Recommendation submitted to the Federalism Commission by the Public Lands Policy Coordinating Office with respect to the State Resource Management Plan

Submitted: August 2023

As recorded in **Utah Code § 63L-10-104**

(2) (a) The office [meaning the Public Lands Policy Coordinating Office] shall, as funding allows, maintain a record of all state agency and political subdivision resource management plans and relevant documentation.

(b) On an ongoing basis, state agencies and political subdivisions shall keep the office informed of **any substantive modifications to their resource management plans.**

(c) On or before **August 31** of each year, the office shall provide a report to the commission [meaning the Federalism Commission] that includes the following:

(i) any modifications to the state agency or political subdivision resource management plans that are **inconsistent** with the statewide resource management plan;

(ii) a recommendation as to how an **inconsistency** identified under Subsection (2)(c)(i), if any, should be addressed; and

(iii) a recommendation:

(A) as to whether the statewide resource management plan should be modified to address any **inconsistency** identified under Subsection (2)(c)(i); or

(B) **on any other modification to the statewide resource management plan the office determines is necessary.**

Accordingly, this document contains the State Resource Management Plan (SRMP) in its entirety as contained in the version dated January 9, 2023. Section headings and page numbers can be found in the Table of Contents, content proposed for removal from the document are shown with a line through the ~~text~~, and new recommendations (or edits) to incorporate into the document are shown in red text.

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INTRODUCTION

Approximately 63 percent of the land within Utah's borders is under the ownership and administration of the federal government, and most of these "public lands" fall within the jurisdictions of the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (Forest Service). Since before statehood in 1896, this federal presence has greatly impacted the lives and livelihoods of Utah's citizens and the local cultures that form the tapestry of rural Utah. On occasion, federal land management has failed to meet the needs and planning interests of local communities. State and county influence on the use and enjoyment of public lands has waxed and waned with political changes and an evolving federal land-management philosophy. With the advent of federal "preservation" policies and the corresponding environmental movement, tensions between federal land managers and state and local governments have mounted.

This State of Utah Resource Management Plan (SRMP) [1] seeks to address and remedy these troublesome disconnects between local land-use needs and desires and federal land-use planning, which have not been adequately addressed in the past.

From the beginning of the settlement of Utah by European explorers and immigrants, the public lands have been the lifeblood of those hearty souls who sought new beginnings and, in most cases, sanctuary from persecution. The land was arid and forbidding, but it was also magnificent in its varied majesty and beauty. Through great hardship and an indomitable spirit and determination, these early settlers harnessed the scarce waters and cultivated the parched soil to create homesteads, farms, ranches, and the local communities that remain today. This community development was not by chance. Rather, it was planned and orchestrated by the territorial government; which, at that time, was dominated by Mormon [The Church of Jesus Christ of Latter-day Saints] church leadership. Land-use planning was prominent in the early settlement of rural Utah, and by the time of statehood in 1896, most of the rural communities that exist today were already established.

Not only did the public lands provide the proving grounds for early homesteading, agriculture, and community development, they also proved to contain vast mineral resources. While Mormon settlers were initially dissuaded from prospecting and mining for precious metals and metallic ores, it wasn't long before non-Mormon soldiers and speculators began to extract those resources. Silver, gold, iron, and copper ores found on Utah's public lands were soon being commercially developed. With the development of rail transportation, coal from central Utah replaced wood as the primary source of heat and steam combustion. The turn of the century saw the discovery of oil and gas in eastern Utah, uranium in southeastern Utah, and gilsonite in central Utah. Timber also played an important role as a heat source and the primary constituent in construction. Once recreation and tourism were thrown into the mix, public lands virtually dominated the settlement and growth of all of rural Utah.

The combination of domestic industry, commercial use, and development of Utah's public lands provided the economic stimulus that allowed rural Utah towns to mature into healthy, stable, and growing communities. This growth called for continual planning by federal, state, and local governments.

Over the course of the decades following Utah's statehood in 1896, federal land-use policy gradually shifted from one of disposal to one of preservation and conservation. Forests were preserved, national parks were created, and Utah's range was placed under strict regulation. While all of these changes served the public interest, each step in this process was accompanied by corresponding diminishment in local authority over land-use determinations. State and county governments were typically required to adapt to federal land-use decisions over which they had no control and minimal input. Increasing limitations placed on access to and use of the public lands began to undermine the economies and stability of rural Utah as well as the cultural identities of communities. Frustration mounted, and tensions between federal land-management agencies and rural communities worsened. This lack of cooperation and coordination

wasn't felt only by state and local government; federal land-management agencies were also under a multitude of external and internal pressures.

In 1964, the United States Congress recognized that federal land laws and regulations had developed somewhat haphazardly over the prior 100 years. There was no comprehensive cohesion and little coordination between land laws, land-management agencies, and the many existing regulations. Accordingly, Congress created the Public Land Law Review Commission (PLLRC) to review all federal land laws and regulations and make recommendations to Congress as to how they should be reformed. This report, appropriately entitled *One Third of the Nation's Land*, recommended "such modifications in existing laws, regulations, policies, and practices as will, in the judgment of the [PLLRC], best serve … to provide the maximum benefit for the general public." Of particular emphasis in the PLLRC report was the need for future planning of land uses and the need to cooperate and coordinate with state and local governments in that planning process "because the effects of public land programs are felt most strongly there and it is at those levels…" Accordingly, the PLLRC recommended that state and local governments be given an "effective role" in the federal land use planning process. [2]

It wasn't until 1976 that the recommendations of the PLLRC were enacted into law. In that year, Congress enacted the Federal Land Policy and Management Act (FLPMA) and the National Forest Management Act (NFMA), which remain the organic acts of the BLM and Forest Service. Both of these acts included the PLLRC's emphasis on planning and the requirement that state and local governments be meaningfully included in federal land-use planning processes. The FLPMA and, to a lesser degree, NFMA are supplemented by the National Environmental Policy Act (NEPA), which requires that federal land-use planning involve state and local governments, and that federal plans be "consistent" with state and local land-use plans (unless state and local plans violate federal law). This consistency requirement presupposes that such state and local land-use plans exist. Unfortunately, the State of Utah and most of its counties had not adopted comprehensive land-use plans prior to 2017. This update to the SRMP, and any changes to the 29 county resource management plans (CRMPs) that have been created since 2017, reflect ~~five~~ additional years of experience in writing state and local land-use plans in Utah and the~~ir~~ corresponding attempts to improve coordination and cooperation with federal land-management agencies.

State land-use planning in Utah has had a checkered history. In 1973, the Utah Legislature enacted a land-use planning statute that would have created a state commission to work with counties to craft local land-use plans pursuant to state guidelines. The law met strenuous opposition from real estate developers and property-rights activists, who successfully mobilized a referendum petition drive and, ultimately, struck down the law in a referendum election. Upon leaving office in 1977, Utah Governor Calvin L. Rampton declared that the failure of state land-use planning was his greatest regret. The issue was so contentious and resounding that the Utah Legislature did not revisit it until 2015, when it passed the law that led to the creation of this SRMP and the aforementioned 29 CRMPs. Utah House Bill 323, sponsored by Rep. Stratton and Sen. Okerlund, which was signed into law by Governor Gary Herbert on March 30, 2015, (1) required each county in Utah to develop a resource management plan as part of its general plan, (2) established content requirements for CRMPs, (3) required the State of Utah to provide information and technical assistance to counties, (4) required a county planning commission to coordinate with other counties, (5) established that a county's general plan serve as a basis for coordinating with the federal government, and (6) established administrative duties of the Governor's Public Lands Coordinating Office (PLPCO) to oversee and assist in the preparation of CRMPs.

Utah House Bill 323 (amended in 2016 as HB0219) was passed during the 2016 general legislative session and required each county to produce a CRMP that contained the following sections: agriculture; air; cultural, historical, geographical, and paleontological resources; ditches and canals; economic considerations; energy resources; fire management; fisheries; flood plains and river terraces; forest

management; irrigation; land access; land use; law enforcement; livestock and grazing; mineral resources; mining; noxious weeds; predator control; recreation and tourism; riparian areas; threatened, endangered, and sensitive species; water quality and hydrology; water rights; wetlands; wild and scenic rivers; wilderness; and wildlife.

The original CRMPs were completed in 2017 and have undergone various amendments since they officially became part of each county's general plan.

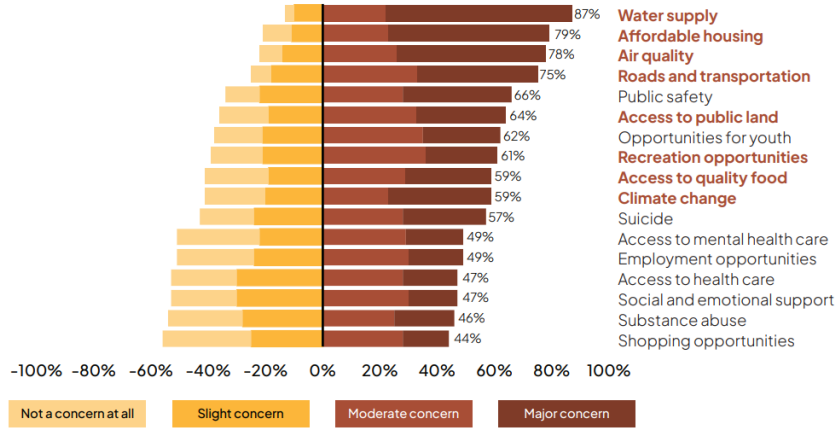
Utah Senate Bill 2 in 2021 appropriated funding to the PLPCO to be utilized to review the SRMP and the CRMPs to address access to public lands, renewable energy resources, utility corridors, critical mineral resources and rare earth elements, and pipeline and infrastructure [3]. Those amendments were incorporated into the SRMP when Utah House Bill 160 was signed by Governor Spencer Cox on March 21, 2022. The majority of the 29 CRMPs have also been updated to include this new information in 2022. Additionally, House Bill 39 approved further amendments to the SRMP in 2023. So that federal agencies may access all of the RMPs at a single location, these plans are available online at rmp.utah.gov.

This SRMP is an aggregation of the land-use decisions and directives that are derived from the county plans. It is PLPCO's firm belief that this resource-planning initiative will give the State of Utah and its counties greater and more meaningful input and direction with respect to federal land-use planning on Utah's public lands.

Continually Gauging Public Perception and Concerns

The Janet Quinney Lawson Institute for Land, Water, and Air at Utah State University, conducted a survey to gauge public perception of key concerns for the residents of 33 Utah cities [4]. The majority of the highest rated concerns are closely correlated to public lands access and active public land management. The results of this study were addressed in the Annual Report to the Governor (2022 Report) as shown in Figure 1.A. below.

Figure I.A How much of a concern are the following issues? (2022)



Residents from 33 Utah cities listed key concerns within their communities. Land, water, and air issues appeared highly and frequently in responses. Source: https://www.usu.edu/utah-wellbeing-project/reports/2022/statewide_report_2022

Coordinating the Management of Utah's Public Lands

The State of Utah supports the wise use, conservation, and protection of public lands and their resources, including well-planned management prescriptions. It is the state's position that public lands must be managed for multiple uses, sustained yields, prevention of waste of natural resources, and to protect the health, safety, and welfare of the public.

It is important to the state economy that public lands be properly managed for fish, wildlife, livestock production, timber harvest, recreation, energy production, mineral extraction, water resources, and the preservation of natural, scenic, scientific, and historical values.

The cornerstone of this management is the coordination and cooperation between the State of Utah and federal land-management agencies. The state recognizes that federal agencies are mandated to manage public lands according to federal laws, policies, and regulations established within the framework of the U. S. Constitution, including the FLPMA, NFMA, and NEPA.

State Sovereignty

Under the Tenth Amendment to the U.S. Constitution, the individual states retain their authority as sovereign except where specifically superseded by powers granted by the U.S. Constitution to the federal government (see U.S. Const. amend. X ["The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."]). "The Tenth Amendment confirms that the power of the Federal Government is subject to limits that may, in a given instance, reserve power to the States" (New York v. United States, 505 U.S. 144, 157 [1992]). In taking actions affecting states, the federal government must always consider whether an incident of state sovereignty is protected by a limitation on an Article I power (See, id.). The Tenth Amendment requires that the federal government treat the state as a sovereign entity—a separate government with unique and distinct powers to be consulted regarding matters pertaining to lands within its borders and affecting its citizens.

Federal Land Policy and Management Act (FLPMA)

The FLPMA (43 USC 1712(c)(9)) requires the BLM to coordinate plans with the land-use planning and management programs of the affected state and local governments. The act states the BLM's land use plans "shall be consistent with State and local plans to the maximum extent [the Agency] finds consistent with Federal law and the purposes of this Act." [5]

The BLM has the responsibility to ensure that consideration is given to those state, local, and tribal plans that are germane in the development of land-use plans for public lands and to resolve, to the extent practical, inconsistencies between federal and non-federal governmental plans.

National Forest Management Act (NFMA)

The NFMA (16 U.S.C. §1604(a)) requires that the Forest Service's forest plans be "coordinated with the land and resource management planning processes of State and local governments and other Federal agencies." [6]

National Environmental Policy Act (NEPA)

Under NEPA (42 U.S.C. § 4321), federal agencies are required to identify possible conflicts with state, local, and tribal plans during the environmental-review process and determine the significance of the

conflict. Where an inconsistency exists, the review should describe the extent to which the federal agency would reconcile its proposed action with the plan or law. [7]

NEPA should analyze the potential benefits of a federal action, not just the negative impacts.

Cooperation

Under NEPA, all federal agencies must complete a NEPA analysis for proposed actions that are likely to cause impacts on the natural or human environment. Federal agencies can designate state and local governments to become formal partners in the NEPA process, as cooperating agencies. A state or local government can be a cooperating agency when it has special expertise with respect to any environmental impact involved in the project proposal. Cooperating-agency status gives the state or local government early input into NEPA analyses and some ability to shape the goals and framework of the federal proposal.

Federal agencies should request participation of cooperating agencies in the NEPA process at the earliest possible time, using the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise, to the maximum extent possible when consistent with its responsibility as the lead agency.

Coordination

When creating land-use plans or resource management plans, the BLM and Forest Service are required to coordinate their plans with state and local government plans. Coordination is a separate process from cooperation, and must occur regardless of whether state or local governments were designated cooperating agencies. Agencies must make efforts to draft federal plans that coordinate with state and local plans.

The FLPMA provides a detailed baseline for the coordination process and identifies specific BLM actions, as follows:

- Remain informed of local land use plans;
- Guarantee that local land use plans are given proper consideration;
- Attempt to resolve inconsistencies between local and BLM land use plans; and
- Provide meaningful involvement for local entities early and throughout the decision-making process.

The NFMA requires the Forest Service to coordinate with local governments, but does not specify how the process of coordination is to be accomplished. Forest Service regulations require the following:

- Responsible officials must coordinate with local governments.
- Responsible officials shall review local plans and policies that are relevant to the federal plan. The review will consider the objectives of local plans, the compatibility and interrelated impacts between local and federal plans, opportunities to address impacts and contribute to joint objectives, and opportunities to resolve or reduce conflicts. This review must be included in NEPA documentation.
- The responsible official will not direct or control management of lands outside of the planning boundary.

Consistency

Consistency between federal, state, local, and tribal plans is the desired outcome for the cooperation, coordination, and consultation processes required of federal agencies. The importance of cooperation, coordination, and consultation between state, local, and federal agencies during planning processes cannot be overstated. Early involvement and equal consideration in environmental reviews, as interdisciplinary team members, stakeholders, and cooperating agencies is the State of Utah's main objective and motivation for creation of the State Resource Management Plan originally adopted on January 2, 2018.

It is the intent of the State of Utah that this SRMP and subsequent implementation plans shall be followed unless inconsistent with any statute or duly promulgated regulation. Should any part of this policy document or implementation plan be found inconsistent with such statute or regulation, or found by a court with competent jurisdiction to be void, unenforceable, or invalid, the remaining provision or parts shall nevertheless remain in full force and effect.

Consistency Review

The Federal Land Policy and Management Act (FLPMA) regulations require that "resource management plans and amendments to management framework plans shall be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other Federal agencies, State and local governments, and Indian tribes…" and affords governors "60 days in which to identify inconsistencies and provide recommendations in writing to the State Director." 43 CFR § 1610.3-2. [8]

Consultation

The requirements of coordination and consistency are required by **statutory law** as contained in FLPMA. On the other hand, cooperation and consultation are derived from **regulatory law** found at 40 CFR §1501.8 [9]. The cooperating agency regulations were promulgated under authority of NEPA to aid in the implementation of NEPA analyses. The cooperating agency regulations allow for a "state, tribe or local agency" to become a **cooperating** agency if they have "special expertise with respect to any environmental issue." These same regulations put very strict parameters on what input a cooperating agency may have in the planning process and in the development of environmental documents, including the right to:

> "***consult*** *with the lead agency in developing the schedule…meet the schedule, and elevate, as soon as practicable, to the senior agency official of the lead agency any issues relating to purpose and need, alternatives, or other issues that may affect any agencies' ability to meet the schedule."*

In addition to the NEPA consultation requirements, there are also specific consultation requirements imposed by the National Historic Preservation Act of 1966 ("NHPA") and its implementing regulations if an action constitutes a federal undertaking. Under Section 106 of the NHPA, federal agencies must "take into account the effects of their undertakings on historic properties" and engage in meaningful consultation with the appropriate tribal or state agency (here, the Utah State Historic Preservation Office or "SHPO"). Overall, "[t]he goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties." However, for purposes of NEPA planning, the CEQ regulations on consultation are most pertinent here, as the NHPA Section 106 consultation typically occurs outside of the NEPA planning process.

Before a federal agency funds, licenses, permits, or otherwise authorizes a proposed undertaking, Section 106 of the National Historic Preservation Act requires that agency to take into account the undertaking's effect on historic properties—cultural and historical resources that are eligible for inclusion in the National Register of Historic Places. The agency must then give the President's Advisory Council on Historic Preservation the opportunity to comment.

The Section 106 process provides detailed steps to meet this statutory requirement, and also allows other consulting parties to participate. These parties include, among others, tribal governments and the State Historic Preservation Officer. A common misconception about the Section 106 Process is that it can prevent an undertaking from occurring. On the contrary, the process actually assists the undertaking by seeking to identify historic properties potentially affected by the undertaking, assessing its effects, and looking for ways to avoid, minimize, or mitigate any adverse effects on historic properties.

Section 404 of the Clean Water Act (CWA) [Moved to Water Quality)

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

The basic premise of the program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. In other words, when a permit is applied for to impact waters of the United States, the applicant must first show that steps have been taken to avoid impacts to wetlands, streams, and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers U.S. Environmental Protection Agency (EPA) website, which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) guidelines, regulations set forth by the EPA. Some states have assumed this permitting authority and regulate these activities.

For most discharges that will have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or state basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met. For example, minor road activities, utility line backfill, and bedding are activities that can be considered for a general permit. States also have a role in Section 404 decisions, through state program general permits, EPA website, water quality certification, or program assumption.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Policy Coordinating Office

§ 63L-11-201. Public Lands Policy Coordinating Office - - Executive Director - - Appointment - - Qualifications - - Compensation.

§ 63L-11-202. Powers and duties of the office and executive director.

§ 63L-11-203. Resource management plan administration.

Office Duties Related to Federal Land

§ 63L-11-301. Office duties related to plans for the management of public lands.

§ 63L-11-302. Principles to be recognized and promoted.

§ 63L-11-303. Findings to be recognized and promoted.

§ 63L-11-304. Public lands transfer study and economic analysis - - Report.

§ 63L-11-305. Facilitating the acquisition of federal lands.

References:

1. https://rmp.utah.gov/
2. https://collections.lib.utah.edu/details?id=1136278
3. https://le.utah.gov/~2021/bills/static/SB0002.html
4. https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1001&context=landwaterair_reports#page=2
5. https://www.blm.gov/sites/default/files/AboutUs_LawsandRegs_FLPMA.pdf
6. https://www.fs.fed.us/emc/nfma/
7. https://www.gpo.gov/fdsys/pkg/CFR-2012-title40-vol34/pdf/CFR-2012-title40-vol34-sec1502-16.pdf
8. https://www.chc4you.org/wp-content/uploads/2019/07/Governors-Consistency-Review-Factsheet_FINAL.pdf
9. 40 CFR §1501.8

ECONOMIC CONSIDERATIONS

Introduction

Utah is a state rich in land resources, most of which are owned and managed by federal agencies. Like many other western states, land ownership in Utah is characterized by large areas of federally controlled land intermingled with state-owned and privately-owned lands.

Of Utah's 52.7 million acres, federal agencies manage 33.2 million acres (63%). Most of this federally managed land is administered by two federal agencies: the U.S. Bureau of Land Management (BLM) and U.S. Forest Service (Forest Service). Other federal agencies, which manage much smaller areas of Utah, include the National Park Service (NPS), U.S. Department of Defense, U.S. Fish and Wildlife Service (USFWS), U.S. Department of Energy, and U.S. Bureau of Reclamation (BOR). Twenty-four percent of Utah's lands are in private ownership, which includes county and municipal lands. Tribal lands account for 4.5 percent of the total. Utah state government agencies own and manage the remaining 10 percent of the land in the state.

Almost any project, particularly in a rural areas, is dependent on resources located on or derived from federal lands. Any change in management or policy can have far-reaching impacts on the area's local economy and must be evaluated to identify and mitigate potential impacts. The BLM's Socioeconomics Strategic Plan (2012–2022) [1] outlines the importance of analyzing socioeconomic impacts not only to meet the legal requirements of the National Environmental Protection Act (NEPA) and the Federal Land Policy and Management Act (FLPMA), but also to better plan, manage, and coordinate with states and local communities.

Natural resources contribute significantly to Utah's economy. Federal land-management policies have dramatic impacts on industries reliant on federal land. With 63 percent of the state under federal land management, the terms cooperation, coordination, consultation, and consistency as discussed in the preceding **Introduction** section of the State Resource Management Plan are imperative to Utah's continued economic success.

Federal agencies must consider the socioeconomic impacts of their actions and are required to evaluate these impacts through the NEPA compliance and documentation process. Additionally, FLPMA requires federal agencies to "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences." [2]

The Socioeconomics Strategic Plan highlights the need to integrate the economic impacts into management decisions and the social values important to local communities, such as the traditional uses of timber and grazing, and how those industries remain essential parts of community identification. [3]

Because federal land is inextricably tied to the economy of Utah and to the livelihood of many rural communities, close coordination with federal land-management agencies with regard to socioeconomic impacts is a key objective tied to each of the resources covered in this document.

Findings

Federal land and environmental policies provide broad land-management guidelines. The interpretation and implementation of these policies are subject to the interpretation and principles of U.S. cabinet secretaries and agency directors. The inconsistency in guidance as these positions change has a direct impact on how the resources in Utah are managed and, thus, on the economy of Utah.

Federal actions generally require NEPA compliance and documentation, such as environmental impact statements. Any delay in the NEPA process can have economic impacts. According to the U.S. Government Accountability Office, the average environmental impact statement takes over 4 years to complete [4]. The loss of potential revenue due to inefficient NEPA analyses and completion can be significant, particularly to communities reliant on public lands.

Congressional Review Act

The Congressional Review Act (CRA) is a tool that Congress may use to pass legislation overturning a rule issued by a federal agency [5]. When Congress passes a law, it often grants rulemaking authority to federal agencies to implement provisions of the law. That delegation of rulemaking authority, and the rules issued by federal agencies under this authority, is a crucial component of the policymaking process. Congress has an interest in ensuring that federal agencies, when issuing rules, are faithful to congressional intent. To conduct oversight of federal agency actions, Congress has a number of tools available, including the CRA.

The CRA was enacted in 1996 as part of the Small Business Regulatory Enforcement Fairness Act. Under the CRA, before a rule can take effect, an agency must submit the rule to Congress and the Government Accountability Office (GAO). Upon receipt of the rule by Congress, Members of Congress have a specified time period during which to submit and act on a joint resolution of disapproval overturning the rule. If both houses pass the joint resolution, it is sent to the President for signature or veto. If the President were to veto the joint resolution, Congress could vote to override the veto. Enactment of the joint resolution would take the rule out of effect or prevent it from going into effect, and the agency would be prohibited from issuing a rule that is "substantially the same" without further authorization from Congress.

The CRA defines a "major rule" as any rule that the Administrator of the Office of Information and Regulatory Affairs [OIRA] of the Office of Management and Budget [OMB] finds has resulted in or is likely to result in— (A) an annual effect on the economy of $100,000,000 or more; (B) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or (C) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets.

The State of Utah supports not increasing the CRA above the $100,000,000 threshold to ensure that the annual effect of any federal action does not significantly affect state and local consumers, industries, citizens, or governments. Furthermore, the State encourages OIRA to continue reviewing federal actions for an annual effect on the economy of $100,000,000 per year (or more). This threshold should not be increased for any federal action pertaining to, or not pertaining to, the CRA. Impacts below this amount may still be significant at the state and local levels.

Public Land Revenues

Revenues produced on public lands in Utah are significant. In 2013, the *Analysis of a Transfer of Federal Lands to the State of Utah* report showed that a total of $331.7 million was generated on lands managed by the BLM and Forest Service in Utah [6]. There is a need to periodically recalculate this economic impact for policy and planning purposes.

The BLM and Forest Service also collect land-based revenues and receipts. These include, among other things, recreation fees, rights-of-way rents, grazing fees, and receipts from timber sales. In 2013, these totaled almost $24 million [7].

Of the $331.7 million in revenue generated on public lands in 2013, Utah and its counties received $149.8 million, or 45.2 percent of the total. Historically, Utah received 50 percent of the mineral-lease royalties, less a small processing fee paid to the Office of Natural Resources Revenue, an office within the U.S. Department of the Interior that collects all mineral lease monies generated on federal lands. Royalty rates are periodically adjusted by Congress [8]. In addition to the payments noted above, Utah counties received a total of $46,208,003 in payments in lieu of taxes (PILTs) in 2023 [9]. PILT payments help local governments carry out such vital services as firefighting and law enforcement, construction of public schools and roads, and search-and-rescue operations. Counties receive PILT payments annually for tax-exempt federal lands administered by the BLM, NPS, USFWS (all bureaus of the Interior Department), Forest Service (part of the U.S. Department of Agriculture), and for federal water projects and some military installations [10].

The BLM makes other payments to states based on the share of the revenues generated on its lands in those states. In Utah these consist of revenues from oil and gas pipeline rights-of-way rentals, grazing district fees (per the Taylor Grazing Act), and sales of public lands and materials (e.g., timber and other forest products). Historically, Utah has received 50 percent of proceeds from oil and gas pipeline rights-of-way rentals, 12.5 percent from grazing, and 4 percent of proceeds from the sale of land and materials. The funds from oil and gas pipeline rights-of-way rentals are processed by the Department of Workforce Services and distributed in the same manner as mineral lease royalties. Receipts from the Taylor Grazing Act go to the Utah Department of Agriculture and Food (UDAF). The UDAF then pays $22,500 to the Utah Cattlemen's Association for the grazing regions' Public Lands Council dues and distributes the remainder to the six regions to be used for range improvements.

Proceeds from land and material sales (or leases) are deposited into the School Permanent Fund by the State of Utah School and Institutional Trust Lands Administration (SITLA) [11].

In March of 2020, the Great American Outdoors Act (GAOA) was passed to provide funding to federal land-management agencies to offset the maintenance backlog on public lands. Please refer to the *Land Use* and *Outdoor Recreation, Tourism, and Film* sections of this document for more specific information on the GAOA.

Economic Impacts of Activities on Public Lands

Public lands are used for many purposes in Utah and accessed by tens of millions of people each year. In addition to mineral and energy extraction, public lands are used for recreation (e.g., hunting, fishing, and wildlife watching), forage, grazing, and timber production. These activities contribute to Utah's economic wellbeing by supporting jobs, generating earnings for Utah residents, and providing tax revenue for the state. The latest economic reports to the Governor's Office contain the most recent economic impacts statewide and are released on an annual basis by the Kem C. Gardner Policy Institute at the University of Utah [12]. ~~In 2013, activities on federal lands supported almost 29,000 jobs in Utah, generated $1.49 billion in earnings, and contributed $7.1 billion to Utah's gross state product.~~

Economic Growth and Public Lands

While public lands are highly valued from a qualitative perspective, the degree to which they contribute to economic growth at the county level is not well understood. A study by Utah State University and Weber State University showed that modest amounts of land owned by the federal government and

managed for general use (also referred to as "multiple-use") are associated with faster economic growth in counties, while large amounts of federal land managed for general use are associated with a "drag" on economic growth. The tipping point, at which the drag begins, is specific to each county but, generally speaking, it occurs when 40 to 45 percent of the county's land is owned and managed for general use by federal agencies. This relationship is strongest for income growth and migration and weakest for employment growth. Twenty of Utah's 29 counties exceed this threshold. [13]

The amount of state-owned land managed for general use does not aid economic growth until that amount has reached a critical mass of about 15 percent of the county's total area. After that point, state management is associated with faster economic growth. Four of Utah's counties have state-owned land in amounts greater than 15 percent. [14]

In the study, counties with well-developed mining sectors were shown to have faster income growth than counties without a dominant mining sector, when all other factors were equal. Counties with relatively well-developed recreation sectors were shown to have greater migration, employment, and income growth than counties without, all other factors being equal. However, it is important to note that these activities are not mutually exclusive. The dataset used in the model includes counties that have both large recreation and well-developed mining sectors, demonstrating that framing economic development choices as "resource use vs. recreation" is a false dichotomy. [15]

Broadband Internet

As high-speed internet connections become increasingly important for economic development, education, healthcare, public safety, and general quality of life, it is essential that management plans address the development of broadband infrastructure throughout Utah. The need for reliable and redundant broadband is growing as rapidly as the tech industry itself, and governments must work with broadband providers collaboratively to prepare for the growing need. Broadband infrastructure must be deployed with the capacity to adapt to evolving technologies.

The Utah Broadband Center [16] in the Utah Governor's Office of Economic Opportunity ~~Development~~ is a state program focused on mapping available broadband services and promoting the development of additional infrastructure in Utah. Communities can work with the UBOC as a resource for planning assistance. The UBOC can provide supporting informational data and resources to implement favorable policies into practice and can assist with planning activities. The UBOC maintains two interactive broadband maps that show the current state of broadband availability in Utah. The UBOC also maintains an economic development map, which allows users to explore the state in detail. Businesses can use this map to scout for locations using interactive data on the following:

- Broadband availability
- Utility information (natural gas, electricity, culinary water)
- Transportation (rail lines, airports, major roads)
- Workforce (higher-education institutions)
- Recreation (state and national parks, ski areas, golf courses)
- Health care facilities

Federal land-management agencies also play a critical role in successful broadband deployment. It is important for these agencies to approach planning in a methodical and efficient way so that underserved county residents gain access to broadband, public lands are minimally disturbed, and service providers can engage in deploying services that benefit Utah's counties. In considering future resource management planning, the priorities listed below are recommended to further the growth of broadband services in Utah.

Broadband Priorities

- Make federal data relevant to broadband planning projects readily available to states, counties, local governments, and broadband providers.
    - Maintain an online inventory and map of federal assets that communities can utilize in broadband planning efforts.
    - Corridors that have undergone NEPA evaluation and have received approval for proposed utility infrastructure projects are likely to be targeted for future broadband deployment. These data would help providers target areas for development that are likely to pass environmental review, and limit the burden on public lands.
    - GIS shapefiles of areas that have undergone NEPA environmental review and previously disturbed areas should be made available online to state, county, and local GIS departments so they can use this information in planning efforts.
    - In recreation areas that track visitation based on fees or permits, we recommend visitation rates be used in conjunction with broadband coverage data to prioritize high user areas. Areas where visitors cannot be tracked but are known to have high usage should also be included. These areas may include locations where agriculture, grazing, fishing, hunting, hiking, rock climbing, cycling, ATV use, industry exploration, and other activities are known to occur.
- Encourage utilization of and access to federally designated communications sites and work with providers to designate new sites.
- Streamline permitting to encourage broadband deployment.
- Increase agency capacity in order to prioritize telecommunications and broadband permitting.

Goals, Objectives, and Policies

Goal(s):

Ensure the economic viability of the State of Utah and access to Utah's public lands that play a significant role in the state and local economy.

Objectives:

The State of Utah has the following six objectives to enhance the quality of life by increasing Utah's revenue base and improving employment opportunities:

1. Monitor, improve, and promote the economic health of both urban and rural communities throughout Utah.
2. Attract new investors and companies while supporting the expansion of existing Utah businesses.
3. Assist entrepreneurs in Utah and engage under-represented populations in starting new companies and growing them.
4. Expand tourism in Utah and the infrastructure to support it.
5. Encourage film production in the state.
6. Support and leverage both partner agencies and community leaders to create proactive, unique economic development solutions statewide.

The State of Utah has identified the need for areas with large amounts of public lands and natural resources to diversify and thus balance out cyclical and seasonal commodity and industry cycles. The state's priority goals for remote, rural-county economies include increasing the export capacity of existing companies, leveraging broadband resources for remote and/or freelance work, and grow the local-

business sector through increased support of entrepreneurism, and unprecedented collaboration between counties (urban and rural), regions, the State of Utah, the federal government, and private sector.

Policies:

- Support the use of a streamlined NEPA compliance and documentation process and, when possible, the utilization of more-timely environmental assessments (EAs) and categorical exclusions (CEs) instead of time-consuming environmental impact statements.
- Support the continuation, full funding, and enhancement of the PILT program.
- Support the full funding of the Secure Rural Schools program in Utah.
- Support the increase of exports from rural Utah.
- Encourages federal agencies to equally consider social and biological issues on lands they manage. Every federal management decision should ask:
    - What are the possible impacts on people?
    - How can we measure them?
    - What is the desired social and economic condition?
- Encourage federal agencies to consider the economic impacts of their management decision to determine:
    - Effects on both traditional and new industries.
    - Effects on both the regional and local economy.
    - Effects on both local and non-local businesses.
- Encourage federal agencies to consider:
    - Intertwined cultural and social effects linked to certain industries and businesses.
    - Long-term sustainability, certainty, and diversification of industries and businesses.
- Support the coordination of economic development efforts between federal agencies and local communities.
- Encourage federal agencies to hire and promote staff locally.
    - Retention of local resource knowledge and best management practices are important for local relationships and resource management
- Encourage federal agencies to collaborate with local universities to create internships and opportunities for students to gain a better understanding of local resources.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

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AGRICULTURE

Introduction

Agriculture is of prime importance to the state of Utah. A variety of agricultural operations can be found in all counties in the state. Indigenous American groups began agricultural activities in Utah at least 1,300 years ago, with focus on maize (corn), squash, and beans. These groups, known as the Ancestral Puebloan and Fremont peoples, created vibrant and diverse cultures that spread across the entire area that would become Utah. A second wave of agriculturalists arrived with members of the Church of Jesus Christ of Latter-day Saints in 1847. Within two decades, dozens of agrarian communities formed along the Wasatch Front and expanded into most of the rest of Utah. The construction of irrigation ditches and canals helped agricultural operations expand and support major population increases. More recently, as rapid urbanization occurs along the Wasatch Front, agricultural lands are being replaced by housing and other development. In 2021, the Utah Department of Agriculture and Food published the Centennial Strategic Plan as a means to promote, preserve, and protect agriculture in Utah.

Findings

In Utah, 18,409 farms encompass 10,811,604 privately owned acres of land, for an average farm size of 587 acres. Of that land, 1,062,894 acres are cropland (9.8 percent) and 8,722,224 acres are permanent pasture and rangeland (80.7% percent) [1]. A substantial variety of farms exist, ranging in size from approximately 11,000 small operations to 270 operations that are valued at more than $1 million [2].

Of Utah's 10.8 million acres of farmland, 1,097,219 acres are irrigated. Of that irrigated portion, approximately 78 percent is harvested cropland and 22 percent is pasture [3]. Most of the non-irrigated farmland is rangeland, though some parts of the state are able to support dryland cultivation of small grains.

