forest's ability to adapt to climate change. Climate change is altering temperature and precipitation levels in the west and will in turn alter the forest and its composition. The US Forest Service (Forest Service) is the largest public land manager in Salt Lake County, managing almost 100,000 acres

in the county, 77,000 acres of which are forested. The US Bureau of Land Management (BLM) also manages a small amount forest lands within the county.

Findings

Salt Lake County is home to 142,816 acres of forested area on lands owned or managed by the Forest Service, BLM, and private landowners. Table 10.1 shows forest types by landowner.

Table 10.1. Acres of forested vegetation type in Salt Lake County by landowner.

FORESTED VEGETATION TYPE	US FOREST SERVICE (ACRES)	BUREAU OF LAND MGMT (ACRES)	PRIVATE (ACRES)
Alpine Dwarf-Shrubland, Fell-field and Meadow	1,509	12	2,000
Aspen-Mixed Conifer Forest and Woodland	8,889	58	2,506
Aspen Forest, Woodland, and Parkland	15,788	0	12,664
Bigtooth Maple Woodland	12,143	273	24,012
Douglas-fir-Grand Fir-White Fir Forest and Woodland	15,555	44	7,102
Douglas-fir-Ponderosa Pine-Lodgepole Pine Forest and Woodland	5,345	18	942
Juniper Woodland and Savanna	3	2	36
Limber Pine Woodland	0	0	45
Lodgepole Pine Forest and Woodland	93	0	117
Mountain Mahogany Woodland and Shrubland	3,715	89	4,372
Pinyon-Juniper Woodland	779	1,007	6,190
Ponderosa Pine Forest, Woodland and Savanna	8	2	4
Spruce-Fir Forest and Woodland	12,100	-	2,668
Western Riparian Woodland and Shrubland	1,000	3	1,723

Source: US Geological Survey, Landfire Existing Vegetation Type, 2012.

Legal Context

Management of forest vegetation on Forest Service and BLM lands follows standard land use planning procedures defined in National Forest Management Act (16 USC §1600 et seq. [1976]), National Environmental Policy Act (42 USC §4321 et seq. [1969]), and Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]). Refer to CRMP Section 12, Land Use, for more information regarding land use decision-making procedures.

10.2 Desired Future State

Salt Lake County desires to maintain and improve forest health for the benefit of water quality, wildlife habitat, recreation, aesthetics, and the forest's adaptation to climate change.

10.3 Management Objectives and Associated Policies and Guidelines

10.3.1 Management Objective

Maintain resilient forest vegetation capable of adapting to changing climate utilizing vegetation treatments, prescribed fire, and other management techniques.

Policies and Guidelines

Coordinate with other managing agencies to promote forest health and the associated impacts on watershed health.

10.2.2 Management Objective

Acknowledge that vegetation composition and distribution may change as a result of changing climate.

Policies and Guidelines

Coordinate with public and private organizations and the canyon water companies to protect watershed, forest health, and wildlife habitat challenged by a changing climate, invasive species, insects, disease, and increasing public use.

10.3.3 Management Objective

Insects and disease outbreaks should be identified, monitored, and managed to avoid large-scale forest impacts.

Policies and Guidelines

Coordinate with state and federal agencies to identify, monitor, and manage insect, and disease outbreaks.

10.3.4 Management Objective

Noxious weeds should be controlled through prevention, infestation reconnaissance, and treatment. See CRMP Section 18, Noxious Weeds for more information.

Policies and Guidelines

- Prevention, early detection, and rapid treatment are the most cost-effective best management practices for noxious weeds.

- Control and reduce existing weed infestations utilizing a suite of available tools.

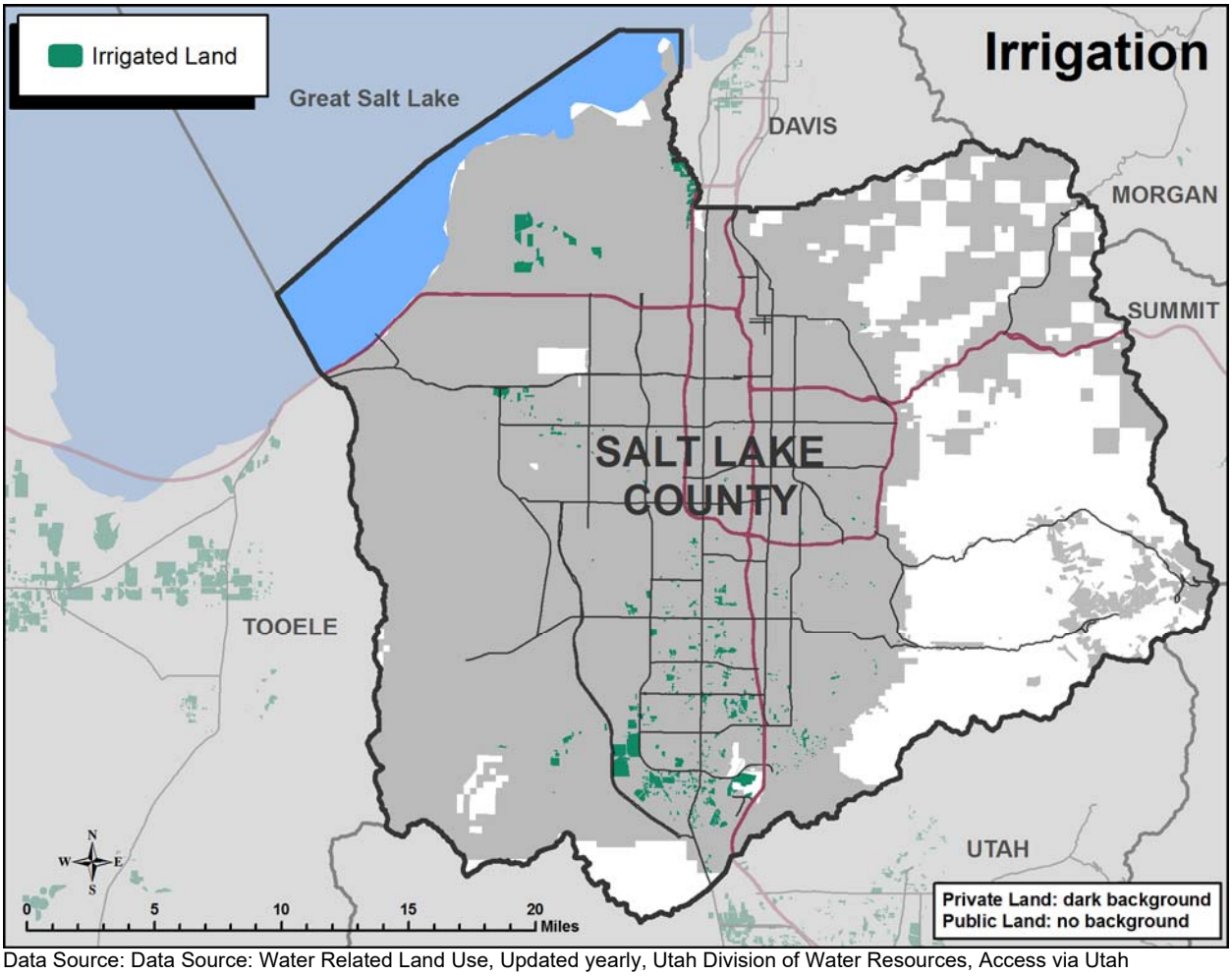
- Coordinate county-wide with agencies, local governments, and other landowners and land managers regarding weed management issues, and continue participation in the Bonneville Cooperative Weed Management Area.

11. IRRIGATION

Irrigation is the practice of supplemental application of water to land beyond that directly received from precipitation. Irrigation expands agricultural output of cropland and sustains additional vegetation growth throughout the landscape. Irrigation, as a resource, is not mentioned in public land plans for Salt Lake County.

Related resources:

- Agriculture
- Ditches and Canals
- Water Rights



Data Source: Data Source: Water Related Land Use, Updated yearly, Utah Division of Water Resources, Access via Utah Automated Geographic Reference Center.

11.1 Management Setting

Context

Salt Lake County's public lands serve as the water source supplying some irrigation systems in the valley. Irrigation systems are an integral element for agricultural viability in Salt Lake County. The use, upgrade, and maintenance of Utah's network of canals, ditches, and dams continues today. Many of the canals and

ditches remain open, but over time many have been lined or piped to improve operational efficiency and for safety reasons.

Dams, diversions, canals, and pipelines are constructed to take advantage of the topography of each watershed and redistribute water from rivers and streams outward to lower-elevation lands, which are more suitable for crop production.

Findings

While public lands are the watersheds that produce water supplies for many irrigation systems, there are no irrigation systems on public lands in Salt Lake County. Salt Lake County Flood Control partners with most major canals companies to convey local municipal storm water downstream. These canals serve as major drainage system facilities and act as trunk lines to deliver storm water to a natural tributary or final destination.

A potential threat to the counties irrigation and storm water infrastructure is the introduction of Aquatic Nuisance Species, especially quagga and zebra mussels. A single localized infestation has the potential to spread across the entire county though the interconnected network used to deliver water.

Legal Context

The rights of the county in and to canals and drains are limited to those included in specific agreements for their use with the owners of such facilities.

Within each watershed, various entities or individuals have legal claims (i.e., water rights) to use the water for "beneficial use" and are permitted to divert waters from streams into reservoirs, canals, and pipelines. The distribution of water is governed by state law and is based largely on geographic proximity, available supply, and ownership of the water rights.

Applicable laws include those found in Utah Code §73 (Water and Irrigation).

11.2 Desired Future State

Salt Lake County desires to protect its watersheds and water quality for the benefit of irrigation users downstream from public lands.

11.3 Management Objectives and Associated Policies and Guidelines

11.3.1 Management Objective

Prevent or mitigate activities on public lands that have negative effects on the quantity or quality of water available for irrigation.

Policies and Guidelines

- Support protection of existing diversions and water delivery infrastructure.

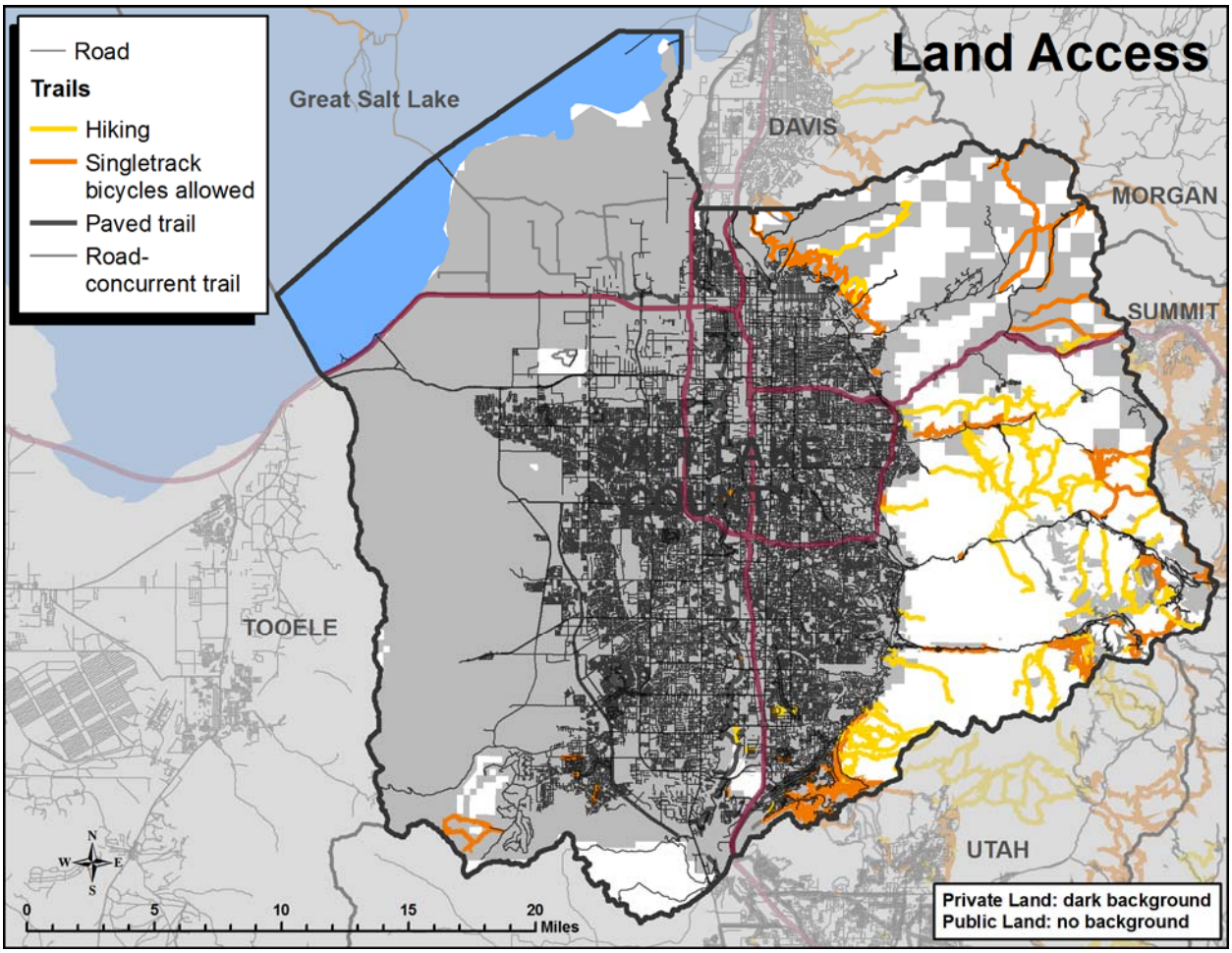
- Coordinate with public and private organizations to support watershed protection and forest health in the face of challenges (such as changing climate, invasive species, and increasing public use).

12. LAND ACCESS

Land access refers to the ability to physically and legally access a given parcel of land. This typically has to do with roads, rights-of-way (ROWs) and property inholdings. Land access also concerns administrative restrictions on the methods or timing of land access, such as motorized vs. non-motorized access, and access that may be restricted at certain times. Finally, access can also refer to crossing or visiting lands via trails or other non-motorized methods. Common land access issues include private land surrounded by federal lands, private lands within designated Wilderness areas, and public lands accessed by crossing through private property.

Related resources:

- Land Use
- Wilderness



Data Source: SGID10.TRANSPORTATION.Roads, 9 March 2017, Utah Department of Transportation and others. Trails, Date unknown, Utah Office of Tourism and GOED. Access via Utah Automated Geographic Reference Center.

12.1 Management Setting

Context

Land ownership in Salt Lake County is complex and varied, and at times it is hard to distinguish public and private property lines. Trespassing, whether deliberate or accidental, causes conflict between the public and private property owners. Salt Lake County residents and visitors benefit from clear and consistent public land access policies.

Findings

Salt Lake County has a responsibility to facilitate land access regardless of land ownership. This is accomplished by acquiring and maintaining ROWs or easements across properties that are not public. The county can acquire and enforce access to its public lands by properly participating in planning processes that involve federal agencies, state agencies, and other stakeholders. Litigation is sometimes a part of land-access issues.

Table 12.1 identifies the miles of public trails by type of access within public lands in Salt Lake County.

Table 12.1. Public Miles of Trail by Type.

TRAIL TYPE	MILES
Hiking	118.1
Singletrack (bicycles allowed)	64.4
Paved Trail	2.4
Road-concurrent Trail	44.5

Source: SGID10.TRANSPORTATION.Roads, 9 March 2017, Utah Department of Transportation and others. Trails, Date unknown, Utah Office of Tourism and GOED. Access via Utah Automated Geographic Reference Center.

Legal Context

Gaining or maintaining access to lands is typically accomplished through ROWs or easements across another landowner's property. The process is different for each type of landowner, and each may have specific administrative procedures, management objectives, and historical context.

Applicable Laws

US Forest Service (Forest Service). Rights-of-way on Forest Service lands are managed through planning documents and procedures established by the National Forest Management Act (16 USC §1600 et seq. [1976]) and the National Environmental Policy Act (42 USC §4321 et seq. [1969]) processes.

US Bureau of Land Management (BLM). The BLM manages ROWs through Resource Management Plans authorized by Federal Land Management and Policy Act (43 USC §1701 et seq. [1976]) and National Environmental Policy Act (42 USC §4321 et seq. [1969]) processes.

R.S. 2477. Prior to the Federal Land Management and Policy Act, rights-of-way on BLM and Forest Service lands were enabled by Revised Statute 2477 (Section 8 of the Mining Act of 1866) and are generally considered to still be available for accessing property within and across public lands.[1] There are no recorded R.S. 2477 roads for Salt Lake County.[2]

Private Property. Just as access to private inholdings among federal lands is important, so too is providing access to public lands through private property. Salt Lake County has an obligation to ensure the ROWs with historic access across private lands remain open. Additionally, as urban development continues, Salt Lake County should facilitate new public access to public lands by purchasing easements across private property.

Salt Lake County can establish new ROWs through private lands in three ways. First, for developing lands, the county can identify ROWs in the transportation component of the General Plan. With ROWs identified, the county can work with developers to construct and maintain ROWs as the land develops over time. Second, the county can guide willing landowners to negotiate mutually beneficial solutions to purchase public ROWs or easements across private property. Finally, in cases where landowners do not want a public ROW or easement across their property, counties can use the doctrine of eminent domain for roadways for public vehicles but not for recreational uses (Utah Code §78B-6-501-3e).

12.2 Desired Future State

Salt Lake County desires to pursue the most appropriate and feasible means of securing legal access to public lands while mitigating conflicts on privately owned lands and avoiding fragmentation of public lands.

12.3 Management Objectives and Associated Policies and Guidelines

12.3.1 Management Objective

Preserve access to public lands, understanding that access does not necessarily imply motorized access in all cases.

Policies and Guidelines

- Maintain and promote cooperative relationships with the Forest Service, BLM, and private landowners in the Wasatch and Oquirrh Mountains.

- Support access and ROWs for general public and administrative use.

- Pursue the most appropriate and feasible means of securing legal public access to critical recreational opportunities while mitigating conflicts on privately owned lands.

12.4 References

[1] Utah's Public Lands Policy Coordinating Office. ND. R.S. 2477 Roads. http://publiclands.utah.gov/rs-2477-roads/ (accessed March 29, 2017).

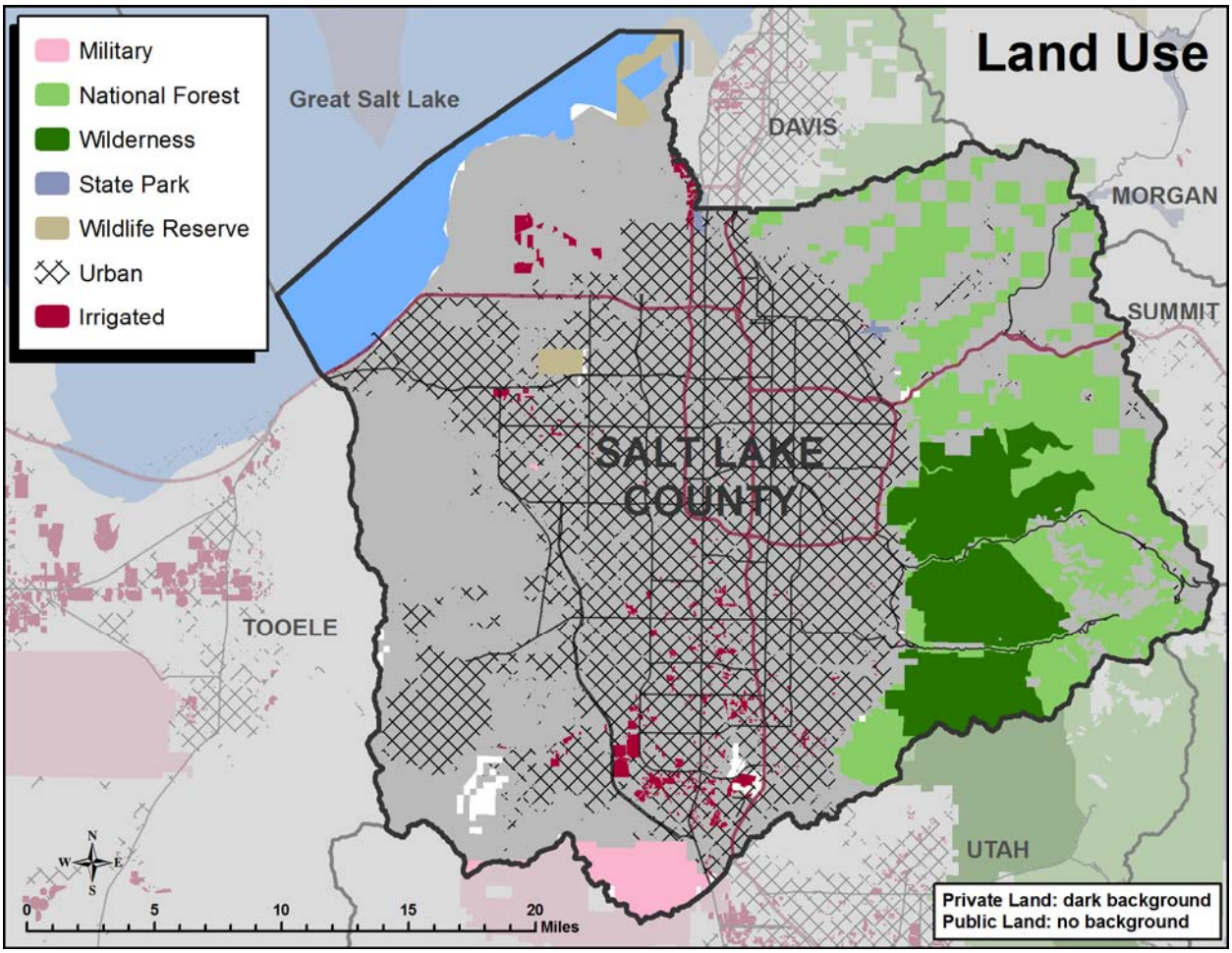
[2] State of Utah. Recorded R.S. 2477 Roads. http://www.recorded2477roads.utah.gov (accessed May 15, 2017).

13. LAND USE

Land use refers to allowable uses for land and resources given many competing demands. Land use decisions are made by public land managers to establish priorities for various resources among the many competing desires and potential uses for those resources. The best land use decisions are made through planning procedures that consider a range of options and provide opportunities for input from a diverse range of affected stakeholders. Land use decisions are made by federal, state, tribal, and local governments, which have jurisdiction over the lands following planning procedures outlined in federal and state statutes, though this is not the case for some federal and state properties, which are managed for specific purposes, such as Camp Williams which is owned by the US Department of Defense (DOD) and managed first and foremost to support national defense.

Related resources:

- Mining
- Land Access
- Livestock and Grazing
- Wetlands
- Wilderness



Data Sources: Water Related Land Use, Updated yearly, Utah Division of Water Resources. Land Ownership, Updated as needed, Utah School and Institutional Trust Lands. Access via Utah Automated Geographic Reference Center.

13.1 Management Setting

Context

Public lands in Salt Lake County serve as critical drinking water sources, important wildlife habitat, pasture for livestock, and highly utilized recreational areas to name a few. Decisions made regarding the prioritization of land uses are made by those with administrative responsibility to manage the lands.

Findings

Of the 515,311 acres of land in Salt Lake County, 73.1% is privately owned, 19.9% is owned by the US Forest Service, 5.2% are state sovereign lands (i.e., the Great Salt Lake), and 1.4 % is within military reservations (i.e., Camp Williams). The remaining 1.4% is split between the US Bureau of Land Management and other departments of the State of Utah (Table 13.1).

Table 13.1. Land ownership and acreage within Salt Lake County.

LAND OWNERSHIP TYPE OR ENTITY	ACRES	PERCENTAGE
Private	376,719	73.11
US Forest Service	97,556	18.93
Utah state sovereign land	26,890	5.22
Military reservations	7,208	1.40
State wildlife reserve or management area	3,244	0.63
US Bureau of Land Management (BLM)	1,972	0.38
Other state ownership	979	0.19
Utah State Parks and Recreation	449	0.09
State trust lands	294	0.06

Source: Spatial analysis of the Utah State and Institutional Trust Lands Land Ownership GIS Layer.

Legal Context

Private Property

Private lands are regulated by land use ordinances and zoning districts approved by local and county governments. Zoning districts, and the regulations established within the zoning districts, are authorized for counties by Utah Code §17-27a-505 and for municipalities by §10-9a-505. Land use ordinance and zoning maps are legislative decisions and established through planning processes open to public discussion and voted on by county and city councils.