The US Bureau of Land Management (BLM) and the US Forest Service (Forest Service) are primarily responsible for administering rangelands in Utah. Currently, 45-million acres of grazing land is located in Utah—73 percent is federally owned, 9 percent is state owned, and 18 percent is privately owned [4]. Of the federal land that permits grazing, 67 percent is managed by the BLM [5].

An Animal Unit Months (AUM) or HM (Head Month)—treated as equivalent measures for fee purposes—is the use of public lands by one cow and her calf, one horse, or five sheep or goats for a month [6]. While most livestock grazing in Utah occurs on federal lands, grazing has declined by more than 66 percent on BLM lands and approximately 50 percent on US Forest Service lands. Most of the decline in public land grazing has occurred in the sheep industry, which has experienced dramatic reductions within Utah. In 1930, Utah's sheep and lamb population reached almost 3,000,000 animals, compared to 300,749 animals in 2017. The total amount of public lands grazing on BLM land during this same period decreased from 2,749,000 (AUMs) to less than 675,000 AUMs, including both cattle and sheep, while grazing on Forest Service land decreased HMs from 2,700,000 HMs to 614,000 HMs [7].

The grazing fees for 2023 were $1.35 per AUM on BLM lands and $1.35 per HM on Forest Service lands to be paid by a permittee or lessee. These fees do not account for additional surcharge rates ($6.18/AUM in Utah) for livestock grazed on an allotment owned by anyone other than the permittee or lessee. A fee of $19.00 per AUM can also be charged for non-willful unauthorized grazing use [8].

There are 8,026 cattle and calf operations in Utah. Of the total cattle and calf operations, 6,508 are considered beef cow operations. There are an estimated 764,725 head of cattle and calves in Utah, which

is down 12,108 from the 2012 census. Beef cows make up 358,00 head while milk and dairy cows make up 97,000 head [9].

Utah's sheep industry is ranked fifth largest in the nation with 1,248 sheep or lamb operations. All sheep and lambs within Utah are estimated to total 285,000 head [10].

Agriculture within the state of Utah is important for the natural, cultural, social, and economic benefits that it provides. Agriculture successfully balances multiple needs between different stakeholders while providing a valuable source of local jobs and income. Utah agriculture results in the following benefits: jobs, local tax bases, multiple environmental benefits, scenic beauty and open space, food and fiber for human consumption, and fuels-active land management.

According to the Agriculture section of *Utah's Vision for 2050*, "Utahns envision feeding their families with healthy, high-quality food grown in Utah. They see an abundance of locally grown products as part of a healthy lifestyle that will improve the quality of life for them and future generations. Utahns also envision being more self-reliant and less dependent on other states and countries to provide their food. They also want a future in which Utah's food industry provides jobs across the state." [11]

Also, according to Utah's Vision for 2050, "Many of the best soils and climates for growing fruits and vegetables are located along the Wasatch Front, where urban growth is pressuring the conversion of farmlands into housing, businesses, and communities. As a result, the acreage of fruit production was cut in half between 1987 and 2006, and the trend is continuing at a rate that will eliminate almost all of Utah's orchards by 2050." [12]

To maintain Utah's high-quality agricultural production, a variety of resources must be managed to strike a balance between development and agriculture. "Significant water resources have historically been devoted to agricultural production. However, in the face of competing demands for water from Utah's current urbanization trends and land use transitions, the multiple social values supported by water allocated to agriculture are too often overlooked. These values include security of local food production, sustaining rural Utah economies and communities, preserving open space in increasingly urbanized areas, improved capacity for both drought management and flood control, and other ecosystem services such as providing wildlife habitat and buffering wetlands and other critical lands from impacts of urban development." [13]

Economic Considerations

In 2020, Utah's agricultural sector production had a value of $2,122,720,000 [14]. However, 2018 data shows that net farm income dropped to $470.8 million, a decrease from $541.3 million in 2013 [15].

Utah's animal industry is the largest within its agricultural sector, bringing in more than $1.6 billion in cash receipts. The livestock and cattle industry are the largest contributor to the animal industry followed closely by the pork industry [16].

In 2015, crop production brought in over $449 million in cash receipts. Feed crops and hay were the two largest contributors to the crop-production industry [17].

A 2014 report published by Utah State University details the significant contributions of agriculture to the state economy. The combined agricultural processing and production sectors account for 15 percent of the state's total economic output, or $21.2 billion, after adjusting for multiplier effects. [18]

The estimated $2.3 billion value of agriculture is concentrated in Utah's rural counties due to the availability of affordable farmland and the high percentage of federally owned land used for grazing within these counties. The economic value that agriculture brings to Utah's rural counties is vital because residents in those areas have a much lower median household income in comparison with the more-populated areas of the state. [19]

Utah's level of agricultural employment is at approximately the same level as 1970, showing a relatively stable number of jobs within the industry. Currently, farm jobs constitute approximately 1.0 percent of Utah's total employment, contributing 20,552 jobs to Utah's economy [20]. Of the total agricultural employment, 15,766 jobs (0.8 percent of total employment) are farm proprietors [21]. The majority of individuals employed in agriculture are small business owners who create jobs and generate revenue within the more-rural and generally less-affluent areas of the state.

In 2021, animal-production jobs averaged an annual salary of $38,526 [National average: $44,463] while crop-production jobs averaged $32,762 [National average: $40,116], for an overall average of $35,933 [22]. From 1990 to 2020, wages increased by 32.8 percent in animal production and 51.7 percent in crop production [23].

Goals, Objectives, and Policies

Goal(s):

- To support the development of Utah's agriculture industries by promoting, preserving, and protecting agricultural production to ensure an abundant supply of locally produced foods and fibers for all Utahns.

Objectives:

1. Continue to allow and increase access to public lands for agricultural use in a manner that, (1) satisfies local needs and provides for economical and environmentally sound agricultural practices, and (2) is consistent with and complementary to Utah's lifestyle, character, culture, heritage, and economy.
2. Expand the potential use of federal lands for the production of all food and fiber products, including crop production, in cases where such uses are acceptable to the public and are feasible.
3. Ensure proper and active management of public-land watersheds; which, supply most of Utah's agricultural and residential water.
4. Improve vegetative health on public and private lands through active management of invasive plants and noxious weeds.
5. Ensure that Utah's water-use planning and management considers agriculture's role within the entire social, economic, and natural systems landscape.
6. Promote and retain agricultural land and water for local food production, self-sufficiency, and food security.
7. Support local efforts to protect agricultural land and water from development. Such efforts should focus on (1) making and keeping agriculture economically and socially viable, and (2) encouraging development patterns and implementing measures that protect agricultural land and water.
8. Oppose efforts by federal agencies, especially the Forest Service and BLM, to obtain control or ownership of water rights used on, or originating on, public lands, where the water has been put to beneficial use by farmers and ranchers.
9. Call upon federal agencies to actively involve and participate with state agencies, local government, and grazing permittees during resource management planning.

10. Strongly recommend that all federal policies and management plans acknowledge and consider the cultural, historical, economic, and environmental importance of agriculture to the state of Utah and its inhabitants.
11. Maintain Animal Unit Months (AUMs) for public lands administered by the BLM and Head Months (HMs) for lands managed by the Forest Service within Utah at or above current levels.
12. Manage grazing within the state of Utah according to best grazing practices and sound scientific management of local environments.
    - Livestock operators should be afforded maximum flexibility concerning seasons of use, stocking rates, and rangeland improvement decisions.
13. Expedite grazing permit renewals on public lands.
14. Support and promote crop production in the state of Utah that follows best management practices such as efficient irrigation systems, proper fertilization, and proper use of pesticides and herbicides.
    - All best management practices should be employed as economically feasible.

Policies:

~~Support the Recommended State Water Strategy's recommendation to assess Utah's agriculture industry. The purposes of the assessment would be to (page 39–40):~~

- ~~*Understand changes in agriculture's presence and location in Utah landscapes;*~~
- ~~*Identify connections and compatibilities between agriculture and adjoining land uses;*~~
- ~~*Assess the water allocation and distribution systems needed to ensure productive systems of land uses for agriculture in relation to neighboring lands;*~~
- ~~*Support an appropriate level and variety of local, sustainable, secure, water-efficient food production for Utah, with a focus on "local farming" that helps ensure food security;*~~
- ~~*Evaluate water-related incentives farmers need to ensure that food production remains part of Utah's future;*~~
- ~~*Inventory agricultural areas that have the highest value for food production and the degree to which the state can work to protect both the lands and water that sustain them;*~~
- ~~*Balance the social and economic benefits of rural agricultural water use by facilitating industry clusters or other means of focusing on the comparative advantages of rural food production while leaving urban water supplies available to meet municipal and industrial demands;*~~
- ~~*Understand the best, most sustainable markets for agricultural production suited to Utah's people, climate, conditions, and comparative advantages;*~~
- ~~*Recommend water-related policies that support and retain a sustainable, economically viable agricultural industry.*~~
- Support the implementation of the action items contained in Utah's Coordinated Action Plan for Water [24], including, but not limited to, investing in infrastructure, vibrant communities, productive agriculture, and healthy water and watersheds.
- Management and resource-use decisions by federal land management and regulatory agencies concerning Utah's vegetative resources should reflect serious consideration of the proper optimization of the yield of water within the state's watersheds.
- The state supports locally driven strategies to protect and preserve agricultural lands.
- Because approximately 63 percent of the state of Utah consists of federal lands, the state's livelihood is substantially affected by the policies of federal land management agencies. As such, it is vital that federal land management agencies work closely and cooperatively with the state to ensure access to and the multiple-use of Utah's public lands.
    - The State will actively pursue cooperating agency status for projects on public lands to ensure that the voice of the State is fully represented.

- The state of Utah supports the concept of multiple-use and sustained yields on public lands. Livestock grazing is an integral part of the multiple-use concept, but public lands should also be used for the production of food and fiber where feasible.
- The state of Utah supports and values the farming and ranching industries as integral parts of its history, culture, and heritage.
    - Agriculture is recognized as a cultural resource within the state of Utah.
- The state of Utah maintains a no-net-loss stance regarding grazing AUMs and HMs on federal lands.
- AUMs and HMs within the state should remain at or above current levels unless a scientific need for temporary reduction is demonstrated to the satisfaction of state officials.
    - In the event of a wildfire, natural disaster, or any other action limiting grazing on permitted grazing allotments, the State requests that federal agencies immediately accommodate producers to provide them with grazing opportunities on available grazing allotments.
- In the case where AUMs or HMs are temporarily reduced, these reductions should be reinstated at the earliest possible moment once vegetative health has been restored to its previous levels.
- Livestock trailing rights and easements should be protected to ensure the viability of ranching operations. Such trails are critical for moving livestock across rangelands and to markets.
- The state of Utah supports a viable and competitive aquaculture industry.
- The state of Utah opposes the voluntary retirement of any grazing allotments on public lands.
- The state of Utah supports programs including, but not limited to, the Grazing Improvement Program, Watershed Restoration Initiative, and Shared Stewardship Program to actively manage public lands and natural resources.

The state of Utah supports active management of wildlife populations to appropriate levels that balance the interests of all public land users, including agriculture and grazing.

- Large ungulates should be managed to target population levels to improve vegetative health on public lands, maintain adequate forage, and ensure proper water quality.
- Managing predators to appropriate levels is vital to ensure that ranchers do not face losses through predation of livestock. Predators that repeatedly prey on livestock should be relocated or be eliminated and ranchers compensated for their losses (*refer to the Predator Management section*).

The state of Utah supports private ownership of water rights and opposes any attempt by federal agencies to obtain water rights within the state.

- The state of Utah recognizes and supports the use of public lands grazing as a tool to manage wildfire risk. Through grazing, fuel loads are reduced, resulting in decreased risk for uncharacteristic and potentially catastrophic wildfires.
- The state of Utah supports the use of targeted grazing alongside other forms of treatment to suppress, manage, and eradicate noxious weeds. Invasive and noxious weeds reduce rangeland health and available forage for livestock and wildlife (*refer to the Noxious Weeds section*).
- Management and resource-use decisions by federal land management and regulatory agencies concerning Utah's vegetative resources should reflect serious consideration of the proper optimization of the yield of water within the state's watersheds.
- Adequate private water rights for livestock and agricultural uses are supported and protected by the state of Utah.
- Grazing permit renewals should not be withheld by federal agencies as a means to acquire water rights within the state of Utah.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Department of Agriculture

§ 4-2-102. *Department created.*
(1) There is created within the state government the Department of Agriculture and Food.
(2) The department created in Subsection (1) is responsible for the administration and enforcement of all laws, services, functions, and consumer programs related to agriculture in this state as assigned to the department by the Legislature.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Uniform Agriculture Cooperative Association Act

§ 3-1-1. *Declaration of policy.*
"It is the declared policy of this state, as one means of improving the economic position of agriculture, to encourage the organization of producers of agricultural products into effective associations under the control of such producers, and to that end this act shall be liberally construed."

Livestock Dealers' Act

§ 4-7-102. *Purpose declaration.*
The Legislature finds that the public interest requires regulation of the sale of livestock between the producer and a person who purchases livestock for resale to protect the producer from unwarranted hazard and loss in the sale of livestock.

§ 4-7-104. *Unlawful to act as an agent or dealer without license—Exception.*
Except as exempted by Section 4-7-105, no person may act as an agent or dealer in this state without being licensed under this chapter.

Agriculture Fair Trade Act

§ 4-8-102. *Purpose declaration.*
(1) The Legislature finds and declares that in order to preserve the agricultural industry of this state it is necessary to protect and improve the economic status of persons engaged in the production of products of agriculture.

(2) To carry out the policy described in Subsection (1), the Legislature determines it necessary to regulate the production and marketing of such products and to prohibit unfair and injurious trade practices.

(3) This chapter shall be liberally construed.

Conservation Commission Act

§ 4-18-102. *Findings and Declarations – Duties.*

(1) In addition to the policy provided in Section 4-46-101, the Legislature finds and declares that:

(a) the soil and water resources of this state constitute one of the state's basic assets; and

(b) the preservation of soil and water resources requires planning and programs to ensure:

(i) the development and use of soil and water resources; and

(ii) soil and water resources' protection from the adverse effects of wind and water erosion, sediment, and sediment related pollutants.

(2) The Legislature finds that local production of food is essential for:

(a) the security of the state's food supply; and

(b) the self-sufficiency of the state's citizens.

(3) The Legislature finds that sustainable agriculture is critical to:

(a) the success of rural communities;

(b) the historical culture of the state;

(c) maintaining healthy farmland;

(d) maintaining high water quality;

(e) maintaining abundant wildlife;

(f) high-quality recreation for citizens of the state; and

(g) helping to stabilize the state economy.

(4) The Legislature finds that livestock grazing on public lands is important for the proper management, maintenance, and health of public lands in the state.

(5) The Legislature encourages each agricultural producer in the state to operate in a reasonable and responsible manner to maintain the integrity of soil, water, and air.

(6) The department shall administer the Utah Agriculture Certificate of Environmental Stewardship Program, created in Section 4-18-107, to encourage each agricultural producer in this state to operate in a reasonable and responsible manner to maintain the integrity of the state's resources.

(7) The Legislature finds that soil health is essential to protecting the state's soil and water resources, bolstering the state's food supply, and sustaining the state's agricultural industry.

Plant Pest Emergency Control Act

Aquaculture Act

§ 4-37-102. *Purpose statement--Aquaculture considered a branch of agriculture.*

(1) The Legislature declares that it is in the interest of the people of the state to encourage the practice of aquaculture, while protecting the public fishery resource, in order to augment food production, expand employment, promote economic development, and protect and better utilize the land and water resources of the state.

(2) The Legislature further declares that aquaculture is considered a branch of the agricultural industry of the state for purposes of any laws that apply to or provide for the advancement, benefit, or protection of the agricultural industry within the state.

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AIR QUALITY

Introduction

Air quality in Utah is monitored by the Division of Air Quality (DAQ), within the Utah Department of Environmental Quality (DEQ). The mission of the DAQ is to protect public health and the environment from the harmful effects of air pollution. It is the responsibility of the DAQ to ensure that the air in Utah meets health and visibility standards established under the federal Clean Air Act of 1963 (42 U.S.C Section 7401) (CAA). To fulfill this responsibility, the DAQ is required by the federal government to ensure statewide compliance with the US Environmental Protection Agency's (EPA) National Ambient Air Quality Standards (NAAQS) and visibility standards within national parks. The DAQ enacts rules pertaining to air-quality standards, develops plans to meet the federal standards when necessary, issues pre-construction and operating permits for stationary sources, and ensures compliance with state and federal air quality rules. The DAQ allocates a large portion of its resources to implementing the CAA.

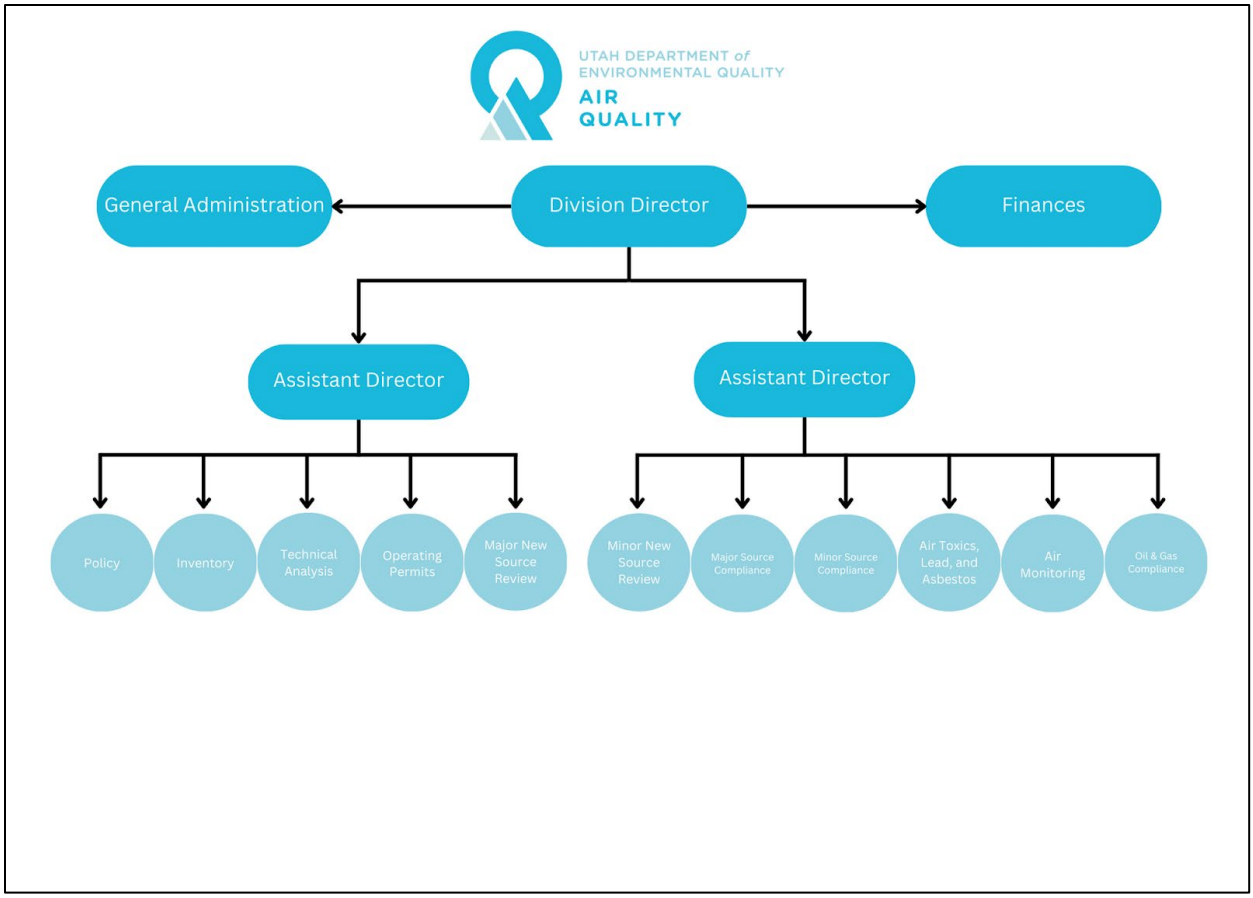
The Utah Air Conservation Act empowers the Utah Air Quality Board (UAQB) to adopt rules pertaining to air-quality issues. The DAQ staff supports the UAQB in its policy-making role. The UAQB comprises representatives from industry, local government, environmental groups, the public, and includes the Executive Director of the DEQ. The UAQB's members have diverse interests, are knowledgeable in air-quality matters, and are appointed by the governor of Utah with consent of the Senate. The director of the DAQ is the UAQB's executive secretary.

The Utah air-quality rules define the roles of the Utah air-quality program. Implementation of the rules requires the DAQ's interaction with industry, other government agencies, and the public. The state air-quality program is responsible for the implementation of the federal standards under the CAA, as well as state rules for pollution sources not regulated by the CAA.

Mission / Goals
The mission of the DEQ is to safeguard and improve Utah's air, land, and water through balanced regulation.

Vision / Objectives
The vision of DEQ is clean air, land, and water for a healthy and prosperous Utah.

Structure
The DAQ is divided into the following programs.



Permitting Program

The DAQ Operating Permit Section, Major New Source Review Section, and Minor New Source Review Section, are responsible for implementing state and federal air permitting programs that are intended to control air emissions from new and modified stationary sources.

Permits are legally enforceable documents that specify the size and number of allowable emission units, operational limits of permitted emission units, and emission limits for each permitted source. Permitted emission limits can be emission limitations (mass or concentration) or surrogate limits such as production rates, hours of operation, fuel consumption, or a combination thereof. Opacity, the measure of opaqueness or transparency of emission plumes, is also a common metric used to both limit and measure source emissions. Permits include testing and monitoring requirements. The results of the tests and the monitoring data are used to determine if a source of air pollution is operating in compliance with the permit and the rules.

The division issues two types of permits. New Source Review (NSR) permits, also known as Approval Orders (AOs), are pre-construction-type permits for new and modified sources of air emissions. These are issued by the New Source Review Sections and have been required in Utah since 1969.

The Operating Permits Section issues the Title V Operating Permits to the “major” stationary sources in the state, as required in Title V of the federal CAA. There are currently 75 of these sources. Operating permits consolidate all air quality related requirements from numerous state and federal air quality programs into a single regulatory document. The purpose of an operating permit is to clarify for the

permit holder, as well as DAQ compliance inspectors, the wide range of requirements applicable to any regulated source by placing those requirements into one consolidated document.

In addition, the DAQ permitting sections process a number of smaller actions such as de minimis determinations for NSR, name changes, tax exemption certificates for pollution control equipment purchases, and soil aeration approvals.

~~**Permitting Branch**~~

~~The Permitting Branch is responsible for issuing two kinds of permits, construction and operating permits. Construction permits are issued to new or modified sources of air pollution through the New Source Review program. Operating permits are issued, on an ongoing basis, through Title V of the CAA.~~

Compliance Program

The Compliance Program comprises five sections: Major Source Compliance, Minor Source Compliance, Minor Source Oil and Gas and Air Toxics, Lead-Based Paint, and Asbestos (ATLAS). These sections are responsible for ensuring compliance with all air pollution orders, permits, rules, and standards. This is accomplished through inspections, audits of stack tests and continuous emission monitoring systems (CEMS), plan and report reviews, accreditation and certification programs, compliance assistance/outreach activities, and, when necessary, enforcement actions.

Planning Program

The Planning program is responsible for developing comprehensive plans (State Implementation Plans, or SIPs) to reduce air pollution in areas that are not in compliance with the NAAQS. Emissions inventories are routinely compiled in order to understand the origins of the various contaminants detected in the air. Computer models (technical analyses) are used to evaluate the impacts of new and existing sources of air pollution, and to understand the relationship between the emissions, meteorology, and pollutant concentrations measured in the air. The Planning Branch is also involved in identifying the air quality impacts of transportation issues (mobile sources), which include vehicle inspection and maintenance, clean fuels, and highway construction. This information must be considered in the development of SIPs in order to ensure that Utah's ambient air remains in compliance with the federal health standards, even as Utah's population and economy continue to grow. The Air Monitoring Center operates a network of air-quality monitors throughout the state.

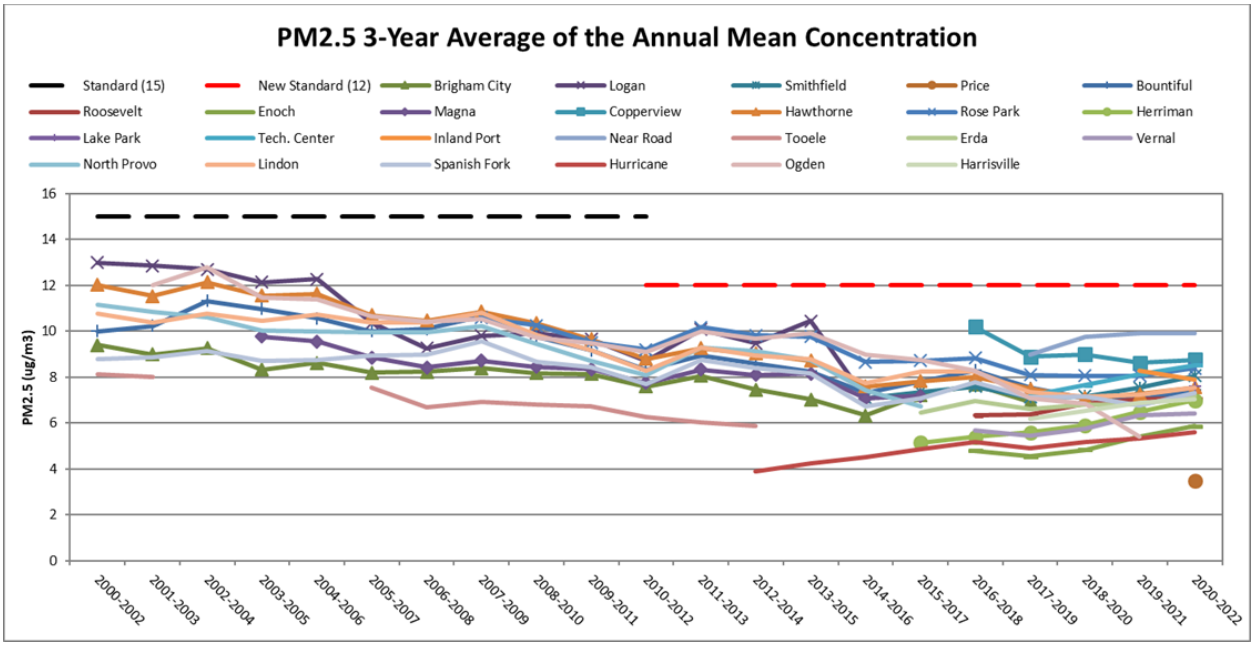
~~**Compliance Branch**~~

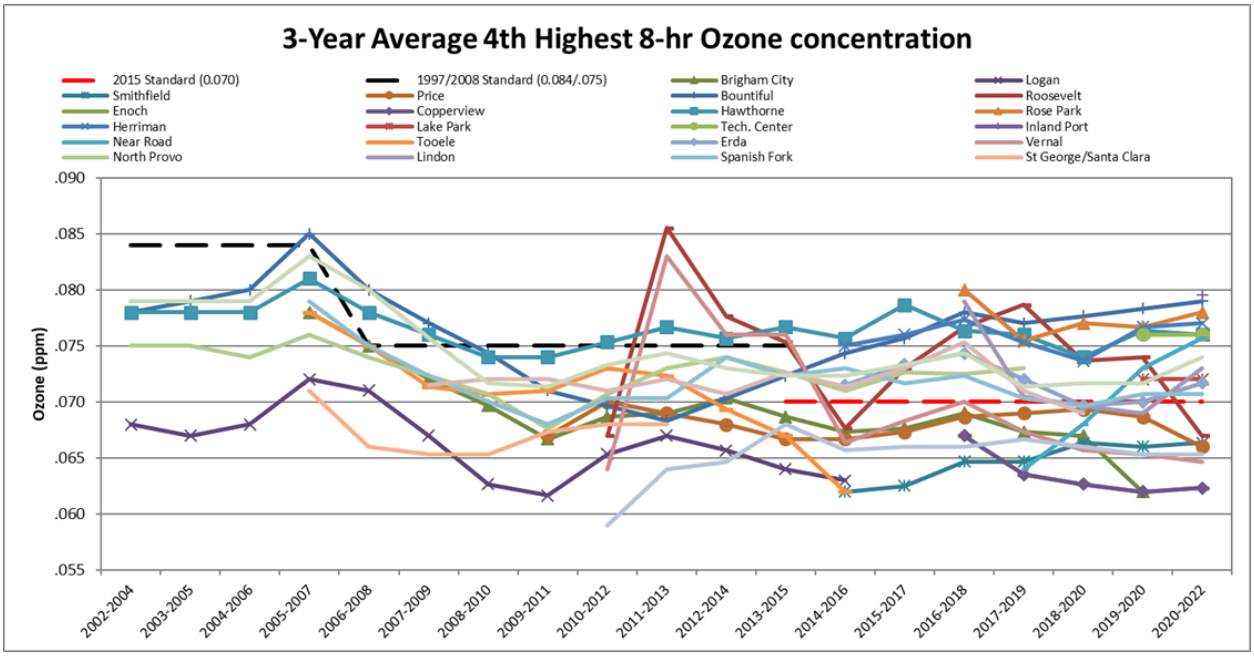
~~The Compliance Branch is responsible for ensuring that industries and residents comply with all Utah air-quality requirements. The branch also monitors mitigation activities associated with asbestos and lead-based paint (hazardous air pollutants). The Small Business Assistance Program has been set up within the Compliance Branch to help small businesses deal with the many requirements surrounding air quality, including the various permitting requirements.~~

Findings

The passage of the CAA in 1963, amended in 1970 and 1990, created a framework for reducing air pollution. The following graphs reflect the ongoing efforts and the success of DAQ in reducing air pollution.

As Utah's population continues to increase, particularly along the Wasatch Front, the policies of DAQ will be critical in achieving air quality standards. Notably, winter inversion and wildfire events make it challenging to comply with established standards.





Air Pollutants

The CAA identifies six common air pollutants that are found throughout the United States and can injure health, harm the environment, and cause property damage. These pollutants are shown in Table 1. [1]

Air Quality Standards

The CAA requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment. The CAA established two types of air quality standards: primary and secondary. Primary standards are intended to protect public health, including the health of sensitive populations such as children, the elderly, and those with respiratory ailments (e.g., asthma). Secondary standards are set to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The standards consist of a numerical value and a form (see Table 2). The form may be a statistical value, such as the 98th percentile calculation, or a rolling average over a designated period of time, which is then compared to the numerical value.

The EPA has established health-based NAAQS for the following six criteria pollutants: (1) carbon monoxide, (2) nitrogen dioxide, (3) ozone, (4) particulate matter, (5) sulfur dioxide, and (6) lead. Each of these pollutants is addressed in greater detail later in this chapter. Table 1 provides a brief description of each criteria pollutant, and Table 2 provides a brief description of each pollutant's primary and secondary NAAQS. The EPA establishes the primary health standards after considering both the concentration level and the duration of exposure that can cause adverse health effects. Pollutant concentrations that exceed the NAAQS are considered unhealthy for some portion of the population. At concentrations between 1.0 and 1.5 times the standard, while the general public is not expected to be affected by the pollutant, the most-sensitive portion of the population may be adversely affected. However, at levels above 1.5 times the standard, even healthy people will suffer adverse effects.

If the air quality in a geographic area meets the NAAQS, it is called an attainment area; areas that do not meet the NAAQS are called non-attainment areas and comprehensive state plans must be developed to reduce pollutant concentrations to safe levels.

The DAQ monitors each of these criteria pollutants, as well as several non-criteria pollutants for special studies at various monitoring sites throughout the state.

Table 1: EPA Designated Criteria Pollutants

EPA Designated Criteria Pollutants			
Name	Sources	Health Effects	Welfare Effects
Carbon Monoxide (CO), a clear, colorless, odorless gas.	Burning of gasoline, wood, natural gas, coal, oil, etc.	Reduces the ability of blood to transport oxygen to body cells and tissues. May be particularly hazardous to people who have heart or circulatory (blood vessel) problems and people who have damaged lungs or breathing passages.	
Nitrogen Dioxide (NO_2) (one	Burning of gasoline, natural gas, coal, oil, and other fuels;	Can cause lung damage, illnesses of breathing	An ingredient of acid rain (acid aerosols) which can

component of NO_x) smog-forming chemical.	Cars are also an important source of NO2	passages and lungs (respiratory system).	damage trees, lakes, flora and fauna. Acid aerosols can also reduce visibility.
Ozone (O_3) (ground-level ozone is the principal component of smog)	Chemical reaction of pollutants; Volatile Organic Compounds (VOCs) and NO_x	Can cause breathing problems, reduced lung function, asthma, irritated eyes, stuffy nose, and reduced resistance to colds and other infections. It may also speed up aging of lung tissue.	Can damage plants and trees; smog can cause reduced visibility.
Particulate Matter ($PM_{10,}$ $PM_{2.5}$) dust, smoke, soot.	Burning of gasoline, natural gas, coal, oil, and other fuels; industrial plans; agriculture (plowing or burning fields); unpaved roads, mining, construction activities. Particles are also formed from the reaction of VOCs, NO_x, SO_x, and other pollutants in the air.	Can cause nose and throat irritation, lung damage, bronchitis, and early death.	Main source of haze that reduces visibility.
Sulfur Dioxide (SO_2)	Burning of coal and oil (including diesel and gasoline); industrial processes.	Can cause breathing problems and may cause permanent damage to lungs.	Ingredients of acid rain (acid aerosols) which can damage trees, lakes, flora and fauna. Acid aerosols can also reduce visibility.
Lead (Pb)	Paint (houses, cars), smelters (metal refineries); manufacture of lead storage batteries; note: burning leaded gasoline was the primary source of lead pollution in the U.S. until the federal government mandated unleaded gasoline.	Damages the nervous systems, including the brain, and causes digestive system damage. Children are at special risk. Some lead-containing chemicals cause cancer in animals.	Can harm wildlife.

Table 2: Ambient Air Quality Standards

Ambient Air Quality Standards				
Pollutant	Averaging Time	Primary / Secondary	Standard	Form
Ozone (O_3)	8 Hour	Primary and Secondary	0.070 ppm	Annual Fourth-highest daily maximum 8-hr concentration, averaged over three years

Respirable Particulate Matter (PM_{10})	24 Hour	Primary and Secondary	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over three years
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	Primary and Secondary	35 $\mu g/m^3$	98th percentile, averaged over three years
	Annual	Primary	12 $\mu g/m^3$	Annual mean, averaged over three years
		Secondary	15 $\mu g/m^3$	Annual mean, averaged over three years
Carbon Monoxide (CO)	1 Hour	Primary	35 ppm	Not to be exceeded more than once per year
	8 Hour	Primary	9 ppm	Not to be exceeded more than once per year
Nitrogen Dioxide (NO_2)	1 Hour	Primary and Secondary	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over three years
	Annual	Primary and Secondary	53 ppm	Annual mean
Sulfur Dioxide (SO_2)	1 Hour	Primary	75 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over three years
	3 Hour	Secondary	0.5 ppm	Not to be exceeded more than once per year
Lead (Pb)	Rolling 3 month average	Primary and Secondary	0.15 $\mu g/m^3$	Not to be exceeded

Utah's Air Monitoring Network

The Air Monitoring Program (AMP) operates a network of monitoring stations throughout Utah (see Table 3). The monitors are situated to measure air quality in both residential neighborhoods and industrial areas. The DAQ annual reports contain maps, tables, and other resources pertaining to the state's compliance with federal and state regulations.

Table 3: Utah Monitoring Network Stations

Utah Monitoring Network Stations									
Station	City	Address	CO	NO_2	O_3	PM_{10}	$PM_{2.5}$	SO_2	Met.
Air Monitoring Center	SLC	240 N. 1950 W.	X	X	X	X	X	X	
Antelope Island	None	North end of island							X
Bountiful	Bountiful	200 W. 1380 N.		X	X		X		X
Copperview	Midvale	8449 S. Monroe St.	X	X	X		X	X	X
Enoch	Enoch	3840 N. 325 E. Minersville Hwy.		X	X		X		X
Erda	Tooele	2163 West Erda Way		X	X		X		X
Harrisville	Harrisville	425 W. 2250 N.	X	X	X		X		X

Hawthorne	SLC	1675 S. 600 E.	X	X	X	X	X	X	X
Herriman	Riverton	14058 Mirabella Dr.		X	X	X	X		X
Hurricane	Hurricane	150 N. 870 W.		X	X		X		X
Prison Site	SLC	1480 N. 8000 W.		X	X		X		X
Lake Park	West Valley	2782 S. Corporate Park Dr	X	X	X	X	X		X
Lindon	Lindon	30 N. Main St.	X	X	X	X	X		X
Near Road	Murray	4951 S. Galleria Dr.	X	X	X		X		X
Price #2	Price	351 S. Weasel Run Rd.		X	X				X
Roosevelt	Roosevelt	290 S. 1000 W.		X	X		X		X
Rose Park	SLC	1354 W. Goodwin Ave.	X	X	X		X	X	X
Saltair	None	6640 W. 1680 N.					X		X
Smithfield	Smithfield	675 W. 220 N.		X	X	X	X		X
Spanish Fork	Spanish Fork	312 W. 2050 N.			X		X		X
Vernal	Vernal	628 N. 1700 W.		X	X		X		X

Background of Utah State Implementation Plans

To protect public health, the CAA requires that federal standards be set to limit the maximum levels of pollutants in the outdoor air. Each state is responsible for developing plans to demonstrate how those standards will be achieved, maintained, and enforced. These plans make up the State Implementation Plan (SIP). The plans and rules associated with them are enforced by the state of Utah and, after federal approval, are also federally enforceable. These plans are the framework for each state's program to protect the air.

In areas where the air quality has improved to the point that the NAAQS are no longer exceeded, the implementation plan remains in effect, and a maintenance plan is prepared to demonstrate how the air will be kept clean for the following 20 years or longer. These maintenance plans also become part of the SIP.

In simple terms, a SIP is a framework that explains how the state is going to restore an area's air quality to NAAQS attainment levels. Each SIP is designed to control a specific non- attainment problem. There is a separate SIP for PM2.5, SO2, CO, ozone, PM10, etc.

Technically, the state of Utah has written the majority of these SIPs as separate chapters of one larger "umbrella SIP," but it is much easier to view them individually as separate documents. Thus, one could refer to the PM2.5 SIP, the ozone SIP, or the CO SIP, etc., rather than stating "Section IX, Part H, Subsections 11-13 of the SIP" (*This would refer to the Emission Limits and Operating Practices requirements for PM2.5 of the Utah SIP*).

Each specific SIP controls its specific non-attainment problem through three general areas—each of those areas dealing with a different group of sources:

1. Transportation controls: This group includes things like broadly mandated fuel changes (oxygenated gasoline, Tier III fuels), I/M programs, implementation of dedicated HOV lanes, fleet turnovers, and other similar programs. These are the rules that apply to the first group of sources—what are known as mobile sources (i.e., gas-powered vehicles).

2. Rule changes and other changes within what DAQ calls "area sources:" This group includes most of the generally applicable rules, and most of the source category rules, such as no wintertime solid fuel burning, changes in the VOC content of surface coatings, opacity requirements on haul roads, rules for boilers and ovens (including bakery ovens), etc. For purposes of the SIP, the definition of an area source is any non-mobile source that isn't a "Major Source" (*see below*).

3. Specific requirements on Major References: Major Sources, also known as SIP-listed sources, are traditionally those that are large enough that their emissions can be individually distinguished on the monitoring filters, or whose emissions impact could individually change the outcome of the attainment demonstration. More recently, the definition of "Major Sources" became more precisely defined by their emission level. Major sources are likely affected by the area source requirements listed in item 2, above, but also have separate sets of individually targeted requirements that apply specifically to each individual facility. Each facility is listed individually in the SIP, along with each requirement. For example, while petroleum liquid storage tanks may have generally applied requirements that affect all such tanks, each of the four major-source refineries is also listed by name, along with a host of specific requirements that apply only to that individual refinery.

Smoke Management Plan

The purpose of the Utah Smoke Management Plan (SMP) is to identify the responsibilities of DAQ and federal, and state land managers to coordinate procedures that mitigate the impacts of prescribed fire and wildland fire use on public health, visibility, and public safety, in terms of smoke or visibility impacts.

See the Fire Management section of the State Resource Management Plan for more information.

Regional Haze

The EPA's Regional Haze Rule requires Utah to address regional haze in each mandatory Class I Area (CIA) located within Utah and in each mandatory CIA located outside Utah that may be affected by pollutants emitted from sources within Utah. The objectives of the Regional Haze Rule are to improve existing visibility in 156 national parks, wilderness areas, and monuments (termed Mandatory Class I Areas or CIAs), prevent future impairment of visibility by manmade sources, and meet the national goal of natural visibility conditions in all mandatory CIAs by 2064. Utah's CIAs consist of: Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capitol Reef National Park, and Zion National Park.

The majority of impact related to regional haze are caused by wildfire smoke and not from point source pollution near the National Parks. Active management of our forest should be supported to address regional haze.

~~The CAA established as a national goal the "prevention of any future, and the remedying of any existing impairment of visibility in mandatory Class I Federal areas" (i.e., our national parks and wilderness areas).~~

See the *Fire Management* section of the State Resource Management Plan for more information.

Oil and Gas

The DAQ coordinates with the Utah Division of Oil, Gas and Mining to locate and identify sources that may require air quality permits. Oil and gas emissions inventory reports contain updated information and best management practices are outlined to promote and ensure compliance.

Environmental Justice Considerations

Environmental justice considerations have been part of NEPA and federal policy since at least 1994 when President Clinton issued Executive Order 12898 which directed the federal government to:

- Identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.
- Develop a strategy for implementing environmental justice.
- Promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation.

Active management of our public lands can have positive impacts in relation to environmental justice and should be addressed during the planning process.

In 2023, President Biden issued Executive Order 14096 which directed the Federal Government to build upon and strengthen its commitment to deliver environmental justice to all communities across America through an approach that is informed by scientific research, high-quality data, and meaningful Federal engagement with communities with environmental justice concerns.

The Environmental Protection Agency (EPA) developed the Environmental Justice Screening and Mapping Tool (interactive) to help quantify and identify locations where environmental justice concerns may exist in the United States. The Utah Department of Workforce Service, the Utah Division of Multicultural Affairs, and others state and local entities can help to improve and confirm the accuracy of data in an effort to avoid, minimize, or mitigate environmental justice concerns.

Economic Considerations

The adverse health effects of both ozone and PM2.5 are well documented, and the high levels measured during winter temperature inversions may affect populations in non-attainment areas. During summer, when regional ozone levels are high, large rural areas may also be affected. People with respiratory disease, the elderly, and children are most at-risk for impacts from both of these pollutants. The current monitoring and modeling efforts will improve the DAQ's understanding of the extent of these effects.

The State will be required to establish an emission budget for vehicle emissions, and all future transportation plans in non-attainment areas must conform to that budget. Other measures, such as vehicle inspection and maintenance programs may also become required. The permitting program in the area would also be affected in non-attainment areas. New sources in non-attainment areas are required to obtain an offset from existing sources to ensure that overall emissions do not increase within the area. New sources in non-attainment areas must also meet the highest standard of control. These restrictions could affect economic development in these areas. [2]

Goals, Objectives, and Policies

Goal(s):

- Safeguarding and improving Utah's air, land, and water through balanced regulation.

Objectives:

1. Utilize the Utah SIP to limit the maximum level of pollutants in the outdoor air and protect public health.
2. Amend the Utah SIP as necessary in order to protect public health and comply with the Clean Air Act (42 U.S.C. § 7401).
3. Develop and amend air-quality rules to implement and enforce the Utah SIP.
4. Coordinate with federal partners to achieve attainment of federal and state air-quality standards.
5. Work with local governments and private industries to attain federal and state air-quality standards while mitigating damage to Utah's economy.
6. Continue to refine the Utah SIP, Utah Air Quality Rules, and policies to achieve attainment of federal and state air-quality standards in existing non-attainment areas.
7. The State urges the federal government to carefully consider the magnitude and nature of a proposed action, as well as past planning, research, and studies when it defines environmental justice study areas.
    - These areas should encompass environmental justice populations potentially affected by a proposed action and they should avoid encompassing unnecessarily large or irrelevant areas where analyses will be meaningless or where it will produce uncertain results that may lead to the erroneous determinations of effect.
8. The state encourages the federal government to first analyze potential health, social, and economic effects – both positive and negative – on the study area's entire population, then assess whether environmental justice populations will be adversely, disproportionately, or positively affected by a proposed action.
    - The scientific approach should be implemented to promote and consider ideas that are testable (or repeatable), without regard to a particular perspective, cultural bias, or preferred outcome.

Policies:

- The state of Utah encourages the development and implementation of innovative technologies and policy to achieve attainment.
- It is the policy of the state that adverse effects should be mitigated through avoidance.
    - However, if avoidance is not appropriate or practicable, the federal government should seek to minimize the effects, followed by mitigation.

- The state will ensure that all Utahns have fair and equitable opportunities to live safe and happy lives by enacting effective policy and a seamless system of services and programs (Vision Statement for the Utah Department of Health and Human Services).

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Title 19, Chapter 2 of the Utah Code empowers the Utah Air Quality Board to enact rules pertaining to air quality activities.

Air Quality Rules

The Utah Air Quality Rules implement the policies and regulations contained in the Utah SIP. Utah Air Quality Rules are enacted by the UAQB, and are organized by the Office of Administrative Rules. The official Air Quality Rules are contained in Utah Administrative Code.

References:

1. https://deq.utah.gov/air-quality/annual-reports-division-of-air-quality
2. https://deq.utah.gov/air-quality/annual-reports-division-of-air-quality
3. https://deq.utah.gov/air-quality/air-quality-laws-and-rules

CULTURAL AND HISTORICAL

Introduction

The State of Utah is endowed with one of the richest, most-diverse collections of cultural and historical resources in North America, and they can be found within the towns, cities, and undeveloped areas of each county. Utah's cultural and historical resources include (1) historical districts, buildings, structures, historic roads, and historic mines; (2) ~~ancient~~ archaeological sites ranging from simple artifact scatters to Ancestral Puebloan cliff dwellings ~~built high above canyon floors;~~ and (3) geographic features or landscapes associated with the traditional cultural practices or beliefs of living communities. These resources enhance quality of life in Utah, and they strengthen Utahns' appreciation of those who came before.

People have lived in Utah for at least 13 millennia. Where they lived, what they ate, and the ways they interacted with each other were influenced largely by changing climates, environments, technological innovations, and fluctuating populations. According to oral traditions, many of Utah's tribes believe that Indigenous people have been here since the beginning of time. The archaeological record currently traces that beginning to the late Pleistocene and early Holocene, a time when warmer climatic conditions caused Lake Bonneville and valley glaciers to recede substantially. During the earliest millennia, a time known as the Paleoarchaic period (ca. 13,000 to 9,000 B.P.) [1], small groups of humans moved frequently over large areas, hunting a wide variety of animals, many of which include now-extinct species like mammoth and ancient bison. They also ate plants, used tobacco, and made distinctive lanceolate-shaped projectile points and stone crescents.

As the climate continued to warm, ancient peoples adapted by foraging across wider ranges and broadening their diets to include more plants, especially seeds. The tools needed to process these seeds, *manos* and *metates*, are the principal artifactual hallmarks of the Archaic period (9,000 to 2,000 B.P.). Initially, people lingered along the receding shorelines and marshes of valley lakes, but over time increasingly relied on food resources in upland settings. Pine nuts became particularly important by the middle of the Archaic period. Toward the end of the Archaic period, it appears that some people settled more permanently in larger groups, adopted bow-and-arrow technology, and dabbled in horticulture. Depending upon where one looks in Utah, the cultivation of corn, beans, and squash became more important between 2,000 and 1,500 B.P. Farming figured prominently in the lifeways of many groups until several factors, chiefly drought, made it untenable by 700 to 650 B.P. This Formative period has two distinct archaeological complexes, the Fremont and Ancestral Puebloan (formerly Anasazi). The former is found throughout Utah north of the Colorado and Virgin Rivers, while the latter is dominant south of those same rivers. Archaeological features common to Fremont farming communities include distinctive rock art styles and relatively large villages consisting of pit houses and granaries. Ancestral Puebloan features include the iconic cliff dwellings, towers, and kivas sometimes highlighted in promotional materials for tourism and outdoor recreation. Telltale artifacts of both complexes include well-made ceramic vessels and small projectile points used with bow-and-arrow technology.

What happened to the people who abandoned farming seven centuries ago is still open to discussion. Many of them may have migrated toward the south and elsewhere. Others probably remained in Utah and returned to a more nomadic, hunter-gatherer existence. Those who stayed may have eventually assimilated or formed new cultures with Numic-speaking groups migrating from the west. Whatever the case, the archaeological record of the Protohistoric period (650 B.P. to contact) looks much different from the Fremont and Ancestral Puebloan complexes of the Formative period. Well-executed, thin-walled ceramics give way to expediently made, thick-walled brownwares, and regionally distinct projectile-point types are replaced by styles common throughout the Intermountain West.

Utah's Indigenous people were introduced to Europeans when the Dominguez-Escalante expedition arrived in 1776. During the next seven decades, the Old Spanish Trail was established as a trade route between Santa Fe and Los Angeles; trappers and explorers such as Jedediah Smith, Jim Bridger, and John C. Fremont passed through the area; and Mormon pioneers settled permanently in the Salt Lake Valley and began establishing agrarian communities throughout the Intermountain West.

Other events and people important to Utah's past followed, leaving tangible footprints still recognizable today. Johnston's Army, deployed to confront the Mormon Rebellion, established Camp Floyd in 1857, and Col. Patrick E. Connor founded Camp Douglas in 1862. The short-lived Pony Express established 27 stations and a trail across Utah, much of which can be traveled today. A host of European and Asian immigrants built districts and communities dedicated to mining metals, coal, and minerals. They also completed North America's first transcontinental railroad at Promontory Summit in May 1869. A few African Americans, free and enslaved, were numbered among the early explorers and pioneers. Many more of them arrived in Utah with the railroad and army in the late 1800s. The districts, sites, buildings, structures, and objects resulting from these important events, and the important people associated with them, may also be significant because of their unique architectural or engineering characteristics, or their potential to yield information about the past.

Today, many people recognize that certain geographical features and landscapes are important to living communities because of their association with cultural practices and beliefs. Known as Traditional Cultural Properties (TCPs), these places are rooted in a community's history and are important in maintaining the community's continuing cultural identity. Rainbow Bridge, which was the first TCP in Utah to be formally listed in the National Register of Historic Places, is recognized for its historic and ongoing cultural significance to at least six Native American tribes. Many other National Register-eligible TCPs are recognized by Native American tribes and communities whose ancestors migrated to Utah in the 19th century. These include public lands that have been used for grazing for more than 170 years, as well as other places used by local communities for traditional activities like hunting, camping, and wood gathering.

As learned from experience, any great community (or county) is enhanced by looking to its future and new development, but also by keeping an eye on its past. History can become an enhancer for quality of life and a stimulator for economic development. Businesses often look for historic settings in historic buildings to provide character, a sense of stability, and a unique marketing angle for their products and services. History is not just a buzzword; it is a foundation for the current political and economic institutions in Utah, a fabric from which the state's communities are woven, and a two-way mirror of our own lives to where we have been and where we are going. Preservation of Utah's history is paramount to retaining a sense of place. For example, constructing a parking lot where there was once a woolen mill instills no true sense of history.

Preservation and growth require balance and a careful planning approach. All too often, the old is torn down to make way for the new, and it is realized too late that the old could have been a better economic stimulus than the new. Conversely, a community may be so encumbered by the past that new development is not properly considered. A dialogue between old and new is needed, which takes advantage of the benefits of both. The new can be given broader character by referring to heritage and tradition, while the old can be reinvigorated by new development.

Utah Code § 9-8-401 states, *"The Legislature determines and declares that the public has a vital interest in all antiquities, historic and prehistoric ruins, and historic sites, buildings, and objects which, when neglected, desecrated, destroyed or diminished in aesthetic value, result in an irreplaceable loss to the people of this state."*

Findings

A vast number of cultural resources in Utah have been researched and documented. The Utah State Historic Preservation Office (SHPO) holds the records of approximately 100,000 individual archaeological sites, most of which are the direct result of agency compliance with federal and state historic preservation laws. Additionally, many of these sites are revisited as part of an undertaking after the initial documentation, creating an additional 30,000 site addendums (all of these findings make up less than 9 percent of the state's 54 million acres being surveyed for archaeological sites). Currently, the SHPO database contains individual records for more than 125,000 ~~65,000~~ historic buildings and structures spread across nearly 400 Utah communities. Some of these structures have multiple lines of entry for additional major properties at the same address, along with updates and additions, increasing the number of entries. The majority of the historic architectural surveys have been completed as a result of environmental compliance requirements or city and county-wide surveys for preservation planning-related projects. [2]

Economic Considerations

Population growth leads to many pressures on cultural resources, especially historic buildings in core neighborhoods, and archaeological sites that may be in the way of new development. Donovan Rypkema's *2013 Economic Study in Utah* notes that historic preservation in Utah is not about building fences around monuments; Utah's historic resources are part of the daily lives of its citizens. However, the historic resources of Utah also provide a broad, significant contribution to the economic health of this state.

Rehabilitating historic structures in Utah reclaims those assets, and the labor required by the projects provides many jobs and high wages for workers. Heritage tourism provides Utah with visitation and direct expenditures and local businesses may be revitalized. Property values near historic structures and districts exhibit higher rates of appreciation.

Because of the importance of historic resources, the Utah Legislature has established economic incentives for the preservation and re-use of historic places and structures. The State of Utah, through Utah Code § 59-7-609, has implemented a tax credit for rehabilitation expenditures associated with qualifying residential historic buildings. Further, the United States Tax Code has provided a similar investment tax credit for the rehabilitation of historic commercial and residential rental properties.

Goals, Objectives, and Policies

Goal(s):

As stated in Utah's first Statewide Historic Preservation Plan in 1973, a purpose of historic preservation "is the acculturation of a citizenry so that the values of the past, the qualities of progenitors, and a reverence for a heritage become ingrained into the lives of people today." More critical is that the goals for historic preservation not only engage and enliven current practitioners within Utah, but also democratize preservation efforts and engage as diverse a population as possible in collective goals. A diverse group of participants is the framework that Utah uses when formulating the overall goals for historic resources. This includes the public, agencies, preservation partners, legislatures and elected officials, students and educators, historic property owners, tourists, and under-represented communities.

Over the next few years, Utah will engage in the following four goals:

(1) increase awareness and appreciation for Utah's diverse heritage;
(2) help shape understanding of historic preservation standards and techniques;
(3) improve collaboration and strengthen existing partnerships while building new ones; and
(4) advance historic preservation as economic development.

To accomplish these goals, there are many potential actions that could be undertaken, including the following:

- Establish preservation commissions and certified local government programs (CLG).
- Create heritage areas and scenic byways to identify, protect, plan, and market.
- Establish local zoning and policies to protect property owners' interests while supporting historic preservation efforts.
- Initiate historic preservation education conferences and workshops.
- Establish historic signage guidelines.
- Provide tax assistance and grants to assist rehabilitation of historic resources.
- Incorporate Main Street America Expansion.
- Develop programmatic agreements with federal and state agencies to address federal and state compliance needs.
- Develop new historic contexts for various property types and themes.
- Partner with federal agencies on programs for archaeological site protections.
- Encourage further growth of the Utah Cultural Site Stewardship Program as a way to promote volunteerism, civic engagement, and cooperation.
- Forge partnerships with nonprofit organizations to establish voluntary protective easements.
- Promote the retention of archaeological materials recovered in Utah within the state boundaries and close to the point of discovery for display and interpretation.
- Create a federally certified state repository for historic-period archaeological material, which is growing closer with the construction of the Museum of Utah.
- Recognize the significant role that historic industries and activities (such as agriculture, grazing, mining, recreation, and timber) have played in the development of Utah and its cultural heritage.
- Participate in interdisciplinary teams as part of the environmental review process.
- Form and maintain stakeholder groups of federal and state agencies, nonprofits organizations, and the general public who are not project-specific in focus, but instead focus on engaging in proactive resource-based historic preservation efforts and collaboration.

Objectives and Policies

It is a policy of the State of Utah to encourage the preservation of cultural and historic sites and landscapes as part of developing a vibrant quality of life and economically prosperous future for the state. The state will employ economic incentives, compliance consultation, tax credits, grants, and technical assistance to encourage preservation.

In accordance with Utah Code § 9-8-502, *"The Legislature finds and declares that preservation and restoration of historically significant real property and structures as identified by the State Register of Historic Sites are in the public interest of the people of the state of Utah and should be promoted by the laws of this state."*

Where possible, the State of Utah will promote the curation and display of archaeological materials near their point of collection. Only a handful of federal archaeological repositories exist in Utah, and the majority are far from rural communities and their areas of collection. It is understood that archaeological collections and materials from federal lands, and their curation, is subject to 36 C.F.R. §79 *et seq*., whereas the regulations were created to *"establish definitions, standards, procedures and guidelines to be*

followed by Federal agencies to preserve collections of prehistoric and historic material remains". While the regulations require that a facility meet high standards for long-term curatorial storage as defined in 36 C.F.R. § 79.9, the regulations require federal agencies to ensure collections are available for *"scientific, educational and religious uses"* per 36 C.F.R. § 79.10(a). Local communities, museums, and others may request a loan of federal archaeological materials per 36 C.F.R. § 79.10(e) following a template agreement included as Appendix B of those regulations. Federally accredited institutions in Utah include the Natural History Museum of Utah (Salt Lake City), Prehistoric Museum at Utah State University Eastern (Price), Edge of the Cedars State Park and Museum (Blanding), and the Fort Douglas Military Museum (Salt Lake City).

The Utah State Legislature unanimously approved H.C.R. 4, *Concurrent Resolution Calling for the Protection of Archaeological Sites*, during the 2022 General Session. The resolution describes the significance of archaeological sites in Utah, names laws that protect these sites, and calls on federal and state agencies to responsibly fund and protect them.

The State of Utah will:

- Support local communities' efforts to create displays and museums that meet federal standards for the display, and possible curation, of archaeological materials as close to their point of origin as possible.
- Promote local efforts for traveling exhibits and display of state-owned archaeological materials for educational and local economic opportunities.
- Coordinate with local federal offices to engage local communities and tourists with the rich archaeological heritage of Utah.
- Call for the federal government to responsibly fund the protection of archaeologically significant sites on lands managed by the federal government.
- Call for the Utah Department of Cultural and Community Engagement, working with other government agencies, to responsibly protect archaeological sites on state lands.
- Call for efforts by the Utah Department of Cultural and Community Engagement, other government agencies, nonprofit organizations, and other interested parties to educate the public, especially the youth, about the importance of protecting cultural heritage and archaeological sites.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Department of Cultural and Community Engagement

§ 9-1-201. *Department of Cultural and Community Engagement--Creation-- Powers and duties*

Division of State History

§ 9-8-201. *Division of State History--Creation—Purpose.*

Antiquities

§ 9-8-301. *Division duties.*

(1) The division shall:

(a) stimulate research, study, and activity in the field of Utah history and related history;

(b) maintain a specialized history library;

(c) mark and preserve historic sites, areas, and remains;

(d) collect, preserve, and administer historical records relating to the history of Utah;

(e) administer, collect, preserve, document, interpret, develop, and exhibit historical artifacts, documentary materials, and other objects relating to the history of Utah for educational and cultural purposes;

(f) edit and publish historical records;

(g) cooperate with local, state, and federal agencies and schools and museums to provide coordinated and organized activities for the collection, documentation, preservation, interpretation, and exhibition of historical artifacts related to the state;

(h) promote, coordinate, and administer:

(i) Utah History Day at the Capitol designated under Section 63G-1-401; and

(ii) the Utah History Day program affiliated with National History Day, which includes a series of regional, state, and national activities and competitions for students from grades 4 through 12;

(i) provide grants and technical assistance as necessary and appropriate; and

(j) comply with the procedures and requirements of Title 63G, Chapter 4, Administrative Procedures Act, in adjudicative proceedings.

(2) The division may acquire or produce reproductions of historical artifacts and documentary materials for educational and cultural use.

(3) To promote an appreciation of Utah history and to increase heritage tourism in the state, the division shall:

(a)

(i) create and maintain an inventory of all historic markers and monuments that are accessible to the public throughout the state;

(ii) enter into cooperative agreements with other groups and organizations to collect and maintain the information needed for the inventory;

(iii) encourage the use of volunteers to help collect the information and to maintain the inventory;

(iv) publicize the information in the inventory in a variety of forms and media, especially to encourage Utah citizens and tourists to visit the markers and monuments;

(v) work with public and private landowners, heritage organizations, and volunteer groups to help maintain, repair, and landscape around the markers and monuments; and

(vi) make the inventory available upon request to all other public and private history and heritage organizations, tourism organizations and businesses, and others;

(b)

(i) create and maintain an inventory of all active and inactive cemeteries throughout the state;

(ii) enter into cooperative agreements with local governments and other groups and organizations to collect and maintain the information needed for the inventory;

(iii) encourage the use of volunteers to help collect the information and to maintain the inventory;

(iv) encourage cemetery owners to create and maintain geographic information systems to record burial sites and encourage volunteers to do so for inactive and small historic cemeteries;

(v) publicize the information in the inventory in a variety of forms and media, especially to encourage Utah citizens to participate in the care and upkeep of historic cemeteries;

(vi) work with public and private cemeteries, heritage organizations, genealogical groups, and volunteer groups to help maintain, repair, and landscape cemeteries, grave sites, and tombstones; and

(vii) make the inventory available upon request to all other public and private history and heritage organizations, tourism organizations and businesses, and others; and

(c)

(i) create and maintain a computerized record of cemeteries and burial locations in a state-coordinated and publicly accessible information system;

(ii) gather information for the information system created and maintained under Subsection (3)(c)(i) and help maintain, repair, and landscape cemeteries, grave sites, and tombstones as described in Subsection (3)(b)(vi) by providing matching grants, upon approval by the board, to:

(A) municipal cemeteries;

(B) cemetery maintenance districts;

(C) endowment care cemeteries;

(D) private nonprofit cemeteries;

(E) genealogical associations; and

(F) other nonprofit groups with an interest in cemeteries; and

(iii) adopt rules, in accordance with Title 63G, Chapter 3, Utah Administrative Rulemaking Act, for granting matching funds under Subsection (3)(c)(ii) to ensure that:

(A) professional standards are met; and

(B) projects are cost effective.

(4) This chapter may not be construed to authorize the division to acquire by purchase any historical artifacts, documentary materials, or specimens that are restricted from sale by federal law or the laws of any state, territory, or foreign nation.

Historic Sites

§ 9-8-401. *Purpose.*

The Legislature determines and declares that the public has a vital interest in all antiquities, historic and prehistoric ruins, and historic sites, buildings, and objects which, when neglected, desecrated, destroyed or diminished in aesthetic value, result in an irreplaceable loss to the people of this state.

Historical Preservation Act

§ 9-8-502. *Legislative finding.*

The Legislature finds and declares that preservation and restoration of historically significant real property and structures as identified by the State Register of Historic Sites are in the public interest of the people of the state of Utah and should be promoted by the laws of this state.

Utah Division of Indian Affairs Act

§ 9-9-103. *Purpose.*

The division shall:

(1) develop programs that will allow Indian citizens residing on or off reservations an opportunity to share in the progress of Utah;
(2) promote an atmosphere in which Indian citizens are provided alternatives so that individual citizens may choose for themselves the kinds of lives they will live, both socially and economically;
(3) promote programs to help the tribes and Indian communities find and implement solutions to their community problems; and
(4) promote government-to-government relations between the state and tribal governments.

§ 9-9-201. *Assumption by state of criminal and civil jurisdiction over Indians and Indian territory*

The state of Utah hereby obligates and binds itself to assume criminal and civil jurisdiction over Indians and Indian territory, country, and lands or any portion thereof within this state in accordance with the consent of the United States given by the Act of Congress of April 11, 1968, 82 Stat. 78-80 (Public Law 284, 90th Congress), to the extent authorized by that act and this chapter.

§ 9-9-403. *Ownership and disposition of Native American remains.*

References:

1. *Before Present*

2. *The terms Cultural Resource(s) and Historic Property(ies) include archaeological sites, TCPs, and buildings. A historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes archaeological artifacts, records, and remains that are related to and located within such properties. The term also includes properties of traditional religious and cultural importance (i.e., TCPs) to an Indian tribe, Native Hawaiian organization, or historical community that meet the National Register criteria.*

DITCHES AND CANALS

Introduction

Ditches are natural or constructed watercourses that can be open, covered, or tiled and are typically used for the irrigation or drainage of agricultural land. Canals are artificial waterways constructed to convey water for irrigation or drainage of agricultural land.

From about 400 to about 1400 A.D., crops from irrigated farms fed the early inhabitants of present-day Utah. Fremont people raised corn irrigated from Clear Creek and the Ancestral Puebloans (sometimes referred to as "Anasazi") raised and stored corn and other irrigated crops. Later tribes also relied on water to sustain the plants and animals on which they depended, whether through hunting, gathering, fishing, or irrigating crops. [1]

The day after arriving in the Salt Lake Valley, Mormon pioneers *"...*immediately rigged three plows and went to plowing a little northeast of the camp; another party went with spades, etc., to make a dam on one of the creeks so as to throw the water at pleasure on the field, designing to irrigate the land in case rain should not come sufficiently [2]." To sustain the influx of pioneer settlers, canals and ditches were constructed throughout Utah, making agriculture possible despite the arid climate.

The term "conveyance" is used to describe the movement of water from a source to an application. Ditches and canals are used to convey diverted water from their source to a location where beneficial use is taken. More than 70 percent of Utah's diverted water is carried in canals, which are managed and maintained by nonprofit, shareholder-owned irrigation companies. There are over 1,000 of these irrigation companies in Utah, most of which are over 100 years old and administered by volunteer directors [3]. Every irrigation company in existence today has largely adapted to the multitude of challenges imposed by urbanization. The longevity of these irrigation companies suggests that they have and can continue to adapt and serve the needs of their shareholders, whether the shareholders want to grow crops, water lawns and gardens, put the water to industrial use, or use the companies' ditches to transport stormwater [4].

Canals and ditches pass through land with various ownership statuses. Any given canal may cross land that is owned by the canal company outright, or else it may utilize an easement or right-of-way to cross lands owned by a municipality or other third parties. Other canals have "prescriptive easements," which, though lacking formal consent or written agreement, allows water to cross another's property for delivery purposes. These easements come with no entitlement except the ability to convey water through the site and to maintain that conveyance. These prescriptive easements are not designed or intended to accept more water than would naturally be received by runoff while in agricultural use. Often, prescriptive easements are found on the downstream-most sections of ditch systems, where the channels are the smallest. This means these ditches have been designed only for agricultural runoff and may thus suffer the greatest impacts from their use for stormwater conveyance. Upstream development that results in increased surface runoff may negatively affect downstream landowner property rights.

Between 2014 and 2017, the Utah Division of Water Rights (UDWRi) inventoried all open canals in the state that had a minimum design capacity of 5 cubic feet per second. The UDWRi's Canal Safety Program and Canal Inventory website provides a listing of Utah canal companies, a statewide map of canals, and a Conservation District directory, among other resources.

Canals and ditches present important public safety concerns; the Utah State Engineer at UDWRi has authority to examine and inspect any ditch or other diverting works and may order additions or alterations to ensure public safety.

Findings

Agriculture is important in Utah for the natural, cultural, social, and economic benefits that it provides. Agriculture successfully balances multiple needs between different stakeholders while providing a valuable source of local jobs and income. In Utah, agriculture provides and maintains jobs, local tax bases, multiple environmental benefits, scenic beauty, food and fiber for human consumption, and fuels-active land management.

Approximately 75 percent of water diverted from natural sources in Utah went to agriculture over the 5-year period of 2013–2018, making the agricultural industry heavily reliant on the effective irrigation and transportation of water [5].

There are more than 9,800 miles of ditches and canals in Utah that carry more than 5 cubic feet per second of water. There may be twice that number of smaller canals in the state. This figure does not include the thousands of miles of drainage ditches, which make land farmable and carry return flows back to streams.

These thousands of miles of ditches and canals irrigate a majority of the 1.1 million acres of irrigated agricultural land in Utah, of which about three-quarters is harvested cropland. The remaining one-quarter is irrigated pasture used for livestock grazing. [6]

Canals and ditches in urban settings serve municipal and industrial interests. They supply water for industrial processes; deliver secondary water to residential landscaping; convey stormwater away from homes, businesses, and other development; and support wetlands and other riparian environments that would otherwise be lost.

The majority of ditches and canals in the state of Utah rely on prescriptive easements.

Furthermore, in 2022, a special topic on "productive agriculture" was published as part of Utah's Coordinated Action Plan for Water [7]. Previous water-planning efforts have identified more than 200 unique recommendations to better secure Utah's water future. The implementation of many of these recommendations will require changes to Utah water law, other legislative actions, and partnerships with non-state entities. The intent of Utah's Coordinated Action Plan for Water is to identify specific actions that Utah's executive branch can undertake immediately to help advance these recommendations.

Economic Considerations

The thousands of miles of Utah's ditches and canals irrigate a majority of the 1.1 million acres of irrigated agricultural land in Utah, of which about three-quarters is harvested cropland with a 2012 value of $458 million [8].

A 2016 report published by Utah State University details the significant contributions of agriculture to the state economy. The combined agricultural processing and production sectors account for 15 percent of the state's total economic output, or $21.2 billion, after adjusting for multiplier effects. [9]

From 1970 to 2015, annual direct cash receipts from livestock and products increased from $1.28 billion to $1.57 billion, a 17.5 percent increase [10]. Annual cash receipts from livestock and products constituted 73 percent of all farm business cash receipts, making livestock the driver behind most of Utah's agricultural economic growth [11]. These direct cash receipts do not reflect the full amount of economic growth

provided by livestock and its products due to the multiplier effect that cash receipts have once they are spent within the community.

As of 2019, Utah's level of agricultural employment is approximately the same as it was in 1970, showing a relatively stable number of jobs within the industry. Currently, farm employment constitutes 1.0 percent of Utah's total employment, contributing 20,654 jobs to Utah's economy [12]. Of the total agricultural employers, 15,679 (0.8%) of the total are farm proprietors [13]. The majority of individuals employed in agriculture are small business owners who create jobs and generate revenue for the rural, and generally poorer areas, of Utah.

Canals and ditches provide tremendous economic benefits to municipalities and industry by providing pre-existing, low-cost options for water delivery and stormwater removal. While no study has been conducted to quantify the value of these services, it would be tremendously expensive if each municipality or industry currently served by Utah's existing network of canals and ditches had to devise their own, independent water delivery and removal systems.

Goals, Objectives, and Policies

Goal(s):

- Provide for the safe and reliable conveyance of water from one location to another for beneficial use and economic prosperity.

Objectives:

1. Support county plans for ditches and canals as well as irrigation.
2. Preserve the integrity and functionality of Utah's existing canals and ditches.
3. Preserve the integrity and functionality of Utah's irrigation companies, which manage and maintain the vast majority of the canals and ditches.
4. Ensure adequate funding for canal infrastructure maintenance and replacement.
5. Continue and improve mapping of existing canals through the canal inventory, conducted by the UDWRi.
6. Continue to allow access and increase access to public lands for canals and ditches and agricultural development in a manner that (1) satisfies local needs and provides for economical and environmentally sound water conveyance practices, and (2) is consistent with and complementary to Utah's lifestyle, culture, and economy.
7. Support irrigation companies and special-service districts in obtaining and maintaining access through public lands for water conveyance needs, including current easements, deeded easements, prescriptive easements, ditch bill easements, and all other easements held.

Policies:

- Encourage indemnity agreements for irrigation companies where their canals are relied upon for flood or stormwater management.
    - Cities and counties must work closely with irrigation companies to ensure canals used for such purposes are properly maintained and have adequate capacity.
- Support cities and counties in preventing the externalization of land-development costs to irrigation companies while still achieving the benefits of land development.
- Encourage contractual agreements between irrigation companies, cities, and counties for increased maintenance costs, liability, and other expenses when ditches and canals are used for stormwater.