Salt Lake County Ordinance Chapter 19.72 – Foothills and Canyons Overlay Zone, also called FCOZ, is the primary regulatory zone for private lands in close proximity to public land with the stated purpose to "promote safe, environmentally sensitive development that strikes a reasonable balance between the rights and long-term interests of property owners and those of the general public." The Foothills and Canyons Overlay Zone regulates development on steep slopes, ridgelines, within stream corridors, and other sensitive areas. Maps delineating the boundaries of the Foothills and Canyons Overlay Zone are on file with the Salt Lake Planning and Development Services Division.

In 2015 and 2016 the Utah State Legislature amended County General Plan requirements to include a RMP component, for which this document was written. Utah Code §17-27a-401 compels counties to assess 28 natural resource categories occurring on public lands within their boundaries and set goals and objectives for each resource. Resource management plans provide federal land managers with local land use plans which they may consider in the planning processes of public lands.

US Forest Service

The Forest Service manages land use decisions by developing land and Resource Management Plans, also known as Forest Plans, under the National Forest Management Act (16 USC §1600 et seq. [1976]). Subsection 1604(a) requires the Forest Service to "coordinate with the land and resource management planning processes of State and local governments and other Federal agencies" during development and revision of Forest Plans. Forest Plans also require consideration of alternatives and public input under National Environmental Policy Act (42 USC §4321 et seq. [1969]), also known as NEPA. This provides an open planning process to assist public land managers in understanding stakeholders' desires for various land uses and identify potential impacts of those uses.

Current applicable Forest Service planning documents for Salt Lake County include the 2003 Revised Forest Plan and Final Environmental Impact Statement for the Wasatch-Cache National Forest.[2]

US Bureau of Land Management (BLM)

The Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]), also known as FLPMA, mandates the BLM to manage lands under multiple-use philosophy. A component of FLPMA is the requirement for an open and public land use planning process, also known as resource management planning, to determine the optimal use of public lands for recreation, conservation, and commercial activities. The BLM is also subject to planning procedures specified in NEPA (42 USC §4321 et seq. [1969]).

Current applicable BLM planning documents include the 1988 Resource Management Plan and Final Environmental Impact Statement.[3]

State Sovereign Lands

The Utah Department of Natural Resources manages state sovereign lands around the Great Salt Lake under the Utah Division of Forestry, Fire, and State Lands (FFSL). Under the Public Trust Doctrine, the State of Utah has fee title ownership of the bed of the Great Salt Lake as sovereign land.[4] The state's management jurisdiction is assigned to the FFSL (Utah Administrative Code R652-70-100). The previously cited comprehensive management plan for the Great Salt Lake provides management direction to achieve reasonable and beneficial uses of the lake's resources under multiple-use, sustained-yield principles (Utah Code §65A-2-1). The supplemental Mineral Leasing Plan provides specific guidance related to existing and potential future mineral leasing activities on the lake. The waters and wetlands of the Great Salt Lake are jurisdictional under the federal Clean Water Act (Federal Water Pollution Control Act) (33 USC §1251 et seq. [1972]) (also see CRMP Section, Wetlands).

Current applicable FFSL planning documents include the 2013 Final Great Salt Lake Comprehensive Management Plan and Record of Decision[5] and the 2013 Final Great Salt Lake Mineral Leasing Plan and Record of Decision.[6]

US Department of Defense (DOD)

The DOD operates Camp Williams Utah Training Center. These facilities serve critical national security interests and land use decisions are made internally, though usually after consulting appropriate local, state, and federal agencies such as the Utah Department of Wildlife Resources and US Fish and Wildlife Service.

Current applicable planning documents from Camp Williams include the 2007 Camp Williams Integrated Natural Resource Management Plan.[7]

Other Applicable Laws

- Wilderness Act: 16 USC §1131 (1964)
- Wild and Scenic Rivers Act: 16 USC §1271 et seq. (1968)
- Utah Wilderness Act: Public Law 98-428 (1984)
- Utah Code: §63J-8-103 (State participation in managing public lands)
- Utah Code: §63J-8-104 (State land use planning and management program)

13.2 Desired Future State

Salt Lake County desires to prioritize resource protection on public lands while striving to balance the needs for clean water, high demand for recreational activities, property rights on private lands, fire prevention and suppression, and county-wide and statewide economic benefits provided by public lands.

13.3 Management Objectives and Associated Policies and Guidelines

13.3.1 Management Objective

Maintain and improve communication and coordination among various federal, state, tribal, and local land use authorities.

Policies and Guidelines

Encourage and participate in coordination and communication among various federal, state, tribal, and local land management authorities. Where appropriate, the county will enter into reciprocal agreements to require notification of planning decisions made by each entity and to provide an opportunity for comments.

13.3.2 Management Objective

Land uses on public lands should prioritize resource protection and environmental stewardship over resource development. Salt Lake County supports restrictive land use designations, including Wilderness areas, roadless areas, and wild and scenic rivers.

Policies and Guidelines

Promote the conservation of regionally significant critical lands.

13.3.3 Management Objective

Ensure that adjacent land uses and land use restrictions do not deny private property owners the rights of fair use, access to, and enjoyment of their property.

Policies and Guidelines

Participate in land management planning activities to ensure that land use restrictions do not deny private property owners the rights of fair use, access to, and enjoyment of their property.

13.3.4 Management Objective

Work to prevent land uses on private property from denying public access to and enjoyment of public lands.

Policies and Guidelines

Defend traditional public land access routes and points when development proposals may threaten access.

13.3.5 Management Objective

Work to consolidate and simplify land ownership patterns on public lands through land transfers and purchases from willing sellers of private land. Private land in-holdings within public lands complicate the Counties focus on resource protection on public lands. The County desires to facilitate land transactions with mutually beneficial outcomes. [8]

Policies and Guidelines

- Support planning efforts which identify parcels of private and public lands with potential for trade or purchase.

- Land transfers should only occur after open and inclusive procedures that provide opportunity for stakeholder input.

- The County will be an active participant in discussions involving potential land transfers.

13.3.6 Management Objective

Support proposed federal designation of the Central Wasatch National Conservation and Recreation Area. [8]

13.4 References

[1] US Forest Service. 2017. The Forest Planning Rule, Planning Rule 101. https://www.fs.usda.gov/main/planningrule/101 (accessed March 23, 2017).

[2] US Forest Service. 2003. Revised Forest Plan for the Wasatch-Cache National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5354094.pdf (accessed March 23, 2017).

[3] US Bureau of Land Management, Salt Lake District. 1990. Proposed Pony Express Resource Management Plan and Final Environmental Impact Statement. http://www.blm.gov/style/medialib/blm/ut/natural_resources/planning/existing_lups6.Par.40049.File.dat/PONYFEIS.PDF (accessed March 23, 2017)

[4] Slade, D. C. 1990. Putting the Public Trust Doctrine to Work: The Application of the Public Trust Doctrine to the Management of Lands, Waters, and Living Resources of the Coastal States. Hartford, CT: Connecticut Dept. of Environmental Protection, Coastal Resources Management Division.

[5] Utah Department of Natural Resources, Forestry, Fire and State Lands. 2013. Final Comprehensive Management Plan and Record of Decision.

[6] Utah Department of Natural Resources, Forestry, Fire and State Lands. 2013. Final Great Salt Lake Mineral Leasing Plan and Record of Decision .

[7] Utah Army National Guard. 2007. Camp Williams Integrated Natural Resource Management Plan.

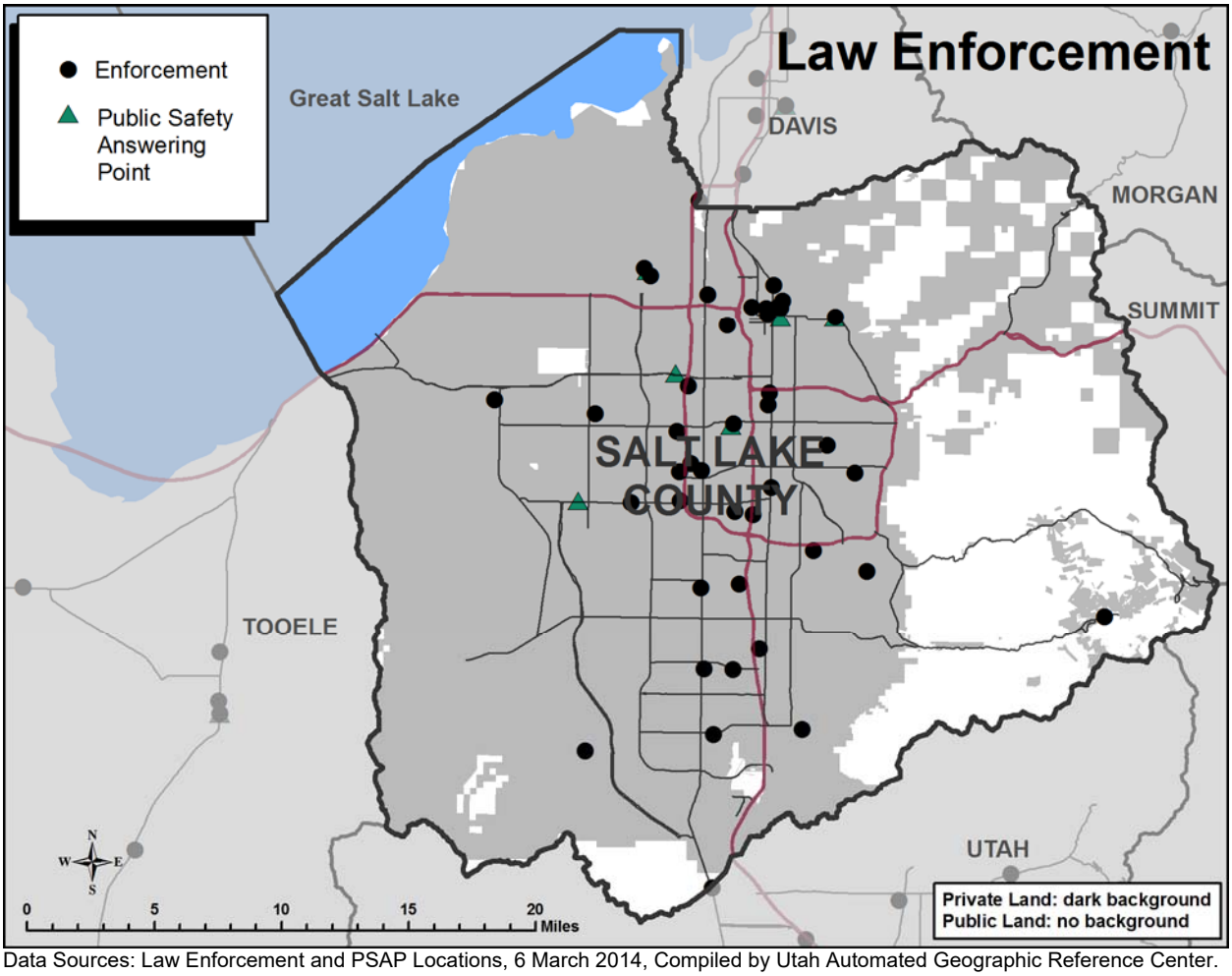
[8] The Accord, Mountain Accord. 2015. http://mountainaccord.com/wp-content/uploads/2016/09/FINAL-Accord-July-13-2015-w-Sigs-and-Attach.pdf (accessed March 23, 2017).

14. LAW ENFORCEMENT

Law enforcement is concerned with the specific, and sometimes overlapping, jurisdictions of law enforcement, response personnel, and emergency management across a county. County planning has generally not addressed law enforcement goals or policies. In the context of resource management planning, appropriate goals might address public safety, property protection, and interagency coordination.

Related resources:

- Economic Considerations
- Fire Management



Data Sources: Law Enforcement and PSAP Locations, 6 March 2014, Compiled by Utah Automated Geographic Reference Center.

14.1 Management Setting

Context

Key law enforcement issues related to natural resources management and public lands are coordination among jurisdictions of various law enforcement personnel and funding issues such as funding for search-and-rescue operations. Law enforcement plays a critical role in protecting natural resources from misuse and theft, managing off-highway vehicles, and in search-and-rescue operations.

Findings

Coordination occurs among several jurisdictions with some form of law enforcement on public lands in Salt Lake County includes US Forest Service, US Bureau of Land Management, Utah Department of Wildlife Resources Resource Conservation Officers, Utah State Park Rangers, Utah Highway Patrol, County Sheriff, and local law enforcement.

Legal Context

Federal and state law enables shared law enforcement duties on public lands.

Applicable Laws

The Federal Land Policy Management Act (43 USC §1701 et seq. [1976]) and Utah Public Safety Code (Utah Code: §53-13-106 et seq.) allows county sheriffs to enter into agreements with federal agencies to share law enforcement duties such that all parties can enforce federal, state, and local laws.

14.2 Desired Future State

Salt Lake County desires coordinated law enforcement to continue in a critical role in the maintenance of law and order on public lands and to protect the health and safety of persons using public lands. This includes enforcements of rules and laws, private property trespass, search-and-rescue operations, and law enforcement. Salt Lake County desires to maintain and promote law enforcement partnerships across agencies, including federal, state, county, and local law enforcement.

14.3 Management Objectives and Associated Policies and Guidelines

14.3.1 Management Objective

Maintain law and order on public lands to protect the health and safety of persons using those areas.

Policies and Guidelines

- Support efforts to maintain law and order on public lands to protect the health and safety of persons using the area, control litter, discourage vandalism, and perform search-and-rescue operations as appropriate.

- Encourage public land managers and law enforcement to notify the county sheriff's office immediately of critical issues affecting public lands. These may include but are not limited to a life-threatening situation, criminal act, project structure failure, contamination of a natural resource, destructive natural phenomenon (e.g., landslide, flood, fire), cultural resource site disturbance, and discovery of human remains.

14.3.2 Management Objective

Effective interagency law enforcement between federal and state agencies and various levels of law enforcement.

Policies and Guidelines

Share and coordinate information, policies, procedures, etc., between federal agencies and state, county, and local law enforcement units.

13.3.3 Management Objective

Effective public land search-and-rescue operations, public land regulation enforcement, and land-access trespass issues between federal and state agencies, and various levels of law enforcement.

Policies and Guidelines

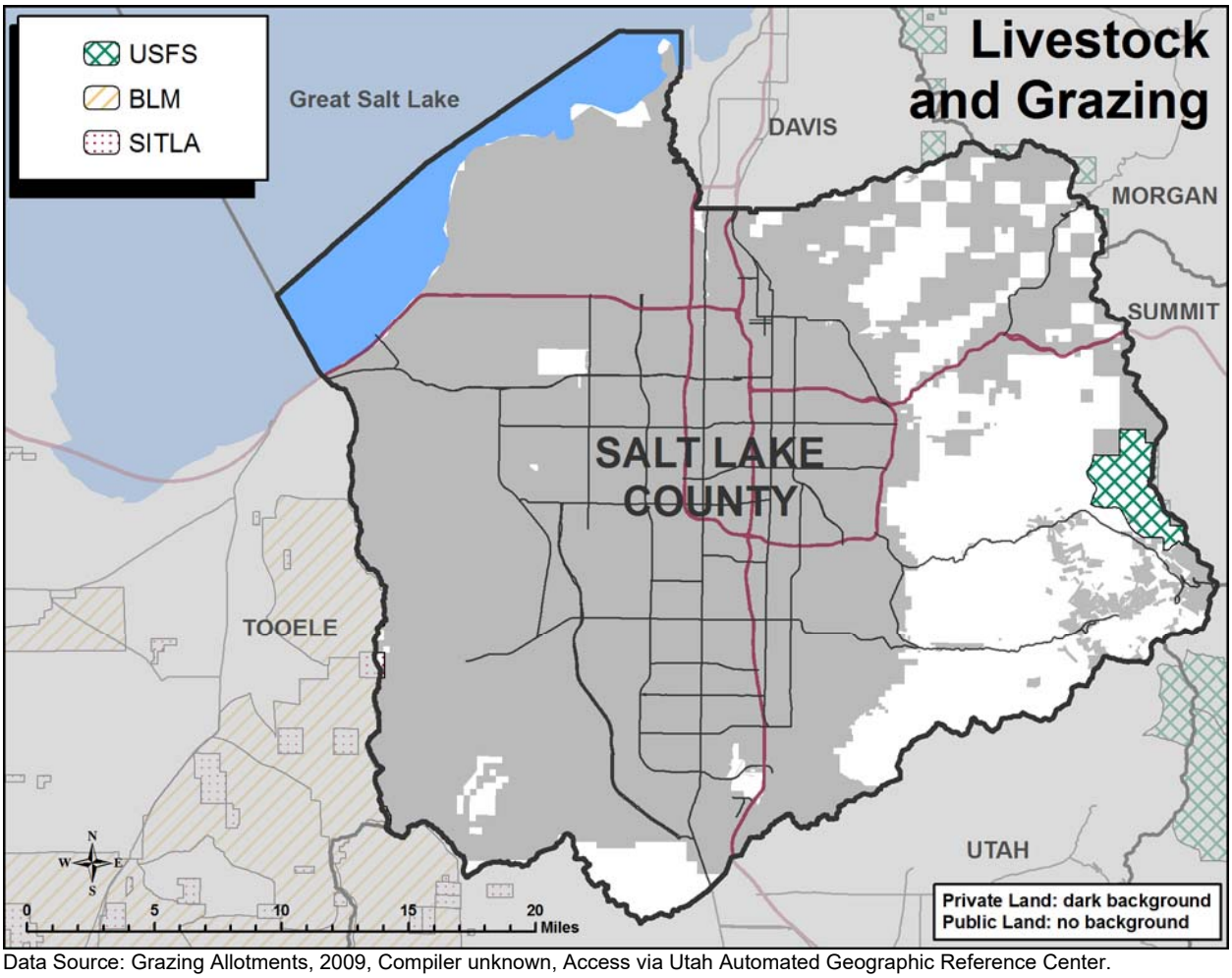
Share and coordinate search-and-rescue operations, regulation enforcement, and trespass issues between federal agencies and state, county, and local law enforcement units.

15. LIVESTOCK AND GRAZING

Livestock includes domestic animals, such as sheep, cattle, and horses, which are raised for commercial and private use. Grazing refers to feeding livestock on growing grass, pasturage, or rangeland. Public and private lands in Utah are used for livestock grazing.

Related resources:

- Agriculture
- Irrigation
- Predator Control



Data Source: Grazing Allotments, 2009, Compiler unknown, Access via Utah Automated Geographic Reference Center.

15.1 Management Setting

Context

Livestock production and grazing is minimal on public lands in Salt Lake County and primarily occurs on Forest Service lands. Grazing is utilized for vegetation and fuel-management purposes at Camp Williams and on private and state lands surrounding the Great Salt Lake. Grazing, when managed appropriately, can improve rangeland health and reduce potential fire danger.

Findings

Based on spatial data of grazing allotments from the AGRC dated 2009, there is one grazing allotment on Forest Service land in Salt Lake County: the Wright allotment, Forest Service number 00118, which is approximately 6,000 acres. However, this allotment may not be in use and Salt Lake City ordinance 17.04 prohibits grazing within protecting watershed areas, which includes Parley's and Big Cottonwood Canyons.

Legal Context

The US Forest Service manages grazing in Salt Lake County based on guidance outlined in the Forest Plan. Forest Plans must follow procedures established under the National Forest Management Act (16 USC §1600 et seq. [1976]) and National Environmental Policy Act (42 USC §4321 et seq. [1969]).

15.2 Desired Future State

Salt Lake County desires to continue to use grazing as a vegetative management tool so long as it does not negatively impact the watershed, wildlife, water quality, recreation, and other resources on public lands.

15.3 Management Objectives and Associated Policies and Guidelines

15.3.1 Management Objective

Support the utilization of grazing as a vegetation management tool when appropriate to meet vegetation health, reduce noxious weeds, and fuel reduction objectives.

Policies and Guidelines

Seek to balance the following variables to ensure long-term health and sustainability of grazing lands:

- Determine available forage[1]
- Calculate stocking rate to determine proper type and number of animals[2]
- Proper season for grazing based on vegetation composition and site conditions
- Appropriate length of grazing time
- Rest periods following grazing to meet management objectives[3]

15.4 References

[1] Pratt, Mindy and G.A. Rasmussen. 2001. Calculating Available Forage, Utah State University Extension. https://extension.usu.edu/rangelands/files/uploads/General%20Grazing%20Management/Calaculating%20available%20forage%20NR_RM_03.pdf (accessed March 29, 2017).

[2] Pratt, Mindy and G.A. Rasmussen. 2001. Determining Your Stocking Rate, Utah State University Extension. https://extension.usu.edu/rangelands/files/uploads/General%20Grazing%20Management/Determine%20Stocking%20rate.pdf (accessed March 29, 2017).

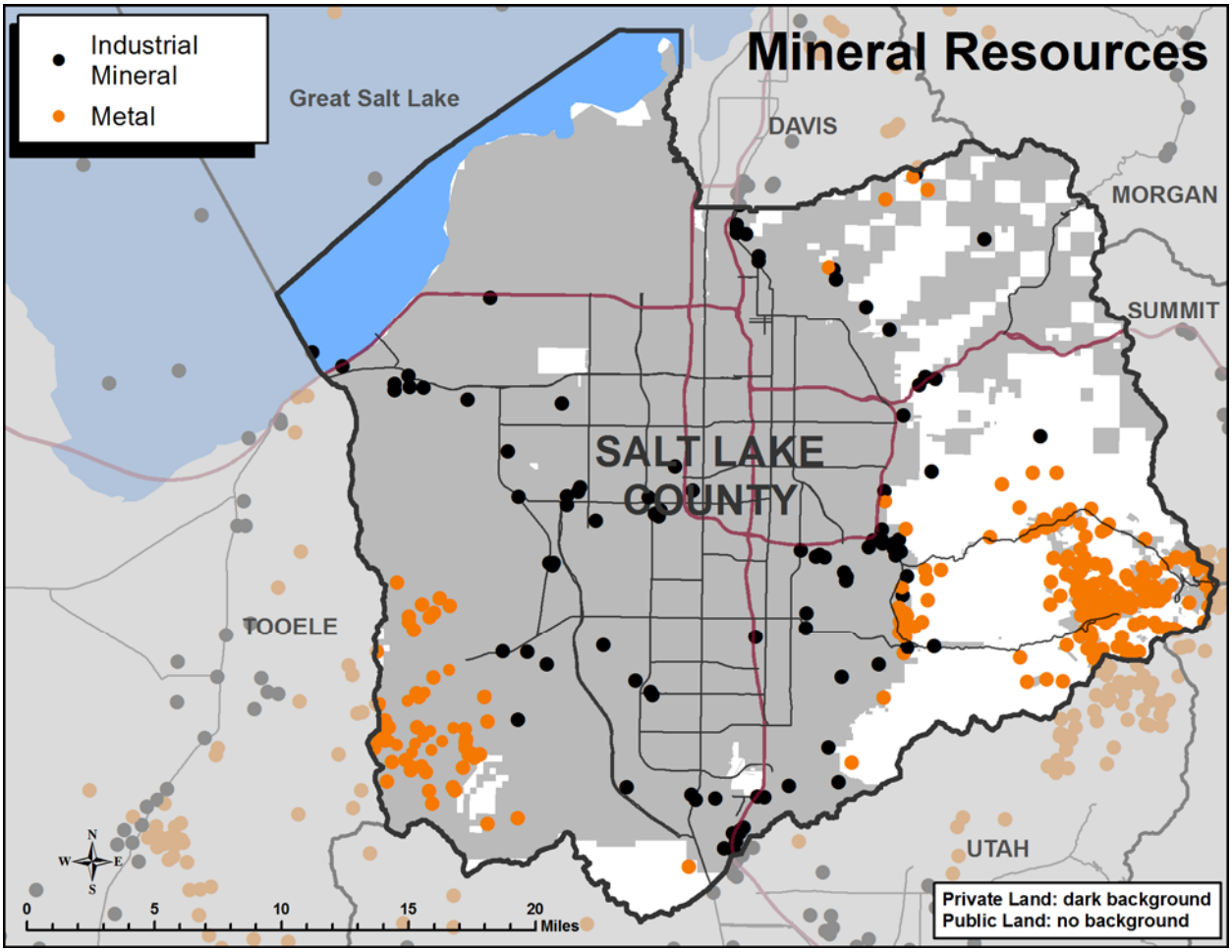
[3] Rinehart, Lee. 2008. Pasture, Rangeland and Grazing Management, ATTRA. https://extension.usu.edu/rangelands/files/uploads/General%20Grazing%20Management/Pasture%20Range%20Grazing%20Management.pdf (accessed March 29, 2017).

16. MINERAL RESOURCES

Mineral resources include known and potential geologic deposits of materials that are useful in industrial processes. Mineral development (mining) is regulated and managed depending on the extracted resource, and are grouped into three categories: locatable, leasable, and saleable.