- Encourage legislation protecting ditch and canal companies from encroachment and liability suits.
- Encourage efficient water transport through the proper lining and piping of ditches and canals, as appropriate.
- Ensure the full funding of revolving loan funds managed by the Division of Water Resources and maintain irrigation companies' access to these funds for canal and ditch infrastructure improvement and replacement.
- Encourage canal companies to provide updated mapping and contact information to the Utah canal inventory and support the UDWRi in its mapping efforts.
- Support reasonable maintenance of conveyance corridors that balances operational needs with the concerns of property owners.
- Support the Recommended State Water Strategy's recommendation 3.2, which suggests the creation of a task force that combines irrigation companies and state agency planning to ensure ongoing agricultural water management. This task force should:
    - identify the portion of Utah's total water supply managed by irrigation companies;
    - establish ongoing evaluation and reporting to the governor's office, Utah Department of Natural Resources, Utah Department of Agriculture and Food, and Water Development Commission on the value of ditches and canals to the Utah economy, Utah culture, and the natural environment sustained by irrigation companies;
    - recommend future management of irrigation companies and their water assets in areas where canal and ditch systems are or will be significantly affected by urban development;
    - evaluate the best means to balance the equities, including costs, when urban development creates additional costs to irrigation systems users; and
    - educate the public and policymakers on the purposes, value, and integrity of these companies.
- Evaluate existing requirements when ditches and canals are abandoned, as required by the State Historic Preservation Office (SHPO) to determine who is responsible for maintenance, liability, and weed control.
- Protect the use, maintenance, and development of all water-diversion and conveyance systems, rights-of-ways, and easements that cross public lands.
- Support the findings and recommendations of Utah's Coordinated Action Plan for Water.
- Oppose special designations on federal land that would restrict the tools available and increase the cost of maintaining and improving ditches, canals and other irrigation infrastructure.
- The state has jurisdiction over water and its conveyance systems, full coordination, cooperation, and consistency with state plans and laws should guide federal actions.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Title 73 - Water and Irrigation

Additional References to State Code and Legislation:

Funding is available to assist canal companies to develop and implement a safety management plan, as described in Utah Code § **73-10-33**.

The Division of Water Rights maintains an inventory of all canals in the state. In 2014 the Utah Legislature passed House Bill 370 directing the Division of Water Rights to create and maintain an

inventory of all canals in the state by July 1, 2017. The following attributes of all open flow conveyances with a minimum design capacity of 5 CFS are to be captured:

- Canal alignment
- Contact information for the canal owner
- Maximum flow capacity
- Is the canal used for flood or stormwater management?
- Date of adoption of a safety management plan, if one has been completed

In 2017 the Utah Legislature passed House Bill 301 expanding the inventory to include all enclosed segments of each, open human-made water conveyance system in first or second class counties.

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ENERGY RESOURCES

Introduction

Affordable, reliable, dispatchable, and diversified energy has been a key component that has contributed to Utah's economic success. Recognizing the central role that energy plays, and to plan for the future of Utah's energy needs, in 2022, Governor Spencer Cox and energy leaders launched the Utah Energy and Innovation Plan [1]. Under this plan, the State of Utah has worked to meet energy demands by means of the balanced use of Utah's abundant energy resources. Since the launch of the plan, the state has implemented programs and policies that demonstrate a commitment to these resources.

Specifically, the State of Utah has established the following energy commitments [2]:

1. Utah is committed to an "any of the above" energy future, supporting efforts and policies that provide a variety of tools and resources that citizens, communities, businesses, and industries can choose from to deliver and obtain affordable, reliable, and dispatchable energy.
2. Utah is committed to American energy independence, pursuing policies and actions that will enable more domestic energy development and enhance global energy security.
3. Utah is committed to pragmatic, market-driven climate solutions that enable innovative energy production. This includes a focus on supporting Utah-based research and development, ensuring that we remain good stewards of our environment for future generations of Utahns.
4. Utah is committed to supporting rural communities through economic development and diversification efforts, infrastructure investment, and workforce training and development.
5. Utah is committed to supporting a clean energy future through a strong and responsible mining program for critical minerals; investment in emerging energy technology such as hydrogen, storage, and energy efficiency; and air-quality research and incentive programs.
6. Utah is committed to collaboration with its local, regional, and federal partners to pursue infrastructure and innovation projects such as electric vehicle charging, transmission, emerging fuel hubs, and coal-community support and diversification.

Energy is a $20.9 billion industry in Utah, generating $656 million in state and local revenues (including $77 million directly for education through the Utah School and Institutional Trust Lands Administration in 2013). There are more than 10,000 direct energy jobs in the state, a total that expands to almost 40,000 when indirect and induced employment is included. Employment directly related to energy has produced earnings at a rate almost twice that of other jobs in the state. According to a recent study conducted by Pricewaterhouse Coopers for the American Petroleum Institute, the oil and natural gas industry alone supported over 103,000 direct, indirect, and induced jobs, provided more than $6.1 billion in wages and contributed more than $12.4 billion to Utah's economy in 2019 [3].

Producing crude oil, natural gas, coal, and renewable energy resources, the State of Utah is a net energy supplier to the nation. The state's diversified energy portfolio also includes: geothermal, solar, oil shale, oil sands, wind resources, and hydropower [4].

Utah has the fourth-highest number of producing mineral leases on federal lands in the United States [5]. In 2020, coal fueled 61 percent of the state's electricity, down from 75 percent just 5 years earlier. Renewable energy, primarily from solar, accounted for about 97 percent of the state's new electrical generation since 2015 [6].

Utah's general policy on energy production is that it supports all forms of energy. Utah is an "all-of-the-above" state and believes there is room in its energy portfolio for all forms of energy.

State Agencies

Utah energy resources are managed by multiple agencies, each with specific roles and duties. The three primary state agencies responsible for energy resources are the Office of Energy Development (OED), the Division of Oil, Gas, and Mining (DOGM), and the Utah Geological Survey (UGS).

Office of Energy Development (OED)

The OED is dedicated to advancing all forms of responsible energy and minerals, including conventional, unconventional, and renewable, as well as fostering innovation in the areas of efficiency, conservation, and alternative transportation. The OED is responsible for implementing Utah energy policy (79-6-301) by facilitating the development of Utah's diverse energy and minerals sector. The OED provides industry assistance through the administration of state and federal tax incentives, fosters education and technological innovation, and collaborates with a variety of stakeholders in government, nonprofit, and the private sector. The office is also dedicated to promoting responsible energy policies, and regularly participates in resolving public lands and environmental issues.

Mission

The OED advances the governor's energy vision, implements state energy policy, and enhances Utah's energy infrastructure, technology, and workforce to provide more affordable, reliable, dispatchable, and diverse energy options for Utah households and businesses.

The OED supports and encourages innovation and responsible development of all energy resources, including renewable, conventional, and unconventional, as well as advancements in the areas of efficiency, conservation, and alternative transportation.

Division of Oil, Gas, and Mining (DOGM)

Originally established in 1955 as the Oil and Gas Conservation Commission, the DOGM was formed to regulate the exploration and development of coal, oil and gas, and other minerals in a manner that:

- encourages responsible reclamation and development;
- protects correlative rights;
- prevents waste; and
- protects human health and safety, the environment, and the interests of the state and its citizens.

While demand, technology, and pricing have changed dramatically over the past 60 years, DOGM's focus remains on industry regulation to protect the public and Utah's environment. The DOGM is committed to the future of oil, gas, and mining in Utah. As resource demands have increased, DOGM has continued its support of responsible resource development, public safety protection, and environmental preservation that supports the goal of ensuring access to affordable and reliable energy sources for future generations.

The DOGM manages the four following programs:

1. **Minerals Program**

The minerals program regulates non-coal mining operations in Utah with a few exceptions, as noted in Utah Administrative Code R647.

The minerals program staff works to ensure reclamation standards can be achieved after mining has been completed. The staff oversees many large mining operations, including the Bingham Canyon copper mine, the unique Topaz beryllium mine, and many small mine and exploration operations.

The staff verifies that mine operators follow their plans for mining and reclamation, including mining within permit boundaries and protecting public safety and the environment. The DOGM holds reclamation bonds to ensure the future reclamation of mine sites.

More than 200 distinct minerals are mined in Utah, which includes the base and precious metals of copper, magnesium, gold, silver, and beryllium. Utah also produces many industrial minerals, such as potash, crushed stone, salt, lime, phosphate, gilsonite, gypsum, and unconventional fuels including oil shale and oil sand. Currently, there are approximately 600 permitted mineral operations statewide [7].

2. Coal Program

The Coal Program is responsible for providing permits to coal companies, completing site inspections to confirm compliance, overseeing reclamation, and enforcing the bond release process. Ensuring provisions of the coal rules are followed allows for continued extraction of coal to occur in a way that reduces and/or eliminates long-term negative impacts to the environment.

Coal extraction is important to Utah. In 2018, five Utah coal operators produced 13,753-million short tons of coal valued at $499 million from six underground mines and one surface mine. Communities in Carbon, Garfield, Emery, Kane, Sanpete, and Sevier counties rely on the coal industry to provide jobs and stimulate their local economies [8 & 9].

3. Abandoned Mine Reclamation Program

Utah has a history rich in mining including the extraction of copper, silver, and uranium. Often, when mines were no longer producing, equipment, open shafts, tunnels, and tailings were abandoned. In 1975, the Utah Mined Reclamation Act was passed, which made it illegal for mines to be abandoned. Today there are an estimated 17,000 mine openings scattered across Utah.

The Abandoned Mine Reclamation Program (AMRP) works to protect the public from dangers associated with old mines by sealing off access to openings and cleaning up waste. Old mining sites can be intriguing to unsuspecting explorers, but can contain dangerous gases, unstable structures, and explosives. Explorers are encouraged to “Stay out and Stay Alive”! [10].

4. Oil and Gas Program

The Oil and Gas Program of the DOGM was established in 1955 to prevent the waste of oil and natural gas, encourage conservation and protect correlative rights of oil and natural gas owners. The Oil and Gas Program mission is to [11]:

- Promote the exploration, development and conservation of oil and gas resources.
- Foster a fair economic return to the general public for those resources.
- Maintain sound, regulatory oversight to ensure environmentally acceptable activities.

By legislative mandate [12], the Oil and Gas Program has oversight responsibility for the following:

- All operations for and related to the production of oil or natural gas including drilling, testing, equipping, completing, operating, producing, and the plugging of wells and the reclamation of sites.
- Spacing and location of wells.
- Operations to increase ultimate recovery, such as cycling of natural gas, maintenance of pressure, and introduction of natural gas, water, or other substances into a reservoir.
- The disposal of salt water and oil-field wastes.
- The underground and surface storage of oil, natural gas, or other products.
- The flaring of natural gas from an oil well.

Utah Geological Survey (UGS)

The UGS provides timely scientific information about Utah's geologic environment, resources, and hazards [13].

Relevant to this section of the Resource Management Plan, the UGS publishes Utah's Energy Landscape report every few years to summarize energy resources. The most recent report, authored by Michael D. Vanden Berg, was published in 2020 (UGS Circular 127).

The UGS manages six programs:

Energy and Minerals Program

The Energy and Minerals Program (1) provides geologic information to government, industry, and individuals to encourage and aid in the prudent development of Utah's mineral and energy resources; (2) inventories, documents, and researches Utah's abundant mineral and energy resources; and (3) maintains the Utah Core Research Center [14].

Notable recent publications from this program include, Critical Minerals of Utah (2020), Proven and Hypothetical Helium Resources in Utah (2020), and Utah's Energy Landscape (2020).

Geologic Hazards Program

The Geologic Hazards Program is focused on reducing Utah's life-safety, property, and economic risk from geologic hazards. The program's threefold mission consists of the following:

- Respond to geologic hazard emergencies and provide unbiased, scientific advice to local governments and incident commanders.
- Investigate and map geologic hazards in urban areas and other areas (to publish and distribute maps and GIS spatial data).
- Provide geologic hazard-related technical and educational outreach and information to inform Utahns about hazards [15].

Geologic Information and Outreach Program

The Geologic Information and Outreach Program answers questions and provides information on Utah's geology to the public, educators, industry, and decision makers; produces non-technical flyers and colorful brochures on a variety of geologic topics; provides geologic resources to teachers; and maintains the Natural Resources Map & Bookstore and the UGS Library.

Geologic Mapping Program

The Geologic Mapping Program maps Utah's geology at scales of 1:24,000 (7.5-minute quadrangle maps) to 1:100,000 (regional maps). These maps and accompanying materials depict and interpret the following: (1) the composition, age, and depositional environment of exposed and subsurface rocks; (2) geologic structures such as faults and folds; (3) Quaternary (surficial) cover; (4) geologic hazards such as landslides and earthquake-producing faults; and (5) economic and groundwater resource features. The maps are used by geologists, government officials, industry representatives, university professors and students, and the public to better understand Utah's geology, delineate and interpret the economic value and potential of property, assess geologic hazards, and make land management decisions. [16]

Groundwater and Wetlands

The Groundwater and Wetlands Program evaluates the quantity and quality of Utah's groundwater resources, and performs wetland mapping and field assessments. The program coordinates with local, county, state, and federal agencies to perform a wide variety of groundwater and wetland studies and makes the data publicly available through web applications, publications, and external websites. These results help partners make scientifically sound decisions on important growth, natural resources, and environmental issues. [17]

Paleontology Program

The Paleontology Section of the Mapping Program maintains and publishes records of Utah's fossil resources and provides paleontological and archaeological recovery services to state and local governments. The UGS's paleontology services are often requested by the U.S. Bureau of Land Management, the National Park Service, the U.S. Bureau of Reclamation, and the U.S. Forest Service. [18]

Energy Specifics

Quick Facts

- Utah accounts for 15 of every 100 barrels of crude oil produced in the Rocky Mountain region. The state's five oil refineries, all located in the Salt Lake City area, can process about 206,000 barrels of crude oil per calendar day.
- In 2022, 53% of Utah's electricity net generation came from coal-fired power plants, down from 75% in 2015. Over the same period, natural gas-fired generation increased from 20% to 26% and utility-scale solar power grew from 0.1% to 9% of the state's generation.
- Utah has the fourth-highest number of producing oil and natural gas leases on federal lands, after Wyoming, New Mexico, and Colorado.
- Utah has the nation's only operating uranium ore mill, which processes uranium ore and radioactive wastes from other states, but there has been no active uranium mine production in Utah since 2012.
- Almost 9 out of 10 Utah households use natural gas as their primary heating fuel, the highest share of natural gas home heating use for any state. [19]

- ~~Utah accounts for 1 in every 10 barrels of crude oil produced in the Rocky Mountain region. Utah's five oil refineries, all located in the Salt Lake City area, can process 203,494 barrels of crude oil per calendar day.~~
- ~~In 2020, 61 percent of Utah's net electricity generation came from coal-fired power plants, down from 75 percent 5 years earlier, while natural gas-fired and solar power generation increased.~~
- ~~Utah's per-capita energy consumption in the residential sector is the third-lowest among the United States, after Hawaii and California.~~

- ~~Utah has the nation's only operating uranium ore mill, which processes uranium ore from mines in other states, as there has been no active uranium mine production in Utah since late 2012.~~
- ~~In 2019, Utah consumed more natural gas than it produced in dry natural gas for the first time since 1991.~~

Petroleum

Utah's rich history as a major oil producer dates back to 1955 and the discovery of the Bluebell field in Duchesne County. More than six decades later, the state still ranks as a major oil producer in the United States. The majority of Utah's oil production is concentrated in Duchesne, Uintah, and San Juan counties. The oil is commonly referred to as "waxy crude" because of its relatively high paraffin content. Utah's two types of petroleum, black and yellow, flow like a liquid at high-temperature, but thicken at room temperature, creating long-distance transportation challenges. However, Utah waxy crude has low levels of acid, sulfur, and metals, which makes it desirable in the refining process. [20]

Findings

Utah ranks 9th in the nation for crude oil production. Utah's crude oil and petroleum resources are predominantly found in the Uinta Basin (Duchesne and Uintah counties) and the Paradox Basin (San Juan County). Oil production from early 2003 to 2014 in Utah boomed, with an increase in exploration and development activity. This activity was fueled by increases in the demand for oil and advances in horizontal drilling technology, reducing the overall operating costs and allowing operators to target isolated petroleum reserves. [21]

Utah crude oil prices peaked near $100 per barrel in summer 2022 before dropping back to about $65 per barrel in the fall, and averaged $81.50 per barrel for the year—the highest price since 2013 and more than double the average price in 2020. This rebound in price, coupled with record-high petroleum demand, resulted in a 26% increase in Utah crude oil production to 44.6 million barrels in 2022, the highest annual production on record [22].

~~In 2014, Utah crude oil production peaked at 40.9 million barrels. Prices have fallen from the 2014 high of approximately $106 per barrel, and production dropped to 30.5 million barrels (a decrease of 18%) in 2016. From 2017 to 2018, the industry experienced a resurgence in crude oil production, reaching 37.1 million barrels in 2018. However, in 2019, production fell again. It reached an all-time low in April of 2020 due to overproduction from OPEC nations and the COVID-19 pandemic. [22]~~

In 2018, Utah's petroleum industry accounted for 213 trillion British thermal units (Btus), or 24 percent of the total energy produced in Utah [23]. Located in the Salt Lake City area, Utah's five oil refineries can process 206,000 barrels of crude oil per day. Oil reaches the refineries via pipelines and trucks from the Uinta Basin, Colorado, Wyoming, and Canada. Utah's refineries account for approximately 30 percent of the refining capacity in the Rocky Mountain region (Utah, Colorado, Wyoming, Idaho, and Montana) [24]. These refineries produce motor gasoline, diesel fuel, and jet fuel. Utah's petroleum products are sold to markets in Utah, Idaho, Nevada, Wyoming, Washington, and Oregon [25]. In December 2011, a pipeline was opened between the Salt Lake City refineries and Las Vegas, providing Nevada with an alternative to California refineries for petroleum products [26].

Utah's proven crude oil reserves account for less than 1 percent of the total in the United States. The Uinta Basin of eastern Utah overlays part of the Green River oil shale, a kerogen-rich formation that represents one of the world's largest oil resources. Kerogen is a fossilized organic material, found in sedimentary rock, which can be heated to extract crude oil. Pilot oil shale projects have been undertaken in the area. Eastern Utah also hosts the largest resources of bitumen in oil sands in the United States. [27]

Other Findings

Tier 3 fuels drastically reduce vehicle emissions - improving air quality. In 2017, the Environmental Protection Agency (EPA) established new emission standards for vehicles. Accordingly, oil refineries are required to produce cleaner fuel products and car manufacturers are required to equip new vehicles with additional equipment to reduce emissions. In vehicles produced after 2017, using tier 3 fuel can reduce emissions by up to 80 percent. Under the leadership of Gov. Herbert, the Utah Legislature worked with the Office of Energy Development and key petroleum stakeholders to create a path forward for smaller refineries in Utah. The result was the High Cost Infrastructure Tax Credit (HCITC), a non-refundable, post-performance tax incentive provided to refineries that committed to making the necessary upgrades to produce Tier 3 fuels. [28]

Economic Considerations

During 2020 Utah ranked 10th in the country in crude oil production and 13th in natural gas gross production [29]. Utah's oil industry has played a significant role in the state's economic prosperity. Utah School and Institutional Trust Lands Administration revenues come primarily from natural gas, coal, oil, real estate development, and other surface uses such as grazing.

From high-paying jobs to tax revenues to federal, state, and local governments, and royalty revenue to Utah citizens and its Permanent School Trust Fund, Utah's petroleum industry has helped support the state's continued financial stability. Utah petroleum fuels a wide-range of vehicles and provides the petrochemical building blocks that go into the production of clothes, cell phones, computers, recreational equipment, and thousands of other everyday items that society consumes. The economic and fiscal impacts of Utah's petroleum industry (2020-2024) can be found in the Utah Petroleum Industry report for 2023. [30]

~~Utah's crude oil and petroleum resources add tremendous value to Utah's energy economy. In 2017, Utah's petroleum industry provided over 19,000 refining jobs and 32,000 oil and natural gas production and development jobs; more than $3 billion in earnings (refining and production/development combined); and an estimated $7.2 billion in state GDP (refining and production/development combined). Average annual salaries in Utah's crude oil and petroleum production industry are more than two times the statewide average. [30]~~

Goals, Objectives, and Policies

One of Utah's goals is to ensure the state's continued economic development through access to its own clean and low-cost energy resources. This will allow the state to meet projected energy growth demands by making balanced use of fossil fuels and renewable resources in market-driven, cost effective, and environmentally responsible ways.

Support for continued traditional energy development from oil and gas is essential to the state's energy plan.

- Facilitate the expansion of responsible development of Utah's energy resources, including traditional, alternative, and renewable sources.
- Pursue opportunities for Utah to export fuels, electricity, and technologies to regional and global markets.

Natural gas

Natural gas is used mostly for home heating (residential, 28%), but starting in mid-2004, more than 2,300 megawatts (MW) of new natural gas-fired electric generating capacity has come online, greatly increasing the amount used by the electric utility sector (from 8% in 2005 to 25% in 2018). Consumption of natural gas in Utah peaked in 2013 at 247 billion cubic feet and, after declining for a few years, increased again to 244 billion cubic feet in 2018. [31]

Findings

Utah ranks 13th in the nation in natural gas production. Natural gas has become one of the primary sources for generating baseload utility-scale electricity [32]. Natural gas is one of the many vital resources in the energy mix, supporting Utah's energy economy with nearly 8,000 direct jobs in oil and gas development and production in 2017. [33]

The majority of Utah's natural gas comes from conventional reservoirs located in the Uinta Basin (Duchesne and Uintah Counties) and the Paradox Basin (San Juan County) [34]. Natural gas production concentrated in the Uinta Basin accounted for about 1 percent of U.S. output in 2015. Carbon County produces about 14 percent of Utah's natural gas in the form of coalbed methane—natural gas produced from coal seams. This form of production has provided as much as one-third of Utah's natural gas output but has been gradually declining from its 2002 peak. [35]

It is estimated that about 2 percent of the United States' proven natural gas reserves are located in Utah. Utah consumes only about one half of the natural gas it produces. The industrial sector is Utah's largest consumer of natural gas, followed by the residential sector. Six in seven households in the state use natural gas for home heating. Natural gas is an essential raw material for many products, including paints, fertilizer, plastics, antifreeze, dyes, photographic film, medicines, and explosives.

Initially used primarily for heating, natural gas resources have been adapted as a fuel source for vehicle fleets and have more recently been selected as one of the preferred fuel sources for baseload, utility-scale electricity generation. Due to low prices and a reduced emission profile compared to other conventional fuel sources, the number of natural gas-fired power plants has increased in recent years. Many natural gas-fired power plants maintain grid stability and account for over-generation from intermittent renewable resources, also known as managing the "California Duck Curve." [36]

Utah is crossed by a major transportation corridor for shipping natural gas from the Opal Hub in Wyoming and the Piceance Basin in western Colorado to markets in Nevada, Wyoming, Idaho, and beyond. The Clay Basin facility, on the Utah-Wyoming border in Daggett County, is one of the region's largest underground natural gas storage facilities. [37]

Renewable natural gas (RNG) is a pipeline-quality gas derived from the decomposition of organic matter. RNG is interchangeable with conventional natural gas as a heating source, transportation fuel, and power generating resource, often as compressed natural gas (CNG) or liquefied natural gas (LNG). Being derived from a cellulosic or advanced feedstock (usually from pig or food waste). RNG qualifies as biofuel under the Renewable Fuel Standard. [38]

In Utah, biogas facilities are currently producing RNG. A few active projects include the following:

- Smithfield's hog farms are located in Central Utah (Beaver and Millard Counties) and provide RNG for the Kern River Gas Pipeline.

- Houweling Tomatoes in Mona, Utah, which uses waste heat and carbon from a nearby natural gas power plant to grow tomatoes.
- Wasatch Resource Recovery, located at the South Davis Sewer District, is an anaerobic digester dedicated to food waste diversion that provides RNG in a partnership with Dominion Energy.

Economic Considerations

Despite the increase in the number of natural gas-fired power plants, an oversupply nationally drove average wellhead prices for natural gas in Utah down 39 percent between 2014 and fall 2020 ($4.35 per thousand cubic feet [Mcf] to $2.63 per Mcf). Unfortunately, natural gas prices in the $2 per Mcf range do not provide economic justification for new natural gas exploration or development. The lower overall production of natural gas and natural gas liquids, coupled with the steady low prices, resulted in a 2019 value of natural gas production of $784 million, the lowest since 2002. [39]

Goals, Objectives, and Policies

Energy development is of particular importance in Utah because of the associated capital investment, job creation, and revenue. A strong natural gas industry contributes to Utah's historically low energy costs and provides a foundation for success across all industrial sectors statewide.

Support for continued natural gas development in Utah is a major component of the state's energy plan. The benefits of developing this abundant and clean resource will continue to play a key role in Utah's economic future and the nation's energy independence. Technologies continue to emerge that are allowing energy producers to access significant and growing supplies of domestic natural gas from shale formations and other unconventional reservoirs.

Coal

Mined throughout Utah for more than 100 years, the majority of Utah coal is consumed in-state for electric power generation. Valued at over $800 million annually, Utah's coal economy is especially important to rural Utah, providing roughly 2,000 high-paying jobs and a significant portion of county tax bases. Due largely to coal's contribution, Utah has benefited from some of the most affordable electricity prices in the nation.

Utah's coal-fired power plants have provided the electric energy that has historically powered homes, businesses, and industry throughout Utah. Utah ranks 12th in the nation for coal production, with most of its economic coal deposits located in three coalfields found in Sevier, Emery, and Carbon counties. Utah's coal is bituminous with a high Btu, low sulfur and ash contents, and high reactivity, making it ideal for power generation due to its high combustion efficiency. [40]

Findings

In 2019, Utah's coal industry accounted for the production of 13,753,000 tons of coal. Four mines from three counties (Emery, Sevier, and Carbon counties) accounted for nearly 90 percent of the total production (Figure 1). In the same year, Utah consumed approximately 12,300 thousand tons of coal for utility-scale electricity generation, accounting for 305 trillion Btu (35%) of the total energy produced in 2018. [41]

After a 17 percent decline in coal production between 2015 and 2016, the demand for coal in Utah has remained steady, with the majority of the produced coal (64% in 2018) used in-state. In the past, Utah has been a significant net exporter of coal, exporting more than 27,000,000 tons in 2000 to local, domestic,

and foreign markets. However, in recent years the energy mix has shifted. Out-of-state domestic demand has decreased to only 1.9 million tons in 2018. Utah's foreign exports peaked in the mid-1990s at about 5 million tons, then dropped to near zero in the mid-2000s. However, the foreign export market has seen a resurgence in the past few years, increasing to 3.1 million tons in 2018. [42]

Economic Considerations

Most of Utah's economic coal deposits are located in three coalfields found in Sevier, Emery, and Carbon counties [43]. Prospective coal reserves, some of which are constrained by land-use restrictions, are also found in Uintah, Grand, Wayne, Garfield, Iron, and Kane counties. The Kaiparowits coalfield, located in Garfield and Kane counties, holds the most significant potential for recoverable coal—an estimated 9,096,000,000 tons recoverable coal reserves [44 & 45]. However, that coalfield is located within the original boundaries of the Grand Staircase-Escalante National Monument, and may not be available for mining.

In 2017, Utah's coal industry provided more than 5,000 jobs, $343 million in earnings, and an estimated $612 million in state GDP. Of the 5,000 jobs provided, the average annual salaries were double the statewide average, totaling approximately $105,000 [46]

Goals, Objectives, and Policies

The State of Utah continues to support the development of its coal resources. The report, Advancing Utah Coal: Technology, Policy, and a Path Forward [47], provides a framework and recommendations for the advancement of strategic coal technologies and a sustainable coal economy in Utah. The Advanced Coal Resource Group (ACRG), which is a state-based working group of members from coal communities, local government, industry and academia, meets regularly. The ACRG focuses on the development and deployment of advanced coal technology and identification of opportunities for responsible coal development and coal industry growth.

Utah, with its forward-thinking research universities and entrepreneurial spirit, is well positioned to provide world leadership in advanced coal technology. University groups and technology companies within the state continue to innovate through research and development. Since 2015, Utah research and development groups have received more than $14 million in coal technology grants. The University of Utah's Industrial Combustion and Gasification Research Facility, located in Salt Lake City, houses some of the most advanced combustion test equipment found in the United States. In 2021, the University of Utah received $1.5 million for coal research.

The Utah Legislature approved the Sustainable Transportation and Energy Plan (STEP) in 2016. This legislation established a 5-year pilot program, under which regulators authorized Rocky Mountain Power to spend an average of $1 million per year on clean-coal technologies.

- The State is committed to an any-of-the-above energy portfolio that includes coal resources.
- Promote access to and the continuation of mining operations for coal in Utah.
- Oppose federally mandated coal moratoriums or other federal actions that impede access to coal resources – particularly, on public lands.
- Remain cognizant of factors contributing to a potential energy crisis, including but not limited to, the early retirement of coal power plants.

Renewable Energy Resources and Storage Solutions

Geothermal

Utah is one of seven states with utility-scale electricity generation from geothermal sources, ranking third in the nation in geothermal energy [48]. Utah has a vast number of untapped geothermal resources and the ability to generate renewable baseload electricity, making geothermal energy one of the most valuable resources in Utah's energy mix.

Most of the potential for geothermal electric power generation in the United States lies in the western part of the country. Relying on Earth's constant temperature, geothermal energy is a continuously available renewable resource. Since it is a continual resource, geothermal energy is the only renewable resource that offers baseload electricity generation in the absence of energy storage.

Utah is located in an active geothermal zone. There are four known geothermal resource areas in Utah as classified by the UGS and the U.S. Bureau of Land Management. Geological studies and well data indicate that several other areas in the state have the potential for geothermal energy development. The areas with the greatest geothermal resource assets are located within the Basin and Range province of western Utah and the Transition Zone of central Utah.

In northern Utah, geothermal resources are associated with the Wasatch fault zone, which defines the eastern edge of the Basin and Range province, separating it from the middle Rocky Mountains (Wasatch Range). These resources have geothermal characteristics similar to those in Nevada, which have similar geology and are also part of the Basin and Range province.

Findings

Geothermal energy represents the fourth-largest share of utility-scale renewable energy generation in Utah. In 2018, Utah's three utility-scale geothermal power plants accounted for approximately 10 percent of the state's total utility-scale renewable generation, or 446 gigawatt-hours [49]. Utah's geothermal power plants have the capacity to generate enough power for over 45,000 homes, most of which is purchased for use in California.

The potential to develop more of Utah's geothermal resources exists with an estimated 18 undeveloped geothermal systems, most located close to transmission lines in the Black Rock Desert (Map - Sevier Thermal Area). [50]

Utah is one of only a few states that produces electricity from geothermal sources. Purchased by Enel in 2007, the Cove Fort geothermal operation located in Millard County underwent a significant efficiency conversion. Enel reopened Cove Fort in 2013, and since then the 25-MW plant has powered approximately 13,000 homes.

Blundell is a geothermal facility located near Milford, Utah. The plant was completed in 1984 and became the first geothermal electric plant to operate outside of California. PacifiCorp is the sole owner of the 38-MW geothermal plant, which consists of two generating units. The 26.1-MW Unit 1 uses "flash" technology and was commissioned in 1984. In 2007, they expanded the plant's capacity by 12 MW by adding an innovative "binary" heat-recovery process to extract more energy from the hot geothermal brine left over from the steam separation cycle.

The Energy Act of 2020 specifically calls out geothermal in companionship to wind and solar in Subtitle B – Natural Resource Provisions (Sections 3101 – 3106). These provisions require the Secretary to

improve interagency cooperation, provide flexibility, and establish national production goals, for wind, solar, and geothermal. Section 3105 allows for noncompetitive leasing for geothermal energy on Federal lands if it will be coproduced from an existing oil or gas well.

The addition of geothermal plants will require additional and new infrastructure to ensure that base load energy from geothermal operations can reach and maintain the electrical grid.

Economic Considerations

While new plant construction requires significant capital investment, geothermal power offers, over time, a lower-cost energy source that diversifies the fuel supply and supports the stability of the power grid. It does not require the purchase of fuel, and because it is a baseload resource, geothermal power is reliable, helping to stabilize prices. It is also dispatchable, meaning that it can be ramped up or down quickly to make up for intermittency caused by other renewable energy sources. The average cost of a geothermal plant over its lifetime is dramatically lower than that of many traditional sources of power.

Because geothermal energy is locally produced, it can help to reduce foreign oil dependence and boost rural economies through royalties and tax payments. A geothermal power project development will involve hundreds of individuals, employing local workers full time and stimulating induced jobs.

Since the enactment of the 2005 Geothermal Steam Act Amendments, 25 percent of federal geothermal revenues from leasing and production on federal lands have been allotted to state and local governments.

Research and development in enhanced geothermal systems (EGS) offer Utah the opportunity to increase its geothermal resources. EGS utilizes advanced drilling techniques from the oil and gas industry to create a subsurface fracture system in which water can be added through injection wells, allowing energy from within the earth to be captured through an engineered geothermal system.

In 2014, the U.S. Department of Energy (DOE) launched the Frontier Observatory for Research in Geothermal Energy (FORGE) initiative to establish a dedicated site for accelerating breakthroughs in EGS technologies and techniques. Through a series of competitive research grants, the DOE sought to identify the ideal location and research team for advancing EGS. In a multi-agency effort, including preliminary research from the UGS, and an education campaign and coordinated federal delegation letter of support provided by the Utah Office of Energy Development (OED), the University of Utah - Energy and Geoscience Institute's bid was selected by the DOE in 2018 as the recipient of the $140 million FORGE research grant and as well as another $80 million in 2022. One of the largest geothermal research grants of its time, the Utah FORGE team has received funding for 5 years to establish and conduct EGS research at a site near Milford. Funding after that 5-year period has yet to be determined.

Also called engineered geothermal systems, this approach offers great potential to dramatically expand the use of geothermal energy. Present geothermal power generation relies on hydrothermal reservoirs, and is somewhat limited in geographic application to specific ideal places in the western United States. EGS offers the chance to extend the use of geothermal resources more broadly.

Geothermal energy is a renewable source of electricity that offers important baseload qualities. To expand options for the development of this resource, federal and state policies are needed that address a range of near-, mid-, and longer-term challenges faced by the industry. These include the following:

- incentive programs,
- lease opportunities on government-controlled lands, and
- expansion of access to transmission infrastructure.

Policymakers should prioritize efforts that address risks and obstacles to development, particularly reduction of resource risk. The development of strategic goals and support for long-term federal programs will help to characterize and identify the overall available geothermal resource base.

Goals, Objectives, and Policies

Goal(s):

Promote and encourage access opportunities and the development of the state's geothermal resources.

Objectives:

- Increase access and the development of geothermal resources for energy, heating, and other economically feasible projects and applications.
- Add to the reliability and sustainability of the state's "all-of-the-above" energy portfolio.
- Work with federal land management agencies to afford geothermal energy resources the same level of attention, access, and incentives as wind and solar renewable resources as outlined by the Energy Act of 2020.
- Supports additional transmission lines to connect geothermal resources to the grid.

Policies:

- Support responsible geothermal resource utilization including enhanced geothermal resources like the FORGE project, for traditional, residential, and commercial uses.
- Encourage ongoing federal appropriations to develop geothermal resources in Utah and promote long-term research at the FORGE project.
- Support the U.S. Bureau of Land Management and the U.S. Forest Service in leasing and selling parcels of land for the development of geothermal industries.

Solar

Solar power is the term most often used to describe the conversion of energy from natural sunlight into electricity, either directly using photovoltaics (PV), indirectly using concentrated solar power, or a combination of these. Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large quantity of sunlight into a small beam. Photovoltaic systems use solar panels, either on rooftops or in ground-mounted solar farms, to convert sunlight directly into electric power.