Related resources:

- Mining
- Energy Resources



Data Source: XYUMOS_2016_April, 2016, Utah Mineral Occurrence System, Utah Geological Survey.

16.1 Management Setting

Context

Locatable minerals are high-value ores and elements such as gold, silver and copper. The extraction of locatable surface and subsurface mineral deposits on public lands is regulated by both the federal and state governments. More information is available in this document under CRMP Section 17, Mining. Salable minerals include sand, gravel, and other stone, the mining of which is regulated by Salt Lake

County. Leasable minerals include oil, gas, coal, and other extracted energy sources, description, and discussion of which are found in this document in CRMP Section 6, Energy Resources.

Findings

Mineral resource development on public lands in Salt Lake County is minimal because the majority of public lands are within a protected watershed. Mineral resource extraction is greatest at the Great Salt Lake and on privately owned lands in Salt Lake County. Major mineral resources include copper, aggregate (rock and gravel), salt, and potash.[1]

Legal Context

Applicable Laws

Federal and state laws regulating development, extraction, and reclamation are presented in CRMP Section 17, Mining, and CRMP Section 6, Energy Resources. CRMP Section 12, Land Use, provides procedural information for land use planning and methods used to establish goals and objectives for mineral resources on public lands.

16.2 Desired Future State

Where mineral resource extraction opportunities exist on public lands, Salt Lake County desires to review them on a case-by-case basis. The county supports mineral extraction on public lands where there is no impact to water quality, air quality, wildlife, and habitat.

16.3 Management Objectives and Associated Policies and Guidelines

16.3.1 Management Objective

Participate in land use decisions related to mining activities on all public lands.

Policies and Guidelines

Coordinate with state and federal agencies in land use decisions related to mining and mineral activities.

16.3.2 Management Objective

Participate in planning processes for any new mineral operations on public lands.

Policies and Guidelines

Coordinate with state and federal agencies in planning processes for any new mineral activities.

16.3.3 Management Objective

Support regulation of mining activities to prevent contributions to poor air quality.

Policies and Guidelines

Oppose new mining operations that contribute to nonattainment status for National Ambient Air Quality Standards for large particulate matter (PM10) and small particulate matter (PM2.5) as well as sulfur dioxide pollution, or those that threaten maintenance areas for ozone and carbon monoxide.

16.4 References

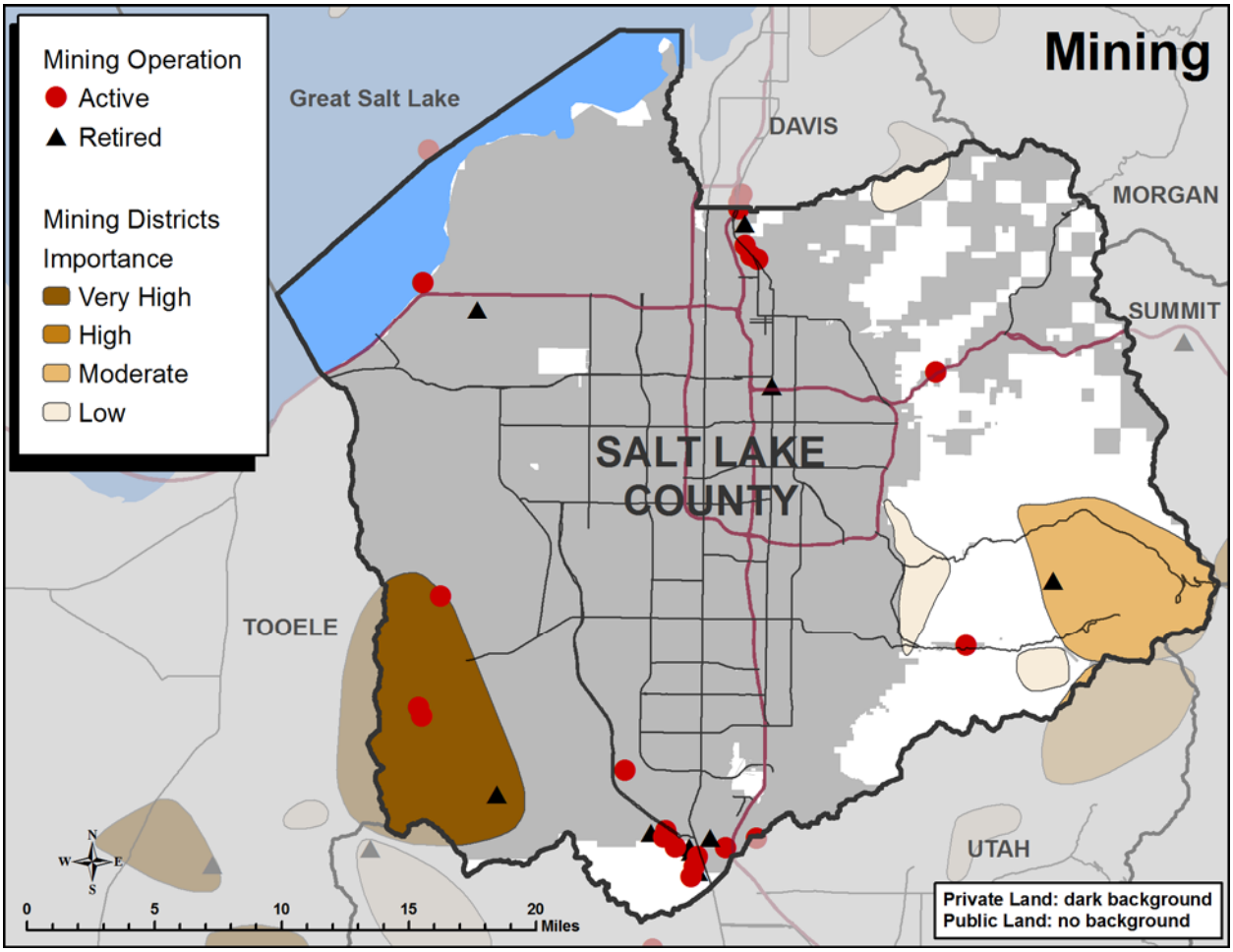
[1] Utah Department of Natural Resources, Division of Forestry, Fire, and State Lands. 2013. Final Great Salt Lake Mineral Leasing Plan and Record of Decision.

17. MINING

Mining refers to the process and industry of obtaining mineral and geothermal resources from a mine, well, or other extractive activity or operation. Mining operations are regulated and managed depending on the extracted resource, and are grouped into three categories: locatable, leasable, and saleable.

Related resources:

- Energy Resources
- Mineral Resources



Data Source: MineralsDBMarch2015_SMOnly, 2015, Utah Division of Oil, Gas, and Mining. Utah_Mining_Districts, Date unknown, Utah Geological Survey.

17.1 Management Setting

Context

Salt Lake County is home to several active mining operations, the largest and most notable being the Kennecott Copper Mine and two aggregate operations: Staker & Parsons and Geneva Rocks. The majority of mining operations occur on private lands; however, some operations are close to public lands. Mining provides economic benefits to Salt Lake County but also has potential to compromise water and air quality.

Locatable minerals are high-value ores and elements such as gold, silver, and copper. The extraction of locatable surface and subsurface mineral deposits on public lands is regulated by both the federal and state governments. The extraction of salable minerals, including sand, gravel, and other aggregate are regulated under public land use planning procedures. Development of salable minerals of private lands are regulated by the county under zoning ordinances. Leasable minerals include oil, gas, coal, and other extracted energy sources, description and discussion of which are found in this document in CRMP Section 6, Energy Resources.

Findings

As of 2015, the Utah Division of Oil, Gas, and Mining (DOGM) reported a total of 30 mines in Salt Lake County (Table 17.1). No mineral extraction from the Great Salt Lake occurs in Salt Lake County even though a portion of the lake lies within the county boundary.

Table 17.1. Active and retired mines in Salt Lake County.

MINE TYPE	SALT LAKE COUNTY (Private* and Public Lands)	US FOREST SERVICE	US BUREAU OF LAND MANAGEMENT
Active mineral	5	0	0
Retired mineral	2	1	0
Active aggregate	15	0	0
Retired aggregate	8	0	0

Source: Utah Division of Oil, Gas, and Mining (DOGM) mining data from 2015.
*Management objectives are for public lands.

Legal Context

The General Mining Law of May 10, 1872, as amended (30 USC §§22-54 and §§611-615) is the major federal law governing locatable minerals on public lands. In addition to defining procedures for discovery and patenting of certain minerals on federal lands, the law allows states to enact legislation regulating mining and reclamation activities. Federal regulations implementing the General Mining Law are found at 43 USC in Groups 3700 and 3800.[1]

In Salt Lake County, the US Forest Service (Forest Service) manages surface mining with guidance from its Forest Plan written under the National Forest Management Act (16 USC §1600 et seq. [1976]) and the National Environmental Policy Act (42 USC §4321 et seq. [1969]), also referred to as NEPA. The US Bureau of Land Management (BLM) manages surface minerals within its jurisdiction based on guidance from the Resource Management Plan written under the Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]), also referred to as FLPMA. The BLM also manages subsurface mining on Forest Service lands that are open to new mining claims. Some Forest Service lands are closed to new subsurface mines, including Wilderness areas or lands within a wild and scenic river (WSR) designation or study area.

Federal laws that are specifically applicable to the Wasatch mountains are a Public Law of 1914 (30 Stat. 714, Public Law 199, September 19, 1914), withdrawing lands from surface disposal for City Creek, Red Butte, Emigration, and Parley's Canyons and a Public Law of 1934 (48 Stat 808, 809 Public Law 259, May 26, 1934), reserving additional lands from mining and mineral patents in Millcreek, Big Cottonwood, and Little Cottonwood Canyons to protect the municipal water supply.

The State of Utah has primacy over regulation and reclamation of mining activities on all lands within the state, and the Utah Legislature has assigned responsibility for administration of mining to DOGM (Utah Code §40-6-4).

For regulation of mineral ore mining, DOGM administers permitting, inspection, and enforcement procedures under the Utah Mined Land Reclamation Act (Utah Code §40-7-8). All large mining operations within the state are required to have an approved notice of intention with the Minerals Program prior to beginning operations. Mining operations are broken up into the three categories: (1) large mine, (2) small mine, and (3) exploration under the Minerals Rules. The DOGM maintains a permit database of active and reclaimed mine sites.

17.2 Desired Future State

Salt Lake County supports Utah's mining heritage and desires to maintain a cooperative relationship with existing mining operations, while encouraging environmental stewardship during active mining and reclamation at the close of each operation. Salt Lake County desires to have active participation in new mineral extraction decision making on public lands and to minimize the impacts of mining to the extent possible.

17.3 Management Objectives and Associated Policies and Guidelines

17.3.1 Management Objective

Maintain a cooperative relationship with existing mining operations while encouraging environmental stewardship during active mining and reclamation at the close of each operation.

Policies and Guidelines

- Support existing mining operations and encourage environmental stewardship and reclamation.
- Plan for and support appropriate landscape buffering surrounding mining operations to mitigate the noise, water quality, and visual impacts of mining.
- Retain sufficient bonding until an appropriate percentage of the potential vegetation ground cover for the site is reestablished.
- Ensure mineral extraction activity is conducted in a manner that minimizes surface disturbance, sedimentation, pollution, and visual impairment.

17.3.2 Management Objective

Participate in planning processes and land use decisions related to mining activities on all public lands. Coordinate with federal and state agencies in approval of new operations.

Policies and Guidelines

Coordinate with BLM and DOGM on all planning activities related to mining and encourage these agencies to notify and consult with the county on new mining proposals.

17.4 References

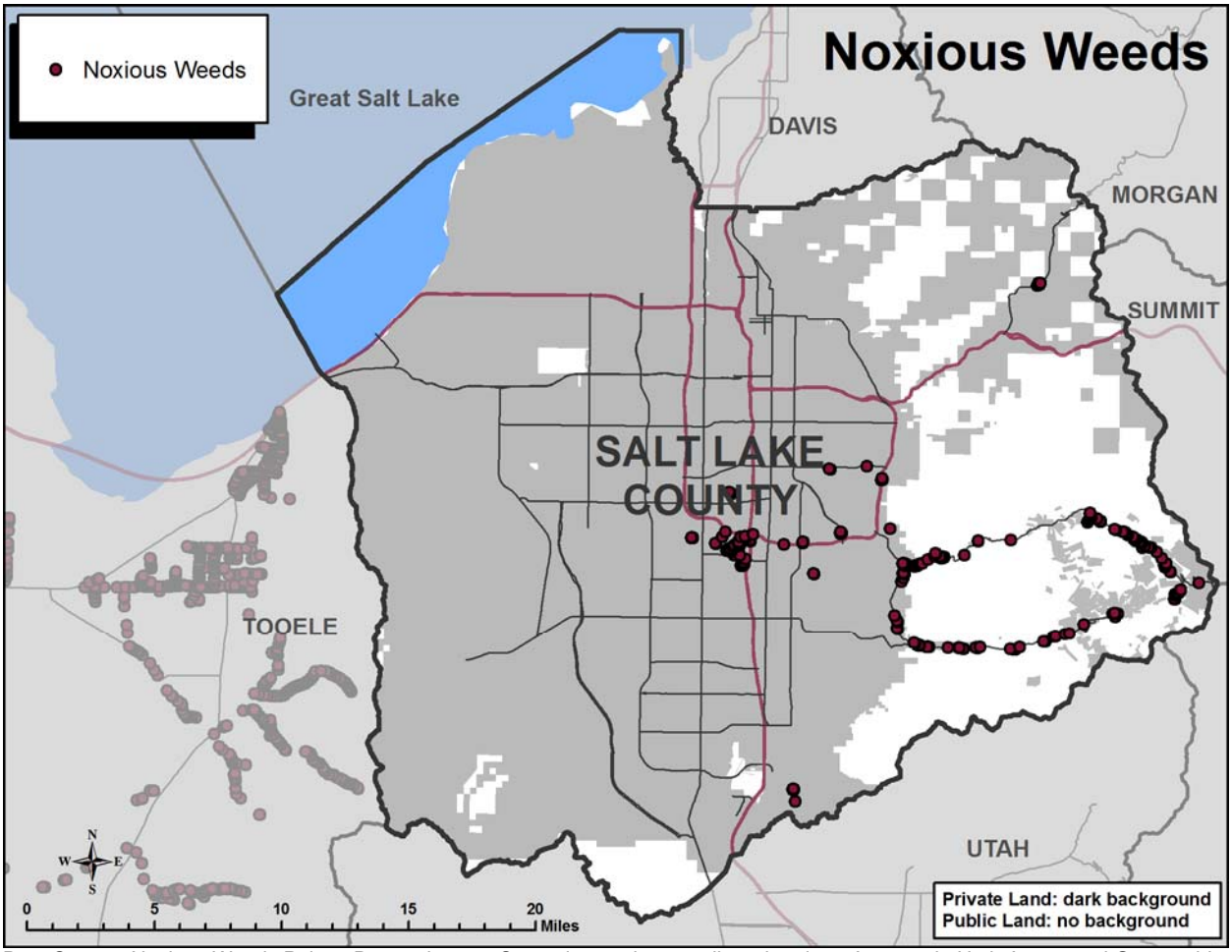
[1] US Department of Interior, Bureau of Land Management. 2011. Mining Claims and Sites on Federal Lands. BLM National Science and Technology Center. P-048.

18. NOXIOUS WEEDS

Noxious and invasive weeds are plants considered harmful to livestock, agriculture, and wildlife, or that otherwise negatively impact the landscape by (e.g., increased wildfire threat, reduced biodiversity). They are typically (but not always) nonnative species that spread rapidly at the expense of native vegetation. Weeds have significant economic considerations because of their impacts on rangeland health, increased wildfire, and direct control costs such as weed removal, crop and seed contamination, and equipment cleaning costs.

Related resources:

- Fire Management
- Air Quality



Data Source: Noxious Weeds Points, Date unknown, Several agencies contributed to data, Access via Utah Automated Geographic Reference Center. A complete inventory of noxious weeds is not available at this time.

18.1 Management Setting

Context

Noxious weeds have significant economic impacts on agriculture industries, reduce the diversity of the landscape, negatively impact forage for wildlife, increase wildfire susceptibility, and can diminish the visual quality of the landscape. Control of noxious weeds is most successful when it is a collaborative effort of both public and private land owners and managers.

Findings

Weed infestations are common across Salt Lake County and this has serious implications for natural resource managers. The Salt Lake County Weed Control Website has this to say about the problem:

> Outside of their native origins, noxious weeds become oppressors with no known natural competitors to keep their populations in check. These silent invaders quickly begin to out-compete native plants, … forever changing our landscapes. Unlike other ornamental(s), … noxious weeds are nothing short of ecological time bombs.[1]

Local governments, public land managers, and private property owners are responsible for controlling weed species included on the Utah's noxious weeds list and other local weed species of concern. County weed control covers lands under local management (roads, parks, etc.) as well as enforcing weed laws on private lands. State law provides county weed managers the right to treat weeds on private lands (assuming proper notice is provided) if the landowner is unwilling or unable to treat the problem themselves. The state may seek reimbursement or apply liens for the work.

Salt Lake County maintains a Weed Control Board and Weed Control Program to address weed infestation on private and county-owned lands. The county also participates in the Bonneville Cooperative Weed Management Area (CWMA). To more effectively treat weeds, the CWMA coordinates weed control across large lands areas (e.g., watersheds) without specific consideration of land ownership. The CWMA is used to coordinate treatment efforts and pool resources. Weed control is most effective when all land managers and landowners act quickly to address infestations when they first begin.

Many species of exotic and invasive weeds exist in Utah. Some species, however, have more potential to be "injurious to public health, crops, livestock, land, or other property."[2] The Utah Noxious Weed Act of 2008 identifies 28 noxious weed species and groups them into three prioritization categories. In December 2015 the official State Noxious Weed list was updated to include 54 and modified prioritization categories.

Class 1A: Early Detection Rapid Response (EDRR) Watch List

This class includes declared noxious weeds and invasive weeds that are not native to the State of Utah and are not known to exist in the state but that pose a serious threat and should be considered a very high priority. The following species are on this list:

- Common crupina (*Crupina vulgaris*)
- Syrian bean caper (*Zygophyllum fabago*)
- African rue (*Peganum harmala*)
- Ventenata (North Africa grass) (*Ventenata dubia*)
- Small bugloss (*Anchusa arvensis*)
- Plumeless thistle (*Carduus acanthoides*)
- Mediterranean sage (*Salvia aethiopis*)

- Malta starthistle (*Centaurea melitensis*)
- Spring millet (*Milium vernale*)

Class 1B: Early Detection Rapid Response (EDRR) Watch List

This class includes declared noxious and invasive weeds that are not native to the State of Utah but are known to exist in the state in very small populations but pose a serious threat to the state and should be considered as a very high priority. The following species are on this list:

- Camelthorn (*Alhagi maurorum*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Garlic mustard (*Alliaria petiolate*)
- Blueweed (Viper's bugloss) (*Echium vulgare*)
- Purple starthistle (*Centaurea calcitrapa*)
- Elongated mustard (*Brassica elongate*)
- Goatsrue (*Galega officinalis*)
- Common St. Johnswort (*Hypericum perforatum*)
- African mustard (*Brassica tournefortii*)
- Oxeye daisy (*Leucanthemum vulgare*)
- Giant reed (*Arundo donax*)
- Cutleaf viper grass (*Scorzonera laciniata*)

Class 2: Control

This class includes declared noxious and invasive weeds that are not native to the state of Utah, pose a threat to the state, and should be considered a high priority for control. Weeds listed in the Class 2: Control list are known to exist in populations of varying size throughout the state. The concentration of these weeds is at a level where control or eradication may be possible. The following species are on this list:

- Leafy spurge (*Euphorbia esula*)
- Dyers woad (*Isatis tinctoria*)
- Medusahead (*Taeniatherum caput-medusae*)
- Yellow starthistle (*Centaurea solstitialis*)
- Rush skeletonweed (*Chondrilla juncea*)
- Yellow toadflax (*Linaria vulgaris*)
- Spotted knapweed (*Centaurea stoebe*)
- Diffuse knapweed (*Centaurea diffusa*)
- Purple loosestrife (*Lythrum salicaria*)
- Black henbane (*Hyoscyamus niger*)
- Squarrose knapweed (*Centaurea virgata*)
- Dalmatian toadflax (*Linaria dalmatica*)

Class 3: Containment

This class includes declared noxious and invasive weeds that are not native to the state of Utah but are widely spread. Weeds listed in the Class 3: Containment class are noxious weeds list that are known to exist in populations of varying size throughout the state. Weed control efforts may be directed at reducing or eliminating new or expanding weed populations. Known and established weed populations, as determined by the weed-control authority, may be managed by any approved weed-control methodology, as determined by the weed-control authority. These weeds pose a threat to the agricultural industry and agricultural products.

The following species are on this list:

- Russian knapweed (*Acroptilon repens*)
- Musk thistle (*Carduus nutans*)
- Houndstounge (*Cynoglossum officinal*)
- Quackgrass (*Elymus repens*)
- Perennial pepperweed (Tall whitetop) (*Lepidium latifolium*)
- Jointed goatgrass (*Aegilops cylindrical*)
- Phragmites (Common reed) (*Phragmites australis* ssp.)
- Bermudagrass* (*Cynodon dactylon*)
- Tamarisk(Saltcedar) (*Tamarix ramosissima*)
- Perennial Sorghum spp. (*Sorghum halepense* and *Sorghum almum*)
- Hoary cress (*Cardaria* spp.)
- Scotch thistle (Cotton thistle) (*Onopordum acanthium*)
- Canada thistle (*Cirsium arvense*)
- Field bindweed (Wild Morning-glory) (*Convolvulus* spp.)
- Poison hemlock (*Conium maculatum*)
- Puncturevine (Goathead) (*Tribulus terrestris*)

Class 4: Prohibited

This class includes declared noxious and invasive weeds that are not native to the State of Utah and that pose a threat to the state through the retail sale or propagation in the nursery and greenhouse industry. Prohibited noxious weeds are annual, biennial, or perennial plants that the Utah Commissioner of Agriculture and Food designates as potentially detrimental or known to be detrimental to human or animal health, the environment, public roads, crops, or other property. The following species are on this list:

- Cogongrass (Japanese blood grass) (*Imperata cylindrical*)
- Scotch broom (*Cytisus scoparius*)
- Myrtle spurge (*Euphorbia myrsinites*)
- Russian olive (*Elaeagnus angustifolia*)
- Dames rocket (*Hesperis matronalis*)

Salt Lake County Noxious Weeds

State law allows additional weed species to be added to a county noxious weed list if locally problematic. Prior to the state's 2015 update, Salt Lake County declared the following three weeds to be noxious in the county. They have since been added to the official Utah list of noxious weeds.

- Garlic mustard (*Alliaria petiolate*)
- Puncturevine (Goathead) (*Tribulus terrestris*)
- Myrtle spurge (*Euphorbia myrsinites*)

Legal Context

The Utah Noxious Weed Act (Utah Code §4-17[2008, amended 2015]) requires counties to maintain a county Weed Control Board, which is responsible to prevent and control noxious weeds on lands under their control of jurisdiction. The State Weed Committee and the Utah Commissioner of Agriculture and Food together determine the specific weed species that are declared as noxious across Utah (R68-9). Counties may add weeds to this list if other species become locally problematic. Section 7 of the Utah

Noxious Weed Act allows counties to compel private landowners to treat weeds on their property. This act does not address weeds on federal lands that are managed by federal land management agencies. The Plant Protection Act (7 USC§2814 et seq. [2000]) requires federal land managers to control undesirable plants on lands they manage through appropriate funding, staffing, and cooperative agreements and coordination with state and local weed-control efforts. The Forest Service addressed weed management in its Forest Plan and further clarified weed management in the 2006 Noxious Weed Treatment Program Environmental Impact Statement[3], in which the US Forest Service targets species from state and local noxious weed lists. Information on US Bureau of Land Management's (BLM) nationwide strategy for weed management is available on their Invasive and Noxious Weeds website.[4]

18.2 Desired Future State

Salt Lake County desires to reduce the occurrence of existing noxious weed infestations on public lands and prevent the establishment of new infestations.

18.3 Management Objectives and Associated Policies and Guidelines

18.3.1 Management Objective

Prevention is the most cost-effective best management practice for noxious weeds.

Policies and Guidelines

Salt Lake County encourages the following prevention strategies be employed for activities on public lands:

- Clean contaminated machinery and equipment prior to transport.
- Cover seed and feed during transport to prevent spilling material.
- Inspect nursery stock for contamination.
- Utilize appropriate landscaping techniques to prevent invasive species.
- Treat newly detected weeds before they become prolific.
- Restore treated areas with appropriate native species as needed

18.3.2 Management Objective

Support early noxious weed detection through weed inventory mapping and monitoring efforts to identify new outbreaks and track existing infestations.