Findings

Utah boasts an above-average number of sunny days per year and has numerous cool, dry areas suitable for solar energy generation. With a high ultraviolet (UV) index in the southwestern corner of the state, and investment in solar photovoltaic (PV) systems over the past 5 years, Utah is now ranked 11th in the nation in installed solar energy-generating capacity, with 1,758 MW. [51]

Utah's solar resources make up the largest share of utility-scale renewable energy generation in the state. In 2018, Utah's 29 utility-scale solar arrays located in Millard, Sevier, Beaver, Iron, and Washington counties accounted for approximately 50 percent of Utah's total utility-scale renewable generation, or 2,224 gigawatt-hours. In 2019, solar energy was the largest contributor to utility-scale renewable capacity in the state, accounting for approximately 55% of Utah's total capacity, or 914 megawatts. [52]

In addition to power generation, Utah's solar resources are harnessed for heating applications in solar thermal systems. These solar thermal systems heat water and provide a non-emission source for small and large-scale buildings.

The Western Solar Programmatic Environmental Statement is being amended to include more states and will define BLM lands that are suitable for utility scale production, and establishes exclusion criteria and design features.

Economic Considerations

Net-metered installed PV solar capacity (rooftop solar) in Utah has grown over the past 10 years. The total capacity increased from 3.4 MW in 2010 to 273 MW in 2018. A combination of decreasing installation and equipment costs and federal and state government incentive programs have supported the growth of rooftop solar in Utah [53]. As a result of the growth over the past 10 years, the solar industry now provides over 7,000 jobs for Utah's electric power generation sector [54].

Utility-scale, net-metered solar, and solar thermal have been supported by the State of Utah through tax incentives. This includes the Production Tax Credit (PTC) for utility-scale systems and the Renewable Energy Systems Tax Credit (RESTC) program for net-metered PV solar systems.

Goals, Objectives, and Policies

Goal(s):

Promote and encourage the development of Utah's solar resources on public lands in locations that do not impede existing rights and access, or that take agricultural land out of production.

Objectives:

- Obtain 20 percent of the state's 2025 adjusted retail electric sales from cost-effective renewable energy resources. In 2015, 4.3 percent of utility-scale net electricity generation came from renewable resources. As of 2020, approximately 14 percent of the state's total electricity was generated by renewable resources.
- Encourage the retention or mitigation of the loss of Animal Unit Months (AUMs) for livestock grazing on public lands when solar farms are constructed.
- Solar energy installations should not impede or limit access to publicly accessible roads or lands.
- Encourage the retention of productive agricultural lands in lieu of converting them into solar farms.
- Consider aesthetic values and environmental impacts during planning and site selection of newly constructed solar farms.
- Work with local representatives and federal agencies to discuss and resolve conflicts with pre-existing uses and the creation of solar power.
- Encourage the utilization of natural gas peaker plants to reduce intermittency and increase the reliability of solar energy generation and delivery.

Policies:

- Develop adequate, reliable, dispatchable, affordable, sustainable, and clean energy resources. Under the state's energy policy, development of renewable energy resources including solar, is supported. Utah allows net metering for residential systems and provides tax credit incentives.

- Support solar projects that benefit the citizens of Utah in areas with available transmission line capacity.
- Comply with federal rules and regulations to the maximum extent possible while avoiding unnecessary expenses for Utah consumers and protecting access to energy resources without infringing on private property rights.
- Support county-led policies related to the disposal of construction byproducts related to renewable energy production (pallets/cardboards).
- Federal agencies must coordinate with counties prior to approving any solar projects on public lands. Inconsistencies between counties and other levels of government must be resolved expeditiously.

Wind

Wind, like water, has been used for centuries to power wells, mill grain, and for sailing. According to the DOE, wind generation could provide 20 percent of the nation's electricity needs by 2030 [55]. Wind turbines are modeled after traditional windmills and use propeller-like blades to harness the wind's energy. Usually three, evenly-weighted blades are mounted on towers more than 100 feet high. The turning blades are used to spin a low-speed shaft (30–60 rpm). This low speed shaft is connected to a high-speed shaft in the gearbox to increase the rpm's to about 1000–1800 rpm, which is required for the generator to produce electricity. [56]
Depending on the year, wind energy can be the source of the second or third largest share of utility-scale renewable energy generation in Utah. In 2018, Utah's five utility-scale wind farms accounted for approximately 18 percent of the total utility-scale renewable generation (795 gigawatt-hours) [57]. Utah's wind farms have the capacity to generate enough power for approximately 85,000 homes, most of which is purchased for use in other states.

Findings

Nationally, Utah ranks 27th in wind electricity generation capacity. Utah's distinctive topography limits wind generation capacity compared to other states' wind-profile potential, such as Iowa, Texas, and Wyoming. However, through the DOE's State Energy Program, the Utah Department of Natural Resources analyzed the state's wind energy potential in the early 2000s using data collected from 109 anemometer towers stationed throughout the state. The research identified 51 potential wind development zones, covering approximately 1,838 square miles, or 2 percent of the state's surface area, with a potential of 9,145 MW. Eleven of the sites have an estimated prospective capacity of at least 250 MW each, totaling 2,750 MW [58].

In 2019, wind energy was the second-largest contributor to utility-scale renewable capacity in Utah, accounting for approximately 24 percent of the total capacity (387 megawatts) [59]. The Milford Wind Project (306 MW, Beaver and Millard Counties), Latigo Wind Park (62 MW, San Juan County), and Spanish Fork Wind Farm (19 MW, Utah County) account for nearly 98 percent of Utah's wind electricity generating capacity.

Economic Considerations

The price of American wind power has declined more than 90 percent since 1980. The cost of energy from the wind is mostly a function of the wind resource—its speed, frequency, and when it occurs. Higher-speed winds are more easily and inexpensively captured. The more the wind blows, the more power that will be produced by wind turbines. The term used to describe this is "average capacity," which is the percentage of power a turbine produces compared to what it could produce if it were always spinning. Overall, wind turbines capture between 20 percent and 40 percent of the energy in the wind. For

example, at a site with average wind speeds of 7 meters per second, a typical turbine will produce about 1,100 kWh per square meter of area per year. If the turbine's blades are 35 meters long, for a total swept area of 1,000 square meters, the power output will be about 1.1 million kWh for the year. [60]

Wind energy projects are eligible for support through the Utah's Renewable Energy Systems Tax Credit (RESTC) program and Production Tax Credit (PTC), which are managed by the Utah Office of Energy Development (OED). However, for the PTC, the State of Utah does require that renewable energy projects be cost-effective, resulting in utilities investing in stateside wind projects (Energy Initiatives and Imperatives: Utah's 10-Year Strategic Energy Plan 2.0).

In addition to strengthening Utah's energy mix with added utility-scale renewable capacity, the state's wind-energy industry provides more than 400 wind-energy jobs and drives the state's energy economy through private investment and property tax revenues (NASEO, US Energy & Employment Report 2020) [61]. The Latigo Wind Park in San Juan County included $125 million in private investment and Beaver and Millard counties have benefited from increased property tax revenue from the $360 million Milford Wind Project [62].

In order to realize the potential of Utah's wind resources, the following actions should be undertaken:

- Explore the potential pathways for wind power to contribute to the future electricity needs of the nation, including objectives such as reduced carbon emissions, improved air quality, and reduced water use.
- Quantify costs, benefits, and other impacts associated with continued wind-energy deployment.
- Identify actions and future achievements that could support continued growth in the use of wind energy.

Wind energy is recognized by the State of Utah energy policy, which supports its development. While studies have identified commercial wind-power potential in the Wasatch and Uinta Mountain ranges in Utah's north-central region and on the mesas of the western region, most wind investment approved for Utah utilities to date has involved Wyoming projects.

Goals, Objectives, and Policies

Goal(s):

Promote and encourage access opportunities and the development of Utah's wind-energy resources in locations that do not impede existing rights and access, or take agricultural land out of production.

Objectives

- Support viable wind energy projects when they are cost effective and compatible for land management practices, including multiple-use activities, and when impacts to viewsheds are taken into consideration.
- Encourage the utilization of natural gas peaker plants to reduce intermittency and increase reliability of wind energy generation and delivery.
- Wind energy installations should not impede or limit access to publicly accessible roads or lands.
- Encourage the retention of productive agricultural lands in lieu of converting them into wind farms.

Policies:

- Support the responsible development of wind-energy infrastructure in areas proven by scientific research to provide consistent wind-energy production along with the additional consideration of transmission infrastructure and capacity.
- Federal agencies must coordinate with counties prior to approving any solar projects on public lands. Inconsistencies between counties and other levels of government should be resolved expeditiously.

Hydropower

Water has been a resource used for centuries, from the water wheel used to grind wheat into flour to today's sophisticated power plants. Utah is home to more than 800 dams. Less than 8 percent of them have associated hydroelectric power generation [63]. The U.S. Bureau of Reclamation operates two hydro plants in Utah. These include a small facility at Deer Creek Reservoir and the larger, 152-MW plant at the Flaming Gorge Reservoir.

In Utah, depending on the year, hydroelectricity typically contributes the second- or third-largest share of utility-scale renewable energy generation. In 2018, Utah's 30 utility-scale hydroelectric plants accounted for approximately 21 percent of the total utility-scale renewable generation (927 gigawatt-hours). The 927 gigawatt-hours generated equates to an estimated 92,700 homes being powered by hydroelectricity in 2018. [64]

Findings

The annual hydroelectric utility-scale capacity fluctuates based on water availability from seasonal rains and melting snow. In 2019, hydroelectricity was the third-largest contributor to utility-scale renewable capacity, accounting for 18 percent of the total capacity (289 megawatts) (Vanden Berg, 2020, p.16) (EIA, 2020).

Hydroelectric generators typically supply between one-third and two-thirds of Utah's net renewable electricity generation, with the annual amount depending on water availability. The state's hydroelectric facilities are more than 60 years old on average; the oldest one dates from 1896 [65]. In Utah, hydropower generation is somewhat less significant than that of other states as a percentage of net electricity generation. Hydroelectric power accounts for just under 2 percent of the state's generation.

The U.S. Bureau of Reclamation operates two hydroelectric plants in Utah, including the small facility at Deer Creek Reservoir, and the much larger, 150-MW plant at the Flaming Gorge Reservoir. PacifiCorp operates 10 hydroelectric plants in the State of Utah, 9 of which range in size from 0.16 to 10.3 MWs in nameplate capacity, and one of which (the Cutler Plant in Box Elder County) generates an appreciably larger 30 MWs. Most of the plants were constructed between the very early 1900s and 1930. However, the oldest are the Granite facility on Big Cottonwood Creek and the Pioneer facility on the Ogden River, which went into operation in 1896 and 1897, respectively. Local municipal utilities and irrigation companies operate a few dozen additional smaller facilities throughout the state, the majority of which are 0.5–3 MWs in size [66].

In June 2023, the Moon Lake Electric Association (a rural electric cooperative serving much of the Uintah Basin) issued a Declaration of the Impending U.S. Energy Crisis. Factors contributing to that impending crisis (as listed in their declaration) are:

- Premature retirements of conventional generation;
- Substantial increase in electricity demand;
- Increases in widespread summer heat events;

- Recent Environmental Protection Agency rules that may force generators to meet "emissions restrictions primarily by limiting hours of operation;"
- Supply chain issues;
- Fuel delivery risks related to the availability of natural gas and coal.

Economic Considerations

Hydroelectric power offers clean and efficient energy production due to low greenhouse gas emissions and some of the lowest electricity prices in the United States. However, other environmental concerns that exist for this energy source exist and have limited its development. These include the costs associated with heavy construction of dams and potential disruptions of plant and animal life. Hydroelectricity is one of Utah's oldest energy resources, with the first hydroelectric generating units constructed in 1896, and provides more than 350 jobs to Utah's energy economy [67].

Although most energy in the United States is produced by fossil-fuel and nuclear power plants, hydroelectricity still plays an important national role. Utah's all-of-the-above energy policy supports continued utilization of the state's hydro-power facilities.

The future of hydroelectric power in the United States is expected to involve increased capacity at current dams and new run-of-the-river projects rather than construction of new, large hydroelectric projects.

Goals, Objectives, and Policies

Goal(s):

Promote and encourage access opportunities and the development and maintenance of Utah's hydroelectric energy resources.

Objectives:

- Maintain existing hydroelectric power infrastructure and seek federal appropriations to avoid, delay, or defer decommissioning when feasible, and as determined by utility companies and local governments.
- Support a feasibility study for pump-storage projects (e.g., the Bear River Project).
- Encourage the addition of in-pipe hydroelectric systems in existing and new pipelines.
- Remain cognizant and proactively mitigate any factors contributing to a potential energy crisis.

Policies:

- Continue to support access to and opportunities for hydroelectric power generation opportunities through maintaining existing infrastructure, considering the development of new infrastructure, and encouraging the adoption of innovative technologies.
- Promote and develop energy resources and infrastructure that protect the state from factors contributing to a potential energy crisis.

Hydrogen

Hydrogen is not an energy source. It is an energy carrier capable of storing and delivering usable energy. Using a fuel cell, hydrogen generates power using a chemical reaction instead of combustion, producing only water and heat as byproducts. This nearly emission-free technology can be used in automobiles, houses, portable power, and much more. [68]

Recognizing the potential for hydrogen fuel cells to successfully integrate renewable and conventional energy resources into the grid through energy storage, the DOE has established The Hydrogen and Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration (MYRD&D) Plan. [69] First published in 2003, the MYRD&D is a living document responsible for tracking research and development in hydrogen fuel-cell technology.

The DOE's goal is to develop technologies that can produce hydrogen at a target of less than $4 per kilogram. The Hydrogen Production Pathways' goal [70] is to create mid- and long-term technologies that will allow hydrogen to be produced economically from resources such as biomass, coal gasification, and solar energy. Currently, natural gas reforming [71] is the favored process for achieving large-scale hydrogen production. This process takes natural gas containing methane and produces hydrogen through a series of thermal processes. This approach allows producers to use existing natural gas reserves and natural gas pipeline infrastructure to produce and transport hydrogen. [72]

Findings

Hydrogen production and energy storage are quickly advancing in Utah [73]. The Intermountain Power Agency (IPA), owner of the 1,800-MW coal-fired power plant in Delta, Utah, is moving forward with a new, state-of-the-art generation facility designed to run initially on a mix of natural gas and hydrogen but will ultimately operate on hydrogen alone [74]. The project partners plan to use excess renewable energy from across the western United States to generate "green hydrogen" by 2025. The hydrogen will be produced via electrolysis and stored in an existing underground salt dome in Millard County. Hydrogen would then be continuously available for utility-scale electricity generation at the Delta site.

The Los Angeles Department of Water and Power, which is the largest buyer of the plant's power, intends to use the new plant to help meet California's 2045 decarbonization target. A mix of 30 percent hydrogen and 70 percent natural gas fuel at start-up in 2025 is expected to reduce carbon emissions by more than 75 percent. Between 2025 and 2045, IPA plans to increase the hydrogen capability to 100 percent renewable hydrogen utilization, enabling baseload carbon-free utility-scale power generation.

Economic Considerations

In 2019, the Utah State Legislature passed H.B. 109, allowing hydrogen fuel production to be eligible for support by the High Cost Infrastructure Development Tax Credit Act [75].

The DOE's goal is to develop technologies that can produce hydrogen at a target of less than $4 per kilogram. The Hydrogen Production Pathways' goal is to create mid and long-term technologies that will allow hydrogen to be produced economically from resources such as biomass, coal gasification, and solar energy.

Goals, Objectives, and Policies

Goal(s):

Strategically plan for and facilitate potential opportunities for hydrogen production and distribution along the primary transportation arteries in Utah.

Objectives:

- Determine the feasibility and potential future distribution needs for hydrogen in Utah.

- The State should purse federal funding opportunities to establish a hydrogen hub, conduct research, and develop policies related to hydrogen.

Policies:

- Support the research and development of hydrogen production and capture infrastructure.
- Preferentially accomplish hydrogen production through processes that do not require the excessive consumption of water resources.

Biomass

Biomass is organic material that comes from plants or animals. Biomass generates energy from once-living organisms, is a renewable energy resource, and can be used as an alternative fuel. [76]

Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. When biomass is burned, the chemical energy in biomass is released as heat. Biomass can be burned directly or converted to liquid biofuels or biogas that can in turn be burned as fuels. [77]

Examples of biomass and its uses for energy include:

- Wood and wood-processing wastes [78] These can be burned to heat buildings, to produce processed heat in industry, and to generate electricity.
- Agricultural crops and waste materials. These can be burned as fuel or converted to liquid biofuels.
- Food, yard, wood, and other municipal solid waste [79]These can be burned to generate electricity in power plants or converted to biogas in landfills.
- Animal manure and human sewage. This can be converted to biogas.

Findings

In Utah, biomass accounts for the last 1.8 percent of utility-scale renewable generation, accounting for 79 gigawatt-hours in 2018. Biomass, primarily in the form of landfill gas at facilities in the metropolitan region on the Wasatch Front in the north-central part of Utah, provided the remaining nearly 2% of the state's renewable electricity generation in 2018. [80]

Renewable natural gas (RNG) is a pipeline-quality gas derived from the decomposition of organic matter (biomass). RNG is interchangeable with conventional natural gas as a heating source, transportation fuel, and power generating resource, often as compressed natural gas (CNG) or liquefied natural gas (LNG). Being derived from a cellulosic or advanced feedstock (usually from pig or food waste), RNG qualifies as biofuel under the Renewable Fuel Standard.

In Utah, biogas facilities are currently producing RNG. A few active projects include:

- Smithfield's hog farms are located in Central Utah (Beaver and Millard Counties) and provide RNG for the Kern River Gas Pipeline.
- Houweling Tomatoes in Mona, UT which uses waste heat and CO2 from a nearby natural gas power plant to grow tomatoes.
- Wasatch Resource Recovery, located at the South Davis Sewer District, is an anaerobic digester dedicated to food waste diversion that provides RNG in a partnership with Dominion Energy.

Goals, Objectives, and Policies

Goal(s):

Explore and implement a variety of biomass energy-production opportunities statewide.

Objectives:

- Convert excess pinyon-junipers and conifers into electricity.
- Explore the feasibility and application of biochar and biofuel opportunities.

Policies:

- Support the advancement of technology to capitalize on biomass energy resources to support Utah's all-of-the-above energy portfolio and further the efforts of associated land-management policies and projects.
- Encourage the capture of methane to be digested into energy, and support federal appropriations to accomplish this process.

Nuclear

Uranium has been mined in Utah for more than 100 years. Uranium was originally a byproduct of radium and vanadium in the early 19th century. It wasn't until the mid-1940s that demand for uranium began to increase because of nuclear weapon manufacturing. From the 1970s through the 1990s, uranium was used as fuel for nuclear power electricity generation. More than 500 uranium mines have operated during this time, but due to declining prices, Utah stopped uranium mining altogether in 2014. There are, however, a number of mines that remain on "stand-by" to reopen if prices rise to a sustainable level.

White Mesa Uranium Mill is located in southeastern Utah and is currently the only fully licensed and operating Uranium Mill in the United States. With 150 employees, the mill has a capped capacity of more than 8 million pounds of uranium each year. The White Mesa Uranium Mill is also a major contributor to producing high-quality vanadium.

The [UAMPS] Carbon Free Power Project is a nuclear plant to be located at the Idaho National Laboratory near Idaho Falls Idaho. It will comprise of up to six 77 megawatt NuScale Power Modules. The NuScale Power Modules provides flexibility to ramp up and down as needed to follow load and complement intermittent renewable resources like wind, and solar. The first module is anticipated to be on-line in 2029 with the remaining modules being installed in 2030.

According to the Strategic Vision for the Office of Nuclear Energy at the Department of Energy, "Nuclear is one of the most resilient, environmentally sustainable, and reliable energy sources on the grid today. Globally, nuclear energy produces about 10 percent of the world's electricity and nearly 30 percent of its emissions-free electricity. Here in the United States, those numbers are even higher: Nuclear provides approximately 20 percent of our electricity, more than 55 percent of our clean energy, and supports about half a million American jobs."

Goals, Objectives, and Policies

Goal(s):

Recognizing that Utah has ample uranium reserves, the goal must be to preserve access to those fuel mineral resources and continue to explore opportunities for nuclear power generation that will make the state's all-of-the-above energy portfolio more reliable, sustainable, and resilient.

Objectives:

- Maintain access to uranium resources statewide.
- Explore opportunities for nuclear energy production in Utah.
- Promote base load and emission free energy production from nuclear sources.
- Promote the planning and installation of new transmission lines to support nuclear energy production and connect to the grid.

Policies:

- Encourage the federal government to support the operation of the White Mesa Mill to remain in operation because it is the only mill processing uranium in the United States.
- Promote the development of nuclear power generation technologies certified for use by the United States Nuclear Regulatory Commission, including molten salt reactors producing medical isotopes.
- Protect the fuel sources requites for nuclear energy from landscape-scale designation or policies that impede, restrict, or limit access to uranium and other associated mineral resources.

Broad Energy Resource Considerations: Policies, Guidelines, Economics

Policies and Guidelines

Title 79 Chapter 3 defines Utah's energy policy. This policy was passed into law in 2007 and is updated as necessary to support the state's energy objectives. The energy policy is succinct and comprehensive, and asserts the State of Utah's responsibility to promote energy resource development, including conventional, unconventional, and renewable energy, as well as energy efficiency, in support of a diverse energy portfolio. To ensure the State of Utah has the ability to responsibly develop its energy resources, the policy defines a proactive role for the state in maintaining pressure on federal land-management and regulatory agencies to ensure development proceeds at a pace that is reasonable and that does not stifle investment and expansion.

Specific to energy use, the policy addresses the state's role in maintaining reliable energy supplies for Utah homes and businesses, while keeping the cost of power stable and affordable. It further articulates the state's role in promoting the associated infrastructure required to deliver resources to points in the market for refinement or consumption. Finally, the policy provides a clear position on the need for energy initiatives to advance in concert with environmental and energy conservation objectives. As such, the policy recognizes that balanced, diverse energy development can be achieved to retain and enhance the quality of life enjoyed by Utah's residents.

Other Applicable Rules

The Utah Oil and Gas Conservation General Rules can be found here:
https://oilgas.ogm.utah.gov/Rules/Rules.htm

The Utah Oil and Gas Conservation Act can be found here:
https://oilgas.ogm.utah.gov/Rules/Conservation_act.htm

"It is declared to be in the public interest to foster, encourage, and promote the development, production, and utilization of natural resources of oil and gas in the state of Utah in such a manner as will prevent waste; to authorize and to provide for the operation and development of oil and gas properties in such a manner that a greater ultimate recovery of oil and gas may be obtained and that the correlative rights of all owners may be fully protected; to
provide exclusive state authority over oil and gas exploration and development as regulated under the provisions of this chapter; to encourage, authorize, and provide for voluntary agreements for cycling,

recycling, pressure maintenance, and secondary recovery operations in order that the greatest possible economic recovery of oil and gas may be obtained within the state to the end that the landowners, the royalty owners, the producers, and the general public may realize and enjoy the greatest possible good from these vital natural resources." [81]

General Energy Policies and Guidelines

- Support the responsible development of renewable and nonrenewable energy resources on public lands managed by the U.S. Bureau of Land Management and the U.S. Forest Service.
- Engage with federal land management agencies on all federal projects related to the development of renewable and nonrenewable energy resources on federal lands in order to promote the responsible development of these resources.
- Oppose the withdrawal of public federal lands from energy development unless the withdrawal of such lands has been fully coordinated with the State of Utah and the counties within which the lands are located.
- Support the development of renewable and nonrenewable energy resources located on public lands inside the state's duly adopted "energy zones," described in Utah State Code Title 63J-8-105.2, the San Juan County Energy Zone; 63J-8-105.5, the Uintah Basin Energy Zone; and 63J-8-105.7, the Green River Energy Zone.
- Support the six commitments outlined in the Utah Energy and Innovation Plan and the expansion of the energy plan to contain measurable goals and objectives.
- The State must remain cognizant and establish proactive goals, objectives, and policies that promote energy resiliency in Utah while avoiding the potential of an energy crisis.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Utah Energy Act

§ 79-6-301. *State Energy Policy.*

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program*

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FIRE MANAGEMENT

Introduction

Wildfire has always existed and is nature's way of cleaning landscapes and recycling resources. Wildfire has improved vegetative species abundance and diversity from the sage-steppe of the western deserts to the high alpine peaks of the Rocky Mountains. Utah's landscapes have become dependent upon wildfire to maintain the health and vigor of the many ecosystems within the state.

After the increase in the 1900s of fire suppression efforts and fire management objectives to keep all wildfires small, many ecosystems departed from their historic conditions. Fire has not been allowed to perform its natural role and, consequently, the natural fuel of ecosystems (dead and excess vegetation) is no longer consumed during natural cycles of vegetative growth and wildfire. As a result, fuel loads in natural and undeveloped areas accumulate to unnaturally high levels and, when wildfires occur, they are often abnormally extensive and damaging, with catastrophic consequences to ecosystems and with greater negative impacts on communities. [1]

Every year, hundreds of wildfires burn on private, state, and federal land in Utah. Fires occurring on federal and tribal lands are managed by the US Forest Service (USFS), Bureau of Land Management (BLM), National Park Service (NPS), US Fish and Wildlife Service (USFWS) and the Bureau of Indian Affairs (BIA).

Wildfires that occur on state and private lands are managed by the Utah Division of Forestry, Fire and State Lands (FFSL) and are coordinated through county fire wardens. County fire wardens work with federal agencies and local fire departments to coordinate suppression efforts. Approximately 94 percent of all Utah wildfires in 2022 were extinguished before they exceed 10 acres. [2]

The FFSL's Lone Peak Fire Center employs hotshot crews, initial attack crews, fuel crews, and engine crews. These crews are dispatched all over the United States to extinguish fires in difficult terrain. When Utah needs help, the same types of resources are requested from outside the state. This national resource sharing allows national fire managers to allocate firefighting resources where they are needed the most. The first priority for firefighters is protecting human life, then preserving property and valuable natural resources. In 2022, about 49 percent of fires in the state were preventable, human-caused events that burned 24,447 acres. Naturally caused fires only burned 1,104 acres. [3]

Catastrophic Wildfire Reduction Strategy

Catastrophic wildfires significantly impact Utah's natural environment, economy, air quality, and infrastructure, and they are considered the state's most preventable natural disaster. Reducing large wildfires in Utah will protect life, property, communities, economies, and the environment.

In 2013, the State of Utah developed the Catastrophic Wildfire Reduction Strategy (CatFire) in response to the severe wildfires of the 2012 fire season. Reducing the catastrophic wildfire requires attention to the following three interdependent goals, which were set forth in the National Cohesive Wildland Fire Management Strategy: (1) restore and maintain resilient landscapes, (2) fire-adapted communities, and (3) strong and effective local wildfire response. These goals have been embraced throughout the development of the state's CatFire strategy.

Mitigation of hazardous fuels can change fire behavior and make wildfires easier to suppress. The effects of the mitigation, however, are not limited to life and property safety but will also affect forest health, water quality, vegetative species abundance, etc. As the State of Utah continues to implement projects

across the state's natural landscapes, the only way to be successful is to integrate existing programs, utilize local and federal partners, and continue to educate the public to create the desired shift toward more resilient communities and ecosystems.

The goals of Utah's CatFire strategy are:

1. Restore and maintain resilient landscapes
2. Fire-adapted communities
3. Strong and effective local wildfire response

The objectives and strategies of Utah's CatFire are:

- Reassess the existing education program to meet current and future needs.
- Ensure literature is updated as necessary to incorporate current research information.
- Identify gaps in research and pursue funding to address research needs.
- Distribute materials to community members, individual landowners, public officials, interagency partners, and the media for further dissemination and outreach.
- Maintain collaborative efforts with interagency partners to deliver and update information.
- Increase participation in state and national programs, including Utah Living With Fire, Ready, Set, Go!, Firewise USA, and Fire-Adaptive Communities.

Resources required for successful implementation of these strategies, goals, and objectives include, but are not limited to, state and area wildlife-urban interface coordinators (WUI) and a CatFire prevention and education coordinator.

Findings

Utah's varied vegetation is a function of precipitation and elevation. The landscapes of Utah can be categorized into three general types: forest, shrub, and grass. Each of these types can be further broken down into several sub-categories. [4]

Forests

For purposes of fuel typing, forests can be subdivided into the following: sub-alpine, aspen, ponderosa, pinyon-juniper, and hardwoods.

Sub-alpine forests are presently expanding in Utah, especially into once-undisturbed stands of aspen. The sub-alpine forest type is prone to high-severity and high-intensity wildfires, which are also known as stand-replacing wildfires. Because of their elevation, wildfire return interval in this forest type can range from 300 to 700 years. These stands will more likely succumb to insect and disease infestations than wildfire.

Aspen forests are in steady decline statewide for a variety of reasons, including the wildfire exclusion paradigm. Low-intensity wildfires are common in this forest type and act primarily to thin and regenerate stands.

The ponderosa forest type is typically characterized by open growth with wide spaces between the trees and an understory of shrub patches and continuous mixed grasses. Because of the wildfire exclusion paradigm, most of the ponderosa forest type is overstocked with multiple layers of understory. The natural wildfire return interval in ponderosa forest is 5 to 10 years, and the wildfire events are generally of

low severity and intensity. However, many ponderosa forest stands are as much as six times removed from this interval, and so when wildfire does occur in these stands, they are of high intensity and severity.

Pinyon-juniper forests in Utah are constantly fluctuating in extent because of their natural tendency to encroach on sage-steppe and their resilience to drought. The pinyon-juniper forests have increased across the state primarily because of fire suppression. Pinyon-juniper forests are now found in areas that they have not historically occupied. Because of this expansion, sage-steppe has decreased significantly across much of Utah, which has resulted in negative impacts to plants, wildlife, and watersheds. The natural wildfire return interval stage-steppe ranges from 5 to 35 years, and in truly homogenous stands of pinyon-juniper can be 50 to 100 years. The severity and intensity of these wildfires is considered to be high in both cases. Most sage-steppe has been encroached by pinyon-juniper and is becoming decadent, with little recruitment.

Hardwood forests in Utah are very rare and occur primarily in riparian zones composed of species that are fast growing and tend to decay before there are any appreciable effects from wildfire.

Shrubs

Shrub forests are predominantly composed of Gambel oak. Gambel oak is clonal, though if it is undisturbed, will expand as even-aged stands that can cover large expanses. The wildfire return interval is disrupted from its standard of 5 to 20 years and tends to produce wildfire that is of high intensity and severity.

Grasses

Grass fuel types are found throughout Utah and are primarily perennial. Of great concern is the nonnative cheatgrass (*Bromus tectorum*). Cheatgrass is an annual plant that invades newly burned areas, especially among the pinyon-juniper and shrub fuel types. The ability of cheatgrass to adapt to varying soil and moisture conditions has created a vast monoculture across many low elevation, wildfire-scarred landscapes. Because cheatgrass cures earlier in the year than other grasses, it is capable of burning earlier in the wildfire season. In many areas, this can alter a 35-35 wildfire return interval to an annual interval. The proliferation of cheatgrass has triggered a significant decrease in the abundance of native grasses across Utah.

Air Quality Considerations

Summer air quality can be impacted by levels of particulate matter generated by wildfires. Wildfire smoke is composed of a complex mixture of gases, fine particles, and water vapor that form when organic matter burns.

Particulates from smoke are a mixture of solid particles—pieces of wood and other burning solids—and liquid droplets. They tend to be quite small, generally less than 2.5 micrometers in diameter, or approximately 1/70th the size of a human hair.

The most serious health threat from smoke comes from fine particles. Because they may lodge more deeply in the lungs, these fine particles are a greater health concern than larger ones. Fine particulates get into the eyes and respiratory system, where they may cause health problems such as burning eyes, runny nose, and illnesses such as bronchitis. They may also aggravate chronic heart and lung diseases.

Finally, the incomplete burning of wood or other organic materials produces carbon monoxide, the gas in smoke. Its levels are highest during the smoldering stages of a fire. [5]

The State recognizes that smoke from wildfires may have an adverse impact on environmental justice communities and the State is committed to reducing these risks through active forest management.

Other Considerations

In recent years [6], Utah has seen a new kind of flood risk emerge, one that includes flooding and debris flows related to watersheds damaged by wildfire. This type of flooding is distinctly different from historically normal floods. Post-fire-related flooding results from enhanced runoff from fire-damaged watersheds, which has significant impacts on water quality. As fires burn, they destroy vegetation and often leave soils in a hydrophobic (water-repelling) state, altering the hydrology of the watershed and producing greater peak flows. It takes a human-built environment to turn a natural event into a natural disaster. This serious problem of debris flows and the elevated risk of debris flow following a wildfire is discussed further in the landslide section of the Utah Hazard Mitigation Plan [7].

Contiguous patches of weeds also pose significant fire risks, and native plant seeding after wildfires is necessary to recruit native species rather than weeds (*refer to the noxious weeds section*).

Economic Considerations

Many wildland fires are multi-jurisdictional and may involve state, private, and federal land. In many cases, each entity pays a proportionate amount for suppression based upon an agreement that is established at the time of the fire. In most cases, the costs are apportioned based upon ownership of acres burned. The state, local government, and federal agencies all participate in coordinated wildfire suppression programs.

Counties and municipalities may participate by agreement with FFSL to provide wildland fire protection on all unincorporated and non-federal lands. Counties may establish budgets with the FFSL to participate in state assistance for wildland fire protection.

Counties and municipalities in a cooperative agreement pay for their own initial attack-suppression costs out of their fire-department budgets, and if a fire goes beyond initial attack, they have the option to delegate financial and management responsibility to FFSL.

The legislature provides a firefighting budget to FFSL each year, which is used to create the necessary firefighting capacity and some suppression costs. If costs for any particular year exceed this appropriation, the FFSL requests a supplemental appropriation to cover the additional costs. The fires must be paid for as the bills come in, so each supplemental appropriation covers the previous fire season costs.

On occasion, the FFSL receives financial relief through the Federal Emergency Management Agency for state and private costs on fires that threaten structures. These are called Fire Management Assistance Grants [8]. These grants pay up to 75 percent of suppression costs. FFSL received four such grants in 2020. [9]

Within Utah, the total cost of 2021 wildfire suppression in Utah was around $88 million. Utah's portion of those costs will be approximately $23 million (*estimated*).

The millions of dollars spent to extinguish large wildfires are widely reported and used to underscore the severity of these events. Extinguishing a large wildfire, however, accounts for only a fraction of the total costs associated with the event. Residents in the wildland-urban interface (WUI) are generally seen as the

most vulnerable to wildfire, but a fuller accounting of the associated costs also reveals the impacts to all Utah residents and gives a better picture of the losses incurred when Utah lands burn.

A full accounting considers long-term and complex costs, including impacts to watersheds, ecosystems, wildlife habitat, infrastructure, businesses, individuals, and the local and state economy. Specifically, these costs include property losses (insured and uninsured), post-fire impacts (such as flooding and erosion), air- and water-quality damages, healthcare costs, injuries and fatalities, lost revenues, infrastructure shutdowns (e.g., highways, airports, and railroads), post-fire rehabilitation, and a host of ecosystem service costs that may extend into the distant future. The Dollar Ridge Fire in 2018 is an example of how a wildfire has direct and indirect impacts. After that wildfire, the Duchesne Valley Water Treatment Plant spent over $32 million to build a treatment plant capable of treating the post-fire water supply.

A study completed in 2017, "Wildfire in Utah, The Physical and Economic Consequences of Wildfire" as required by H.B 464, assesses the economic impacts of wildfire and provides a quantifiable analysis of the impact of wildfire on livestock and grazing, water quality, recreation and tourism, and air quality. [10]

Since 2022, the U.S. Forest Service has been working with states and other stakeholders to address the "Wildfire Crisis." In Utah, there are two identified wildfire crisis areas on the Wasatch and the Pine Valley mountains. Funding for this program was contained within the Bipartisan Infrastructure Law.

Goals, Objectives, and Policies

Goal(s) (by project/program):

Wildland Fire Suppression

Because of land ownership patterns in Utah, large wildland fires seldom involve a single jurisdiction. The vast majority of large incidents involve multiple ownerships and agencies. The FFSL works with federal land management agencies to suppress wildfires, aggressively providing for safety first. However, in certain areas, federal agencies put more emphasis on wildfire's natural role in ecosystem health. In those instances, the State of Utah and federal fire managers should work together to ensure that to the extent possible, both resource benefit and protection of private land are accomplished.