Policies and Guidelines

Continue to utilize the county Interactive Noxious Weed map and the staff and technology used to maintain the map.

18.3.3 Management Objective

Support rapid treatment of noxious weeds to control existing weed infestations utilizing a suite of available tools, also known as integrated weed management.

Policies and Guidelines

- Chemical treatment using hand, vehicle, and aerial applications
- Mechanical treatments (mowing, disking)
- Biological treatments, including insects and grazing livestock such as goats and cattle
- Physical treatments, including water removal, flooding, and burning

18.3.4 Management Objective

Regulation and enforcement of noxious and invasive weeds within the county.

Policies and Guidelines

- Maintain full participation on the Salt Lake County Weed Control Board.
- Coordinate county-wide with agencies, local governments, and other landowners and land managers regarding weed management issues, and continue participation in the Bonneville CWMA.
- Consider adding weed species to the Salt Lake County Noxious Weed list to control new weeds if necessary.

18.3.5 Management Objective

Appropriately manage existing and invasive weeds in Salt Lake County through education, research and funding.

Policies and Guidelines

- Support public education efforts that target weed identification, prevention, and suppression.
- Encourage innovative funding solutions for weed control and management solutions.
- Support efforts to apply for state and federal grants to support weed control efforts in the county.

18.4 References

[1] Salt Lake County. 2017. Weed Control Website. http://slco.org/weeds/ (accessed March 23, 2017).

[2] Utah State Legislature. 2015. Utah Noxious Weed Act – Administrative Rules. Enacted July 2, 2008, Modified December 15, 2015. http://le.utah.gov/xcode/Title4/Chapter17/4-17.html (accessed January 25, 2016.)

[3] Forest Noxious Weed Treatment Program. Final Environmental Impact Statement. Wasatch Cache National Forest.

[4] US Department of the Interior, US Bureau of Land Management. 2017. Invasive & Noxious Weeds Website. https://www.blm.gov/wo/st/en/prog/more/weeds.html (accessed March 23, 2017)

19. PREDATOR CONTROL

Predator control includes strategies and practices to control the actions of or reduce the number of problematic or nuisance predator animals. In Utah, the focus is on coyotes, as specified in two predator-related bills passed by the Utah State Legislature in 2012.

Related resources:

- Livestock and Grazing
- Wildlife

19.1 Management Setting

Context

Predator and prey populations require balance to avoid adverse impacts from either population. Predator control is primarily a function of the Utah Department of Wildlife Resources and the US Department of Agricultures' Animal and Plant Health Inspection Service (APHIS). In addition to predator control, DWR and APHIS work to manage nuisance animals, which are native and introduced species of wildlife that thrive in urban environments and have become problematic. Additionally, DWR considers predator management needs and goals in management plans for various wildlife species in order to maintain population viability and resilience.

Findings

The APHIS program and DWR coordinate efforts to resolve wildlife conflicts on public and private lands. Conflicts can occur for many reasons, including the following: (1) predators injuring or killing livestock, (2) wildlife damaging farm crops or raiding livestock feed stocks, and (3) wildlife populations becoming problematic in residential areas.

Legal Context

Applicable Laws

The Animal Damage Control Act (7 USC §426-426c [1931]), as amended, gives the US Secretary of Agriculture authority to control a range of predatory animals to protect livestock, game animals, and wildlife. The Secretary delegated this authority to the APHIS and the Animal Damage Control Program. A 1993 Memorandum of Understanding between the Forest Service and APHIS provides that "APHIS and state agencies are recognized as having the authority and expertise to conduct predator control on National Forest System lands, to determine livestock losses, and to determine methodology for animal damage management. Under the Memorandum of Understanding, APHIS is named the lead agency in preparing environmental documentation for predator control and other animal damage management activities initiated by APHIS on National Forest System lands."[1]

At the state level, predator populations are primarily controlled through manipulation of hunting licenses, though individual animals can be removed if they become problematic. When livestock are injured or killed, the Wildlife Damage Compensation Act of 2011 (Utah Code §23-21-1) provides a mechanism for the DWR to reimburse livestock owners for damage caused by bear, mountain lion, wolf, and eagle. The Utah Mule Deer Protection Act of 2012 (Utah Code §23-30-101) adds a $5 fee to big game hunting permits, which funds the predator control programs. Money from this fund is used by the DWR to reimburse coyote hunters and trappers $50 for each coyote lawfully removed. The Wolf Management Act of 2010 (Utah Code §23-29) acknowledges that wolves are currently covered by the Endangered Species

Act (ESA) but it is the policy of Utah that wolves should actively managed (controlled) and not be allowed to establish anywhere in the state.

19.2 Desired Future State

Salt Lake County desires to maintain sustainable and mutually beneficial predator and prey populations. Predator control should be used sparingly and only when absolutely necessary.

19.3 Management Objectives and Associated Policies and Guidelines

19.3.1 Management Objective

Encourage DWR and APHIS to maintain sustainable and mutually beneficial predator and prey populations.

Policies and Guidelines

Cooperate with DWR and APHIS to determine management priorities for predators and nuisance species. Support predator control programs when native species require relief from predators.

19.4 References

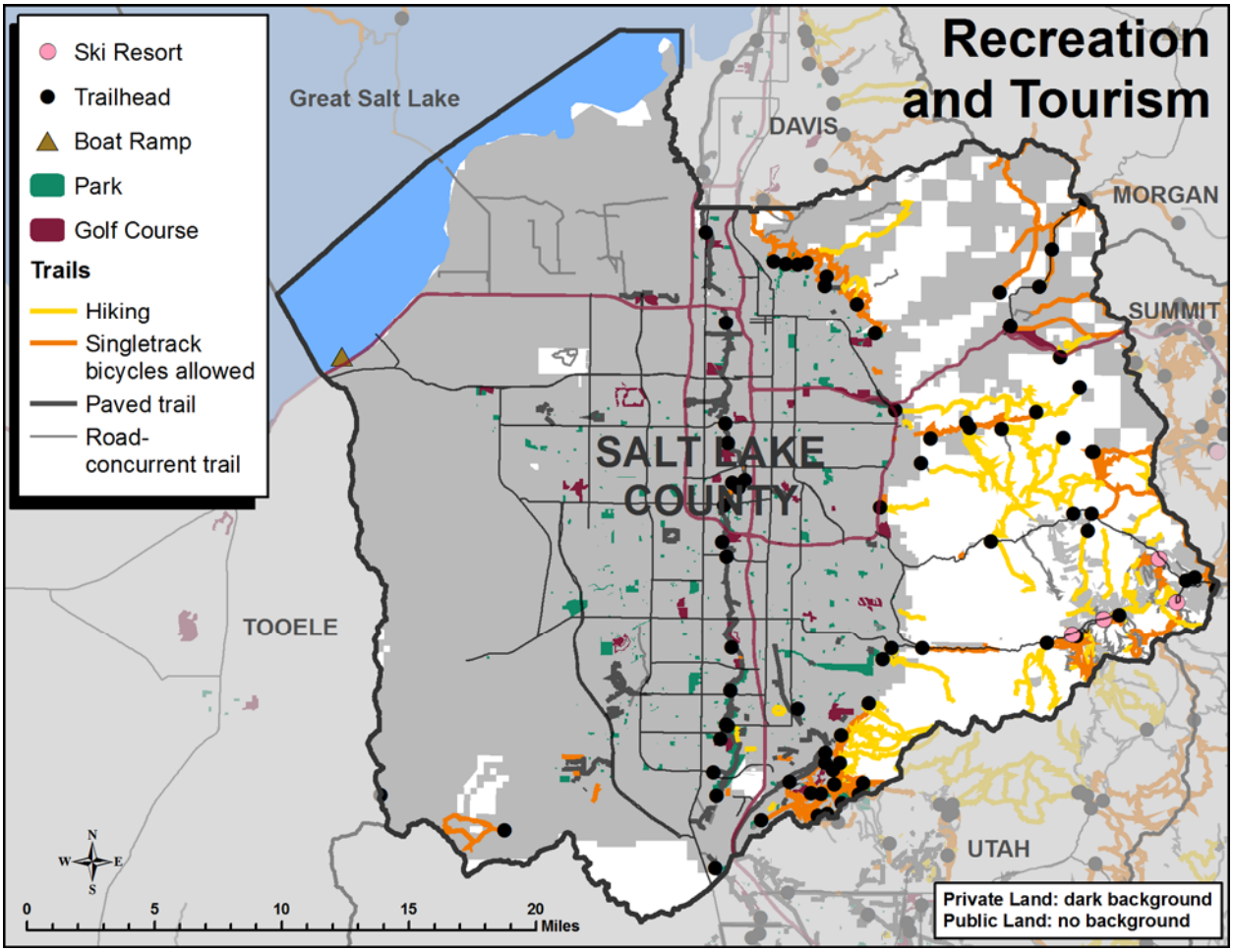
[1] US Forest Service. 1995. TITLE 2600 - Wildlife, Fish, and Sensitive Plant Habitat Management, Amendment No. 2600-95-5. https://www.fs.fed.us/dirindexhome/fsm/2600/2650.txt (accessed March 25, 2017).

20. RECREATION AND TOURISM

Recreation consists of activities that are pursued for enjoyment. Tourism is the social, cultural, and economic phenomenon of visiting places for pleasure. Outdoor recreation is a significant and growing part of Utah's economy. Tourists and travelers spent a record $8.2 billion in the Utah economy during 2015, and the tourism industry supported an estimated 137,192 jobs. Tourism is beneficial to Salt Lake County's economy by bringing in over $55 million in tax revenue in 2015; $16.5 million was collected in the county through transient room tax.[1]

Related resources:

- Land Access
- Land Use
- Wilderness



Data Sources: Ski Area Locations, Boat Ramps, Golf Courses, Trailheads, and Parks Local, Date unknown, Compiled by Utah Automated Geographic Reference Center. Trails, Date unknown, Utah Office of Tourism and GOED. Access via Utah Automated Geographic Reference Center.

20.1 Management Setting

Context

Salt Lake County's public lands provide a variety of recreational opportunities for local residents and visitors. Activities including skiing, hiking, mountain biking, camping, fishing, climbing, picnicking, Off Highway Vehicle use, horseback-riding, snowmobiling, hunting, and photography. The public lands in Salt Lake County receive heavy, year-round use due to the close proximity to populated urban centers of the Wasatch Front. Excessive utilization can threaten natural resources such as water quality, and it can cause conflict with local residents.

Findings

The Uinta-Wasatch-Cache National Forest is the primary public land manager in Salt Lake County, managing almost 100,000 acres, of which 36,403 are within designated Wilderness areas in the county. The Uinta-Wasatch-Cache National Forest receives significant visitation (Tables 20.1 and 20.2). People visit its ski resorts, campgrounds, trails, and backcountry sites. Overcrowding is often an issue when visitation exceeds available space. Restrooms, parking facilities become overwhelmed, which leads to resource degradation and impacts.

Table 20.1. Visitation types for the Uinta-Wasatch-Cache National Forest in 2007 and 2012.

NATIONAL FOREST VISIT TYPE[a]	FISCAL YEAR 2012	FISCAL YEAR 2007
Skiing	1,434,000	1,574,000
Non Skiing	6,195,000	5,220,000
Totals	7,629,000	6,794,000

Source: US Forest Service National Visitor Use Monitoring, National Resource Manager (apps.fs.usda.gov/nfs/nrm/nvum/results/). [a] National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

Table 20.2. Site visits to the Uinta-Wasatch-Cache National Forest in 2007 and 2012.

SITE VISIT TYPE[a]	FISCAL YEAR 2012	FISCAL YEAR 2007
Day Use Developed	3,313,000	3,586,000
Overnight Developed Areas	572,000	863,000
Undeveloped Areas	4,724,000	2,784,000
Wilderness	408,000	441,000
Totals	9,017,000	7,674,000

Source: US Forest Service National Visitor Use Monitoring, National Resource Manager (apps.fs.usda.gov/nfs/nrm/nvum/results/). [a] A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time. A single person can visit more than one site during a visit.

Legal Context

Recreation on public lands is managed under US Forest Service Forest Plans and US Bureau of Land Management Resource Management Plans. State law allows counties to levy taxes on hotel stays to raise funds for local uses.

Applicable Laws

The US Forest Service makes land use decisions, including those regarding recreation, by developing Forest Plans, under the National Forest Management Act (16 USC §1600 et seq. [1976]). The Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]) mandates the US Bureau of Land Management to manage lands, including recreational uses, under multiple-use philosophy. Both federal land managers set recreation policy following planning procedures specified by the National Environmental Policy Act (42 USC §4321 et seq. [1969]).

State laws applicable to recreation and tourism include the Transient Room Tax enabled by Utah Code (§59-12-3 et seq.), which allows counties to levy a tax up to 4.25% on hotel accommodations. The Tourism, Recreation, Cultural, Convention, and Airport Facilities Tax Act, (Utah Code §59-12-6 et seq.) allows counties to levy a tax up to 4% on short-term motor vehicle rentals. Funds collected under this law may be used for the development, operation, and maintenance of cultural, recreational, or tourist facilities. Utah Code §17-31-8 requires all counties that levy taxes to form an advisory board to represent the industries being taxed. Utah Code §63N-7-1 created the Board of Tourism, which advises the Utah Governor's Office of Economic Development on "planning, policies, and strategies and on trends and opportunities for tourism development."

20.2 Desired Future State

Salt Lake County desires to provide high-quality recreational experiences for visitors and residents. To accomplish this, the county desires a recreation system that is balanced, sustainable, and provides a range of settings that accommodates for year-round outdoor recreation opportunities. The recreation system must account for heavy and increasing demands with sufficient facilities, maintenance, and transportation to support high levels of use at locations with convenient access. The system should also be capable of providing opportunities for environmental education, backcountry experiences, and cultural resource protection.

Salt Lake County desires to include a diverse range of stakeholders, including local property owners, public land managers, and business owners when planning for recreation system improvements.

20.3 Management Objectives and Associated Policies and Guidelines

20.3.1 Management Objective

Engage recreation users, resource managers, and local residents in developing strategies for managing recreation to meet desired future conditions and address recreation pressures and demands.

Policies and Guidelines

Work cooperatively across agencies to support recreation choice and demand. When conflicts arise, pursue practical, lasting, win-win solutions in an atmosphere of open communication, broad participation, and respect.

20.3.2 Management Objective

Encourage education in values of outdoor recreation.

Policies and Guidelines

Support education efforts about naturalness, solitude, and other backcountry values. Recognize the value of outdoor activities in the development of children and young people, and through education and hands-on experience, encourage their active participation.

20.3.3 Management Objective

Improve the quality of recreation experience for visitors and residents.

Policies and Guidelines

- Support the development of funding mechanisms for the creation, implementation, and ongoing operations of needed recreational facilities, transportation options, infrastructure, and maintenance. Install interpretive signs in multiple languages at high-use areas, including parking lots, trailheads, and viewpoints to foster stewardship, encourage proper behavior, and appreciate natural resources.

- Encourage participation from a diverse range of stakeholders in development of recreation system improvements, including local governments, private land owners, recreation groups, and other stakeholders.

20.4 References

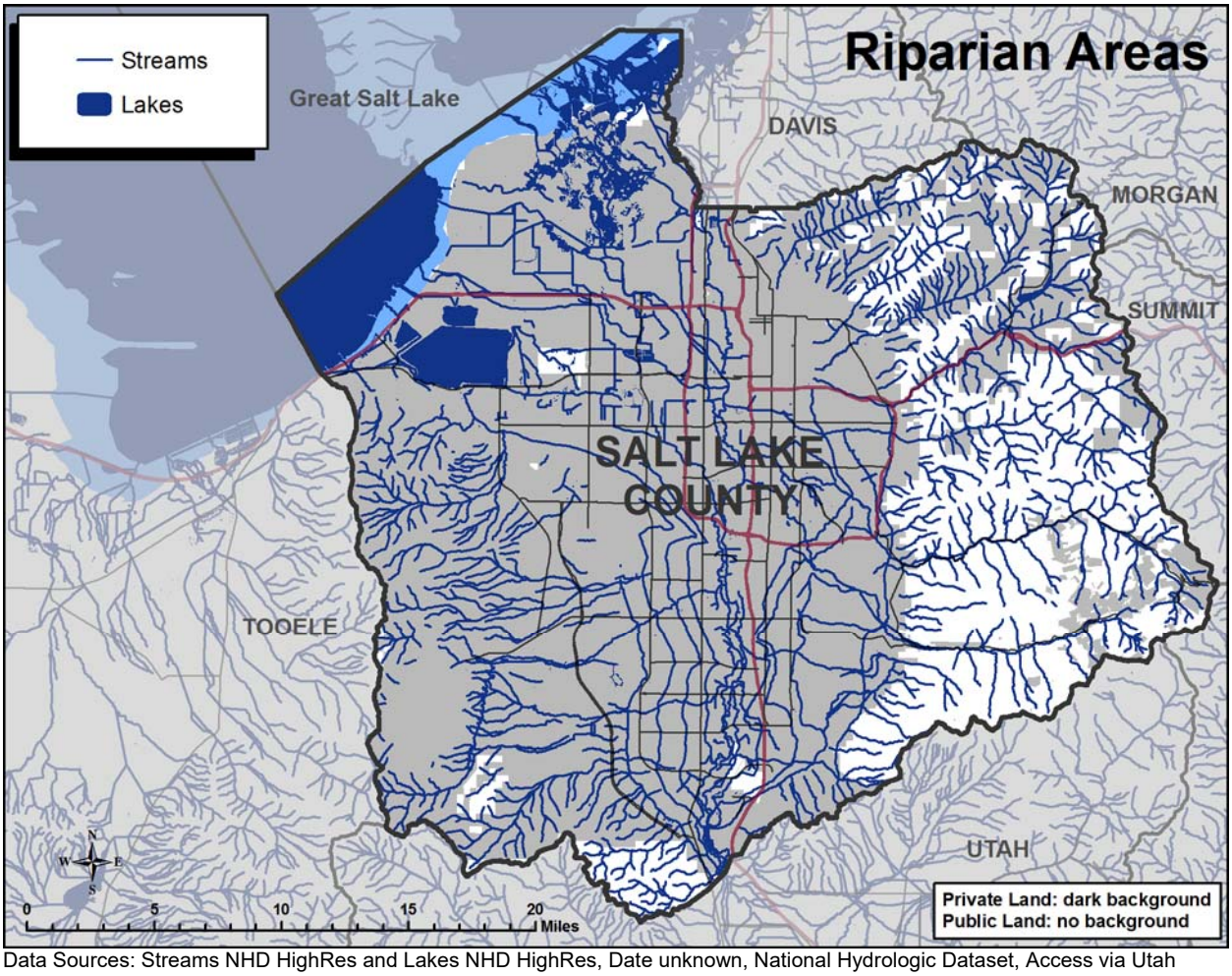
[1] Kem C. Gardner Policy Institute, University of Utah. 2017. The State of Utah Travel and Tourism Industry. https://travel.utah.gov/wp-content/uploads/2017-Travel-Tourism-Brochure-FINAL-2.13.17.pdf (accessed March 26, 2017).

21. RIPARIAN AREAS

Riparian areas are zones where terrestrial and aquatic ecosystems directly interact with each other. They occur around numerous types of waterbodies including rivers, lakes, and springs. Similar to wetlands, riparian areas provide numerous benefits to society but a few of the most important of these include wildlife habitat area, hydrologic recharge areas, and water quality improvements.

Related resources:

- Flood Plains and River Terraces
- Wetlands
- Water Quality and Hydrology



Data Sources: Streams NHD HighRes and Lakes NHD HighRes, Date unknown, National Hydrologic Dataset, Access via Utah Automated Geographic Reference Center.

21.1 Management Setting

Context

Riparian areas are often disturbed by flooding, grazing, road construction, cabin development and recreation activities. After disturbances, riparian areas become prime locations for the establishment of

invasive and noxious weeds. Climate change also affects riparian areas by altering flow regimes and increasing water temperature thereby threatening cold water fisheries.

Riparian areas are important for many reasons. They act as buffers by intercepting or diluting pollutants and sediment before they reach water. Riparian areas play an important role in erosion processes by slowing water and stabilizing banks. They provide critical wildlife habitat and are an important component of both terrestrial and aquatic ecosystems. The width of riparian areas is influenced by many factors, including human disturbance, hydrology, and climate. Because riparian areas are highly sensitive to human disturbances, it is important to manage them with respect to surrounding areas and their land use.[1]

Findings

Riparian vegetation is mapped by the US Geological Survey using remote sensing. Table 21.1 shows riparian acreage in Salt Lake County by land ownership.

Table 21.1. Total acreage of riparian vegetation in Salt Lake County and on public lands.

RIPARIAN TYPE	SALT LAKE COUNTY (ACRES)	US FOREST SERVICE (ACRES)	US BUREAU OF LAND MANAGEMENT (ACRES)
Western Riparian Woodland and Shrubland	2,726	1,000	3
Freshwater Forested/Shrub Wetland	116	26	0
Totals	2,842	1,026	3

Source: US Geological Survey, Landfire Existing Vegetation Type, 2012.

Legal Context

Applicable Laws

Riparian vegetation is not regulated directly by federal or state legislation. There are, however, statutes that cover associated resources and do have implications for riparian areas. Section 404 of the Clean Water Act (33 USC §1344 et seq.) regulates permits for dredged or fill material in Waters of the United States. The Endangered Species Act (16 USC §1531 et seq. [1973]), also referred to as the ESA, may sometimes cover riparian areas when projects impact habitat of a listed species.

21.2 Desired Future State

Salt Lake County desires to protect and restore functioning and connected aquatic and terrestrial habitats, and ecosystems while increasing resiliency to climate change.

21.3 Management Objectives and Associated Policies and Guidelines

21.3.1 Management Objective

Maintain and/or restore habitat to sustain populations of well-distributed native and desired nonnative plant, vertebrate, and invertebrate populations that contribute to viability of riparian-dependent communities.

Policies and Guidelines

- Establish protocols for determining appropriate buffer widths, land use zones, and accompanying use regulations to meet water quality objectives under local conditions.[2,3] Establish protocol for

determining appropriate buffer width to meet wildlife habitat, target species habitat, and wildlife migration or dispersal functions related to specific landowner wildlife conservation objectives.[2,4]

- Support efforts to implement actions in riparian areas as outlined in the 2015 Salt Lake County Integrated Watershed Plan, including: bioengineered aquatic habitat structures, infiltration basins, floodplain reconnection, land acquisition for habitat preservation, reallocation of water rights, and changes to beneficial use of water definition. [5]

21.4 References

[1] Jordan River Commission. 2013. Best Practices for Riverfront Communities. http://jordanrivercommission.com/wp-content/uploads/BP-high-res-for-web.pdf (accessed March 23, 2017).

[2] Riparian Buffer Design Guidelines, USDA, General Technical Report RMRS-GTR-203, January 2008. https://www.fs.fed.us/rm/pubs/rmrs_gtr203.pdf (accessed March 16, 2017).

[3] Johnson, Craig, and Susan Buffler. 2008. Riparian Buffer Design Guidelines For Water Quality And Wildlife Habitat Functions On Agricultural Landscapes In The Intermountain West. USDA

[4] Alma Winward. 2000. Monitoring Vegetation Resources in Riparian Areas. USDA Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-47.