The State of Utah should also work with private landowners and state agencies to identify areas where allowing fire activity may reduce overall risk of future catastrophic wildfire and promote forest health. The decision to follow a less-aggressive fire-suppression strategy should be made with an emphasis on safety of human life and in areas where escape and spread to homes and infrastructure are negligible.

The FFSL maintains cooperative agreements with all federal land-management agencies, all 29 Utah counties, and more than 100 municipalities across the state. Through cooperative agreements, Utah counties and municipalities can have catastrophic wildfire costs covered by the state as long as these local governments (1) perform their own initial attack, (2) adopt a WUI ordinance, (3) meet minimum wildland firefighting qualifications, and (4) perform prevention, preparedness, and fuel mitigation work at their expense.

The FFSL's fire-management program is responsible for protecting life and property by preventing the origin and spread of wildfire on 15 million acres of state and private lands in Utah. The FFSL has limited resources to carry out this very large task. Through cooperative agreements, FFSL provides a fire warden in each county. Wardens coordinate with local fire departments to support their individual wildland firefighting programs. There is heavy reliance on local fire departments, especially for initial attacks. This

successful arrangement results in the overwhelming majority (95 percent) of wildfires being fully suppressed before reaching 10 acres in size. In rare instances, when wildfires grow beyond initial attack, fire managers supplement efforts by calling upon hand crews and aerial firefighting resources through state programs and federal agencies.

The FFSL fire-management program assists local fire departments by providing training and coordination through entities like the Utah Fire and Rescue Academy. The State of Utah oversees the national wildfire coordination group (NWCG) certification (red card) for more than 1,500 fire department members every year who are trained to control wildland fire. The FFSL also administers several federal and one non-federal source of funding for fire departments to assist with the purchase of personal protective equipment, suppression equipment, communications gear, and apparatus. Additional equipment is made available to fire departments through the Federal Excess Personal Property program, which is administered by the fire-management program. This program has placed more than 1,200 pieces of wildfire-fighting equipment with departments statewide.

Wildland Fire Prevention

Wildland fire prevention includes activities intended to reduce human-caused ignitions. The FFSL's prevention efforts are guided by the National Cohesive Wildland Fire Strategy and CatFire Strategy.

The State of Utah promotes wildfire prevention through the Fire Sense Campaign. This effort is carried out through a multi-agency committee involving fire-prevention staff from the USFS, BLM, NPS, and BIA. The FFSL's wildfire communications, prevention, and education coordinators lead prevention projects.

Wildland Community Preparedness has identified more than 650 communities at risk (CARS) from wildfire. CatFire is the guiding document that directs the State of Utah's efforts in reducing that risk. Homeowners and property managers receive education and technical guidance from FFSL and their local leaders in reducing their individual risk. Local governments that provide this outreach and technical assistance are given incentives to do so through their cooperative agreements.

Federal land-management agencies receive direction from the National Cohesive Wildland Fire Management Strategy (NCWS). Both the national and CatFire strategies contain the following three pillars:

- Fire-adapted communities
- Resilient landscapes
- Safe, effective initial attack

The FFSL and local leaders assist CARs through community engagement, planning, and hazardous-fuels management. Area WUI coordinators deliver educational programs and work with community leaders and planners to develop Community Wildfire Preparedness Plans (CWPP). These plans identify hazards and outline the mitigation strategies to address them. More than 190 CWPPs have been completed in Utah.

The FFSL also supports national preparedness initiatives like Firewise USA Communities, Ready, Set, Go!, and Fire Adapted Communities.

Wildland Fire Fuel Management

Fuel management refers to the practice of modifying vegetation through mechanical, chemical, biological, or manual treatments, or by using fire. The FFSL employs area WUI and fuels coordinators that assist communities with the development of CWPPs and in implementing mitigation strategies. Local governments are given incentives to carry out fuel-reduction work through their cooperative agreements. The State of Utah promotes fuel breaks, thinning, chaining, prescribed fire, and the selection of fire-resistant vegetation in green-stripping and burned areas.

The FFSL administers federal and state grants for fuel mitigation. These funds can be requested by local governments and private parties.

Expand Planning Opportunities

- Utilize existing tools to effectively and efficiently expand planning opportunities to the 625 identified CARs in Utah.
- Train urban and volunteer fire departments to deliver the National Cohesive Wildland Fire Management Strategy objectives and strategies to more efficiently reach those in the WUI.
- Update and modify as needed the planning documents to meet the needs of the State of Utah and intent of the Healthy Forest Restoration Act.

Organizational Development

- Standardize program delivery to improve consistency across Utah.
- Provide cross-discipline training to meet needs of individuals and other programs.
- Expand cross-ownership contract sharing to reduce wildfire mitigation costs.

Resources required: CatFire program coordinator and the regional planning process.

Wildland Fire Legislation

- Update statutes and codes to align more closely with current wildfire suppression management decision tools.
- Establish a reward system through tax relief for preparing for wildland fire.
- Provide increased funding to help communities prepare for wildfire.

Resources required: Salt Lake City staff and area office fire staff.

Program Integration

- Increase communication and cooperation among programs within the Department of Natural Resources and other state and federal agencies.
- Utilize when appropriate other programs to meet the intent of CatFire and the National Cohesive Wildfire Fire Strategy.
- Help to identify areas of potential integration through the Landscape Scale Restoration program.
- Increase participation from municipalities entering into cooperative agreements with FFSL.

Resources required: CatFire program coordinator, CatFire communications and prevention coordinator, and the CatFire Fire Risk Assessment.

Project Identification and Implementation

- Identify both federal and non-federal mitigation projects identified in the priority areas of the Forest Action Plan, through the interagency fuels committees and/or through the CatFire strategy process.
- Plan and complete projects that meet the needs of entire communities that focus on resilient landscapes and fire adapted communities.
- Incorporate a maintenance schedule for communities that are achievable and effective.

Resources required: CatFire program coordinator, CatFire Fire Risk Assessment, CatFire funding, and state and area WUI coordinators.

Utah's Watershed Restoration Initiative (WRI)

Utah's Watershed Restoration Initiative (WRI) [11] focuses on improving three ecosystem values: (1) watershed health and biological diversity, (2) water quality and yield, and (3) opportunities for sustainable uses of natural resources. Significant investments have been made through WRI to improve rangeland health and watershed conditions. Since the program's creation in 2006, WRI has improved nearly 2 million acres in Utah. In fiscal year 2020, the Utah Legislature contributed $6.2 million to WRI. Eighty-six participating partners completed restoration of 110,041 acres of uplands and 166 miles of stream and riparian areas, leveraging the legislative funds by a factor of 14-to-1. Sportsman-generated funding plays an important role in the WRI. Counties appreciate the benefits realized through WRI habitat restoration projects. The long-term results of the WRI will be measured in reduced wildfire acreage and suppression costs, reduced soil loss from erosion, reduced sedimentation and storage loss in reservoirs, improved water quality and yield, improved wildlife populations, reduced risk of additional federal listing of species under the Endangered Species Act, improved agricultural production, and resistance to invasive plant species.

To participate effectively, counties must send their staff to attend meetings and field tours of the WRI regional teams, expressing their views and advocating the kinds of watershed restoration efforts they feel are most important. More information on the WRI program, including dates and times of upcoming regional team events is available at the WRI website at watershed.utah.gov.

Utah's Shared Stewardship Program

Shared Stewardship is an agreement between the State of Utah and the Forest Service that provides a framework for the State of Utah and the Forest Service to work together to identify forest health priorities that focus on restoration projects. The primary goals of the projects are protecting communities and watersheds from the threat of large unwanted wildfires.

The Agreement commits to:

- Existing partnerships, programs, and initiatives that have been successful in Utah.
- Working together to identify and map shared priorities for protecting at-risk communities and watersheds across all lands.
- Making joint decisions and sharing resources for immediate and ongoing work in priority areas.
- Engaging local communities in dialogue and learning about active management and desired
- landscape-scale outcomes, including capacity building and economic development opportunities.
- Shared planning efforts, including the integration of Utah's Forest Action Plan and the Forest Services' Five-Year Vegetation Management Plans.
- Co-managing wildfire risks and supporting each other in decisions that we have made together.

Burn Permits

Utah State Law and Utah Department of Environmental Quality (DEQ) rules specify the times, places, and conditions in which the public may carry out burning operations on private land. The closed fire season from June to November has one set of rules, while the rest of the year has another set of rules. Depending on the type of burning and where it takes place, a permit is not always needed. Several types of fire are exempt from some laws and rules; however, notification to the local fire department is always required.

Wildland-Urban Interface Code

The FFSL uses the International Wildland-Urban Interface Code as a basis for establishing the minimum standards discussed in the 2006 *Utah Wildland-Urban Interface Code*. A county ordinance that at least meets the minimum standards was required to be in place by September 2006. The FFSL incorporates by reference the 2003 International Code Council Wildland-Urban Interface Code as the minimum standard for wildland fire ordinance in conjunction with Utah requirements. [12]

Utah Wildfire Risk Assessment Portal (UWRAP)

The *Utah Wildfire Risk Assessment Portal* (UWR AP) is the primary mechanism for the FFSL to convey wildfire risk information. It consists of a suite of applications tailored to reflect wildfire risk. The application is available for the public, local community groups, private landowners, government officials, hazard-mitigation planners, and wildland fire managers. It provides the data needed to support mitigation and prevention efforts across the state. The UWR AP provides access to wildland fire risk assessments completed as part of the West Wide Wildfire Risk Assessment (WAA), which includes three primary outputs: the Fire Risk Index, Fire Threat Index and Fire Effects Index. Risk is defined as *"the possibility of suffering, harm, or loss."* Within the WWA, the data layer that defines wildland fire risk is the Fire Risk Index (FRI), while the *"possibility of suffering, harm, or loss"* is represented by the Fire Threat Index (possibility) and the Fire Effects Index (harm or loss). The Fire Risk Index is calculated from the Fire Threat Index (FTI) and the Fire Effects Index (FEI).

General Objectives and Policies

1. The primary goal of all fire management decisions will be firefighter and public safety. At no time will the preservation of property or natural resources take higher priority than human life safety.
2. Provide initial attack assistance to all lands where cooperative agreements are in place.
3. Manage and pay for wildfires delegated to it by local jurisdictions that have cooperative agreements.
4. Provide firefighting resources including hand crews and fire engines for assignment to initial and extended attack wildfires.
5. Pursue outreach and education efforts aimed at preventing wildfires and preparing homeowners/landowners in the eventuality of wildfire.
6. Advocate that local jurisdictions uphold the wildland-urban interface code.
7. Support the Catastrophic Wildfire Reduction Strategy and the National Cohesive Wildfire Fire Strategy.
8. Pursue opportunities to conduct and assist other partners with fuel reduction work including mechanical treatments and prescribed fire.
9. Support the efforts of the Utah Watershed Restoration Initiative, Shared Stewardship Program, and other rehabilitative efforts throughout Utah.

10. Advocate for forest-management practices that promote species diversity and overall ecosystem health.
11. Encourage local jurisdictions to prevent wildfires, prepare their residents for wildfire, and reduce their fuel load by entering into cooperative agreements that give incentive for those actions.
12. Participate with federal wildfire agencies to leverage and combine resources and strengths wherever possible.
13. Support the Watershed Restoration Initiative and Shared Stewardship Program to encourage reduced wildfire acreage and suppression costs, reduced soil loss from erosion, reduced sedimentation and storage loss in reservoirs, improved water quality and yield, improved wildlife populations, increased forage, reduced risk of additional federal listing of species under the Endangered Species Act, improved agricultural production, and resistance to invasive plant species.
14. Support, and when funding and opportunities allow, partner with the U.S. Forest Service and other partners to expedite active forest, private land, and public land management.
15. Leverage state tax dollars with federal funding through cost-sharing and grant opportunities.
16. Increase cooperation between state agencies to prioritize and fund high priority projects through comprehensive watershed restoration efforts at landscape scales.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Utah Fire Prevention and Safety Act

§ 53-7-104. *Enforcement of state fire code and rules--Division of authority and responsibility.*

(1) The authority and responsibility for enforcing the state fire code and rules made under this chapter is divided as provided in this section.

(2) The fire officers of any city or county shall enforce the state fire code and rules of the state fire marshal in their respective areas.

(3) The state fire marshal may enforce the state fire code and rules in:

(a) areas outside of corporate cities, fire protection districts, and other local districts or special service districts organized for fire protection purposes;

(b) state-owned property, school district owned property, and privately owned property used for schools located within corporate cities and county fire protection districts, asylums, mental hospitals, hospitals, sanitariums, homes for the aged, residential health-care facilities, children's homes or institutions, or similar institutional type occupancy of any capacity; and

(c) corporate cities, counties, fire protection districts, and special service districts organized for fire protection purposes upon receiving a request from the chief fire official or the local governing body.

§ 53-7-203. *Utah Fire Prevention Board--Creation--Members--Terms--Selection of chair and officers--Quorum-- Meetings--Compensation--Division's duty to implement board rules.*

§ 53-7-204. *Duties of Utah Fire Prevention Board--Unified Code Analysis Council--Local administrative duties.*

Forestry Fire and State Lands

§ 65A-8. *Management of Forest Lands and Fire Control.*

Catastrophic Public Nuisance Act

§ 11-51a-101. *Title.*
§ 11-51a-102. *Definitions.*
§ 11-51a-103, *Declaration of catastrophic public nuisance - - Authority to declare and demand abatement.*

§ 11-51a-104. *Emergency abatement of a catastrophic public nuisance - - Indemnify, defend, hold harmless.*

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

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10. *https://le.utah.gov/interim/2017/pdf/00005325.pdf*
11. *WRI is a diverse partnership of state and federal agencies working together with private organizations, industry, local elected officials and stakeholders, coordinated by the Utah Department of Natural Resources. Watershed.utah.gov*
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FISHERIES

Introduction

The term "fisheries" generally applies to waterbodies and the fish that inhabit them, and the relevant resource-use and management actions, such as fishing regulations, management prescriptions, and other policies intended to meet specific objectives for each waterbody.

Fisheries are an important resource and contribute significantly to Utah's economy. Around 1.1 million pounds of fish are stocked in Utah waterbodies annually, and there are approximately 700,000 anglers within the state. There are 43 waters in Utah that are classified as Blue Ribbon fisheries (BRFs), which are designated as among the best fisheries in the state in terms of sport fishing. It has been estimated that these fisheries alone contribute $328 million annually to Utah's economy and generate 3,976 jobs within the state. [1]

Sportfish species are supported in a variety of recreational fisheries, which are usually grouped into (1) coldwater species, which ~~typically~~ include whitefish, grayling, trout, char, and salmon, and (2) warmwater or cool-water species, which include bass, walleye, perch, catfish, bluegill, crappie, and a number of others. Great Salt Lake is a brine shrimp-focused fishery. Rare fish species and those subject to federal listing under the Endangered Species Act are referenced more fully in the chapter entitled "Threatened, Endangered, and Species in Need of Conservation." ~~For the most part, there are no fisheries in Utah for imperiled species.~~ Utah also supports a diverse assemblage of native, non-game fish, such as suckers, chubs, and minnows. These fishes are generally not targeted by anglers but represent important aspects of Utah's natural resources and heritage. Colorado River Cutthroat trout and roundtail chub are the only native fish species that are classified as sportfish in Utah. Maintaining Utah's natural diversity in fish species is also economically advantageous, because recovery of critically imperiled populations is costly. Fisheries management decisions in Utah are made by considering both the needs of anglers and native, non-game fish species.

Fisheries in Utah are managed by the Utah Division of Wildlife Resources (UDWR). The UDWR divides the state into five geographic management regions, each of which is led by an aquatic manager. Typically, at least two fisheries biologists support each of these regional managers.

The state also promotes fishing through the creation of community fisheries and various outreach activities.

Findings

The UDWR Wildlife Board establishes seasons, harvest limits, and other wildlife regulations. The process for determining the balance among competing uses and establishing the best fishery and wildlife management policies is described in state law. This process is founded on an open, public dialogue concerning these issues. Five regional advisory councils (RACs) are active across the state, each consisting of a dozen or more individuals nominated by various interest groups. Council members can include citizens, local elected officials, sportsmen, agriculturists, federal land managers, and members of the public at large. The duty of each RAC is to hear input and recommendations, to gather data and evaluate expert testimony, and then to make informed policy recommendations to the Wildlife Board.

The Wildlife Board uses public input, the recommendations of the RACs, and the assembled facts to make determinations and establish policies best designed to accomplish the purposes and fulfill the intent of the wildlife laws. The Wildlife Board generates wildlife management policy, and exercises its powers by promulgating administrative rules and issuing proclamations and orders under Utah Code.

Blue Ribbon fisheries [2] are waters that provide highly satisfying fishing and outdoor experiences for diverse groups of anglers and enthusiasts. Blue Ribbon status indicates that a water has been reviewed by UDWR biologists and the Blue Ribbon Fisheries Advisory Council and has been determined to have:

- High-quality sport fishing
- High-quality outdoor experience
- Excellent accessibility and user amenities
- High-quality fish habitat
- Economic benefits for the state

Criteria used for the designation as a BRF include items related to water quality, water quantity, angler access, sustainability, management intensity, level of use, unique setting, unique regulation, and unique species or fish assemblage. Specifically:

- Water quality and quantity: A body of water, warm or cold, flowing or flat, will be considered for Blue Ribbon status if it has sufficient water quality and quantity to sustain a viable fishery.
- Water accessibility: The water must be accessible to the public.
- Natural reproduction capacity: The body of water should possess a natural capacity to produce and maintain a sustainable recreational fishery. There must be management strategies that will consistently produce fish of significant size and/or numbers to provide a quality angling experience.
- Angling pressure: The water must be able to withstand angling pressure.
- Specific species: Selection may be based on a specific species.
- Fish numbers and size: The water must provide anglers the opportunity to catch desired numbers and size of fish.

The mission of the Blue Ribbon Fisheries Advisory Council is to identify Utah waters that provide Blue Ribbon angling experiences—or have the potential to provide Blue Ribbon experiences—in order to enhance and protect these economically valuable natural resources and their watersheds.

Blue Ribbon Fishery status is a designation that local communities can work toward by improving accessibility to local waterbodies as well as taking steps to improve habitat for fish. Both of these steps can be accomplished through land-use ordinance and by working with state and federal partners to improve habitat and water quality. There are 43 waterbodies in Utah designated as BRFs.

Aquatic Invasive Species

Aquatic Invasive Species (AIS), also termed Aquatic Nuisance Species, are defined by the UDWR as nonnative species of aquatic plants and animals that cause harm to natural systems and/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, largemouth bass, and catfish.

Quagga and zebra mussels (ZQM) represent the most significant AIS threat to Utah waters. Once established, these invasive mussels reproduce and spread quickly, clogging water and power infrastructure, damaging water-based recreational equipment and watercraft, and negatively impacting food webs in aquatic ecosystems. There is currently no effective method of eradicating or controlling ZQM once they are established in a waterbody. Quagga and zebra mussels are mostly spread through the transport of recreational watercraft from infested waterbodies to non-infested waters. Preventing their spread is the most effective management strategy.

Lake Powell in southern Utah became infested with quagga mussels in 2013 and remains the only infested waterbody in Utah. The UDWR AIS program was established in 2007 and focuses largely on watercraft inspection and decontamination. Boats leaving Lake Powell are inspected for attached mussels and standing water upon exit. Boats arriving to launch at other Utah waterbodies are inspected before launch, with hot water decontamination performed on boats that have recently been used in a ZQM-infested waterbody. The UDWR manages one of the largest AIS programs in the West, having performed nearly 460,000 watercraft inspections and 11,200 decontaminations in 2020. The UDWR also works with surrounding states to address watercraft being transported across state lines from ZQM-infested regions.

Other AIS of concern in Utah include the New Zealand mudsnail and Eurasian watermilfoil. Several parasites and diseases are also considered invasive due to their effects on local fisheries. Each malady has a unique lifecycle and management implications, including transmission from hatcheries, anglers, and natural sources. These include whirling disease and spawning syndrome, which affect trout species found in Utah.

Fish Stocking

Fish stocking takes place in many waters in Utah. A regularly updated list of stocking waters with dates and details of fish species stocked can be accessed online. Utah residents are fortunate to have an extensive and well-managed system of state fish hatcheries, which makes it possible to furnish anglers with high-quality fishing experience that involve higher catch rates and larger fish specimens than otherwise possible given the capacity of Utah waters to produce fish, and considering Utah's growing human population.

Utah's Community Fisheries Program

The UDWR is committed to developing more community fisheries—places one can walk, bike, or bus to, and catch a fish or two. Community fisheries provide a fun, easy way to spend quality time with family and friends outdoors, near home. They offer a setting for parents and kids to socialize, enhance family interaction, and keep busy Utahns in touch with the natural world surrounding them. Fishing provides families with opportunities to get away from their day-to-day problems and share time together.

Youth Fishing Clubs

Kids benefit immensely from fishing. It's a sport that builds self-esteem and confidence while enhancing problem-solving and decision-making skills. The UDWR's Community Fishing Program includes an educational component for urban children (ages 6–13) who have never fished, or haven't fished as much as they'd like. Youth fishing clubs form each spring in various communities to introduce young people to the joys of responsible sport fishing. The clubs are led by adult mentors who teach interested youth about fish, the places they live, and how to catch them. Those interested in volunteering or enrolling children in a youth fishing club can visit DWR's website to view a list of these clubs.

Sportfish Management

Within the last decade, the UDWR has begun focusing its sportfish-management direction on: (1) protection and enhancement of conservation sportfish species (e.g., cutthroat trout), (2) quality and trophy fishing opportunities, (3) recruiting and retaining new anglers through development of community fisheries, and (4) biological control of undesirable species through the stocking of hybrid predators such as wipers and tiger muskie, and (5) management of "multi-story" fisheries. [3]

The increased emphasis on the above-mentioned concepts provides the UDWR new opportunities for fisheries management. It also increases the challenges of selecting appropriate stocking plans for Utah waterbodies. Compounding the biological challenges, there has been increased diversity in the fishing public and their expectations regarding constitutes a successful fishery. In 1984, anglers in Utah preferred catching rainbow trout, and angler satisfaction was tied to the ability to harvest their limits of 10–12-inch fish. Consequently, virtually all hatchery production was devoted to the culture of rainbow trout. Over the last 35 years, however, angler interest in warmwater and cool-water fisheries has grown. The UDWR is working to meet this increased demand for warmwater and cool-water angling opportunities into the future.

The UDWR manages the following warmwater and cool-water species: bluegill, channel catfish, black crappie, largemouth bass, smallmouth bass, tiger muskie, walleye, hybrid striped bass, and yellow perch. There are a number of other species of warmwater and cool-water game fish that exist in Utah waters and provide angling opportunities such as: Sacramento perch, green sunfish, white bass, black bullhead, and northern pike. For the most part, these other species are not actively managed.
Trout are still dominant in smaller coldwater systems throughout Utah, such as the waters along the Mirror Lake Highway and elsewhere in the Uinta Mountains, the Boulder Mountains, the Wasatch Mountains, the Manti Mountains, and the La Sal Mountains.

Regardless of the management concept or species, the protection of native aquatic species is a principal concern for fisheries managers. Stocking and management practices that would be detrimental or cause the decline of native species are typically avoided. The UDWR is developing sterile variants of certain species (e.g., walleye) to provide angling opportunities while minimizing impact to native species downstream of stocking locations.

Species stocked in lakes and ponds

The following species are typically stocked in flatwater environments: rainbow trout, tiger trout, brown trout, cutthroat trout, kokanee salmon, splake, lake trout, brook trout, largemouth bass, bluegill, channel catfish, tiger muskie, wiper, yellow perch, walleye, and black crappie. Future development of sterile variants of certain species may increase demand for them.

Stream Fisheries

Managing self-sustaining fisheries in Utah streams should be a priority. The species which are typically stocked in streams are (sterile) brook trout, brown trout, cutthroat trout, and tiger trout. Tiger trout can be used in stream and river systems primarily in conjunction with cutthroat trout restoration projects. Tiger trout also have advantages in waters that present significant water quality challenges, making the use of rainbow trout impractical.

Planning

The challenging combination of forecasted resident population growth, a stable per-capita rate of fishing participation among Utahns, and the forecasted persistence of drought make strategic and adaptive management planning a critical component of future fisheries management efforts in Utah. Many management plans continue to be developed for certain high-profile waters with cooperation with the public through internet-based surveys, as well as committee-based approaches involving interested members of the public. However, more-recent planning efforts have focused on development of statewide strategic management practices. Community fisheries, tiger muskie stocking, and drought-response plans are examples of UDWR's proactive efforts to strategically and proactively address the challenges ahead.

Economic Considerations

From high-mountain streams and lakes to larger reservoirs and small community ponds, Utah offers many places to fish. Recreational fishing provides a significant economic benefit to the Utah economy and particularly benefits anglers [4]. Economic benefits have been estimated based on angler expenditures associated with the fishing trips. Estimates by the Department of Applied Economics at Utah State University indicate that in 2011 a typical angler spent $90 per fishing trip to Blue Ribbon waters in Utah. This resulted in $184 million in direct expenditures made by anglers for Utah goods and services, which generated an additional $143 million in economic output, resulting in a total economic output of nearly $327 million. Approximately 3,976 jobs were associated with these expenditures related to BRFs. Tax revenue generated by this increased level of output, labor income, and added value was estimated to be $35 million for state and local governments. The variety of angling experiences available to Utahns is important, and it helps to sustain recreational activity in a number of state parks associated with waterbodies.

Brine Shrimp Commercial Fishery

Brine shrimp are a prolific aquatic species that inhabit the hyper-saline waters of Great Salt Lake. The brine shrimp play an important role in the region's fisheries for several reasons. First, abundant supplies of brine shrimp and cysts (eggs) support millions of migrating and breeding shorebirds, waterfowl, and other avian species [5]. Second, brine shrimp cysts are harvested commercially by more than a dozen local companies, the economic impact of which is discussed below. Over the past 10 years, an average of 14,070,000 kilograms of raw harvest (cysts, empty shells, brine shrimp, algae, and other material) are harvested annually from Great Salt Lake. The dried and processed cysts supply more than 40 percent of the worldwide demand of brine shrimp used in the aquaculture industry. Management of harvest quotas is completed by the UDWR to prevent overexploitation.

Great Salt Lake supports over $1.3 billion in total economic output and many different industries. The Great Salt Lake also provides over 7,700 jobs in all sectors. [6]

The Utah Brine Shrimp Royalty Act requires harvesters pay a tax for brine shrimp eggs collected from Great Salt Lake. A portion of the monies generated in this way are added to a special state fund (Species Protection Account) used for conservation projects, which help plants and animals from being added to the Endangered Species Act and those that are listed.

Continued reductions in Great Salt Lake water elevation beyond the new record low set in 2021 could threaten the brine shrimp harvest. Low lake levels require dredging to maintain the use of harbors by harvest boats, and increases in lake salinity as lake levels drop has a negative impact on brine shrimp productivity.

Goals, Objectives, and Policies

Goal(s):

The UDWR's mission is to serve the people of Utah as trustee and guardian of the state's protected wildlife. Fish are considered protected wildlife and fall under the authority of the UDWR. The UDWR manages fisheries in Utah with the two following primary goals: (1) provide high-quality recreational fishing opportunities and (2) conserve native aquatic species, including fish, amphibians, and mollusks.

Assisting the UDWR in decision making and establishing management priorities is the Wildlife Board, which receives local input from the five RACs. The RACs consist of 12–15 members who are nominated

by various interest groups and selected by the Utah Department of Natural Resources' leadership. Members represent agriculture, sportsmen, non-consumptive wildlife, locally elected public officials, federal land agencies, and the public at large. The duty of each RAC is to hear input and recommendations, gather data, and evaluate expert testimony, and then to make informed policy recommendations to the Wildlife Board.

Objectives and Policies:

1. Protect, conserve, and improve Utah's fish and aquatic wildlife and the habitats upon which they depend.
2. Provide for the varied demands of fish and aquatic wildlife recreationists.
3. Seek constituent support and participation in fish and aquatic wildlife management programs.
4. Ensure the persistence of the diversity of native fish and aquatic wildlife in Utah, while also providing excellent opportunities for anglers and other recreationists.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Wildlife Resources Code of Utah

§ Utah Code Title 23A. *Wildlife Resources Code of Utah.*

§ 23A-5-303. *Release of wildlife unlawful - - penalty.*

§ 23A-2-206. *Jurisdiction of division over public or private land and waters.*

§ 23A-9-301. *Diversion of water prohibited--Exception for flood control.*

§ 23A-9-201. *Screens or other devices required--Failure to install after notice a misdemeanor.*

§ 23A-9-202. *Notice of intention to drain or divert waterway.*

§ 23A-9-303. *Taking protected aquatic wildlife or eggs [is] unlawful except as authorized.*

§ 23A-9-305 *Possession or transportation of live aquatic wildlife unlawful except as authorized*

§ 23A-5-309. *Taking, transporting, selling, or purchasing protected wildlife illegal except as authorized - - penalty.*

§ 23A-3-211. *Aquatic Invasive species Interdiction Act.*

Public Lands Planning

§ 63L-11-303. *Findings to be recognized and promoted.*

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

References:

1. *Man-Keun Kim and Paul M. Jakus. 2013. Final Report: The Economic Contribution and Benefits of Utah's Blue Ribbon Fisheries. Department of Applied Economics; Utah State University. 50 ppg.*
2. https://wildlife.utah.gov/blue-ribbon-fisheries.html
3. *Two-Story Reservoirs: a class of reservoirs characterized by distinct strata of warm and cold water caused by temperature-induced density differences. The warm stratum and corresponding littoral zone are dominated by black bass, yellow perch, black crappie, and sunfishes. The cold stratum is generally dominated by trout, such as stocked rainbow trout. Fish of the warm stratum naturally reproduce while the trout are dependent upon stocking. Some naturally reproducing populations of brown trout and cutthroat trout exist in these reservoirs, but they never make up much of the observed angler harvest.*
4. *Man-Keun Kim and Paul M. Jakus. 2013. Final Report: The Economic Contribution and Benefits of Utah's Blue Ribbon Fisheries. Department of Applied Economics; Utah State University. 50 ppg.*
5. *Conover, M.R., and J.N. Caudell. 2009. Energy budgets for eared grebes on the Great Salt Lake and implications for harvest of brine shrimp. Journal of Wildlife Management 73(7):1134–1139*
6. https://deq.utah.gov/water-quality/great-salt-lake-water-quality-standards

FLOODPLAINS AND RIVER TERRACES

Introduction

A floodplain is land that is susceptible to become inundated by water of any natural source [1]. A floodway is the stream channel and that portion of the adjacent floodplain that must remain open to permit the passage of the base flood. A 100-year flood is the flood elevation that has a one-percent chance of being equaled or exceeded in any given year, also known as the "base flood."

Flooding typically refers to a temporary overflow of water onto lands that are not normally inundated, which produces measurable property damage or forces the evacuation of people and vital resources. The Federal Emergency Management Agency (FEMA) further defines a flood as [2]:

> A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from: overflow of inland or tidal waters; unusual and rapid accumulation or runoff of surface waters from any source; or, Mudflow. Or, a collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floods frequently cause loss of life and may also damage, destroy, or disrupt property, communications, transportation systems, electric service, community services, crop and livestock, and commerce. Floods increase the likelihood of hazards such as transportation accidents, water supply contamination, and other health risks.

Several factors determine the severity of floods. These include rainfall intensity, rainfall duration, rapid snowmelt, and wildfires. A large amount of rainfall over a short time span can result in flash-flood conditions. Small amounts of rain can also result in flooding at locations where the soil has been previously saturated, or if rain concentrates in areas where impermeable surfaces are predominate. Impervious surfaces include parking lots, paved roadways, or burned areas with hydrophobic soils. Topography and ground cover are also contributing factors for floods. Water runoff is greater in areas with steep slopes and little or no vegetative ground cover.

The frequency of inundation depends on the climate, soil, and channel slope. In regions where substantial precipitation occurs during a particular season, or in regions where annual flooding occurs due to spring melting of winter snowpack, areas at risk may be inundated nearly every year.

Findings

As settlements and communities formed in Utah, little regard was given to the purposes and functions of floodplains. Homes, businesses, and even entire communities have
been built within floodplains and in high risk flooding areas. The development of these floodplains has resulted in continual and oftentimes severe social and economic loss.

Traditionally, planning for flood control in Utah has focused on protecting existing development(s) through structural works such as dams, diversions, and levees, and providing emergency relief and recovery assistance to flood victims following a disaster.

These approaches are expensive and have not been very effective in reducing flood damages. Despite considerable expenditure on flood-control works, annual damages due to flooding continue to rise. It is

apparent that a better understanding of flood risks and alternative flood-control measures are needed, those that address the root problem: humans' insistence to use and occupy flood-hazard areas.

The Utah Division of Emergency Management (DEM) provides expertise in the National Flood Insurance Program, Floodplain Management, Risk MAP (Risk Mapping Assessment and Planning), and mitigation planning.

The National Flood Insurance Program (NFIP) provides that alternative. This law addresses the need to control development in floodplains and to protect human health by relocating people and not floodwaters. It does not prohibit floodplain development but guides development in floodplain areas, balancing nature's needs to convey floodwaters with land-use needs. The U.S. Congress created NFIP in 1968, offering nonstructural approaches to reduce flood damage. The program makes flood insurance available to property owners in flood prone communities. In return, each community agrees to guide future floodplain development. It requires local governments to adopt and enforce floodplain regulations that meet federal requirements before flood insurance can be obtained in their community.

Floodplain management [3] is a community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community. These measures take a variety of forms and generally include zoning, subdivision, and building requirements, and special-purpose floodplain ordinances.

Prior to the creation of the NFIP, floodplain management as a practice was not well established, and only a few states and several hundred communities actually regulated floodplain development. For many communities, the NFIP was their initial exposure to land-use planning and community regulations.

A community's agreement to adopt and enforce floodplain management ordinances to prevent or regulate the construction in special flood hazard areas which may increase flood hazards, particularly with respect to development and new construction, is another ~~is an~~ important element in making federally backed flood insurance available to home and business owners in participating communities. Currently, more than 229 communities ~~2296 communities~~ in Utah voluntarily adopt and enforce local floodplain management ordinances that provide flood-loss reduction building standards for new and existing development. There are 790 digital printed panels and 146 paper panels with mapped flood risk. On those panels, there are a total of just over 7,400 mapped stream miles and more than 48,000 unmapped stream miles in Utah.

To better understand and communicate the areas where the risk of flooding is increased, FEMA's Risk MAP Program (which stands for Risk Mapping Assessment and Planning) provides communities with flood information, data, and tools they can use to enhance their mitigation planning efforts and act to better prepare their citizens. The State of Utah (DEM) signed a Cooperating Technical Partner Partnership Agreement with FEMA on December 1, 2004. This agreement establishes the partnership with FEMA to create and maintain accurate, up-to-date flood-risk data for the state of Utah. Through more-precise flood-mapping products, risk-assessment tools, and planning and outreach support, Risk MAP strengthens local ability to make informed decisions about reducing flood risk.

The 2019 State Hazard Mitigation Plan (SHMP) is the result of a collaborative effort between state, federal, and local groups and individuals, including FEMA, DEM, and the State Hazard Mitigation Team (SHMT), which continues to meet quarterly to discuss and incorporate new information and ongoing mitigation efforts.

The SHMP is designed to evaluate the risks that currently pose the greatest threats to Utah, and includes an assessment of natural hazards such as earthquakes, wildfires, floods, and naturally occurring phenomena such as radon gas and problem soils. The plan then goes one step further in prioritizing how

and when the threats will be addressed, suggesting mitigation activities that will have the greatest chance of success.

The Utah Division of Water Rights administers the Dam Safety Program, which assesses existing dam condition to prevent dam failure and uncontrolled release of water. The Dam Safety Program was established to protect the public against the possibilities and consequences of dam failures. There are nearly 300 "high hazard" dams statewide, with almost 100 along the Wasatch Front.