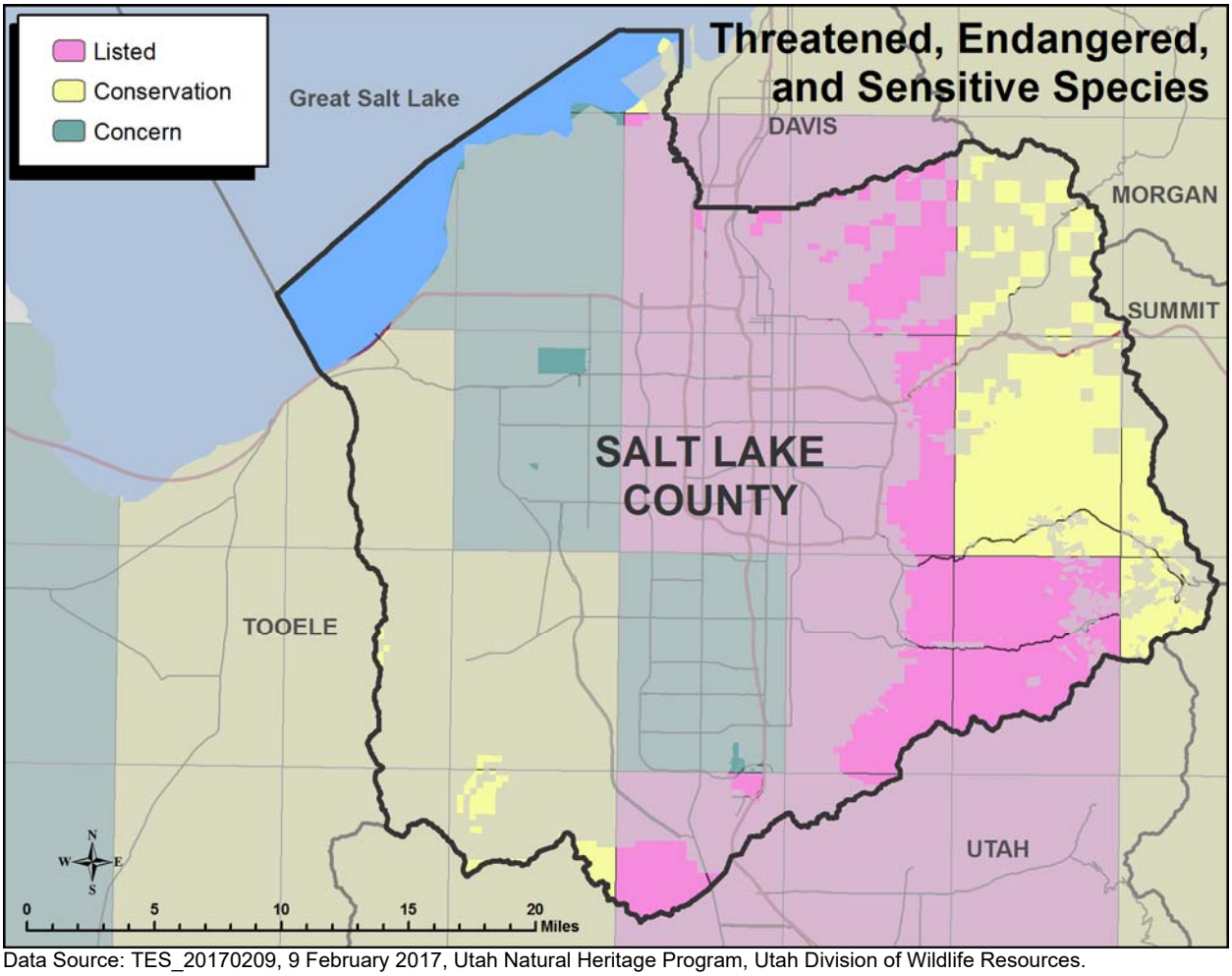
[5] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

22. THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Threatened, endangered, and sensitive species refers to plant, animal, and other living organisms that are, to some level, threatened by extinction. Federal and state governments have management responsibility to protect and restore imperiled species and the critical habitat that supports them.

Related resources:

- Wildlife
- Fisheries



Data Source: TES_20170209, 9 February 2017, Utah Natural Heritage Program, Utah Division of Wildlife Resources.

22.1 Management Setting

Context

Critically imperiled plant and animal species are federally listed according to the Endangered Species Act (ESA). Under the ESA the US Fish & Wildlife Service (USFWS) is responsible for conservation of terrestrial and freshwater aquatic species that are endangered or threatened with extinction due to loss of habitat, overutilization, disease, predation, inadequate protection, and other factors both human-made and

natural. For sensitive species in Utah that are not protected by the ESA, the Utah Department of Wildlife Resources (DWR) is tasked with conservation. Utah's primary objective for managing sensitive species is to maintain wildlife and wildlife habitat well enough to prevent federal designation.[1] Once a species is federally listed, the state loses primacy for the management of that species. This implies federal regulation of activities on state and private lands that may directly threaten listed species or that species' habitat. From state and local perspectives, federal designation of endangered species means less local control of land use issues, which might cause harm to the designated species.

Utah's 2015 Wildlife Action Plan stated goal is "to manage native wildlife species and their habitats, sufficient to prevent the need for additional listings under the Endangered Species Act".[1] This goal precludes plants.

The DWR Habitat Designation Advisory Committee divides species into three categories following an official Designation Process (DWR Administrative Rule R657-48).[2] This ranking includes plants. The ranking system is summarized in the following list:

- ***S-ESA.*** Federally listed or candidate species under the ESA.

- ***CS.*** Species receiving special management under a Conservation Agreement in order to preclude the need for federal listing.

- ***SPC.*** Species of concern.

Findings

Salt Lake County has the following federally listed threatened or endangered species[3]:

- Yellow-Billed Cuckoo, Threatened
- Ute's Ladies Tresses, Threatened

Other species that may occur in Salt Lake County include gray wolf. Wolves are no longer covered by the ESA except some parts of Utah, including Salt Lake County.[4]

The following 11 sensitive wildlife species have wildlife action plans by the DWR:[4] burrowing owl, western toad, ferruginous hawk, black swift, Lewis's woodpecker, Bonneville cutthroat trout, American white pelican, yellow-billed cuckoo, least chub, bald eagle, and Columbia spotted frog.

The DWR lists the sensitive species shown in Table 22.1 as occurring in Salt Lake County.[2]

Legal Context

Applicable Laws

The ESA (16 USC §1531 et seq. [1973]) was established to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species."

Table 22.1. Utah Division of Wildlife Resources special-status animal species occurring in Salt Lake County.

American three-toed woodpecker, SPC	least chub, CS
American white pelican, SPC	Lewis's woodpecker, SPC
bald eagle, SPC	long-billed curlew, SPC
black swift, SPC	lyrate mountainsnail, SPC
bobolink, SPC	northern goshawk, CS
Bonneville cutthroat trout, CS	short-eared owl, SPC
burrowing owl , SPC	smooth greensnake, SPC
California floater, SPC	spotted bat, SPC
Columbia spotted frog, CS	Townsend's big-eared bat, SPC
ferruginous hawk, SPC	western pearlshell, SPC
grasshopper sparrow, SPC	western toad, SPC
kit fox, SPC	yellow-billed cuckoo, S-ESA

Source: Utah Division of Wildlife Resources.[2]

Utah code related to threatened and endangered species begins with Utah Code §23-14-1, which created the DWR with authority over wildlife in the state. Under this authority, the DWR works to protect and manage sensitive wildlife species.

The US Department of Interior and Related Agencies Appropriations Act of 2002 created the federal State Wildlife Grants program, which enables Congressional appropriators to consider funding wildlife and habitat conservation on a year-to-year basis. This law requires that each state have a current, approved Wildlife Action Plan to remain eligible for any State Wildlife Grants funding that Congress appropriates to the federal program. States that choose to participate in the State Wildlife Grants program must review and revise their Wildlife Action Plans at least once every 10 years, if they want to maintain their eligibility." Utah's initial Wildlife Action Plan was completed and approved in 2005, and there is currently a 2015 draft available.[1]

In 2009 the state passed the Brine Shrimp Royalty Act (Utah Code §59-23 et seq.), which initiated a royalty on brine shrimp harvest to fund the Endangered Species Mitigation Fund. The Endangered Species Mitigation Fund significantly expanded the funding base for conservation of wildlife species which are designated as Utah Sensitive Species or are ESA listed. The purpose of this fund is to avoid, reduce, and/or mitigate impacts of ESA listings on the people of Utah.[5] Funds are used by the state to develop, study and protect state listed special status species.

22.2 Desired Future State

Salt Lake County desires to maintain the viability of at-risk wildlife and plant species, including endangered, threatened, and sensitive species along with their habitats and unique communities.

22.3 Management Objectives and Associated Policies and Guidelines

22.3.1 Management Objective

Protect critical habitats for at-risk wildlife and plant species and, where possible, restore degraded habitats and connectivity between fragmented habitats.

Policies and Guidelines

- Support efforts that restore degraded habitats and connectivity between fragmented habitats, such as efforts to connect large patches of forests.
- Limit grazing in sensitive areas if grazing is a threat to a sensitive, threatened or endangered species, including riparian areas and aquatic habitats.
- Restore or maintain hydrologic functions of water bodies and waterways.
- Promote aquatic habitat protection. Preserve aquatic habitats identified by agencies as used or occupied by special status species in their current state by avoiding any action that would remove water from these areas.

22.3.2 Management Objective

Support the primary goal outlined in the DWR Utah's Wildlife Action Plan, which seeks to keep native species off the Endangered Species List.

Policies and Guidelines

- Encourage responsible recreation and effective education and enforcement.
- Encourage limited grazing in sensitive areas.
- Support actions which provide connectivity between fragmented habitats that support at-risk wildlife and plant species.
- Encourage the protection of open lands that support at-risk wildlife and plant species.
- Support the restoration of degraded habitats where at-risk wildlife and plant species are found.
- Coordinate with DNR and the Utah Department of Transportation to reduce wildlife-vehicle collisions on Salt Lake County roadways.
- Support other projects which aim to mitigate wildlife-vehicle collisions.

22.4 References

[1] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2015. Utah Wildlife Action Plan, Draft Version 6-4-2015. https://wildlife.utah.gov/wap/wap2015draft.pdf (accessed March 14, 2017).

[2] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2015. County Lists of Utah's Federally Listed Threatened, Endangered, and Candidate Species. http://dwrcdc.nr.utah.gov/ucdc/viewreports/sscounty.pdf (accessed March 27, 2017).

[3] Utah Department of Natural Resources, Division of Wildlife Resources. 2015. Utah Sensitive Species List. http://dwrcdc.nr.utah.gov/ucdc/viewreports/SSL_Appendices.pdf (accessed March 27, 2017).

[4] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2012. Wolf Management in Utah. https://wildlife.utah.gov/pdf/fact_sheets/wolves.pdf (accessed March 27, 2017).

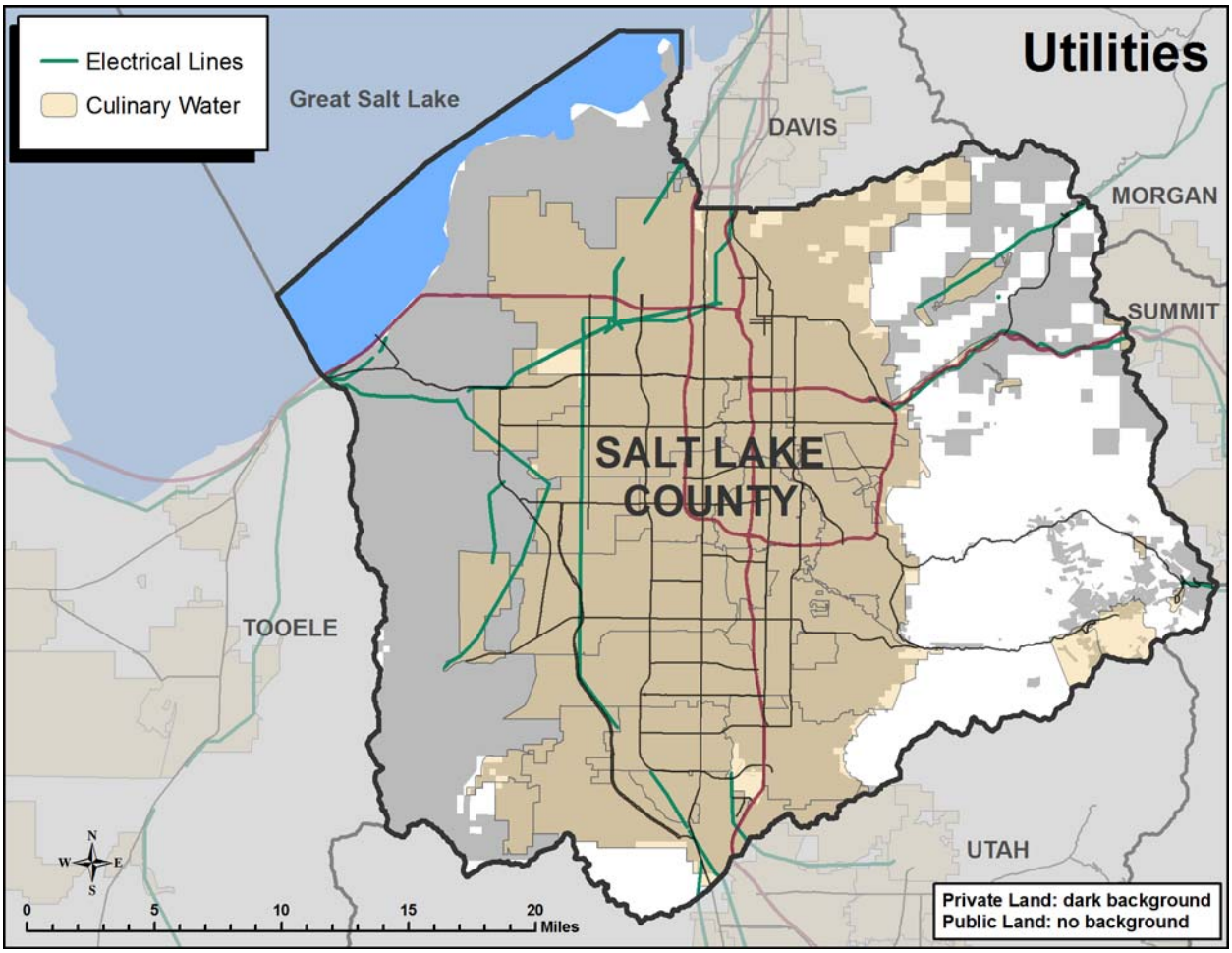
[5] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2014. Endangered Species Mitigation Fund. https://naturalresources.utah.gov/wp-content/uploads/ESMFguidelines2014forwebsite.pdf (accessed March 27, 2017).

23. UTILITIES

Utilities are useful services and commodities provided to the community at a cost. Examples of utilities include electricity, water, and communication services. Utility corridors often cross public lands impacting the land and its ecosystems.

Related resources:

- Energy Resources
- Cultural, Historical, Geological, and Paleontological Resources
- Land Use



Data Sources: Electrical Lines, 1989, State of Utah Comprehensive Emergency Earthquake Preparedness Program. Retail Culinary Water Suppliers, December 2015, Several agencies. Access via Utah Automated Geographic Reference Center.

23.1 Management Setting

Context

Utilities, including reliable transportation of energy and communication services, are important to the people and businesses of Salt Lake County. However, utility corridors crossing public lands have the potential to adversely impact the natural resources, land uses, and visual quality.

Findings

Energy transmission pipelines and powerlines occur throughout Salt Lake County, though precise counts, quantities, and locations are not available.

Legal Context

Utility corridors on public lands are generally managed during the land and resource planning stages. Forest Plans specifically address transportation and utility corridors.

Applicable Laws

Utility corridors are managed under land use planning procedures specified for the US Forest Service by the National Forest Management Act (16 USC §1600 et seq. [1976]) and for the US Bureau of Land Management by the Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]). Both federal land management agencies are subject to the National Environmental Policy Act (42 USC §4321 et seq. [1969]) planning process.

23.2 Desired Future State

Salt Lake County desires that adequate utilities remain available and are provided in ways that do not adversely impact public lands. When possible, new utility infrastructure should be constructed in established utility corridors and should avoid culinary water supply.

23.3 Management Objectives and Associated Policies and Guidelines

23.3.1 Management Objective

Ensure that utilities are provided in ways that do not adversely impact public lands and that support the growth of Salt Lake County.

Policies and Guidelines

- Coordinate with land agencies and utility companies in planning and designing utility corridors.
- Support utility corridors that minimize the number of separate rights-of-ways and overall environmental impacts.
- Work within the planning framework of established Forest Plans.

24. VISUAL RESOURCES

Visual resources are the objects, scenes, vistas, etc., that humans experience, whether natural or human-made. They are often considered on the landscape scale but small items can also be a visual resource.

Related resources:

- Cultural, Historical, Geological, and Paleontological Resources
- Land Use

24.1 Management Setting

Context

Scenic and appealing views add to the quality of life. Salt Lake County has mountains, peaks, canyons, the Great Salt Lake, a wide valley, and urban and rural environments that all contribute to the scenic resources of the county.

Findings

Public lands provide the stunning mountainous scenery in the eastern portion of the county. The skyline of snowy peaks, tree-covered hillsides, and deep canyons are primarily managed by the US Forest Service (Forest Service). Other large portions of the viewshed, including the Oquirrh Mountains to the west of Salt Lake County, are privately owned.

Legal Context

Visual resources on public lands are generally managed during the land and resource planning stage. For their most recent plans, the Forest Service used the Scenery Management System to evaluate and manage scenery resources while the US Bureau of Land Management used Visual Resource Management.[1,2]

Applicable Laws

Visual resources are managed under land use planning procedures specified for the Forest Service by the National Forest Management Act (16 USC §1600 et seq. [1976]) and for the BLM by Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]). Both federal land managers are subject to the National Environmental Policy Act (42 USC §4321 et seq. [1969]) planning process.

24.2 Desired Future State

Salt Lake County desires to maintain or improve the visual resources within the county.

24.3 Management Objectives and Associated Policies and Guidelines

24.3.1 Management Objective

Maintain or improve scenic and appealing objects, scenes and vistas on public lands in Salt Lake County.

Policies and Guidelines

- Land use goals, decisions and transportation and utility solutions should consider the impacts of development on visual resources and the overall experience the public has on public lands.[1,2]

- Significant vistas and landscapes that have special visual and aesthetic qualities will be preserved and maintained.[3]

- Encourage the enhancement of the aesthetic beauty of our built environment.[4]

24.4 References

[1] Salt Lake County. 2013. Draft Big Cottonwood Canyon General Plan. http://slco.org/pwpds/pdf/BigCottonwood_-_DRAF.pdf (accessed March 28, 2017).

[2] Salt Lake County. 2013. Parleys Canyon General Plan. http://slco.org/pwpds/pdf/ParleysPlan_-_DRAFT_.pdf (accessed March 28, 2017).

[3] Salt Lake County. 2012. Emigration Canyon Township General Plan. http://slco.org/pwpds/zoning/pdf/EmigrationPlan/DRAFT-EmigrationCany1.pdf (accessed March 28, 2017).

[4] Wasatch Front Regional Council. N.D. Wasatch Choices 2040. http://www.wfrc.org/publications/wasatchchoices2040report.pdf. (accessed March 28, 2017).

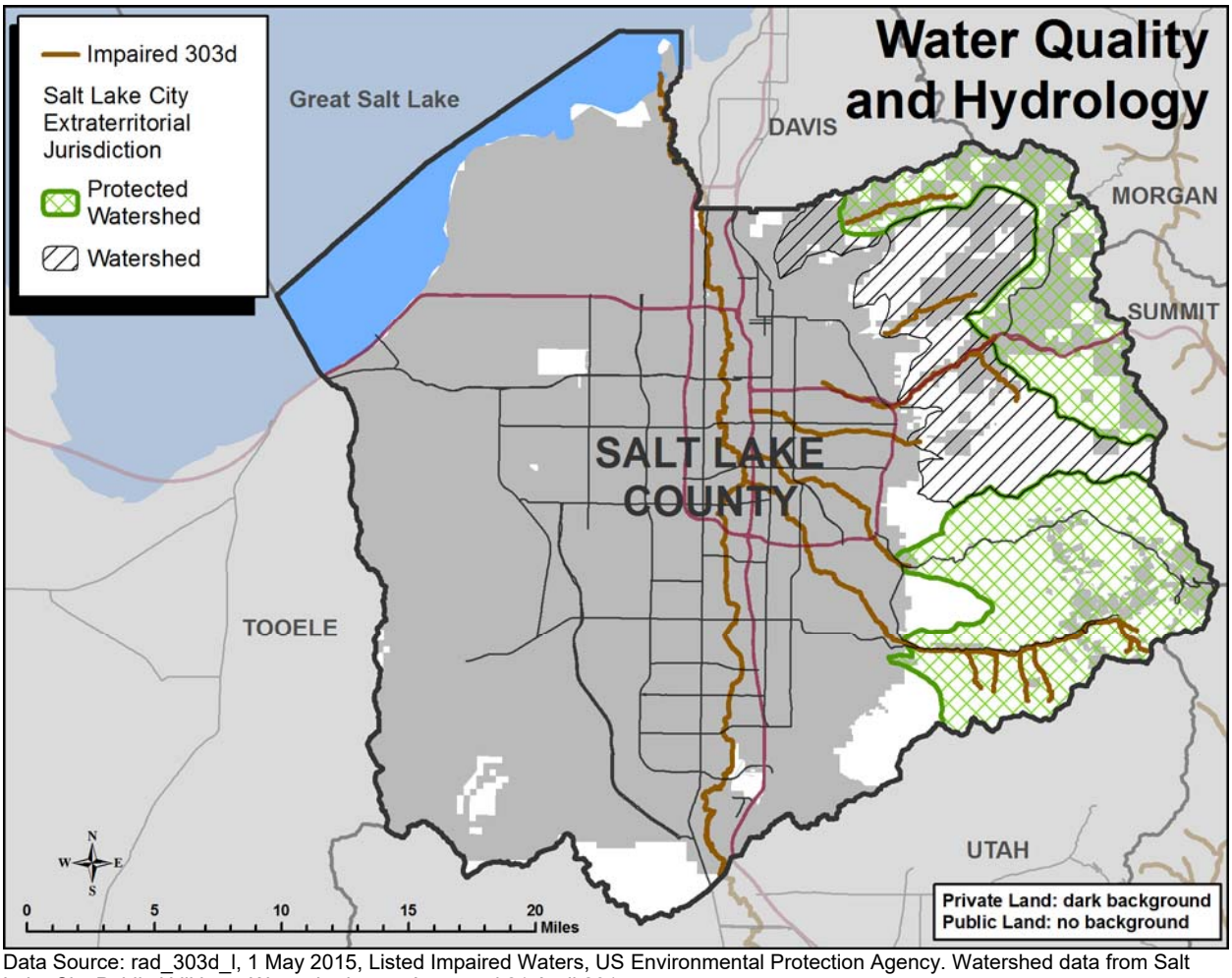
25. WATER QUALITY AND HYDROLOGY

Water quality and hydrology are two distinct but inherently related components of water. Water quality describes the condition (physical, chemical, and biological) of water with respect to specific use, such as culinary water supply, aquatic wildlife, or agriculture. Water quality is highly affected by flow and timing (the poorest water quality usually occurs during periods of low flow).

Hydrology characterizes the timing (when water is available), distribution, and flow of water across the human and natural landscape.

Related resources:

- Irrigation
- Water Rights
- Floodplains and River Terraces
- Wetlands



Data Source: rad_303d_l, 1 May 2015, Listed Impaired Waters, US Environmental Protection Agency. Watershed data from Salt Lake City Public Utilities – Watershed map, Accessed 21 April 2017
http://www.slcdocs.com/utilities/watershed/images/trailhead%20overview2.pdf

25.1 Management Setting

Context

Water Quality. The watersheds that serve the Salt Lake Valley are critically important as a drinking water source for Salt Lake County. Maintaining high water quality standards has economic benefits because it requires less treatment for drinking. Good water quality can have positive cascading benefits to other resources such as recreation and tourism, wetlands, wildlife, fisheries, and agriculture.

Hydrology. Winter and spring snowfall are the principle sources of surface water in this region.[1] Annual melting of high-elevation snowpack creates water runoff flows that refill reservoirs and recharge groundwater aquifers. Spring peak flows also support sediment transport, channel maintenance, and riparian vegetation. Spring rains provide a minor contribution to reservoir storage but are primarily important for postponing the timing of reservoir water use. Although thunderstorms may add flow, low flows or dry conditions generally occur in the late summer, which result in many water quality issues. Local watersheds provide water for culinary and irrigation purposes as well as inflow to the Great Salt Lake.

Most streams in Salt Lake County have headwaters in national forest areas or other public lands. These streams are City Creek, Red Butte Creek, Emigration Creek, Parley's Creek, Mill Creek, Big Cottonwood Creek, Little Cottonwood Creek, and Bells Canyon Creek. Other unnamed and small intermittent streams also emerge from the foothill areas.

Findings

Water Quality. In the Revised Uintah-Wasatch-Cache National Forest Plan the Forest Service states that the underlying premise of the Forest's resource management for the Central Wasatch Management Area is, "the need to provide long-term, high quality culinary water to the large urban population of the Salt Lake Valley."[2] The Forest Service continues, stating that, "Salt Lake City owns all or the largest percentage of water rights in each of the Wasatch Canyons except Red Butte, and has congressionally delegated authority to protect the water supply. Congress also directed the Forest Service to administer designated watersheds in cooperation with Salt Lake City for the purpose of storing, conserving and protecting water from pollution."[2] Additionally, a Public Law of 1914 (30 Stat. 714, Public Law 199, September 19, 1914) directs the U.S. Secretary of Agriculture to administer the lands in cooperation with Salt Lake City "for the purpose of storing, conserving, and protecting from pollution the said water supply."

In Utah, water quality is regulated by the state based on the source of pollutants entering waterways, defined either as "point source" or "nonpoint source" pollution. Point sources discharge pollutants directly into a waterbody, usually through pipes or ditches originating from industries or waste treatment plants. Nonpoint sources of pollution are those that do not originate from distinct locations and tend to vary in time and space. Nonpoint source pollution occurs when runoff from rainfall or snowmelt picks up pollutants from the human and natural landscape and transports them indirectly to a waterbody.

Local regulations and plans protecting water quality include Salt Lake City's watershed ordinances (17.04), Salt Lake County Health Department Regulations, and the Salt Lake County Integrated Watershed Plan.[3].

Common water quality characteristics include the following:

- ***Conductivity.*** A measure of the ability of water to conduct an electrical current. It is dependent on the amount of dissolved solids in the water.

- ***Dissolved oxygen.*** A measure of the amount of oxygen dissolved in water. Water's capacity to carry dissolved oxygen is inversely related to temperature; as temperature increases, dissolved oxygen decreases. Fish and other aquatic organisms require dissolved oxygen for respiration. If dissolved oxygen levels are too low, aquatic organisms can be severely impacted.

- ***Nutrients.*** Nutrients such as nitrogen and phosphorus are essential for plant and animal growth and nourishment. However, excessive nutrients from human sources become problematic when they over accumulate and can cause adverse effects within waterbodies. For example, nutrient-fed algal blooms can consume oxygen needed by other aquatic organisms, produce toxins that can harm livestock and humans, and contaminate recreational waters.

- ***pH.*** A measure of acidity, pH is used as an indicator of chemical changes in the water. Some streams in Utah tend to have slightly higher pH because of their limestone substrates.

- ***Suspended sediment.*** The amount of sediment moving along a stream suspended in the water column. This depends partly on water flow; fast-flowing water can move more sediment than slow-flowing water. This measurement also depends on the amount of fine sediments available to transport.

- ***Water temperature.*** Changes in water temperature can impact aquatic organisms, as well as humans (e.g., recreational and industrial uses). Water temperature also affects dissolved oxygen—as temperature increases, water's capacity to dissolve oxygen decreases.

- ***Turbidity.*** A measure of the amount of particulate matter that is suspended in water. Turbidity measures the scattering effect that suspended solids have on light entering the water.

Common point sources pollution include the following:

- Livestock feeding operations
- Industrial wastewater
- Municipal wastewater
- Pesticide applications
- Stormwater inputs
- Construction activities
- Industrial activities
- Municipal and transportation sources

Common nonpoint sources pollutants and sources include the following:[4]

- Fertilizers, herbicides, and insecticides from residential and agricultural areas
- Forest roads
- Oil, grease, and other chemicals on impervious surfaces such as roads and parking lots
- Sediment from construction areas and roadways
- Salts from roadways and agricultural areas
- Acid drainage from abandoned mines
- Bacteria and nutrients from septic systems, pet waste, and livestock

The Utah Department of Environmental Quality considers some streams on public lands within Salt Lake County to be impaired by at least one water quality constituent. Cadmium is a problem in City Creek,

Parley's Creek, Big Cottonwood Creek, and Little Cottonwood Creek in areas with public lands. Emigration Creek exceeds state standards for the bacteria Escherichia coli (E. coli). Other pollutants causing impairments are pH and zinc. Table 25.1 lists watersheds with public lands within Salt Lake County and their impairment.

In 2015, Salt Lake County published a Watershed Management Plan [3] which included an evaluation of water quality from 2010 to 2014. Their evaluation covered Total Dissolved Solids, pH, temperature, dissolved oxygen, E. coli, and macroinvertebrates. The watersheds were split into upper watersheds and lower watersheds, with most upper watersheds having a high proportion of public land. With the exception of these known water quality issues, the streams in the upper watersheds emerging from public lands tend to have overall good water quality. The pH, temperature, and dissolved oxygen concentration measurements are considered good in the upper watersheds. Water quality deteriorates as the stream flows into the lower watershed areas in urbanized areas with high amounts of impervious surface area and population.

Table 25.1. List of watersheds with public lands within Salt Lake County and their impairment status.[5]

Stream	Watershed	Use	Impairments	Public Lands in Watershed
City Creek	City Creek 1 (Lower)	2B, 3A	none listed	USFS
	City Creek 2 (Upper)	1C,2B, 3A	cadmium (3A)	USFS
Red Butte Creek	Red Butte Lower	2B, 3A	Observed/Expected Bioassessment	USFS
	Red Butte Upper	1C,2B,3A	none listed	USFS
Emigration Creek	Emigration Lower	2B,3A	E-coli (2B)	State Park
	Emigration (Upper)	2B,3A,4	E-coli (2B) Approved TMDL	USFS
Parleys Canyon Creek	Parleys Canyon Creek 1 (Lower)	1C,2B,3A	E-coli (1C)	USFS
	Mountain Dell	1C,2B,3A	not listed	USFS
	Parleys Canyon Creek 2 (Upper)	1C,2B,3A	cadmium (3A)	USFS
Mill Creek	Mill Creek 3 (Upper)	2B,3A,4	none listed	USFS
Big Cottonwood Creek	Big Cottonwood Creek-2 (Upper)	1C,2B,3A	copper, cadmium (3A)	USFS
Little Cottonwood Creek	Little Cottonwood Creek-2 (Upper)	1C,2B,3A	pH (1C, 2B,3A) copper, cadmium, zinc (3A)Approved TMDL for zinc	USFS
Bells Canyon Creek	Bells Canyon	1C,2B,3A	not assessed	USFS

1C: Domestic water2B: Infrequent primary contact and secondary contact
3A: Aquatic wildlife, cold water species
4: Irrigation

Hydrology

In terms of defining local hydrologic systems, spatial datasets from the US Geological Survey like the National Hydrography Dataset and the Watershed Boundary Dataset are used to determine the location of

watershed boundaries and surface water (rivers, lakes, and springs) in Salt Lake County. Tables 25.2 and 25.3 provide basic hydrologic statistics for Salt Lake County.

Table 25.2. Total miles of linear water features in Salt Lake County.

WATERBODY TYPE	SALT LAKE COUNTY (MILES)	US FOREST SERVICE (MILES)	US BUREAU OF LAND MANAGEMENT (MILES)
Connector	8.1	0	0
Canal/ditch	378	0	0.5
Lake/pond	1.2	0	0
Intermittent stream/ river	742.1	185.6	3.9
Perennial stream/ river	246.9	104.8	0.1
Artificial path	105.2	2.8	0
Totals	1,481.5	293.2	4.5

Source: US Geological Survey, National Hydrological Dataset, Streams.

Table 25.3. Total acres of water bodies in Salt Lake County.

WATERBODY TYPE	SALT LAKE COUNTY (ACRES)	US FOREST SERVICE (ACRES)	US BUREAU OF LAND MANAGEMENT (ACRES)
Lake/Pond	24,569.5	152.3	0
Reservoir	7,140.5	0.7	0
Totals	31,710.0	153.0	0

Source: US Geological Survey, National Hydrological Dataset, Lakes.

Legal Context

Water quality and hydrology each have specific laws and regulations related to the resources.

Applicable Laws

Water quality. With respect to water quality, the Utah Department of Environmental Quality (DEQ), Division of Water Quality (DWQ) is responsible for maintaining water quality in Utah. Water quality is regulated by the DWQ based on the source of pollutants entering waterways, defined as either point source or nonpoint source pollution.

Point source pollution. Point source pollution originates from a distinct business, operation, or other specific location. Point source pollutants are highly regulated under the Clean Water Act (Federal Water Pollution Control Act) (33 USC §1251 et seq. [1972]) and Utah Water Quality Act (Utah Code §19-5) through the issuance of permits and possible fines if permit requirements are not met. The EPA issues discharge permits within the National Pollutant Discharge Elimination System (NPDES). In Utah, the State was granted primacy by EPA to manage the NPDES permitting program as the Utah Pollution Discharge and Elimination System (UPDES) and is operated by the DWQ.

National Pollutant Discharge Elimination System permits are required for all point sources listed above. The Clean Water Act explicitly excludes agricultural runoff and irrigation return flow as point source pollution and do not require NPDES permits.

Nonpoint source pollution. Nonpoint source pollution originates from a variety of dispersed sources, such as parking lots, roads, residential landscaping, agricultural operations, stream bank erosion, and fire scars. Once mobilized, these pollutants enter streams, waterbodies, wetlands, and groundwater. Because of its complex nature, nonpoint source pollution is not regulated through permitting under the Clean

Water Act. Instead, nonpoint source pollution is managed in Utah by the DWQ through voluntary and incentivized actions of individual landowners. The Utah Water Quality Act (Utah Code §19-5) requires states to prepare nonpoint source pollution assessment reports and include provisions for federal funding for implementing nonpoint source management.[3] In some cases local governments have established development codes to compel actions to reduce nonpoint source pollution.

Due to the diffuse nature of nonpoint source pollution, the DWQ uses water-quality data in streams and lakes to determine levels of pollution within a watershed. The DEQ collects water quality monitoring data to determine if a waterbody supports its designated beneficial uses and meets water quality standards.

A statewide assessment report, called the Integrated Report, is produced by the DWQ every other year. This report summarizes overall surface water conditions, estimates the importance of key water quality concerns, identifies impaired waterbodies, and helps agencies prioritize resource needs.[3] This report also helps in the development of Total Maximum Daily Load (TMDL), which is a calculation of the maximum amount of a pollutant that a waterbody can have while still meeting water quality standards and required for impaired waterbodies. Data for assessed waters in Utah is public and can be found in the Utah Environmental Interactive Map application. Water quality data is divided by waters with no impairments, waters with no evidence of impairment, waters with insufficient data, impaired waters with a Total Maximum Daily Load, and impaired waters that need a Total Maximum Daily Load.

Hydrology. Title 73 (Water and Irrigation) of Utah Code provides the majority of legal framework for water use and management in Salt Lake County. The appropriation of water from the rivers, lakes, and wells is regulated by the Utah Division of Water Rights and Utah Code §73-2-1.1. More information on water rights can be found in this document under CRMP Section 26, Water Rights.

25.2 Desired Future State

Salt Lake County desires to maintain and/or improve watersheds and water quality to maintain public water supply and provide stable and productive riparian and aquatic ecosystems and groundwater resources on public lands. The county also desires to reduce pollutant loads entering waterways to improve water quality. Salt Lake County desires to coordinate activities among various local, state, and federal agencies and organizations to protect water quality across the county.

25.3 Management Objectives and Associated Policies and Guidelines

25.3.1 Management Objective

Proactively address water quality needs in watersheds across Salt Lake County.

Policies and Guidelines

- Encourage continued monitoring by the State DWQ to ensure that the public water supply remains at its current service level and is not adversely affected by new development.

- Support activities which implement strategies to protect wetlands, riparian areas, and stream bank stability to prevent degradation from erosion and sediment transport to protect water quality, habitat, and hydrologic functions.

- Support activities which increase stream corridor and watershed recharge area preservation to improve habitat, social, recreational, and water use functions.

- Support water quality analysis to standardize ordinances and policies that protect the watershed.

25.3.2 Management Objective

Identify abandoned mines and develop pollution reduction strategies.

Policies and Guidelines

Use the following best management practices to remediate acid drainage and dissolved metals:

- Divert clean water away from reactive materials to prevent contamination.
- Remove reactive materials from areas where they may come in contact with water.
- Isolate reactive materials from surface and/or subsurface water to prevent contamination.
- Manipulate water chemistry to favor desired conditions.
- Treat contaminated water to remove contaminants.

25.3.3 Management Objective

Support the reduction of pollution from septic systems.

Policies and Guidelines

- Require new septic systems to strictly comply with building code standards and ensure that existing septic systems are monitored and maintained to achieve safe operating conditions.

- Existing septic systems not meeting health codes should be improved or replaced.

25.3.4 Management Objective

Support activities which reduce pollution from industrial sources.

Policies and Guidelines

Use of best management practices for industrial sites include the following:

- Establish vehicle cleaning areas with drainage to sanitary sewer.
- Use detention/retention/infiltration basins.
- Use storm drain inlet protection.
- Minimize stormwater drainage.
- Practice fugitive dust suppression.
- Utilize secondary containment of stormwater and runoff.

25.3.5 Management Objective

Support activities which reduce pollution from municipal sources.

Policies and Guidelines

Encourage the use of best management practices for residential areas including the following[5,6,7,8,9]:

- Maintain vegetative ground cover and mulch to minimize stormwater drainage.
- Establish water and sediment containment basins.
- Establish pet waste ordinances.
- Use street cleaning.
- Use fertilizer and pesticides at appropriate times and in appropriate amounts.

- Educate the public about stormwater, storm drains, water quality, riparian areas, floodplains and groundwater. To this end, the Salt Lake County Watershed Planning and Restoration Program created the Stream Care Guide to assist county residents living along waterways take part in improving water quality.[10]

25.3.6 Management Objective

Support activities which prevent erosion and resulting sediment from entering watercourses.

Policies and Guidelines

- Manage runoff to reduce its quantity and velocity.
- Stabilize fine soil or mine waste particles in place.
- Trap mobilized particles before they leave the site.

25.3.7 Management Objective

Coordinate management objectives and activities across the many jurisdictions, agencies, departments, and organizations that work on water quality issues in Salt Lake County.

Policies and Guidelines

Encourage coordination between the various entities that have any effect on culinary water, such as Salt Lake County, each of the water districts, private water systems, Forest Service, EPA, US Army Corps of Engineers, State of Utah, Division of Environmental Quality, Salt Lake City Public Utilities, and the City-County Health Department to share and discuss information and policy positions.

25.4 References

[1] Western Regional Climate Center. 2002. Climate of Utah. http://www.wrcc.dri.edu/narratives/UTAH.htm (accessed March 23, 2017).

[2] US Forest Service. 2003. Revised Forest Plan for the Wasatch-Cache National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5354094.pdf (accessed March 23, 2017), p. 4-153.

[3] Salt Lake County Watershed Planning and Restoration. 2016. 2015 Integrated Watershed Plan. http://slco.org/uploadedFiles/depot/publicWorks/fwatershed/resources/2015SLCoIWP.pdf (accessed April 21, 2017).

[4] Utah Department of Environmental Quality, Utah Division of Water Quality. 2014. Nonpoint Source Management Plan for Abandoned Mines in Utah. https://deq.utah.gov/ProgramsServices/programs/water/nps/docs/2012/02Feb/Abandoned_Mine_NPS_Feb272012.pdf (accessed March 23, 2017).

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[6] Utah Department of Environmental Quality, Utah Division of Water Quality. 2013. Utah Statewide Nonpoint Source Pollution Management Plan. http://www.deq.utah.gov/ProgramsServices/programs/water/nps/mgmtplan2013/docs/2014/06Jun/2013_Utah_Statewide_NPS_Management_Plan.pdf (accessed March 23, 2017).

[7] Jordan River Commission. 2013. Best Practices for Riverfront Communities. http://jordanrivercommission.com/wp-content/uploads/BP-high-res-for-web.pdf (accessed March 23, 2017).

[8] Salt Lake County. 2014. Stormwater Best Management Practices. http://slco.org/pweng/stormwater/ (accessed March 23, 2017).

[9] Johnson, C. and S. Buffler. 2008. Riparian Buffer Design Guidelines For Water Quality And Wildlife Habitat Functions On Agricultural Landscapes In The Intermountain West. USDA Forest Service, Rocky Mountain Research Station. https://www.fs.fed.us/rm/pubs/rmrs_gtr203.pdf (accessed March 23, 2017).

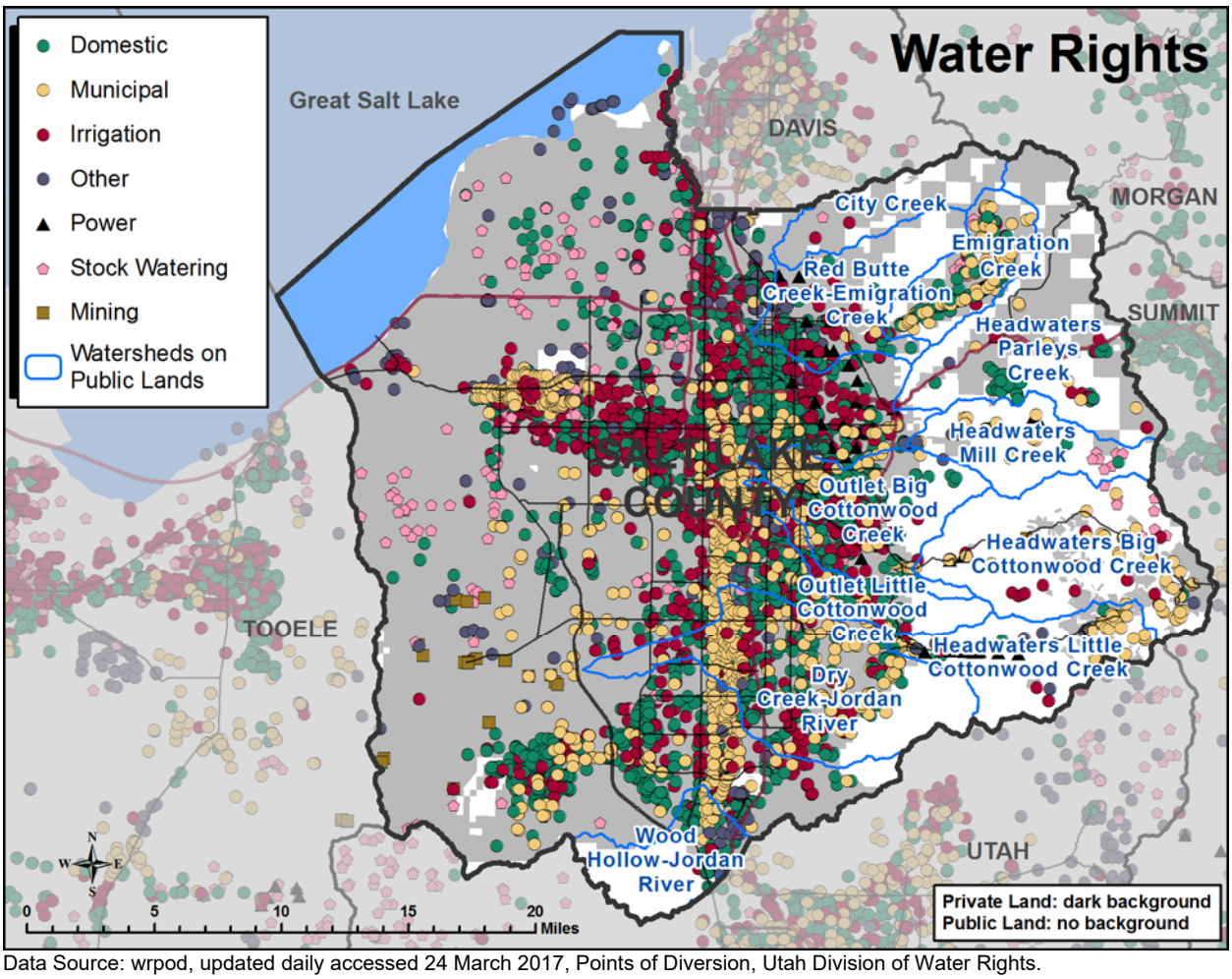
[10] Salt Lake County, Department of Watershed Planning & Restoration. 2014. Stream Care Guide, A Handbook for Residents of Salt Lake County.

26. WATER RIGHTS

Water is a renewable natural resource, available in finite supply, and subject to competition between stakeholders as annual supplies vary. The demand to supply water to Utah's various interests is expected to be a continually complex issue for stakeholders to coordinate. Water resources are a natural system resulting from a fluctuating cycle of precipitation and subsequent absorption into the earth and/or the drainage of water from high elevations to lower elevations. The network of flowing water, both above and below the earth's surface, extends beyond obvious topographic or political boundaries. As a result, management and use of water supplies requires coordination between the various jurisdictions of local, state, and federal entities

Related resources:

- Ditches and Canals
- Irrigation
- Water Quality and Hydrology



Data Source: wrpod, updated daily accessed 24 March 2017, Points of Diversion, Utah Division of Water Rights.

26.1 Management Setting

Context

Salt Lake County's public lands serve as the watershed that support many water rights used in the valley including drinking water supplies. In-stream flows (the policy of not removing or diverting flow from a stream) benefit aquatic habitats, wetlands, and riparian areas and many sensitive species are dependent on those habitats.

Findings

Appropriation, Beneficial Use, and Transfers

Utah's extensive arable lands significantly exceed the water supply provided by Utah's arid climate. The disparity in the ratio between available land and available water necessitated the establishment of legal framework through which available water is allocated. The legal identification of who possesses the right to use available water, where it's taken from, where it's used, how much is used, in what order of priority, and for which specific purpose(s) is called an "appropriation." Point of Diversion data, Stream Alteration data, Place of Use data, and Adjudication Areas data can be used to help determine areas of the county that may have complex water rights issues. Table 26.1 provides a summary of water right appropriations utilizing water from watersheds on public lands in Salt Lake County.

The purpose for which the allotted water is legally intended is called the Beneficial Use. Common beneficial uses include domestic, irrigation, municipal, electric power generation, mining and stock watering purposes.

The ownership of a right to use water identified by appropriation is called a "water right." Utah state law classifies water rights as "real property," which can be held by an entity or individual and may be bought and sold. A water right is tied to a specific source (defined as a "diversion"). Irrigation water rights are tied to a quantified acreage of land and must be continually used for the purpose for which it was appropriated, which is defined as beneficial use. With some limitations, water rights may be rented or sold to other users, subsequent to the Utah Division of Water Rights (DWRi) approval, and provided that the transfer of water rights does not affect other relevant water users. With some limitations, water rights for a certain beneficial use may be held in lieu of a different beneficial use subsequent to the DWRi approval and an appropriate exchange can be accounted for by DWRi. With some limitations, the use of water rights from a specific diversion may be transferred to the use of water from another diversion, subsequent to the DWRi approval and an appropriate exchange rate can be accounted for by DWRi.[2] Water rights are subject to available supply, so ownership of a water right may not necessarily guarantee that the user receives a specific predefined volume of water. Additionally, not all water rights possess an equal standing when annual water allocations are reduced due to availability.

The laws in the State of Utah governing the statewide administration of water rights are based on the principles of a legal doctrine known as the "Prior Appropriations Doctrine," which establishes the ranking of a water right's priority based on the chronologic establishment of the original beneficial use, making older water rights senior to newer water rights. In other words, all water rights are not created equal. As available water supply diminishes at any given diversion, a junior water right holder may have to yield remaining water supply to the holder of a more senior water right holder.

Table 26.1. Approved and perfected water rights within watersheds originating on public lands in Salt Lake County.

HUC-12 WATERSHED	DOMESTIC		IRRIGATION		MUNICIPAL		POWER		OTHER*		TOTAL	
	CFS	AF	CFS	AF	CFS	AF	CFS	AF	CFS	AF	CFS	AF
City Creek	-	-	326	-	-	-	-	-	-	1	326	7.5
Dry Creek-Jordan River	64	51,670	194	15,914	5,005	1,201,050	5	-	942	10,673	6,211	1,379,306
Emigration Creek	14	2,315	7	290	1,456	36,167	-	-	1	10	1,477	38,782
Headwaters Big Cottonwood Creek	5	3	26	4,378	83	8,796	172	-	3	350	289	13,527
Headwaters Little Cottonwood Creek	6	10	160	3,359	284	28,474	521	-	198	5	1,170	31,848
Headwaters Mill Creek	2	-	-	-	146	7,528	147	-	7	-	301	7,528
Headwaters Parleys Creek	9	1,408	386	34	200	71,605	240	-	-	19	835	73,066
Outlet Big Cottonwood Creek	216	835	647	25,327	2,070	593,235	160	-	420	7,763	3,512	627,160
Outlet Little Cottonwood Creek	122	5,038	2,780	184,794	1,377	229,077	6	-	828	38,415	5,113	457,324
Red Butte Creek-Emigration Creek	46	822	1,109	1,127	19	617	20	760,000	9	38	1,203	762,604
Wood Hollow-Jordan River	43	3,332	1,251	134,740	772	340,026	400		129	143,846	2,595	621,944
Grand Total	527	65,433	6,886	369,963	11,412	2,516,575	1,671	760,000	2,537	301,120	23,032	4,013,090

Sources: Utah Division of Water Rights, Point of Diversion Data; United States Geological Survey, Watershed Boundary Dataset, Hydrologic Unit Code 12 (HUC-12). Water Right Units are Cubic Feet per Second (CFS) and Acre Feet (AF).
*Other uses include stock watering, mining, and unlisted beneficial uses.