~~The~~ FEMA has mapped flood hazards in portions of Utah. The flood mapping program (Risk MAP) identifies flood hazards, assesses flood risks, and partners with states and communities to provide accurate flood-hazard and risk data to guide them to mitigation actions. Not all flood risk is mapped, and flood risks changes over time due to climate and changing weather patterns, development, flood events, and the technology used to develop the data ~~available data~~, so these maps are periodically updated for accuracy.

The FEMA also leads the Nation Dam Safety Program. According to the FEMA National Dam Safety Program Fact Sheet, the area downstream of a dam that would be impacted in the event of a failure or uncontrolled release of water is called the "dam failure inundation zone." Before buying a home or business, it is the buyer's responsibility to determine whether it is in an inundation zone.

High-hazard dams are not always large reservoirs. Some detention ponds or debris basins are also classified as high hazard because their failure would put downstream homeowner property and lives at risk.

Economic Considerations

Anywhere it can rain, it can flood and cause damage to property and infrastructure. County and statewide flood losses can be analyzed using the Spatial Hazard Events and Losses Database for the United States (SHELDUS) database. Washington, Salt Lake, Weber, and Utah, some of the most populated counties in Utah, also have the highest total losses from flooding.

Goals, Objectives, and Findings

Goal(s):

- Ensure the safety of Utahns, property, and infrastructure impacted, or potentially impacted, by floodplains and river terraces.

Objectives and Policies:

1. Continue to coordinate the National Flood Insurance Program and have flood risks mapped so that property owners can be more aware of flood hazards and be eligible to obtain flood insurance at reasonable rates.
2. Restore floodplain connectivity for threatened and endangered species that rely on these locations in areas outside human habitation while preserving the health and safety of residents.
3. Educate citizens and developers to review flood risk information on their property and identify measures they may implement to help protect their property from flood damage.
4. Encourage the use of bio-engineering practices or flood structures, dams, catch basins, gully plugs, and reseeding of grass ways to help reduce erosion during and after storm events.
5. Support analysis and approval processes for floodplain restoration as categorical exclusions under the National Environmental Protection Act (NEPA).

6. Support active management and restoration projects on federal lands to restore sinuosity, vegetation, and floodplain function that mimic the natural hydrologic system in suitable areas
7. Prioritize long-term hydrologic function over short-term ground disturbance, however allowing disturbance for assisting natural function or for natural disturbance modeling.
8. Encourage federal agencies to re-seed or revegetate burned areas as soon as possible after wildfires to mitigate sedimentation in streams and riparian areas.
9. Support proper management of forest health to decrease the risk of catastrophic wildfire and subsequent flooding damage.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Utah Code § 53-2a-106. Coordination for state development in a flood plain.

Any state agency that plans to develop or construct a building within a flood plain shall consult and coordinate with the Division of Emergency Management ~~division~~ to ensure compliance with minimum standards of the National Flood Insurance Program, 42 U.S.C. Chapter 50, Subchapter I.

References:

1. Utah Code §10-9-103
2. https://www.fema.gov/pdf/nfip/manual201205/content/22_definitions.pdf
3. https://www.fema.gov/pdf/nfip/manual201205/content/22_definitions.pdf

FOREST MANAGEMENT

Introduction

Utah's forests provide numerous social and economic benefits, including recreation, wildlife habitat, livestock grazing, open space, forest products, and carbon sequestration. Most of the forested lands in the state are either held by private landowners or managed by the U.S. Forest Service (Forest Service).

Forests in Utah cover 18.2 million acres, about one-third of Utah's land area. Most of this is managed by federal agencies [1]. The Bureau of Land Management oversees 7.2 million acres of Utah's forest, but only 115,000 acres are classified as productive forest. The Forest Service manages 6.3 million acres of forest, of which 2.8 million acres are classified as productive forests. About one-quarter of Utah's forests are on non-federal lands. Private landowners and Tribes manage 2.9 million acres, of which 594,000 acres are productive forest. The State of Utah oversees 1.4 million acres of forest, more than half of which are managed by the School and Institutional Trust Lands Administration (SITLA). In addition to these forests, Utah has 1.8 million acres of urban and community land with 16.6 percent tree cover, or 300,000 acres of urban and community forests [2]. Urban and community forests are expanding with urban and community development, and they provide significant ecosystem services to the people of Utah.

Many of these private forests were originally acquired for cattle grazing, agriculture, or mining development and are typically located near large tracts of public forest where critical watershed areas exist. Although relatively small in acreage, these private forestlands overlay many of the state's most valuable watershed, wildlife, and recreation areas and form critical fringe and connectivity zones throughout larger tracts of public forests (Utah Forest Legacy Program, Assessment of Need). Because of their locations, these lands are capable of providing benefits as well as posing risks for nearby communities if not properly managed. Utah's private forest landowners are a diverse group, consisting of corporate owners and private individuals, owners of large and small acreages, multi-generation owners and those who have only recently acquired forestland. Utah's non-industrial private forest (NIPF) landowners are distributed throughout all twenty-nine counties and own land for a variety of reasons and uses.

An estimated 3,500 landowners control the management and land-use activities on private forestlands greater than 10 acres in size. A national survey suggests there are about 11,000 forest landowners in Utah who own parcels smaller than 10 acres. Surveys conducted by the FFSL and Utah State University (USU) identified wood products, livestock, and recreation as the three primary reasons for forestland ownership in Utah. Utah owners of commercial high-elevation forestlands own an average of 6,300 acres.

The average forest landowner holds 600 acres of forestland, ranging between 40 and 15,000 acres.

Utah has more than 13,000 farms and ranches throughout the state. Rural forest landowners, ranchers and farmers may, through use of conservation plantings and other management practices, improve forest health and productivity, reduce soil erosion, improve riparian areas, improve crop and livestock productivity and improve wildlife habitat.

In addition to these forests, Utah has 1.8 million acres of urban and community land with 16.6 percent tree cover, or 300,000 acres of urban and community forests. Urban and community forests are expanding with urban and community development, and they provide significant ecosystem services to the people of Utah. [3]

Utah's Division of Forestry, Fire, and State Lands (FFSL) is responsible for maintaining forest health, responding to wildfires, and managing sovereign lands in Utah. Each of FFSL's six area offices employs

a forester who works with landowners and lessees to aid those wishing to utilize, improve, or conserve their forested lands.

The state also promotes urban and community forestry through programs like Tree City USA and the Arbor Day poster contest.

Findings

Approximately 25 percent of Utah's forests are in non-federal ownership. The vegetation communities that characterize Utah's forests and woodlands vary widely according to soil, climate, and topography. The availability of water is the primary determining factor. Utah woodlands generally begin at elevations of 4,500 feet, where pinyon-juniper combinations join mountain mahogany, Gambel oak, and sagebrush. As elevation and precipitation increase, the highly valued timber species of lodgepole and ponderosa pines begin to appear along the Uinta Mountains and in select areas of southern Utah, respectively.

Utah's greatest variety of traditional forest species flourishes in the Montane Zone, which includes all landscapes from 7,500 to 9,500 feet in elevation and receives annual precipitation of 18 to 40 inches. Nearly monotypic stands of Douglas-fir dominate the cool, north-facing slopes and canyon walls of this forest type, with Engelmann spruce, blue spruce, and subalpine fir coming in at elevations generally above 9,000 feet. Other coniferous species found in Utah's subalpine zone include modest stands of limber and bristlecone pine and a concentrated band of white fir that runs south through the central portion of the state. Clustered stands of quaking aspen, second only to Douglas-fir in state-wide distribution, add deciduous texture and golden fall color to Utah's forest lands between 6,000 and 10,000 feet in elevation.

Private landowners in Utah maintain stewardship over approximately 2.9 million acres of forest and account for 17 percent of the timber harvested in the state [4]. Although relatively small in acreage, these private forest lands overlay many of the state's most valuable watershed, wildlife, and recreation areas, and they form critical fringe and connectivity zones throughout larger tracts of public forest.

Forest Health

A healthy forest is one that provides a multitude of benefits, including but not limited to increased oxygen production and cleaner air, watershed protection, wildlife habitat, timber and other forest products, livestock grazing, recreation opportunities, and scenic beauty. When too many trees and plants are competing for space, sunlight, water, and minerals in the soil, the trees can become stressed. Stressed trees are more susceptible to insect and disease outbreaks. Much like plants in a garden, some trees must occasionally be removed (thinned) to provide for the health of those that remain. Fire is nature's way of thinning the forest. With an ever-increasing number of people building homes in the forest, as well as an emphasis on wildfire suppression, natural wildfire regimes have been largely removed from the system.

Some forests have too few trees or too few species of trees to provide the full range of ecological and economic benefits. This may be a result of fire, insect or disease outbreak, or human activities such as excessive visitation, motorized vehicle use, excessive logging, or overgrazing.

Accumulation of large amounts of woody debris and increased fuel loads, coupled with mortality-causing disturbance regimes (e.g., fire, insects and pathogens) exacerbate the potential for catastrophic wildfire. Research shows these conditions are often inconsistent with historical patterns of forest development. Some far-reaching impacts include changes in hydrologic function, nutrient cycling, and introduction of noxious and invasive species.

According to data from 2014, the average net annual growth of trees in Utah is -4,556,000 cubic feet per year. This shows that trees are dying faster than they are growing.

Significant issues impacting the timber resources in Utah include declining forest health, productive capacity of forest ecosystems, ~~fragmentation~~, and socio-economic concerns. Due to a lack of active vegetation management, forests in Utah have become more susceptible to intense wildfire, insect damage, and diseases. By ensuring that forests are managed and kept healthy, they will continue to provide benefits to the public.

Utah's landscape has many forest types, each with unique concerns. They are discussed below.

Mixed-conifer forests consist primarily of Engelmann spruce, sub-alpine fire, white fir, and some blue spruce. These high-elevation forests are found throughout Utah and are critical for watershed values. The major threat to mixed-conifer forests is the spruce bark beetle (*Dendroctinus rufipennis*) which has, in many cases, run its course. In stands with remaining spruce, it is critical to monitor for the presence of these beetles and remove infested trees before the adults take flight and colonize new trees in the area.

Douglas-fir is a relatively high-value timber tree. It often occurs in monotypic stands or mixed with white and subalpine fir. Overcrowded stands with large trees are susceptible to Douglas-fir bark beetle (*Dendroctinus pseudotsugae*). This species is somewhat less aggressive than the spruce beetle but can cause considerable damage if left unchecked. Maintaining appropriate stocking levels of all age classes is important to reduce damage, and the application of anti-aggregation pheromones in high-value areas can be very effective at preventing attacks.

Aspen stands are some of the most ecologically diverse forest types in the state. As such they are critical wildlife habitat. Aspen depends upon disturbance such as fire or cutting to stimulate new trees growing from the roots. In the absence of disturbances, many stands are in decline across the state. When young trees spring up they are often eaten and destroyed by wildlife and livestock before they can grow tall enough to be out of reach. In order to preserve these ecological treasures, active management is required to create and protect new young stands.

Ponderosa pine is a valuable timber species that is more common in central and southern Utah. Healthy ponderosa forests are typically open and park-like, with a few large trees and mixed shrubs and grasses in the understory. These large trees have thick bark that is resistant to fire damage under natural conditions, which include frequent, small fires that help keep the understory open. Without these frequent, small fires or forest management, the stands become overgrown and these majestic and valuable trees are at risk from the dual threats of mountain pine beetle (*Dendroctinus ponderosae*) and catastrophic wildfires.

Lodgepole pine is a valuable timber species that is seen at higher elevations in northern Utah. Some lodgepole forests consist purely of lodgepole pine, established following wildfires. Others can be mixed. At higher elevations, they are mixed with species such as subalpine fir, Engelmann spruce, and aspen. At lower elevations the mix includes aspen, Douglas-fir, and ponderosa pine. The ecology of each type of lodgepole forest is unique. All types of lodgepole are susceptible to mountain pine beetles.

Pinyon-juniper forests are very drought resistant so much so that they often encroach on other vegetation types. Due to the dense shade created when these stands grow densely, little vegetation can grow beneath. This creates vegetation problems for wildlife and invites severe wildfires that can cause long-term damage. Many opportunities are being researched to utilize the relatively small-diameter wood products that come from these abundant forests.

Gambel oak is classified as a key terrestrial habitat in the Utah State Wildlife Action Plan. Oak supplies "mast" (edible seeds, nuts, and fruit) to a variety of wildlife species. Oak readily resprouts after

disturbances such as wildfire, so other types of vegetation generally do not replace it following a burn. Currently, there is a surplus of young saplings in Utah and a deficit of older, more mature trees. This is due largely to the inappropriate fire frequency and intensity. Other threats to this forest type include invasive plant species such as cheatgrass, and urban development/cabin communities.

Riparian forests consist of the widest variety of trees and shrubs. This includes but is not limited to mountain maple, bigtooth maple, Fremont cottonwood, narrowleaf cottonwood, boxelder, peachleaf willow, coyote willow, hawthorn, chokecherry, and river birch. These forests act to filter sediment and pollutants from rivers and streams, reduce erosion, and provide immense value to domestic livestock and wildlife species. One of the main threats to this forest type is invasive tree species, particularly Russian olive and tamarisk. Continued education of loggers in Utah's Water Quality Guidelines is necessary to protect and preserve these riparian areas.

Urban forests provide economic and environmental benefits. When properly planted, they reduce heating and cooling costs and increase property values for individual homes. In larger cities, trees reduce the "heat island" effect, reduce pollutants, and help reduce stormwater.

Forest Action Plan (FAP)

The goals and strategies developed by the 2020 Utah Forest Action Plan (FAP) align with Utah's Shared Stewardship Agreement, a 2019 partnership initiative between the Forest Service Intermountain Region and the State of Utah. Shared Stewardship is a fitting framework for the Utah FAP because it builds on a shared vision and strategies that seek to engage partners, stakeholders and communities in identifying and developing priority projects through collaboration. Like Shared Stewardship, the Utah FAP takes an "all lands" approach, recognizing the need to address wildland fire threats and other forest management objectives at a landscape scale and across ownership boundaries. The Utah FAP's four goals, and strategies to achieve them, are consistent for FFSL, all of its partners, and all forests statewide. The strategies are guided by the core elements and mutual commitments in Utah's Shared Stewardship Agreement, as well as Key Performance Indicators (KPIs) developed by the State of Utah and Forest Service to monitor progress toward desired outcomes. The four goals are as follows:

1. Restore healthy and resilient trees and forests across Utah.
2. Reduce wildfire risk to communities, water resources, and other natural resource values.
3. Increase collaborative landscape-scale forest restoration activities across the state.
4. Build capacity among partners, stakeholders and communities to engage in forest restoration activities across Utah.

A priority landscapes map is presented for all forests in Utah based on the Shared Stewardship risk- and outcome-based approach. The map is a tool to help FFSL, Forest Service, and all their partners to identify high-priority landscapes for forest restoration and wildfire risk-reduction projects through collaborative approaches. [5]

Utah's Shared Stewardship Program

Shared Stewardship is an agreement between the State of Utah (FFSL and PLPCO) and the Forest Service that provides a framework for the State of Utah and the Forest Service to work together to identify forest health priorities that focus on restoration projects. The primary goals of the projects are protecting communities and watersheds from the threat of large unwanted wildfires.

The agreement commits to:

- Existing partnerships, programs, and initiatives that have been successful in Utah.
- Working together to identify and map shared priorities for protecting at-risk communities and watersheds across all lands.
- Making joint decisions and sharing resources for immediate and ongoing work in priority areas.
- Engaging local communities in dialogue and learning about active management and desired landscape-scale outcomes, including capacity-building and economic-development opportunities.
- Shared planning efforts, including the integration of the Utah FAP and the Forest Services' Five-Year Vegetation Management Plans.
- Co-managing wildfire risks and supporting each other in decisions that have been made together.

Cooperative Forestry Programs in Utah include the Following:

The FFSL provides assistance to private landowners with forested acreage or land that is capable of growing trees. There are several programs designed to inform and assist forest landowners.

The Forest Stewardship Program encourages the long-term stewardship of important state-owned and private forest landscapes by assisting landowners to more-actively manage their forests and related resources. The program provides assistance to owners of forest land in the form of technical assistance, forest management plans, and education. In addition, FFSL's foresters monitor forestry activities on private forests to encourage the use of best management practices for water-quality concerns.

Funding for forest management practices by NIPF landowners may be provided through various U.S. Department of Agriculture Natural Resource Conservation Service programs, such as the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Conservation Stewardship Program (CSP), Healthy Forest Reserve Program (HFRP), and other relevant conservation technical and financial assistance programs authorized by the Farm Bill. In addition, several Federal and State grant programs provide project funding that might assist NIPF landowners, including the Landscape Scale Restoration Program (LSR), Wildland Urban Interface Program (WUI), and Watershed Restoration Initiative (WRI).

In many cases, statutory, administrative, and physical constraints limit the ability to implement restoration treatments within the context of historical functions and conditions. There are legal authorities to provide legal justification for these types of activities. These mechanisms include the National Forest Management Act, the Multiple Use Sustained Yield Act, the Federal Land Policy and Management Act, the National Fire Plan, the Healthy Forests Restoration Act, the Organic Administration Act, and the Clean Water Act.

Managing forests encompasses a high degree of conflict and management needs to transition to the emerging direction of collaborative, cross-boundary, landscape-scale, cross-boundary forest restoration initiatives, which are necessary to address today's forest health and wildfire challenges. The goals and strategies of the Forestry Strategic Plan (FSP) and 2020 Forest Action Plan (FAP) [6 & 7] reflect this direction.

It is important to reach a balanced and agreeable approach to conservation and sustainably managed forests. The National Forest Management Act requires that the Forest Service coordinate their land management planning with the related planning efforts of state, local and tribal governments. The Forest Service publication *Understanding Your Opportunities for Participating in the Forest Service Planning Process* details how coordination helps ensure that landscape management has consistency across ecosystems and political boundaries so that mutual goals can be achieved where possible. The 2012 Forest Planning Rule requires that the Forest Service review and consider state, local and tribal land use

plans and policies during the forest plan process and assess the interrelated impacts of these local plans when developing forest plans.

The Forest Health Program provides information to federal and state land managers, as well as private forest landowners, on current and past insect and disease conditions in the state through annual detection and monitoring. It also provides training, education, and assistance related to forest health issues, potential effects, and opportunities for prevention and mitigation.

The Forest Legacy Program conserves and retains private forestlands of regional or national significance that are threatened with conversion to non-forest uses. The program uses conservation easements or fee acquisition to prevent forest fragmentation and conversion, maintain traditional land uses, and protect significant environmental values on private lands for future generations. Conservation easements are used to achieve this goal with priority given to lands which:

- are threatened by future conversion to non-forest uses,
- maintain forest sustainability,
- protect and enhance water quality and water supplies,
- protect wildlife habitat and maintain habitat connectivity for biodiversity,
- maintain and restore riparian areas, and
- assist in maintaining the cultural and economic vitality of rural communities.

The Conservation Education Program complements existing local, state, and federal natural resource education programs and encourages education partnerships by increasing awareness, knowledge, and appreciation of natural resources and ecosystems, connecting children to nature, and helping people to better understand natural resource issues.

The Urban and Community Forestry Program provides financial and technical assistance to Utah communities to conduct inventories and manage trees and forests to maximize social, environmental, and economic benefits. The program provides competitive grants and engages volunteers in a wide range of projects, such as tree planting, education, and training; encourages communities to participate in Tree City USA, a national program of the Arbor Day Foundation; and works with many local agencies, nonprofit groups and private businesses.

Urban Forestry means the planning, establishment, protection, and management of trees and associated plants, individually, in small groups, or under forest conditions within cities, their suburbs, and towns as defined by the Cooperative Forestry Act of 1978.

Because this definition of Urban Forestry stretches beyond large metropolitan, “urban” areas, a more descriptive title is “Urban and Community Forestry " (U&CF).

Another term that is often used when talking about U&CF is “Arboriculture”. Arboriculture is the science of tree planting and maintenance and is a major component of U&CF. Professional tree trimmers are labeled “arborists" and can become certified through the International Society of Arboriculture.

Arbor Day Grants

The FFSL, Forest Service, and Utah Community Forestry Council provide annual Arbor Day celebration grant assistance. The range for this grant is $200 to $600 and provides funds for communities to meet one of the four criteria for Tree City USA, which is to proclaim and observe Arbor Day. Utah cities, towns, and communities interested in developing or improving a sustainable community forestry program and are not currently a Tree City USA may apply.

Community Forestry Partnership Grants

The FFSL, in partnership with the Forest Service, provides the opportunity for any Tree City USA community to apply for this grant. The range is $1,000 to $8,000, and the grant is intended to encourage the planting and maintenance of trees within communities and meet the following objectives:

- Promote urban forestry planning and tree management plans.
- Connect urban forestry benefits to diverse environmental issues.
- Cultivate an appreciation and understanding for the social, economic, environmental and aesthetic values of trees, forests and related resources in cities and towns.
- Develop and encourage the profession of urban forestry through technology transfer, education, and training.
- Seek support from all levels of government and citizens for Urban and Community Forestry Programs.

A major priority of the State Urban and Community Forestry Program is to assist communities in moving from a "developing" stage of their urban forestry program to the "managing" stage. The Forest Service defines a "managing" forestry community as having all four of the following benchmarks ("developing" communities have at least one component):

- Tree ordinance
- Professional forestry/arboriculture staff
- Tree board/commission
- Tree management plan based on inventory data

Economic Considerations

In 2016, Utah comprised approximately 3.7 million acres of non-reserved timberland, with national forests accounting for 75 percent, private and tribal owners accounting for 16 percent, and other public agencies accounting for the remaining 9 percent. All private timberland was at that time classified as NIPF timberland, and Utah had no large tracts of timberland owned by entities operating primary wood-processing facilities. Sawtimber volume on non-reserved timberlands was estimated at 4.2 billion cubic feet, or approximately 21 billion board feet MMBF Scribner in 2016.

Utah's 2016 commercial timber harvest was 24.9 million board-feet (MMBF) Scribner, 29 percent higher than the 2012 harvest of approximately 19.4 MMBF. Although harvest was higher in 2016, this volume is 18 percent less than the 2007 harvest of around 30 MMBF Scribner, and more than 60 percent less than the 1992 harvest of 64 MMBF. Of the timber harvested in Utah during 2016, 48 percent was live and 52 percent was salvage or standing dead when harvested. While Utah's harvest has increased overall since 2012, all of this increase has occurred on national forest land, which has increased by 96 percent. Harvest levels from private and tribal timberlands, and other public lands, declined during this same period by 43 percent and 50 percent, respectively.

As in most of the western states, decreasing federal timber harvests during the 1990s led to greater shares of annual timber harvest coming from other ownerships. National forests still provided the majority of Utah's harvest (80 percent) in 2016, but the volume and share supplied by private and tribal owners continues to be an important component. During 2016, private and tribal landowners accounted for 14 percent (3.6 MMBF) of Utah's timber harvest. The share of harvest from BLM and state lands in Utah was 6 percent of the total in 2016.
National forests provided the majority of sawlogs and house logs harvested in Utah, with 80 percent and 82 percent, respectively, in 2016. National forests also provided the majority of other products (e.g.,

furniture logs, post and poles, fiber logs) at over 76 percent. Sawlogs accounted for about 72 percent (17.9 MMBF) of the total volume harvested in 2016; house logs were 12 percent; and other products accounted for about 16 percent.

In 2016, Summit County led Utah's timber harvest with 29 percent (7.3 MMBF) of total volume, followed by Kane and Sanpete counties, with 13 and 7.5 percent, respectively. In 2012, Summit County led Utah's timber harvest, with 33 percent (6.4 MMBF Scribner) of total volume; Uintah followed with 12 percent (2.3 MMBF); and Emery, Rich, and Sanpete counties followed, each providing 7.7 percent (1.5 MMBF).

In 2016, there were 18 primary forest products manufacturers. This included eight sawmills, seven house-log and log-home manufacturers, and three other forest-products facilities. Only 58 percent of the wood was processed in-state. The remainder was processed in Colorado, Wyoming, and Idaho.

The number of Utah sawmills has declined since 1966, but the average output per mill has risen from 1.4 million board feet [MMBF] to 1.9 MMBF. In 1992, sawmills alone produced 63.6 MMBF of lumber and other sawn products. House log, log home, and other roundwood product manufacturers processed an additional 7.6 MMBF of Utah timber. In addition to these traditional wood products, Utah's timber industry utilizes 82 percent of the mill residue it produces during processing. Because Utah's sawmills are not near pulp mills or particle board plants, most of the residue is used locally for firewood, fencing materials, windbreaks, hogfuel, landscaping materials, and animal bedding. [8]

Research is needed to find new markets for wood utilization. Biochar is showing some potential as a soil amendment. Essential oils have also become a small but somewhat viable market for juniper trees. Though the landowners are not paid for juniper removal, many want it removed for management purposes. This allows essential oil producers to make money and contribute to Utah's economy while private landowners receive the benefit of healthier, wildfire-resistant properties at little to no cost.

A consistent supply of project work, and the associated timber or woody biomass, is key to fostering a workforce of skilled and capable forest- and wood-workers. And this skilled workforce is the critical element. These forest- and wood-workers are the individuals and companies who have the knowledge, skills, abilities, and equipment to help private landowners as well as federal, state, and local agencies complete the necessary management work. Land-management agencies do not have the necessary capacity for forest health and wildfire risk reduction. The private sector—both people power and capital—is required to get the work accomplished.

In addition to timber management, domestic livestock grazing is a vital management tool in Utah's forests to manage fuel loads, reduce wildfire risk, and provide economic benefits to local communities. Grazing in Utah's national forests has declined by roughly 50 percent since the early 1900s. Currently, there are an estimated 614,000 active animal-unit months (AUMs) on Utah's national forests, which contributes more than $61.4 million to local economies. In addition to the economic benefits, domestic livestock grazing reduces the cost of vegetation management.

Goals, Objectives and Policies

Goal(s) [9]:

- Promote healthy and resilient trees and forests.
- Advance partnerships for cross-boundary, landscape-scale initiatives on federal, state and private lands.

- Integrate forestry programs with other FFSL and Utah Department of Natural Resources programs for increased effectiveness.
- Heighten the visibility of forestry programs and services for greater public awareness, knowledge, and involvement in active stewardship of trees and forests.
- Build a respected, responsive, capable, and enduring forestry organization [and industry] where people want to work.

Objectives:

1. Assist private landowners with forested acreage.
2. Ensure a healthy forest that displays resilience to disturbance by maintaining a diverse set of structures, compositions, and functions across the landscape.
3. Encourage maximum sustainable logging and grazing to reduce wildfire risk, stimulate new growth, and to provide economic benefits and jobs to Utah's rural counties.
4. Foster urban forestry through the planning, establishment, protection, and management of trees and associated plants, individually, in small groups, or under forest conditions within cities, their suburbs, and towns.
5. Assist the forest product industry to achieve viable and sustainable operations.
6. Utilize the Utah Forestry Action Plan (FAP) as a guidance document.
7. Support and enhance the goals of the Forestry Action Plan (FAP):
    - Restore healthy and resilient trees and forests across Utah.
    - Reduce wildfire risk to communities, water resources, and other natural resource values.
    - Increase collaborative landscape-scale forest restoration activities across the state.
    - Build capacity among partners, stakeholders and communities to engage in forest restoration activities across Utah.
8. Mature and old growth forests should be managed for tree characteristics in lieu of designating specific areas or boundaries for mature and old growth forests.
    - Mature and old growth forest characteristics should be considered when actively managing forest ecosystems, but should not impede the ability to actively manage and restore forest ecosystems. Ecosystem resiliency is in part dependent on having a range of various tree age classifications within a forested ecosystem.
9. Oppose designations, policies, or other actions that limit, restrict, or impede the States ability to actively manage forest resources in Utah.
10. Support the Western Governor Associations Forestry Resolutions that was coordinated by the governors of multiple western states and local subject matter experts.
    - Encourage federal land management agencies to adopt the Western Governor Associations recommendations.

Policies:

- Support the sustainable removal of conifers to promote the establishment of aspen and attendant grass, forbs and shrubs where appropriate.
- Encourage timber harvesting to prevent fuel load and biomass buildup.
- The State encourages Agencies to adopt policies that promote and facilitate early detection and control of insect and disease outbreaks using biological, cultural, and chemical methods.
- Encourage prompt removal and salvage of drought, fire, and beetle-killed timber and reseed or replant as appropriate to maintain healthy forests and watersheds.
- Support the use of all appropriate silvicultural methods to reduce the risk of damage due to insects, disease and fire.
- Use trees of the best genetic quality when replanting a site.
- Monitor and control invasive species, particularly in riparian corridors.

- Encourage agencies to adopt and maintain scientifically sound forest management policies based on current, high-quality data to pursue multiple use of public forest resources to provide sustainable yield of timber, forage, firewood, wildlife, fisheries, recreation, and water.
- Identify and target private forest landowners located in important forest resource areas for assistance with planning.
- Develop Forest Stewardship Plans in accordance to FFSL standards for private forest landowners who demonstrate their commitment to proactive management.
- Encourage and promote cooperation by other land management agencies (state, private and federal,) employing ecosystem management, forest health, and stewardship principles.
- Develop partnerships and cooperative relationships with organizations that share goals of forest management.
- Develop and present workshops for private landowners.
- Design and implement demonstration areas.
- Promote job-related training and educational opportunities.
- Educate loggers and other contractors on the Forest Water Quality Guidelines.
- Support the management of timberlands suitable for commercial harvest for timber or wood-fiber production.
- Support the management of forestlands not suitable for commercial harvest to maintain forest-cover species with emphasis on production of other forest resources and uses.
- Support the management of non-commercial aspen stands in mixed-age groups to provide forage.
- Support the use of commercial sales of timber and forest products and thinning to control stocking where opportunities exist.
- Support harvest of forest products when the activity would improve water production and/or does not adversely affect water quality.
- Where feasible, encourage the harvest of forest products in areas of proposed or existing vegetation treatments to offset costs of treatments and reduce the need for additional site entries.
- Support planting new trees to provide desired cover where natural regeneration is insufficient.
- Support the use of mechanical removal, chemical removal, or fire to alter or perpetuate forests and increase herbaceous yield where timber harvest is impractical or demand does not exist.
- Understand current and emerging enabling technologies for wood processing.
- Develop an inventory of possible large, medium, and small business possibilities that could utilize small-diameter wood.
- Conduct an initial industry viability assessment based on analyzing a variety of business configuration scenarios.
- Provide an initial assessment report and presentation.
- Support federal partnerships with industry to create scalable projects to provide certainty in the supply of timber.
- Support the re-establishment of a viable wood-fiber industry.
- Support the use of the timber industry to sequester carbon through the harvest of wood products.
- Oppose federal designations for mature and old growth forest based on specific boundaries rather than forest characteristics.
- The State generally opposes any designation, policy, or other action that limits, restricts, or impedes the States ability to conduct forest management statewide.
- There are established and designated Utah Timber Agricultural Commodity Zones for the purpose of:

  (a) preserving and protecting the agricultural timber, logging, and forest products industry within these zones from ongoing threats;

  (b) preserving and protecting the significant history, culture, customs, and economic value of the agricultural timber, logging, and forest products industry within these zones from ongoing threats; and

(c) maximizing efficient and responsible restoration, reclamation, preservation, enhancement, and development of timber, logging, and forest products and affected natural, historical, and cultural activities within these zones, in order to protect and preserve these zones from ongoing threats.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State Land Use and Management Planning for Federal Lands
§ 63L-8-104. *State land use planning and management program.*

Forestry, Fire, and State Lands

§ 65A-8-105. Urban and Community Forestry Program.

§ 65A-8-301. Legislative finding and purpose.

Utah Forest Practice Act

Uniform Agriculture Cooperative Association Act

Plant Pest Emergency Control Act

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GEOLOGICAL AND PALEONTOLOGICAL

Introduction

Utah is widely recognized for the diversity of its geological and paleontological resources. Straddling three physiographic provinces— (1) Basin and Range Province, (2) Middle Rocky Mountains, and (3) Colorado Plateau—Utah's geology and topographic variety are foundational to the state's economic prosperity and quality of life, providing opportunities for mineral and energy resource development as well as recreation and tourism.

Mineral and energy in Utah includes such diverse resources as the metallic mineral concentrations that led to creation of one of the world's largest open-pit mines; oil and natural gas accumulations that represent a significant contribution to the nation's fossil-fuel supply; critical minerals and rare-earth elements that contribute to national security and economic prosperity; geothermal resources that contribute to a diverse renewable-energy portfolio; and a variety of salts and other industrial minerals and substances from Great Salt Lake (see Mineral and Mining and Energy Resources). Utah's geology contains world-class fossil localities, including dinosaur fossils and world-class scenic and recreational resources. These resources attract many visitors to Utah's five national parks and its dozens of national monuments, national recreation areas, and state parks. Utah has the most complete record of the history of life on Earth for an area its size.

Along with the benefits that Utah's geologic resources bring, ongoing geologic processes also present challenges for, and hazards to, Utah's citizens and economic concerns. For example, hazardous faults can generate large earthquakes, with potentially devastating effects; slopes underlain by weak rock or soil are prone to land sliding; clayey bedrock and soils are locally prone to expansion or collapse; and uranium-bearing rocks and soil produce potentially deadly radon gas. Also, Utah's status as the second driest state in the nation brings a related set of challenges and hazards for development and quality of life: water-supply resources are limited, and water quality is vulnerable to degradation from development activity; subsidence and earth fissuring occur locally over aquifers depleted by consumptive use; and the precipitation that does fall often triggers flooding and debris flows, typically as the result of rapid spring snowmelt and intense cloudburst storms. Proactive mitigation of geologic hazards is key to sustaining the health, safety, and welfare of Utah's citizens and visitors.

Findings

Many of Utah's most interesting geological sites coincide with popular recreation destinations, particularly its national parks, national monuments, national recreation areas, and state parks. In addition to these high-profile locales, there are numerous other notable sites throughout the state, and the Utah Geological Survey (UGS) features these on its interactive GeoSights map.

Utah is famous for its dinosaur fossils. The Mesozoic Era is known as the "Age of Dinosaurs," and Utah has perhaps the best Mesozoic rock record in the world. Well-known dinosaur localities in Utah include Dinosaur National Monument in northeastern Utah, Cleveland-Lloyd Dinosaur Quarry at the Jurassic National Monument in the northern San Rafael Swell, St. George Dinosaur Discovery Site at Johnson Farm, and Utahraptor State Park. Utah is also famous for its trilobite and other Cambrian fossils dating back to the origins of multicellular life. Trilobites are a class of extinct marine invertebrate popular with collectors; Utah's Cambrian includes four levels preserving soft-bodied fossils, which in other countries (China and Canada) are surrounded by national reserves. The rest of Utah's marine Paleozoic record is just as extraordinary, as is its marine Mesozoic record. The Uinta Basin preserves a spectacular record of the first half of the Age of Mammals, with critical records documenting the origins of nearly all the modern orders of mammals as exhibited at the Utah Field House of Natural History in Vernal, Utah.

Utah's fossil record of nearly every vertebrate group is extraordinary (although lacking in any fossil whales). Utah specimens can be seen in museums throughout the world.

Utah's extraordinary paleontological record includes the following:

- 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 leaf and wood localities, which are remnants of plants (e.g., Escalante Petrified Forest State Park).
- Trace fossils, which may include skin impressions, eggs, track sites, and remnants of burrows or borings.

Additional Findings

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. Utah statutes allow local jurisdictions to address geologic hazards through zoning districts and ordinances 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.

Utah Code §79–3–202 defines the powers and duties of the Utah Geological Survey with regard to the investigation and research of geological and paleontological resources and geologic hazards, as well as collection, preservation, and distribution of data.

Additional information on Utah's geologic hazards, as well as guidelines for conducting geologic-hazard investigations, can be found in *UGS Circular 122, Guidelines for Investigating Geologic Hazards and Preparing Engineering-geology Reports, with a Suggested Approach to Geologic-hazard Ordinances in Utah*. [1]

There are no state requirements for paleontological resources on private lands. Should the Utah State Paleontologist identify a particular area as sensitive for such resources 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 U.S. Bureau of Land Management (BLM) maintains a list of paleontologists with permits for BLM lands.