The source of the water may be a determining factor when identifying which beneficial use may be applied. Drinking water often comes from wells where little or no treatment is required, while irrigation water often comes from rivers because irrigation water does not typically need to be treated. Water appropriated for irrigating farmland must be used only for irrigation until (and if) approval to change the use can be obtained from the DWRi. Similarly, irrigating farmland from a culinary well is not legal unless approval has been obtained from DWRi. Additionally, failure to actively maintain beneficial use may result in the forfeiture of the water right.

Depletion

Whether it is used for drinking or irrigating corn, water rights are typically quantified as a gross volume of flow and represent the maximum amount of water a water rights holder is entitled to divert from a common supply. However, it is a common misconception that a water rights holder owns that water, or that all the water diverted is taken out of circulation. Because of the cyclical nature of how finite water supplies become available to users, ownership of a water right entitles the owner to only the single annual beneficial use for which the right was appropriated. Water right ownership entitles the holder to divert a given volume of flow (if both available supply and water right seniority allow) and apply that diverted water to the beneficial use. However, after the use of the water has been applied, the water must then be released downstream to the next user. Water rights are quantified at the diversion point because there is no reliable way to accurately measure water returned to the system after all the various beneficial uses.

"Depletion" is the term defining the actual net water volume a user takes from a given diversion point, removing it from the system and rendering it unavailable for reuse by downstream users. A water right is more accurately described as the right to an estimated amount of depletion. The estimated amount of depletion is approximated based on known rates of water that are lost to the system for a particular use, which is why water rights are tied to a specific beneficial use.

As water supplies fluctuate from year to year, any water right is subject to available supply. The State of Utah follows the prior appropriation system, which grants priority water rights to whoever has documented the earliest beneficial use of water.

Diversions can be any drilled or dug well, gate, valve, dam, or pump that takes water from a natural stream channel or groundwater. The DWRi maintains records of all water wells, storage dams, and diversions, as well as places of use, and municipal water suppliers. However, many water rights holders in Utah are entities that function for a collective set of water shareholders. Shareholders own a portion of water right(s) which is administered by the water right holder. This is usually the case within irrigation districts or ditch companies. The DWRi does not necessarily possess records of individual shareholders because those records are held by the entity owning the water right on behalf of the shareholders. Changes to any water rights may be applied for by filing an application to the DWRi. The DWRi and the Utah Division of Natural Resources are both held by appointees of the governor, accountable to the governor, subject to state legislative action, and tasked with administering all state and federal water rights within Utah.

Legal Context

Utah's water, including rivers, lakes, and groundwater is regulated under Utah Code Title 73-1et seq., Water and Irrigation, and is subject to additional legal settlements, rulings, and treaties, which also play significant roles in determining how water is allocated to users in the western United States.[1] Utah Code Utah Code §73-1-1 declares all water, above and below ground, is property of the public and shall be governed by the Utah State Legislature for "beneficial purposes". Utah Code §73-2-1 creates a state engineer with responsibility "for the general administrative supervision of the waters of the state and the

measurement, appropriation, apportionment, and distribution of those waters." Subsection 1.1 created the DWRi within the DNR with authority over water rights in Utah. Utah Code 73-3-1 et seq. addresses the appropriation of water rights, methods for obtaining and defending rights, etc.

Another section of state code applicable to water, and especially to municipalities, includes Utah Code §10-8-15 which provides extraterritorial jurisdictional authority for municipalities to enact ordinances with effects outside of official city boundaries for purposes of "preventing pollution or contamination of the streams or watercourses." Under this law, cities of the first class may enact ordinances covering all lands within watersheds that provide domestic or culinary water. Cities of other classes may enact ordinances effective "15 miles above the point from which it is taken and for a distance of 300 feet on each side of such stream." Utah Code §10-8-18 give municipalities the authority to acquire water sources to provide water for the city and its' inhabitants, including the right to purchase land, purchase and lease water sources, and purchase, lease or form water companies.

26.2 Desired Future State

As a political subdivision of the State of Utah, Salt Lake County has a legitimate interest in seeing that all reasonable steps are taken to preserve, maintain, and enhance water resources for the public. Salt Lake County desires to preserve and enhance in-stream flows on public lands for the benefit of aquatic habitats and sensitive species; while recognizing existing water rights.

26.3 Management Objectives and Associated Policies and Guidelines

26.3.1 Management Objective

Maintain existing water rights to support drinking water needs in Salt Lake County.

Policies and Guidelines

- Support measures that ensure that the quantity of water use is within the limits of the water right.
- Coordinate with water resource management entities, especially water districts and canal companies, to ensure water supplies and water delivery infrastructure will meet growth needs.

26.3.2 Management Objective

Maintain water in streams, lakes, and wetlands of adequate quantity and quality to provide for in-stream flows and existing downstream uses including support of healthy riparian and aquatic habitats, stability and effective function of stream channels, ability to route flood discharges, and to maintain recreation opportunities.

Policies and Guidelines

- Support requirement of in-stream flow determinations on special-use permits that have the potential to impact streams.
- Support the acquisition and conversion of water rights for in-stream flows. Work with the Department of Water Rights, as necessary, to modify water right beneficial use to allow in-stream flows. [3]
- Coordinate with public land management agencies to acquire and protect water rights for use on public land and maintain them with the State Water Engineer.

- Support strict stormwater management policies for each jurisdiction and maintain robust stormwater mitigation infrastructure focusing on ecological stormwater treatment methods.

26.4 References

[1] Utah Division of Water Rights. n.d. Frequently Asked Questions Website. http://www.waterrights.utah.gov/wrinfo/faq.asp (accessed February 2, 2016).

[2] Utah Department of Natural Resources. 2013. Study of Issues Related to State Jurisdiction Over Water Rights. http://www.waterrights.utah.gov/wrinfo/Brochures/state_jurisdiction_over_water_rights.pdf (accessed March 23, 2017).

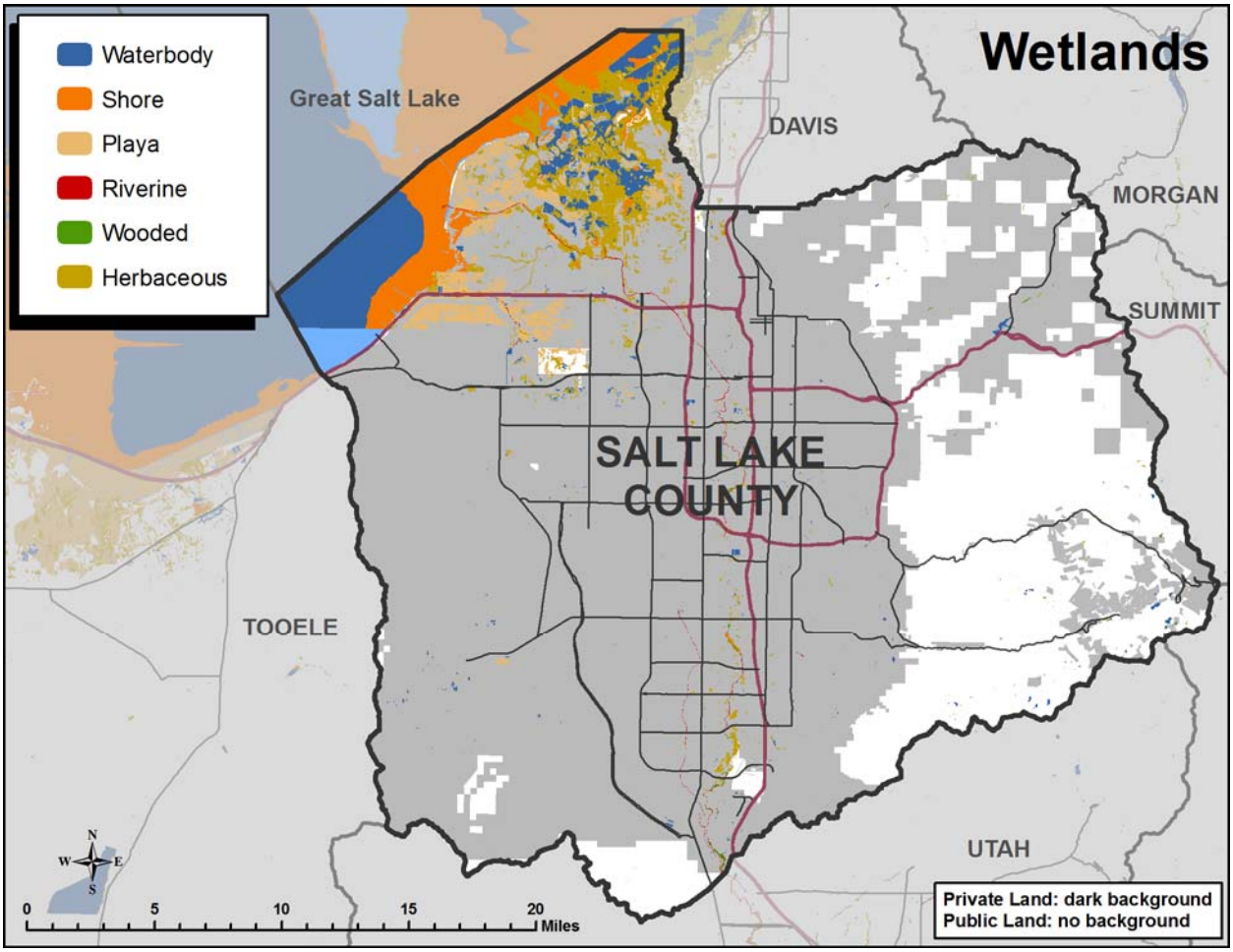
[3] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

27. WETLANDS

Wetlands have been defined in different ways by numerous entities and agencies. However, the US Army Corps of Engineers and the Environmental Protection Agency jointly define wetlands as: “Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that do under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” This definition of wetlands is perhaps the most relevant to local land planners because the USACE and the EPA are the agencies that have legal jurisdiction over wetlands, including wetlands on private property. Wetlands provide numerous benefits to society but a few of the most important of these include wildlife habitat area, hydrologic recharge areas, and water quality improvements. Other values like recreation (e.g., hunting, fishing, and bird watching) are a combination of processes.[1]

Related resources:

- Floodplains and River Terraces
- Riparian Areas
- Water Quality and Hydrology



Data Source: Wetlands, 2017, National Wetland Inventory, Utah Wetland Functional Classification: Version 1, Utah Geological Survey.

27.1 Management Setting

Context

Wetlands are highly productive ecosystems that provide habitat for a wide assortment of wildlife, including birds, fish and other sensitive species. Wetlands are a critical component to a functioning hydrological system. Wetlands also have the ability to improve water quality by acting as filters. In addition, wetlands can lessen the effects of flooding by storing water and releasing it slowly with the potential to help replenish aquifers.

Findings

Table 27.1 shows wetland acreage in Salt Lake County by type and ownership status.

Table 27.1. Wetland acreage by type and ownership status within Salt Lake County.

WETLAND TYPE	SALT LAKE COUNTY	US FOREST SERVICE	US BUREAU OF LAND MANAGEMENT
Freshwater Emergent Wetland	14,789.8	18.4	0.0
Freshwater Forested/Shrub Wetland	271.0	31.2	0.0
Freshwater Pond	1,313.9	29.1	0.0
Lake	38,976.1	0.0	0.0
Riverine	511.1	0.0	0.0
Totals	55,862.0	78.7	0.0

Source: US Fish and Wildlife Service's National Wetland Inventory with additional data from the Forest Service, Utah Geological Survey, and Utah Automated Geographic Reference Center.

The Utah Wetland Information Center at the Utah Geological Survey provides a broad spectrum of wetland-related resources from spatial data to outreach and educational materials.[2] An issue statewide is gaining control over the invasive species *Phragmites australis* in wetland areas. This is a focus of work by Dr. Karen Kettenring's wetland ecology lab at Utah State University (http://karinkettenring.weebly.com).

Legal Context

Applicable Laws

All jurisdictional waters and wetlands, regardless of ownership, are regulated by the EPA and USACE under Section 404 (Permits for Dredged or Fill Material) of the Clean Water Act (33 USC §1344 et seq.). Activities that involve excavation or placement of fill in jurisdictional waters or wetlands require a permit issued by the USACE and may be reviewed by EPA. The extent of jurisdiction is determined on a project-by-project basis, in consultation with the USACE.

27.2 Desired Future State

Salt Lake County desires to maintain and improve wetlands found on public lands for the benefit of its watershed, water quality, flood control, and wildlife habitat.

27.3 Management Objectives and Associated Policies and Guidelines

27.3.1 Management Objective

Support maintenance and improvement of wetlands found on public lands.

Policies and Guidelines

- Support protection of existing wetlands from activities which may fill, degrade, or alter vegetation.
- Support restoration, where possible and practical, of wetlands that have been eliminated or degraded. The EPA provides guidelines to wetland restoration.[3]
- Support maintenance and/or restoration of natural timing and variability of water table elevation in spring sources, meadows and wetland areas.
- Support public education programs on the importance of wetlands, property value improvements provided by managed open spaces including wetlands, and develop land management partnerships that include landowners.
- Foster collaboration between research and management entities, including Utah Department of Wildlife Resources, Utah Department of Water Quality, US Fish and Wildlife Service, and Utah Geological Survey, on future assessment and mapping of wetlands.[4]
- Support maintenance and/or restoration of diversity, productivity, vigor, and regenerative capacity of native and desired nonnative riparian and wetland plant communities to provide an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems; provide adequate summer and winter thermal regulation; and to help achieve rates of surface erosion and channel migration characteristic of those under which desired communities develop.[5]

27.3.2 Management Objective

Support efforts to acquire water rights for environmental flows.

Policies and Guidelines

- Support the acquisition and conversion of water rights for in-stream flows. Work with the DWRi, as necessary, to modify water right beneficial use to allow in-stream flows and for specific areas of ecological importance such as wetlands.[6]
- Implement laws and policies for a broader array of agencies or conservation organizations to hold in-stream water rights for the benefit of aquatic habitats and Species of Greatest Conservation Need.

27.4 References

[1] Novitzki, R., D. Smith, and J. Fretwell. 1996. Wetland Functions, Values, And Assessment. National Water Summary On Wetland Resources. Washington, D.C.: US Government Printing Office.

[2] Utah Geological Survey. 2017. Utah Wetland Information Center Website. https://geology.utah.gov/resources/wetlands (accessed May 15, 2017).

[3] US Environmental Protection Agency. 2017. Wetlands Protection and Restoration Website. https://www.epa.gov/wetlands (accessed March 23, 2017).

[4] Utah Department of Natural Resources, Forestry, Fire and State Lands. 2013. Final Comprehensive Management Plan and Record of Decision. http://forestry.utah.gov/images/statelands/greatsaltlake/2010Plan/OnlineGSL-CMPandROD-March2013.pdf (accessed March 23, 2017).

[5] US Forest Service. 2003. Revised Forest Plan for the Wasatch-Cache National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5354094.pdf (accessed March 23, 2017).

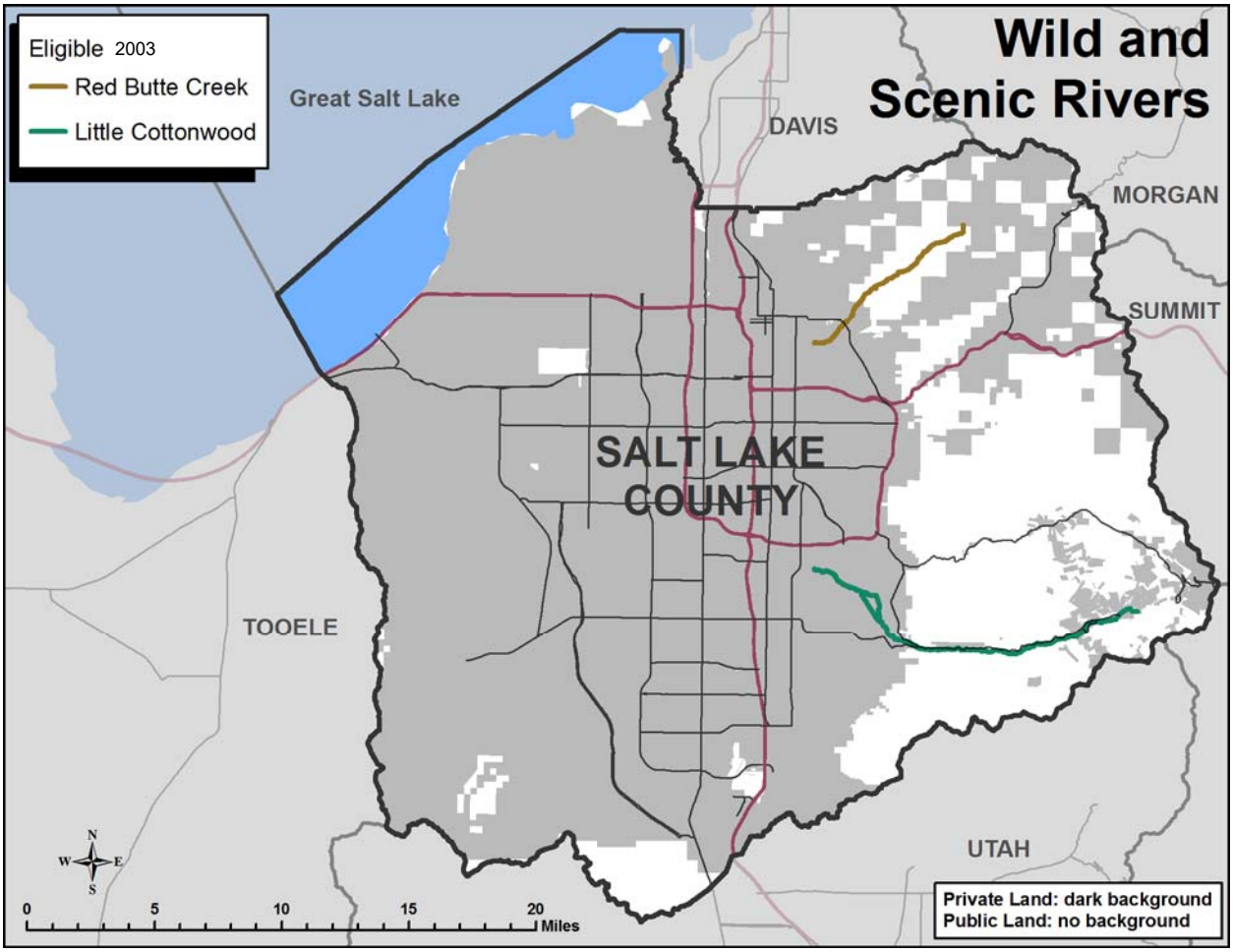
[6] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

28. WILD AND SCENIC RIVERS

The Wild and Scenic Rivers (WSR) designation is reserved for free-flowing waterways that exhibit "outstandingly remarkable" value (scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value). For this purpose, "free-flowing" is defined as a river section that is flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. Rivers with this designation are protected within the WSR system for the enjoyment of present and future generations.[1]

Related resources:

- Wilderness
- Recreation and Tourism
- Land Use



Data Source: Streams NHD High Res, Date unknown, National Hydrologic Dataset, Access via Utah Automated Geographic Reference Center.

28.1 Management Setting

Context

Wild and scenic rivers are designated by the US Congress after federal land managers recommend specific river or stream segments for designation. Water courses that are determined to have WSR characteristics are designated as eligible during land use planning procedures. The National Environmental Policy Act process is followed to assess potential impacts of land use decisions, including WSR designation. Plans are adopted after consultation with local governments, residents, Native American Tribes and other interested parties. Proposed WSR are then managed as default WSR until Congress either designates the water course as WSR or returns them to the agency for other management purposes.

Findings

Salt Lake County currently does not have any rivers officially designated as wild and scenic. However, Salt Lake County has two stream segments that are eligible for wild and scenic designations and were recommended by the US Forest Service in 2003 for inclusion in the WSR system: Red Butte Creek (Scenic) and Little Cottonwood Creek (Recreational). [2] This recommendation was removed by the US Forest Service in the 2008. [3]

Wild and Scenic River designation for water courses on public lands aligns with other goals and objectives for lands in Salt Lake County, including the protection of drinking water sources and the desire to provide recreational opportunities to residents and visitors

Legal Context

Applicable Laws

The Wild and Scenic Rivers Act of 1968 (16 USC §1271 et seq.) provides the legal framework and criteria for designation of streams and rivers segments as WSR. Eligible water courses are recommended for designation by federal land managers after a determination is made through planning procedures included in the NEPA (42 USC §4321 et seq. [1969]) and well as land and resource planning documents. The Forest Service planning procedures are detailed in the National Forest Management Act (16 USC §1600 et seq. [1976]), while the BLM follows Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]).

28.2 Desired Future State

The protection of water courses as WSR aligns well with other county goals to protect Salt Lake County's drinking water supplies and provide recreational opportunities for residents and visitors. Salt Lake County supports protective management of eligible river segments to protect their outstanding remarkable values until officially designated or rejected by Congress.

28.3 Management Objectives and Associated Policies and Guidelines

28.3.1 Management Objective

Maintain Red Butte Creek and Little Cottonwood Creeks as free-flowing to the extent feasible in an urbanized and managed environment.

Policies and Guidelines

Support management activities that seek to protect and enhance water quality of Red Butte Creek and Little Cottonwood Creek. Support riparian restoration efforts along Red Butte Creek and Little Cottonwood Creek. Oppose water development activities, such as dams, diversions, or other structures that would change eligibility of Red Butte Creek and Little Cottonwood Creek for WSR status.

28.3.2 Management Objective

Support active and open communication among various federal, state, tribal, and local land use authorities during decision-making processes regarding wild and scenic river designations.

Policies and Guidelines

- Participate in Forest Plan revision processes, including open house meetings, comment periods, etc., to convey Salt Lake County goals and objectives for local rivers and streams.

- Coordinate involvement from a broad range of stakeholders during land use decisions, including local governments, landowners, and other land use authorities.

- Support public education efforts on the allowed recreation activities and the benefit of Wilderness areas to watershed health.

28.4 References

[1] National Wild and Scenic Rivers System. n.d. About the WSR Act. Accessed: 1/21/16.

[2] US Forest Service. 2003. Revised Forest Plan for the Wasatch-Cache National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5354094.pdf (accessed March 23, 2017).

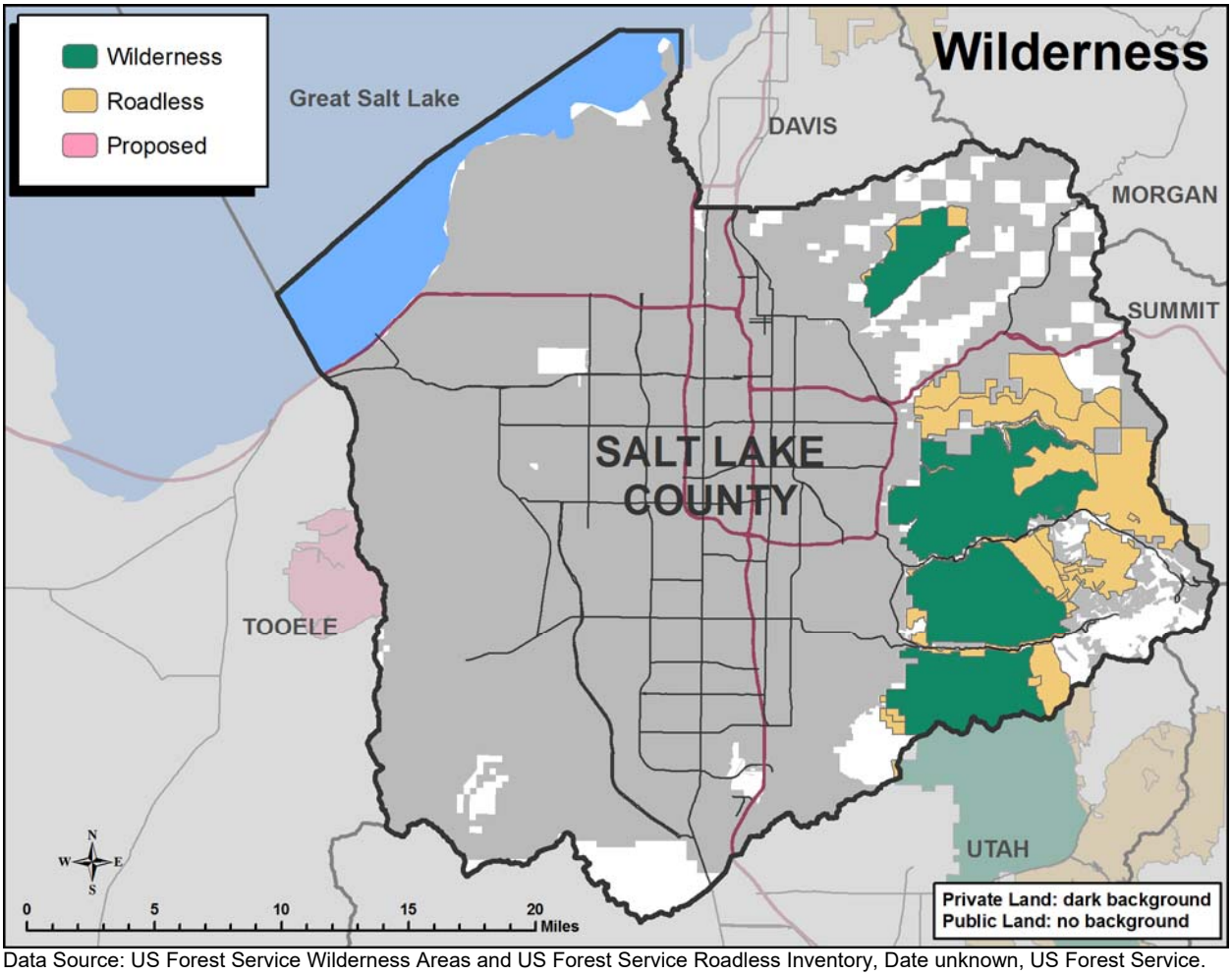
[3] US Forest Service. 2008. Revised Forest Plan for the Wasatch-Cache National Forest, Amendment Number 5.

29. WILDERNESS

The term "Wilderness" is an administrative designation created under the Wilderness Act of 1964 and is applied to specific parcels of public lands. The Wilderness designation enables preservation and protection of "Federal lands retaining primeval character and influence" and as such severely limits consumptive and motorized uses. A second component of this discussion has to do with lands under other special designations besides official Wilderness areas, which also significantly restrict the types of allowable uses. The Forest Service special management classes include, Wild and Scenic River designations, Roadless Areas, and Recommended Wilderness Areas. The BLM special designations include Areas of Critical Environmental Concern, Wilderness Study Areas, and Resource Conservation Areas.

Related resources:

- Wild and Scenic Rivers
- Land Use



Data Source: US Forest Service Wilderness Areas and US Forest Service Roadless Inventory, Date unknown, US Forest Service. Wilderness_BLM98Reinventory, 1998, US Bureau of Land Management. Access via Utah Automated Geographic Reference Center.

29.1 Management Setting

Context

Wilderness areas on the Wasatch-Cache National Forest are in close proximity to a highly urbanized area with a population of over 1 million. These areas receive heavy year-round recreation use by those seeking backcountry experiences. Demand placed on trailhead facilities, parking areas, restrooms, trash collection, etc. often exceeds capacity. Visitors to backcountry points of interest, campsites, and trails and may lead to resource degradation.

Findings

All designated Wilderness areas in Salt Lake County are found on the east side of the county under the US Forest Service (Forest Service). Other Forest Service lands with restrictive management designations include Roadless Areas and proposed Wild and Scenic Rivers. The Forest Service currently has no Recommended Wilderness Areas in Salt Lake County. There is no BLM Wilderness, or other restrictive designations on BLM lands in Salt Lake County. Table 29.1 provides details on Wilderness areas and other restrictive use designations in Salt Lake County. Local Forest Service Forest Plans and BLM Resource Management Plans provide additional information about other restrictive land use designations.

Table 29.1. Designated Wilderness in Salt Lake County.

WILDERNESS AREA	ACREAGE
Mount Olympus	15,102
Lone Peak (Salt Lake County portion)	9,806
Twin Peaks	11,496
Total	36,404

Source: Utah State and Institutional Trust Lands land ownership spatial database.

Table 29.2 shows areas in Salt Lake County covered under the 2001 Roadless Area Rule.

Table 29.2. Areas covered under the 2001 Roadless Area Rule within Salt Lake County.

ROADLESS AREA	ACRES
Lone Peak Contiguous	873
Mt. Aire	9,674
Mt. Olympus	9,143
Twin Peaks	6,153
White Pine	1,940
Total	27,783

Source: Forest Service GIS data.

Legal Context

Wilderness areas are designated by the US Congress after land managers recommend specific areas for designation. Lands which appear to qualify as Wilderness are designated as Recommended Wilderness Areas (Forest Service) or Wilderness Study Areas (BLM) in planning documents. The National Environmental Policy Act (NEPA) process is followed to assess potential impacts of land use decisions, including Wilderness designation. Plans are adopted after consultation with local governments, residents, Native American tribes and other interested parties. Recommended Wilderness and Wilderness Study Areas are then managed as default Wilderness until Congress either designates them as Wilderness or returns the land to the agency for other management purposes. Other protective land use designations, such as Roadless or Areas of Critical Environmental Concern are management designations implemented through land management plans and Resource Management Plans.

Applicable Laws

The Wilderness Act of 1964 (16 USC §1131-1136 [1964]) provides the legal framework and criteria for Wilderness designation. Wilderness areas are recommended for designation by federal lands managers after a determination is made through planning procedures spelled out in the NEPA (42 USC §4321 et seq. [1969]) and well as land and resource planning documents. The Forest Service planning procedures are spelled out in the National Forest Management Act (16 USC §1600 et seq. [1976]), while the BLM follows the Federal Land Policy and Management Act (43 USC §1701 et seq. [1976]). Wilderness designation does not necessarily rule out all use of motorized vehicles and equipment. There are provisions in the Wilderness Act for motorized access during emergencies, to manage fire, insects, and diseases, and other considerations.

Three current Wilderness areas in Salt Lake County were officially designated by the Utah Wilderness Act of 1984 (Public Law 98-428[1984]). Since that time no additional land in the county have been designated nor have any additional lands been proposed or considered through federal land planning processes.

The state enacted the Utah Wilderness Act of 2014 (Utah Code §63L-7-101 et seq.) to provide a Wilderness designation option for state-owned lands.

29.2 Desired Future State

Salt Lake County supports existing Wilderness designation in the county. Wilderness provides unique experiences to residents and visitors and provides an important level of protection for the county's drinking water supply. Wilderness areas in Salt Lake County receive heavy recreational use. Efforts should be undertaken to mitigate and prevent resource damage in Wilderness areas.

Salt Lake County is not opposed to the expansion of existing Wilderness area boundaries if additional lands exhibit Wilderness characteristics. Additional Wilderness designations should be weighed against the needs of all recreation uses and demands on public lands.

Salt Lake County desires to maintain and cultivate mutually beneficial land management relationships to establish proper management of Wilderness. The County encourages coordination and cooperation among federal land managers, county government, municipalities, residents, and user groups to help alleviate conflicts.

29.3 Management Objectives and Associated Policies and Guidelines

29.3.1 Management Objective

Support active and open communication among various federal, state, tribal, and local land use authorities during decision making processes regarding Wilderness, especially during Forest Plan revisions.

Policies and Guidelines

Participate in Forest Plan revision processes, including open house meetings, comment periods, etc., to convey Salt Lake County goals and objectives for Wilderness lands.

29.3.2 Management Objective

Support adjustments to Wilderness boundaries, as agreed to in the Mountain Accord, to enable project developments which cannot be completed within Wilderness Areas, such as the Bonneville Shoreline Trail or transportation improvements. [1]

Policies and Guidelines

- Coordinate involvement from a broad range of stakeholders during land use decisions regarding Wilderness, including local governments and landowners.

- Engage recreation users in Wilderness areas when developing strategies for management of the lands.

29.3.3 Management Objective

Support enforcement of rules and regulations regarding allowed activities in Wilderness and proper behavior in the backcountry.

Policies and Guidelines

- Encourage engagement of Wilderness recreational users at trailheads and in Wilderness areas to enforce rules and reinforce proper Wilderness etiquette.

- Support public education efforts on the allowed recreation activities and the benefit of Wilderness areas to watershed health.

29.4 References

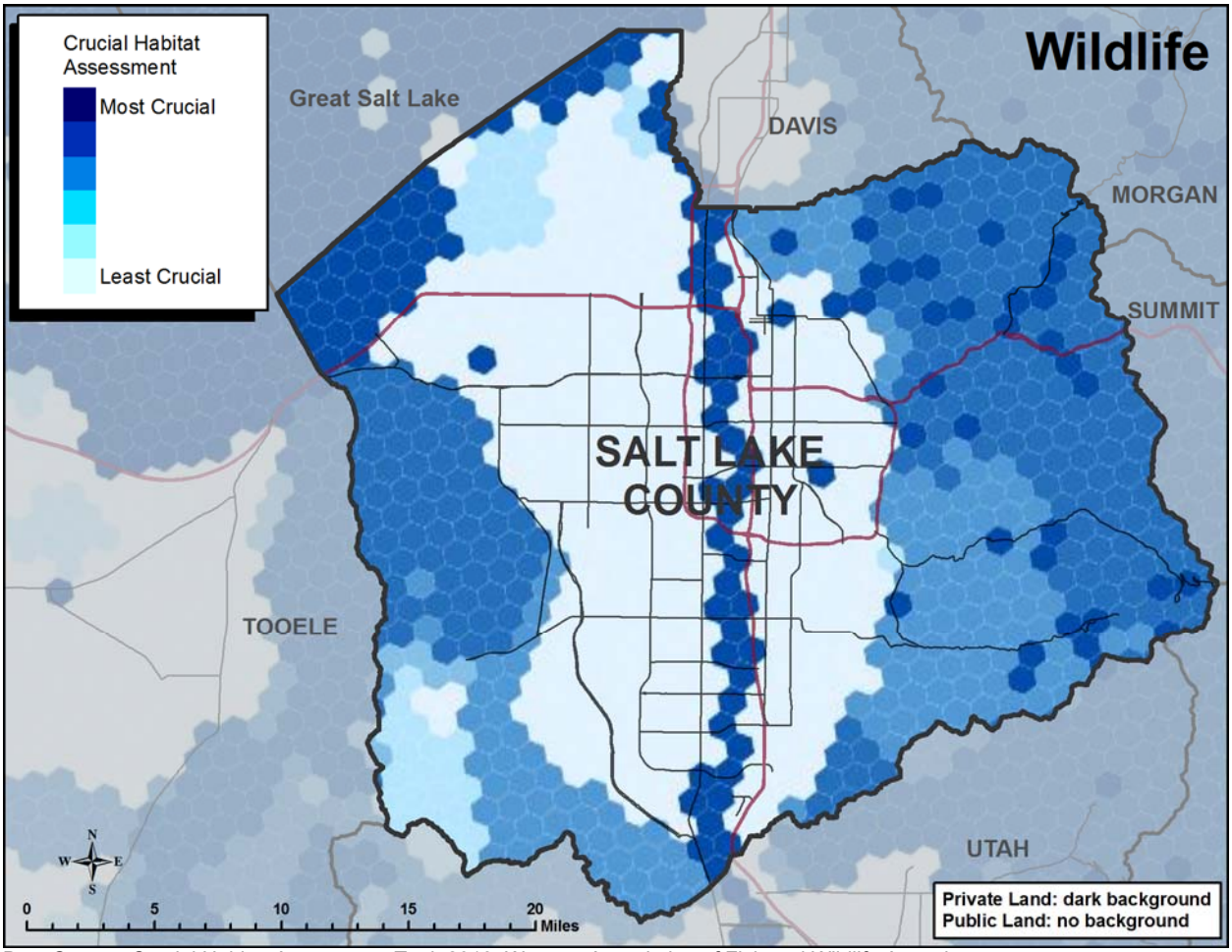
[1] The Accord, Mountain Accord. 2015. http://mountainaccord.com/wp-content/uploads/2016/09/FINAL-Accord-July-13-2015-w-Sigs-and-Attach.pdf (accessed March 23, 2017).

30. WILDLIFE

Wildlife is the population of undomesticated animals living in a natural environment, including both game and nongame species. In Utah "wildlife" includes vertebrate animals (fish, amphibians, reptiles, birds, mammals) as well as brine shrimp, crayfish, and mollusks. This section does not specifically address sensitive species (see CRMP Section 22, Threatened and Endangered Species) or aquatic wildlife (see CRMP Section 8, Fisheries).

Related resources:

- Threatened and Endangered Species
- Fisheries
- Predator Control



Data Source: Crucial Habitat Assessment Tool, 2013, Western Association of Fish and Wildlife Agencies.

30.1 Management Setting

Context

Salt Lake County enjoys a diverse and abundant wildlife population, which contributes to a productive natural environment. Wildlife also yield important social and economic resources including recreation opportunities such as photography, wildlife observation, and hunting.

Findings

The Utah Department of Wildlife Resources is the wildlife authority for the state. It is the DWR's responsibility to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state regardless of land ownership and jurisdiction. Assisting the DWR in decision making and establishing management priorities is a Wildlife Board and five RACs that provide local input on wildlife related issues. Each RAC consists of a diverse group of interest group representatives, including agriculture, sportsmen, federal land agencies, general public, and elected officials.

The DWR has published management plans for mule deer, elk, moose, bighorn sheep, black bear, beaver, northern river otter, bobcat, wild turkey, and greater sage grouse. Utah's Wildlife Action Plan considers key habitats and provides management strategies to improve the habitat's condition (see pages 73–123). Also, the plan considers threats and provides actions to reduce the threats (see pages 124–216).[1] Habitat for wildlife cross jurisdictional boundaries and is best managed by cooperative means. Table 30.1 shows the generalized ranking of habitat in the county and its distribution between public and private lands.

Federal land managers must consider wildlife and their habitats in Forest Plans and Resource Management Plans as well as during National Environmental Policy Act (NEPA) analysis.

Table 30.1 Acres and Percentages of Generalized and Ranked Crucial Wildlife Habitat.

GENERALIZED HABITAT		SALT LAKE COUNTY		PUBLIC LAND		PRIVATE LAND	
	Rank	Acres	Percentage	Acres	Percentage	Acres	Percentage
Most Crucial Habitat	1	74,267	14%	34,059	7%	40,208	8%
	2	125,620	24%	47,328	9%	78,293	15%
	3	86,677	17%	48,910	9%	37,767	7%
	4	3,054	1%	145	>0.1%	2,910	1%
	5	24,469	5%	2,075	0.4%	22,394	4%
Least Crucial Habitat	6	201,556	39%	6,170	1%	195,387	38%

Data Source: Crucial Habitat Assessment Tool, 2013, Western Association of Fish and Wildlife Agencies.

Legal Context

Salt Lake County recognizes the authority of the DWR and the Wildlife Board and RACs in managing the wildlife in the county.

Applicable Laws

All naturally occurring wildlife in Utah are considered property of the state (Utah Code §23-13-3). Utah Code §23-14-1 gives the power to manage wildlife to the DWR. Utah Code §23-15-2 establishes that the state has jurisdiction of all wildlife in the state, including aquatic wildlife, whether on public or private land. Utah Code §4-23-2 declares that preserving the wildlife resources of the state is important to the economy of the state. Utah Code §23-14-2.6 establishes RACs who advise the state Wildlife Board regarding wildlife management issues.

30.2 Desired Future State

Salt Lake County desires to maintain healthy native wildlife populations through the protection and enhancement of habitat, natural landscapes, and ecosystems in the county.

30.3 Management Objectives and Associated Policies and Guidelines

30.3.1 Management Objective

Support land management actions that keep native species off the Endangered Species List. Provide for sustained diversity of species at the genetic, population, community, and ecosystem levels. Maintain communities within their historic range of variation that sustains habitats for viable populations of species.

Policies and Guidelines

- Support public education programs that promote water conservation, wildfire prevention, and wildlife habitat.

- Support management objective to reduce future fragmentation of intact habitats. Provide connectivity in fragmented habitats and between habitats to promote genetic diversity in wildlife populations.

- Work cooperatively with the DWR to manage wildlife populations.

30.3.2 Management Objective

Support maintenance and improvement of existing aquatic habitats, including riparian and wetland habitat.

Policies and Guidelines

- Participate in Utah's Watershed Restoration Initiative to fund riparian area restoration projects.

- Support education efforts about Best Management Practices in riparian areas including managed grazing[2] and weed control[3] in riparian areas.

- Support efforts and activities supporting watershed health and aquatic habitat as outlined in Salt Lake Counties 2015 Integrated Watershed Plan.[4]

30.3.3 Management Objective

Support active management of vegetation (e.g., weed removal and treatment) to reduce components or factors that promote risk of catastrophic fire, such as cheatgrass, excessive conifer encroachment, or unnaturally large stands of mature Gambel oak. Support management actions to reduce potential for insect epidemics.

Policies and Guidelines

- Support fuel reduction strategies including vegetation treatments, silvicultural actions, prescribed fire, prescriptive grazing, and weed control.

- Encourage vegetation management focus on approximating natural disturbances and processes by restoring composition, age-class diversity, patch sizes, and patterns for all vegetation types.

30.3.4 Management Objective

Coordinate with DNR and the Utah Department of Transportation to reduce wildlife vehicle collisions on Salt Lake County roadways.

Policies and Guidelines

- Encourage development of wildlife crossing structures to provide safe passage of roads or other movement barriers.[1]

- Support mitigation projects which aim to mitigate wildlife vehicle collisions.

30.4 References

[1] Utah Department of Natural Resources, Utah Division of Wildlife Resources. 2015. Utah Wildlife Action Plan, Draft Version 6-4-2015. https://wildlife.utah.gov/wap/wap2015draft.pdf (accessed March 14, 2017).

[2] Bellows, Barbara. 2003. Managed Grazing in Riparian Areas. Appropriate Technology Transfer for Rural Areas. https://extension.usu.edu/rangelands/files/uploads/General%20Grazing%20Management/Riparian%20grazing.pdf (accessed March 14, 2017).

[3] Sheley et.al. 1995. Managing Riparian Weeds. Rangelands 17(2). https://journals.uair.arizona.edu/index.php/rangelands/article/viewFile/11260/10533. (Accessed March 14, 2017).

[4] Salt Lake County, Department of Watershed Planning & Restoration. 2015. Salt Lake County Integrated Watershed Management Plan.

31. SALT LAKE COUNTY PLANNING DOCUMENTS

Over the years, numerous entities have participated in planning efforts related to the resource topics included in this CRMP. The following is a list of other planning documents that have been reviewed in preparation of the CRMP. The CRMP is not a replacement for these other plans, nor is it inclusive of all goals, policies, and objectives of the other plans. Ongoing coordination will be necessary to continue to define and achieve shared objectives.

BLM Salt Lake District. 1988. Proposed Pony Express Resource Management Plan and Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management, Salt Lake District, September. 149 p.

Envision Utah. 2010. Wasatch Canyons Tomorrow. 64p.

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Salt Lake County. 2012. Kearns Township General Plan. Salt Lake County, Utah. Adopted September 11.

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Salt Lake County. 2012. Millcreek Township General Plan, Salt Lake County, Utah. Adopted September 11. 320p.

Salt Lake County. 2013. Big Cottonwood Canyon General PLan Draft. Salt Lake County, Utah, Public Open House Draft, July 17. 53p.

Salt Lake County. 2013. Little Cottonwood Canyon General Plan. Salt Lake County, Utah, Public Open House Draft, July 17. 44p.

Salt Lake County. 2013. Parleys Canyon General Plan. Salt Lake County, Utah, Public Open House Draft, July 17. 45p.

Salt Lake County. 2015. Integrated Watershed Management Plan.

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School and Institutional Trust Lands Administration (SITLA). 2012. TITLE R850. SCHOOL AND INSTITUTIONAL TRUST LANDS, ADMINISTRATION. effective October 1, 2015

State of Utah. 2013. Conservation Plan for Greater Sage-grouse in Utah, February 14. 80p.

Utah Division of Forestry, Fire, and State Lands. 2013. Final Great Salt Lake Comprehensive Management Plan and Record of Decision, Utah Department of Natural Resources Division of Forestry, Fire, & State Lands. March 2013. 391p.

Utah Division of Forestry, Fire, and State Lands. 2013. Final Great Salt Lake Mineral Leasing Plan and Record of Decision, Utah Department of Natural Resources Division of Forestry, Fire, & State Lands. March 2013.105p.

Utah Division of Water Resources. 2010. Jordan River Basin Planning for the Future. 133p.

Utah Division of Wildlife Resources and the Cougar Advisory Group. 2015. Utah Cougar Management Plan V. 3 2015 - 2025. 41p.

Utah Division of Wildlife Resources. 2014. Utah Mule Deer Statewide Management Plan, Department of Natural Resources, Utah Division of Wildlife Resources, 38p.

Utah Division of Wildlife Resources. 2015. Utah Predator Control Program Summary 2014-2015. 6p

Utah Governor's Council on Balanced Resources. 2013. State of Utah Outdoor Recreation Vision, January, 60p. http://www.utah.gov/governor/docs/OutdoorRecreationVision.pdf

Utah Governor's Office of Energy Development. 2014. Utah Energy Efficiency and Conservation Plan. 47p.

Utah Weed Advisory Council and Utah Weed Control Association. 2004. Utah Strategic Plan for Managing Noxious and Invasive Weeds. February 34 p.

Utah Wildlife Action Plan Joint Team. 2015. Utah Wildlife Action Plan: A plan for managing native wildlife species and their habitats to help prevent listing under the Endangered Species Act. Publication number 15--14. Utah Division of Wildlife Resources, Salt Lake City, Utah, USA.

Wasatch-Cache National Forest. 2008. Cottonwood Canyons Scenic Byways Corridor Management Plan.

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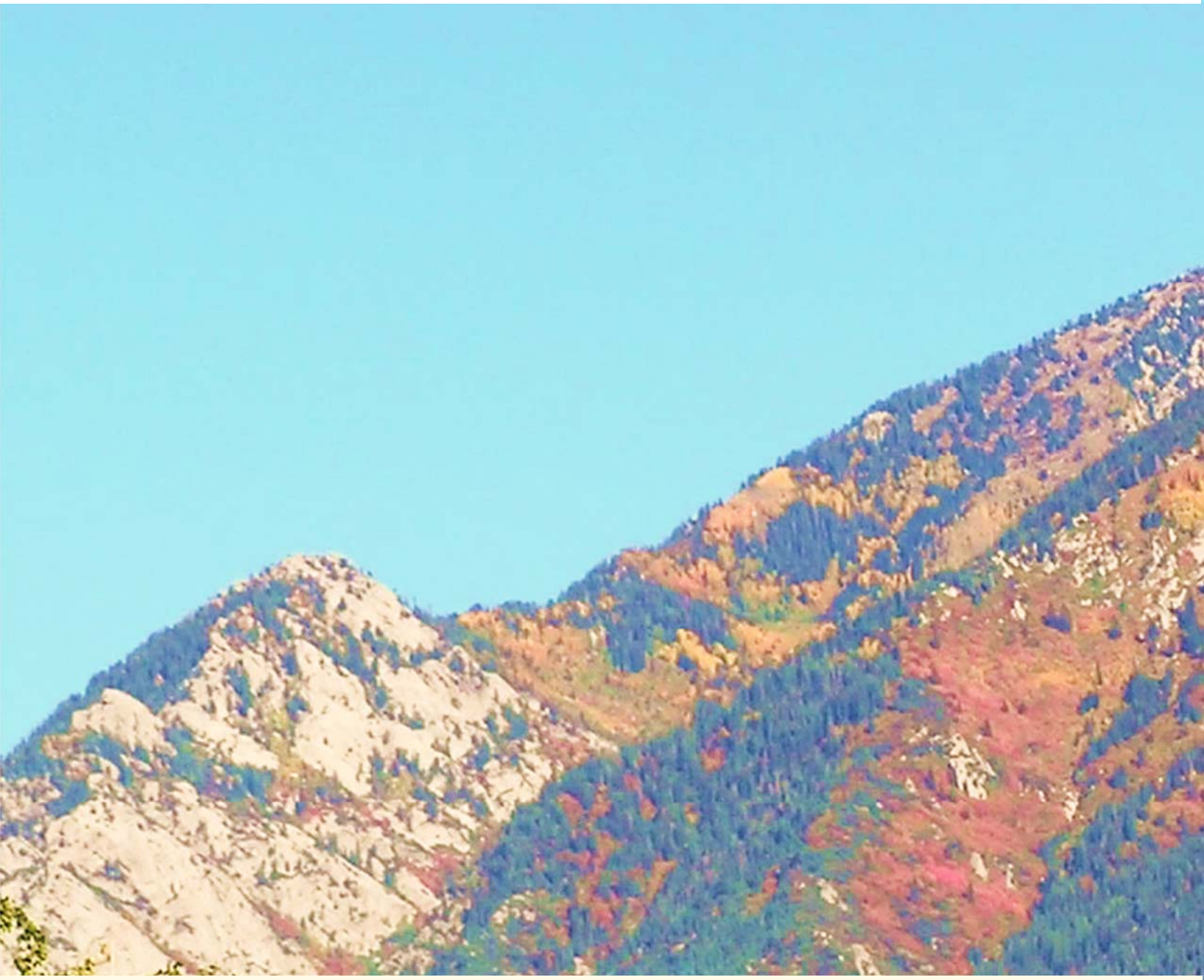
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