There are federal and state laws and regulations protecting significant paleontological resources, including the Antiquities Act (16 USC §432, 433 et seq. [1906]) and National Environmental Protection Act (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, the BLM has developed regulations for the protection of paleontological resources on lands administered by their field offices.

Utah Code §79–3–501 through 510 addresses permits required to excavate critical paleontological resources on lands administered by the state, ownership of collections and resources, designation of paleontological landmarks, requirement for report of discovery on state or private lands, establishment of

a state paleontological register, and protection of School and Institutional Trust Lands Administration interests relating to paleontological resources.

Where possible, the State of Utah will promote the curation and display of paleontological materials near their point of collection. Only a handful of federal paleontological repositories exist in Utah, and most are far from rural communities and the areas of collection. Federally approved repositories from throughout the United States may curate paleontological materials in their own collections from federal lands in Utah. It is understood that paleontological collections and materials from federal lands, and their curation, are subject to the Paleontological Resources Preservation Act of 2009, whereas the regulations were created to "establish definitions, standards, procedures and guidelines to be followed by Federal agencies to preserve collections of prehistoric and historic material remains." While the regulations require that a facility meet high standards for long-term curatorial storage as defined by the U.S. Department of the Interior (DOI) museum collection is available for "scientific and educational uses." Local communities, museums, and others may request a loan of federal paleontological materials from the approved curation facility housing the specimens. Federally accredited institutions in Utah for the repository of paleontological materials include the Natural History Museum of Utah (NHMU) (Salt Lake City), Prehistoric Museum at Utah State University Eastern (Price), BYU Paleontological Museum (Provo), and Vernal Field House of Natural History State Park and Museum (Vernal). Additionally, the St. George Dinosaur Discovery Site at Johnson Farm and the Museum of Moab may curate limited paleontological materials, but are still seeking full federal repository status.

Paleontological collections from state and private lands have more flexibility in their availability for display, and the state should promote loan and display of these types of collections for the benefit of local communities. Utah Code §53B-17-601 designates the NHMU as the state-mandated museum, and indicates the NHMU shall "make available to people throughout the state, through traveling exhibits and outreach programs, archeological and paleontological objects retrieved from the state of Utah" and "shall provide professional expertise and assistance in the proper care of the archeological and paleontological collections from state lands as they are housed throughout the state." The NHMU must approve repositories of paleontological collections on an annual basis for other institutions within Utah and for curation out of state.

Summary of Potential Fossil Yield Classification (PFYC) System

The Potential Fossil Yield Classification (PFYC) system [2] is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in a paleontological resource assessment, and should be used to assist in determining the need for further mitigation assessment or actions.

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 PFYC 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 within 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 descriptions for the various classes can be found at this link and are intended 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.

Statewide geology and geologic resource maps have been compiled by the UGS. The maps are available through the UGS website (https://geology.utah.gov).

Economic Considerations

Cultural, historical, geological, and paleontological resources are often connected with tourism and recreation. For example, the UGS has created a GeoSites online interactive map to help people explore Utah's geological sites.

Please refer to the *2022 Economic Report to the Governor* for economic considerations related to mineral and energy resources. This report is updated annually and the most recent version should be used when reviewing related economic considerations. [3]

Additional data can be found in *UGS Circular 121, Utah's Energy Landscape.* (https://ugspub.nr.utah.gov/publications/ circular/c-121.pdf).

Goals, Objectives, and Policies

State of Utah objectives related to geological and paleontological resources are encapsulated in Utah State Code, under "Powers and duties of [the Utah Geological] survey" (§ 79–3–202). In summary, the state's objectives are to investigate, research, and analyze geological and paleontological resources "in order to facilitate their economic use," to "contribute to the most effective and beneficial administration" of lands administered by the state, and "to serve the needs of the state and to support the development of natural resources and utilization of lands within the state." Additionally, Utah State Code tasks the UGS with determining and investigating "areas of geologic and topographic hazards that could affect the safety of, or cause economic loss to, the citizens of the state."

The state shall ensure all of Utah's communities have access to these resources and collections, and will:

- support efforts of local communities to create displays and museums that meet federal standards for the display, and possible curation, of paleontological materials as close to their point of origin as possible;
- promote local efforts for traveling exhibits and display of state-owned paleontological materials for educational and local economic opportunities; and
- collaborate with local federal offices to engage local communities and tourists in awareness and appreciation of Utah's rich paleontological legacy.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

State of Utah Resource Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Paleontology

§ 79–3–501. *Permit Required to Excavate Critical Paleontological Resources on State Lands—Removal of Specimen or Site.*

§ 79–3–502. *Permit Required to Excavate Critical Paleontological Resources on School and Institutional Trust Lands—Removal of Specimen or Site.*

§ 79–3–503. *Ownership of Collections and Resources.*

§ 79-3-505. *Paleontological landmarks.*

References:

1. https://ugspub.nr.utah.gov/publications/circular/c-122.pdf
2. https://www.blm.gov/policy/im-2016-124#:~:text=Policy%2FAction%3A%20The%20Potential%20Fossil,actions%20that%20involve%20surface%20disturbance%2C
3. https://gardner.utah.edu/wp-content/uploads/ERG2022-Full.pdf?x-71849&x71849

IRRIGATION

Introduction

Irrigation is the practice of applying supplemental water to land (beyond that which is received by the land from naturally occurring precipitation) for the purpose of increasing the agricultural output of cropland and sustaining additional vegetation growth throughout the landscape.

Much of Utah's agriculture would not be possible without irrigation. Utah's arid climate provides limited and frequently unreliable annual rainfalls. Traditionally, irrigation water has been distributed via a network of canals and ditches from rivers and streams, but many have been converted to pipelines. Additionally, because of the extensive conversion of agricultural lands into more-urban uses, some irrigation water is now distributed through secondary irrigation supply lines that parallel the municipal culinary water supply, which allows water users to irrigate using water previously allotted to farmland [1]. The owner of a ditch, canal, flume, or other watercourse is required to maintain the watercourse in order to prevent damage to the property of others and maintain an open route of travel [2].

Within each watershed, various entities and individuals have legal claims (i.e., water rights) to use the water for "beneficial use" and are permitted to divert water from streams into the storage dams, canals, and pipelines. Beneficial use is "the basis, the measure, and the limit of all rights to the use of water" in the state of Utah [3]. Activities that promote the economy are generally considered to be beneficial uses. The use of water for beneficial purposes has been declared to be a public use [4]. The distribution of water in Utah is governed by state law and is based largely on geographic proximity, available supply, and ownership of the water rights [5].

Findings

According to the Utah Division of Water Resources, approximately 75 percent of water diverted from natural sources in Utah goes to agriculture. Nearly all of this water is used for agricultural irrigation. By some estimates, more than 70 percent of Utah's diverted water is carried in canals, which are managed and maintained by nonprofit, shareholder-owned irrigation companies. There are more than 1,000 of these irrigation companies, most of which are more than 100 years old and administered by volunteer directors. [6]

There are more than 5,000 miles of canals in Utah that carry more than 5 cubic feet per second of water, and perhaps twice that many smaller canals. This figure does not include the thousands of miles of drainage ditches that make land farmable and carry return flows back to streams. These thousands of miles of canals transport the surface water used to irrigate a majority of the 1.1 million acres of irrigated agricultural land in Utah; the balance is irrigated with groundwater. Approximately 97 percent of irrigated lands are harvested croplands. [7]

Though they were built to carry irrigation water to farms, canal systems in urban settings also serve municipal and industrial interests. They supply water for industrial processes; deliver irrigation water to suburban lawns through so-called "secondary water systems;" move stormwater away from threatened homes, businesses, and institutions; and support wetlands and other riparian environments that would otherwise be lost. [8]

Significant water resources have historically been devoted to agricultural production. However, in the face of competing demands for water from Utah's current urbanization trends and land use transitions, the multiple social values supported by water allocated to agriculture are too often overlooked. These values include security of local food production, sustaining rural Utah economies and communities, open space

in increasingly urbanized areas, improved capacity for both drought management and flood control, and other ecosystem services, such as providing wildlife habitat and buffering wetlands and other critical lands from impacts of urban development.

Increasing the efficiency of this key resource has been a top priority of local, state, and federal efforts. Through programs funded by the United States Department of Agriculture (USDA), such as the Environmental Quality Incentives Program (EQIP) managed by the Natural Resource Conservation Service (NRCS), along with the Agricultural Resource Development Loan (ARDL) program from the Utah Department of Agriculture and Food (UDAF), many improvements have been made to farm irrigation systems. Such improvements have included enclosing ditches and conveyances to reduce water loss to seepage, replacing less-efficient systems with higher-efficiency sprinklers, pivot systems, precision laser leveling of flood-irrigated fields, and converting orchards to ultra-efficient micro-irrigation/drip systems. These improvements will continue to be a priority for years to come, but must be undertaken with care due to the effects such changes may have on river-basin hydrology, downstream water users, and local ecosystems.

A more glaring yet largely unaddressed issue is the aging of irrigation delivery systems. Canals and ditches continue to age and fall into disrepair. This is largely due to the overwhelming cost of piping and other improvements, and the lack of grant resources available to address these issues. The required technology is readily available. The reality is that there are two things that must happen. Meaningful grant resources must be made available, and there must be a conceptual shift in the minds of irrigation companies and their shareholders. While it is understood that agriculture generally has a small profit margin, the public has reaffirmed through the Envision Utah effort that maintaining the agriculture industry is of high value. This, along with other considerations, validates the use of public funds to address the aging infrastructure so vital to agricultural profitability. At the same time, water shareholders and users must change their mentality as to the cost of their water shares. They must be willing to accept an increased water assessment, with foresight equal to irrigation forbearers, and take advantage of low- and no-interest loan programs that are available. Some companies have been able to do this but the majority continue to merely "make it through one more year."

Furthermore, in 2022, a special topic on "productive agriculture" was published as part of Utah's Coordinated Action Plan for Water [9]. Previous water planning efforts have identified more than 200 unique recommendations to better secure Utah's water future. The implementation of many of these recommendations will require changes to state water law, other legislative actions, or partnerships with non-state entities. The intent of Utah's Coordinated Action Plan for Water is to identify specific actions that Utah's executive branch can undertake immediately to help move some of these many recommendations forward.

Economic Considerations

In 2017, there were 1.06 million acres of harvested cropland in Utah—of which more than 80 percent was irrigated—with a value of $574 million. [10]

Irrigation adds tremendous value to agriculture. In 2012, irrigated farms accounted for roughly half of the total value of crop sales on 28 percent of U.S. harvested cropland [11], a number that is likely significantly higher in Utah due to extremely low precipitation rates found across most of the state.

In 2008, small farms (annual sales under $250,000) made up 62 percent of the total irrigated farmland in Utah [12].

A 2016 report published by Utah State University details the significant contributions of agriculture to the state economy. The combined agricultural processing and production sectors account for 15 percent of the state's total economic output, or $21.2 billion, after adjusting for multiplier effects. [13]

There are more than 250,000 acres of irrigated pasture in Utah, most of which are grazed by livestock [14]. From 1970 to 2015, direct cash receipts from livestock and products increased from $1.28 billion to $1.57 billion, a 17.5 percent increase [15]. Cash receipts from livestock and products constituted 73 percent of all farm business cash receipts, making livestock the driver behind most of Utah's agricultural economic growth [16]. These direct cash receipts do not reflect the full amount of economic growth provided by livestock and its products due to the multiplier effect that cash receipts have once they are spent within the community.

Irrigation infrastructure also provides tremendous economic benefits to municipalities and industry by providing pre-existing, low-cost options for water delivery and stormwater removal. While no study has been conducted to quantify the value of these services, it would be tremendously expensive if each municipality or industry currently served by Utah's existing network of canals and ditches had to devise their own, independent water delivery and removal.

Goals, Objectives, and Policies

Goal(s):

- Ensure the safe and reliable conveyance of water resources to promote sustainable agriculture and other irrigation related activities.

Objectives:

Help water rights holders maintain beneficial use and avoid forfeiture of water rights.

Create opportunities and incentives for irrigators to make efficiency improvements that protect both the environment and water rights on the river-basin level.

- Ensure the proper and active management of public land watersheds, which supply most of Utah's agricultural, municipal, and industrial water.
- Preserve the integrity and functionality of Utah's existing canals and ditches, which water much of Utah's irrigated land.
- Preserve the integrity and functionality of irrigation companies, which manage and maintain the vast majority of Utah's canals and ditches.
- Ensure adequate funding for canal infrastructure maintenance and replacement.
- Provide public safety by limiting access to dangerous structures, as well as training and encouraging operators and the public to practice safety and identify safety concerns.
- Preserve access and system efficiency with regular maintenance of rights-of-way and easements. When possible, coordinate efforts between canal operators and government entities as a means of encouraging cooperative relationships between organizations while facilitating public interests.

Establish long-term plans for:

- Preservation of high-value farmland that still allows the orderly, planned transition of other agricultural land and water resources to municipal use.
- Preservation of historical significance and public access where desirable.

- Modernization of shared operations and equipment that facilitate the use of appropriate irrigation technologies.

Encourage agricultural irrigators to:

- Where appropriate, modernize and provide resources to assist with upgrades such as pressurized pipe systems that reduce traditional flood irrigation and favor transitioning to sprinkler and drip irrigation.
- Explore and develop alternative irrigation water management strategies, such as deficit irrigation, split-season leases, water banking, and other practices that can augment municipal supplies or provide environmental benefits such as improved water quality and instream flows for fish habitat.
- Coordinate irrigation scheduling between water users—cooperate with crop irrigators' operational needs when systems are shared with secondary irrigation users.
- Encourage residential and commercial landscape irrigation efficiency and water-quality protection practices that emphasize native-plant choices, xeriscaping techniques, reduction of impermeable surfaces, reduction in chemical use, proper stormwater handling, etc.
- Utilize stormwater treatment methods that prevent stormwater runoff from entering canals and ditches.

Policies:

Support the findings, tasks, and recommendations of Utah's Coordinated Action Plan for Water.

Support the Recommended State Water Strategy's recommendation to create basin-level councils to create benefits for farmers who help optimize regional water supplies, conserve in-stream flows, or enhance water quality.

- Management and resource-use decisions by federal land management and regulatory agencies concerning Utah's vegetative resources should reflect serious consideration of the proper optimization of the yield of water within the state's watersheds.
- Encourage indemnity agreements for irrigation companies where their canals are relied upon for flood or stormwater management. Cities and counties must work closely with irrigation companies to ensure canals used for such purposes are properly maintained and have adequate capacity.
- Support cities and counties in preventing the externalization of land development costs to irrigation companies while still achieving the benefits of land development.
- Ensure the full funding of revolving loan funds managed by the Utah Division of Water Resources and maintain irrigation companies' access to these funds for canal and ditch infrastructure improvement and replacement.
- Encourage federal agencies to implement proper watershed management to minimize the impacts on diversions, headboxes, canals, and ditches due to heavy flooding and debris flow as a result of catastrophic wildfire.
- Encourage federal agencies to implement proper watershed management to provide adequate water quantity and quality to meet present and future needs.
- Oppose special designations on federal land that would restrict the tools available and increase costs to maintain or improve irrigation infrastructure.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Title 73: Water and Irrigation

References:

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2. *Utah Code Ann §73-1-8*
3. *Utah Code Ann. §73-1-3*
4. *Utah Code Ann. § 73-1-5*
5. *Utah Code Ann. § 73-1-5*
6. *https://envisionutah.org/utah-water-strategy-project*
7. *https://ag.utah.gov/wp-content/uploads/2020/10/Utah-2020-Final-Annual-Report-Statistical-Bulletin.pdf*
8. *https://envisionutah.org/utah-water-strategy-project*
9. *https://gopb.utah.gov/waterplan/*
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15. *https://extension.usu.edu/apec/files/EconomicContributionofAgriclturetotheUtahEconomy2014.pdf*
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LAND ACCESS

Introduction

Approximately 71 percent of Utah consists of public lands managed by federal or state agencies. These lands and their resources cannot be separated from the cultural fabric, quality of life, historic uses, and economic wellbeing of the State of Utah. The many vital industries in Utah, including but not limited to recreation and tourism, oil and gas, renewable energy, agriculture, mining, and timber, require access to public lands. Roads, trails, and other types of access are also used by law enforcement and emergency medical services in the protection of residents and visitors.

Roads created prior to October 21, 1976, that cross non-reserved federal lands are known as Revised Statute 2477 (R.S. 2477) roads. The rights-of-way for these roads were granted in accordance with the Mining Act of 1866. Roads are a vital part of Utah's infrastructure. They provide access to public lands for towns, mines, ranches, natural resources, grazing allotments, water systems, lands held in trust for the benefit of Utah's schoolchildren, hunting, fishing, camping and picnicking, and sightseeing. Roads provide access for administrative uses such as school buses, emergency vehicles, mail delivery, search and rescue, and land management. Land access contributes to the preservation of Utah's culture and heritage. R.S. 2477 rights-of-way and other access opportunities may include, but are not limited to, horse trails, cattle trails, maintenance routes (e.g., for waterways and pipelines), wagon roads, jeep trails, logging roads, homestead roads, mine-to-market roads, and all other rights-of-way established and held consistent with the law.

Findings

The State of Utah has undertaken efforts during the past several years to identify and plot the location of all Class B and Class D roads crossing U.S. Bureau of Land Management (BLM) land that are legitimately part of the state's transportation system.

There are approximately 12,500 roads covering over 35,700 miles in Utah that have been identified, reviewed, documented, and inventoried for inclusion in the state road system with R.S. 2477 right-of-way status. Many additional and important roads exist in the state road system that may or may not qualify for R.S. 2477 (pending further review and evaluation).

The Public Lands Policy Coordinating Office has prepared an interactive map [2] (known as "Access Map 360") to highlight the current transportation system, in areas within the stewardship of the BLM, setting forth all roads claimed by the state and counties as part of their transportation systems. The map includes but is not limited to all roads claimed by the State of Utah and counties pursuant to R.S. 2477. It is expected that the BLM will conform to the transportation provisions of resource management plans to be consistent with this map, as required by The Federal Land Policy and Management Act of 1976 (FLPMA) Section 1712(c)(9).

Thousands of miles of roads and other access opportunities also exist on land managed by the U.S. Forest Service (Forest Service). These roads provide critical access for recreation, hunting, fishing, livestock ranching, timber harvesting, and other activities. Many roads within national forests have not been identified or documented as qualifying for R.S. 2477 right-of-way status because of the early establishment of Utah's National Forests and the resulting federal withdrawal of R.S. 2477 claims. Nevertheless, roads within national forests continue to provide much-needed access to public lands and private lands within the boundaries of Utah's national forests and the State of Utah will work to ensure access for current and future generations.

Economic Consideration

Land access is critical to the health, safety, and economic viability of Utah. The state defends the current and historic right to access both federal and state lands in the pursuit of recreational activities, mining, energy development, ranching, farming, logging, motorized vehicle use, hunting, fishing, and other historic uses.

As of 2022, Utah's recreation industry contributes 66,736 jobs, $3.1 billion in wages and salaries, $6.1 billion dollars in total outdoor recreation value added to the state economy, and accounts for 2.7 percent of Utah's gross domestic product (GDP) [3].

Likewise, as of 2017, Utah's mining and energy industry directly and indirectly supported 3.8 percent of the state's employment, 4.2 percent of earnings, and 5.7 percent of the state's GDP [4]. In 2021, Utah generated approximately $2 billion in cash receipts, primarily from cattle, dairy products, and hay, and accounted for 2.6 percent of the GDP when combined with the agricultural-processing industry [5]. These economic contributions are particularly important and impactful in rural communities around the state. It is important to note that all of these industries, and countless others, are supported by access to public lands and resources.

Goals, Objectives, and Policies

Goal(s):

- Protect current and future access to, and use of lands managed by the BLM, Forest Service, U.S. National Park Service, U.S. Fish and Wildlife Service, and all other publicly owned areas of the State of Utah.
- Elevate federal agencies' recognition of Utah's legal access rights to and across federal lands.

Objectives:

1. Protect traditional and cultural access to public lands.
2. Maintain access to all R.S. 2477, Class B, and Class D roads and pursue judicial recognition of vested interests and rights through the Quiet Title Act and other legal means.
3. Strategically expand access to state, School and Institutional Trust Lands Administration (SITLA), and federal lands to increase the value and enjoyment of parcels.
4. Promote the transfer of SILTA properties within national monument boundaries for properties with greater access and economic opportunities.
5. Encourage regular review of existing roadway infrastructure, planning documents, and policies to address future needs.
6. Maintain road systems for safe, convenient, and equitable access for citizens of all ages and physical conditions.
7. Provide and protect access for utility and communication providers.
8. Oppose new roadless areas and similar designations that limit access.
9. Identify dedicated easements by each county and locally protect them to maintain access.
10. Preserve traditional access roads and trails serving mines and other historical uses, in current and future national monuments, and incorporate them into travel-management plans and land-use plans.
11. Educate the public about the importance of public-land access, multiple-use of public lands, and sustainable-yield land use and activities.
12. Encourage the provision of additional road infrastructure to accommodate safe and enjoyable outdoor recreation practices on public lands.

13. Expedite the National Environmental Policy Act (NEPA) and policy process in order to avoid, minimize, or mitigate access limitations on public lands.
14. NEPA should analyze the potential benefits of a federal action, not just the negative impacts.
15. Ensure access to emergency responders for fires, medical incidents, search and rescue, and similar efforts.
16. Ensure access to forestry, mineral, energy, and other needed resources for state and national security and for economic prosperity.
17. Ensure access for forest management and stewardship projects.
18. Keeping roads, trails, and route open promotes environmental justice and allows underserved communities to access and connect with nature for mental and physical health purposes.

Policies:

- Support the protection of traditional and cultural access to public lands.
- Resist as non-negotiable all status changes to public rights-of-way established under R.S. 2477 by state and federal agencies. They are vested property rights, held jointly by the state and counties, duly recognized in federal and state law.
- Honor FLPMA Title V grants to county governments or the State of Utah in perpetuity. Nothing in Title V gives the U.S. Secretary of the Interior, or any other decision maker, the authority to arbitrarily close a road or a corridor once access has been granted except by cooperation and coordination with the government entity holding the grant. In applying for a right-of-way, or other use of lands under FLPMA Title V, consistent with Utah Code § 72-3-108, the state or counties do not relinquish their rights to the land, its use or property ownership under R.S. 2477 or any other law, regulation, or act.
- Enact policies on the assumption that transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to Utah's economy and quality of life and must provide, at a minimum, a network of roads, trails, and other necessary infrastructure that provides for:
    - Movement of people, goods, and services across public lands;
    - Reasonable access to a broad range of resources and opportunities throughout the resource-planning area, including:
        - livestock operations, trailing, and range improvements;
        - solid, fluid, and gaseous mineral operations including critical minerals, renewable energy locations, and fuels minerals;
        - recreational opportunities and operations, including motorized and non-motorized recreation,
            - including the infrastructure needed to meet visitors' current and future needs (such as trailheads, parking areas, restrooms, information centers, and signage);
        - public safety needs (including law enforcement, firefighting, search and rescue, and EMS);
        - access for transportation of wood products to market;
        - safe and comfortable access for people with disabilities and the elderly; and
        - access to state lands and SITLA lands to accomplish the purposes of those lands.
- Support expanding access to state and SITLA lands to increase the economic value of parcels.
- Encourage regular review of existing access infrastructure and future needs in an effort to maintain transportation systems for safe and convenient access.
- Keep roads open for utility and communications companies to ensure reliable delivery of services to citizens of Utah and allow for the maintenance of current and future infrastructure, including but not limited to transmission and distribution lines, pipelines, and communications towers.

- Opposes any additional evaluation of Forest Service land, or other federally managed lands, as "roadless" or "un-roaded" beyond the Forest Service's second roadless-area review evaluation (RARE2) and oppose efforts by agencies to specially manage those areas in a way that:
    - closes or declassifies existing roads without the coordination and consent of the local government;
    - permanently bars travel on existing roads;
    - excludes or diminishes traditional, multiple-use activities, including grazing, proper forest harvesting, hunting, fishing, and vegetation management;
    - interferes with the enjoyment and use of valid, existing rights, including water rights, local transportation plan rights, R.S. 2477 rights-of-way, grazing allotment rights, and mineral leasing rights; or,
    - prohibits development of additional roads reasonably necessary to pursue traditional multiple-use activities.
- Encourage the Forest Service to review and amend its roadless rule to allow for additional access to reduce fuel loads and to improve water quality and quantity, wildlife habitat, species diversity, and forest ecosystem health.
- Maintain access to and across public lands, including R.S. 2477 rights-of-way. The right of the public to have unrestricted access to all roads granted under R.S. 2477, or FLPMA Title V, shall be held inviolate.
- Maintain access to roads that provide access to and across public lands managed by any land management agency unless concurrence on the closure of unnecessary or unsafe roads can be met through cooperation and coordination with the state and the counties within which the roads in question are located.
- Maintain access to lands managed by the State of Utah and establish new roads where access to state lands is currently not available.
- Support recognition by the federal government of the public use of R.S. 2477 rights-of-way and urge the federal government to administratively and formally recognize the rights-of-way and their use by the public as expeditiously as possible.
- Take reasonable administrative and legal measures to protect and preserve access to valid existing rights-of-way granted by Congress under R.S. 2477 and to support and work in conjunction with counties to redress cases where R.S. 2477 rights-of-way, and other access options, are not recognized or are impaired.
- Assist in identifying and inventorying roads and participate with federal land management agencies in the land-use planning process, including travel and transportation management.
- Consider, evaluate, and analyze access and transportation needs during land-use planning processes. No roads, trails, rights-of-way, easements, or other traditional access for the transportation of people, products, recreation, energy, or livestock may be closed, abandoned, withdrawn, or have a change of use without full public disclosure, analysis, and coordination with state and county plans and personnel.
- Maintain access to all water-related facilities such as dams, reservoirs, delivery systems, monitoring facilities, livestock water, handling facilities, etc. Ensure that this access is economically feasible with respect to the method and timing of such access.
- Support the supposition that each county should determine what roads to which they have a right-of-way, as stated in Utah code 72-5-104, which dedicates public rights-of-way on certain roads on private land. Encourage Utah counties to inventory roads that have been traditionally used for public access to public lands and make needed amendments to local plans to establish authority and enforcement protocols. Federal agencies should abide by state code and shall respect county decisions regarding dedicated easements.
- Maintain access provided by Utah code 72-5-104 as essential for landowners to access private property and for the public to access and use public lands.
- Support and protect private property rights within the confines of Utah law.

- Maintain accessibility to state and federal lands and amenities via multiple modes of transportation, inclusive to persons with disabilities, and in accordance with relevant accessibility guidelines to the extent possible.
- Maintain and protect access to approved roads, trails, mines, historic uses, etc., within national monuments, and add or reroute any access network if needed for the safety, health, economy, and welfare of Utah citizens.
- Support educational campaigns and marketing strategies that educate the public about access to and multiple-use and sustainable-yield practices on public lands.
- Supports and assists in obtaining and maintaining access to public lands to facilitate vegetation management and wildlife habitat projects implemented by the Shared Stewardship, Watershed Restoration Initiative, or other similar programs.
- Identify individual roads of significant importance and address associated concerns regarding those roads with federal and county stakeholders during the management-planning process, rather than deferring conversations to later dates.
- Support administrative access for all valid permit holders.
- Support increasing access to, and provide infrastructure for, outdoor recreational activities on public lands.
- Oppose pauses or moratoriums that limit access to public lands for multiple-use, sustainable yield, historic, cultural, and traditional practices.
- Support and encourage an expedited NEPA process and policy decisions.
- Support the use of Class 1 and Class 2 electric-assist bicycles wherever mountain bike use is permitted in an effort to provide equity in access to federal lands for citizens of all age groups and physical abilities.
- It is the policy of the State that creating new roads for public access must be considered as a reasonable alternative when reviewing federal land use plans or transportation plans.
    - The practice of only analyzing roads for closure is arbitrary and capricious due to the fact that NEPA requires the consideration of all reasonable alternatives.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

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LAND USE

Introduction

In Utah, land use issues and policies fall under the jurisdictions of federal, state, tribal, and local government entities. Land use on federal lands (i.e., U.S. Forest Service [Forest Service], Bureau of Land Management [BLM], and National Park Service [NPS]) is guided by federal land and resource management plans. Land use on state lands is determined by the managing state agency. Land use on tribal lands is determined by the tribal government or, for trust lands, by the Bureau of Indian Affairs. Land use on private lands is determined by the county or, in incorporated municipalities, by the municipality through land use and zoning ordinances.

Land use is not a resource in the same sense as most other state resources. Land use depends heavily on the preferences and policies of the managing entity. Consequently, due to the substantial amount of Utah's lands that are federally owned, federal land management policies significantly impact Utah's economic development. Rural counties throughout the state are reliant on federal land for resources that spur economic growth and stability. These resources include minerals, recreation, oil and gas, timber, water, agriculture, fisheries, and wildlife.

Utah contains a patchwork of land-use authorities. Land-use decisions made by each of these authorities affect the other authorities. Coordination of planning efforts in a proactive, cooperative manner helps ensure that land-use decisions complement rather than contradict each other.

Public land management is dictated by laws and regulations. These laws and regulations require public land management agencies to prepare land and resource management plans, which include land-use allocations that specify locations that are available, or not available, for certain uses. These include decisions such as what lands are available for livestock grazing, mineral material use, oil and gas leasing, and locatable mineral development; what lands may be available for disposal via exchange and/or sale; and what lands are open, closed, or limited to motorized travel. The laws and regulations also require the federal land-management agencies to involve local governments in the planning and decision-making processes. Further, federal land managers are required to ensure that land-use plans and management decisions are consistent with local governments' approved plans, ordinances, and policies to the fullest extent possible while maintaining consistency with federal law.

The Utah Legislature has established land use planning zones for energy, forestry, and grazing (Utah Code 63J, Chapter 8) and has outlined specific findings and principles for public land planning (Utah Code 63L, Chapter 11) [1]. The legal descriptions for the aforementioned planning zones can be found in Utah Code 63J-8, and visual maps can be obtained from the Public Lands Policy Coordinating Office. The management of these lands should be in accordance with Utah's land-use prescriptions to the maximum extent allowable by federal law.

Findings

The list of federal land uses and types of designations is extensive and is constantly altered by the various federal managing agencies and Congress [2].

Bureau of Land Management: Designations and Planning [3]

Most of the BLM's land-use plans will contain one or more special designations that require the land be managed with a particular focus to provide for public recreation or to conserve some significant resource. These special designations include:

Special Recreation Management Area (SRMA): The BLM's land-use plans may designate SRMAs to provide specific recreational opportunities, such as developing trailhead areas for hikers, mountain bikers, and off-road vehicle users.

Wilderness Area: In 1964, Congress passed the Wilderness Act, which established the first wilderness areas. The law defined wilderness areas as places "where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." The BLM is responsible for 223 wilderness areas, which encompass more than 8.7 million acres in 10 western states. The BLM manages these lands to ensure that they maintain these wilderness characteristics.

(Please refer to the Wilderness section of the State Resource Management Plan.)

Wilderness Study Area (WSA): In 1976, under the Federal Land Policy and Management Act of 1976 (FLPMA), Congress directed the BLM to review the roadless areas it managed to determine if they met certain standards for wildness. After an extensive public involvement process, the BLM in 1980 designated about 25 million acres of lands that met these standards as WSAs. Since that time, Congress has reviewed some of these areas and has designated some as wilderness and released others for non-wilderness uses. Until Congress makes a final determination on a WSA, the BLM manages these areas to preserve their suitability for designation as wilderness.

Under FLPMA, Congress also directed the BLM to maintain and update an inventory of lands that met the act's wilderness standards. Conditions relating to wilderness characteristics may change over time, so the BLM continues to maintain and update this inventory. Changes to the inventory do not change those lands designated as WSAs.

Area of Critical Environmental Concern (ACECs): ACEC designations are used for areas where special management attention is needed to protect important historical, cultural, and scenic values, or fish and wildlife or other natural resources. ACECs can also be designated to protect human life and safety from natural hazards. ACECs can only be designated during the land-use planning process. (Research Natural Areas are considered a type of ACEC).

Other designations commonly associated with BLM management include, but are not limited to National Scenic Trails, National Historic Trails, National Recreation Trails, National Recreation Areas, National Monuments, and National Conservation Areas. [4]

U.S. Forest Service: Designations and Planning

The history of the Forest Service and forest planning dates back more than 115 years, but most planning policies and actions related to modern forestry management began with the passing of the National Forest Management Act (NFMA) in 1976 [5]. The 2012 Planning Rule [6] is the most recent planning process change, and amendments to the 2012 rule were proposed in December 2016 to clarify the Department's direction for plan amendments, including direction for amending land management plans developed under the 1982 rule [7]. During the forest planning process several topics are considered including, but not limited to:

Adjacent lands and holdings: air quality, climate change; cultural resources; ecological sustainability; fire and fuel management; fish, wildlife, and plants (including threatened endangered, proposed, and candidate species; species of conservation concern; management indicator species and, species used and enjoyed by the public); fishing, hunting, trapping, and

> gathering; forests and timber management; grazing and rangelands; renewable and nonrenewable energy and mineral resources; social and economic sustainability; soil; sustainable recreation; water and watersheds; wild and scenic rivers; and, wilderness. [8]

Designations commonly associated with Forest Service management include, but are not limited to, Wilderness, Wilderness Study Areas, Wild and Scenic Rivers, National Scenic Trails, National Historic Trails, National Recreation Trails, National Scenic Areas, National Science Research Areas, National Scenic and Wildlife Areas, National Scenic Recreation Area, National Recreation Areas, National Recreation and Geologic Areas, National Monuments, National Volcanic Monuments, Special Management Areas, National Protection Areas, National Conservation Areas, Research Natural Areas, National Historic Sites, and Inventoried Roadless Areas. [9]

National Park Service: Designations

Utah is home to Zion, Arches, Capitol Reed, Canyonlands, and Bryce Canyon national parks. These parks, commonly referred to as the Mighty Five ® bring millions of visitors to Utah every year from around the world.
Designations that are associated with the National Park Service include, but are not limited to National Parks, National Monuments, National Recreation Areas, Wilderness, Wild and Scenic Rivers, National Scenic Trails, National Historic Trails, National Recreation Trails, National Preserves, National Seashores, National Lakeshores, National Historic Sites, National Memorials, National Battlefields, National Historic Parks. [10]

U.S. Fish and Wildlife Service: Designations and Management

The Great Salt Lake and surrounding areas are essential locations for migrating bird populations, and the U.S. Fish and Wildlife Service (USFWS) operates several different locations and species in coordination with the State of Utah.

Designations that are associated with the (USFWS) include, but are not limited to, National Monuments, Wilderness, Wilderness Study Areas, Wild and Scenic Rivers, National Wildlife Refuges, Waterfowl Production Areas, Wildlife Coordination Areas, and National Fish Hatcheries. [11]

National Monuments

The nine national monuments in Utah are Dinosaur, Natural Bridges, Cedar Breaks, Jurassic, Hovenweep, Timpanogos Cave, Rainbow Bridge, Bears Ears, and the Grand Staircase-Escalante. The first seven national monuments are smaller in size than the Bears Ears and Grand-Staircase Escalante, which in total encompass more than 3,200,000 acres in southern Utah. National monuments are created by the President of the United States using powers vested by the Antiquities Act, which states that all national monuments must "be confined to the smallest area compatible with proper care and management of the objects to be protected." [12]

Visual Resource Management

The BLM also uses Visual Resource Management Classes as part of the land-use planning process and management. [13]

> The Bureau of Land Management (BLM) administers more than 247 million acres of public lands, primarily in the western United States. BLM-administered public lands are managed in accordance with approved resource management plans (RMPs). The RMPs establish how the

public lands will be used and allocated for different purposes; they are developed with public participation and collaboration. RMP decisions establish goals and objectives for resource management (desired outcomes) and the measures needed to achieve these goals and objectives (management actions and allowable uses).

Visual Inventory Values and Visual Resource Management Class Designation

For visual resources on BLM-administered lands, the visual values reflected in Visual Resource Inventory (VRI) classes are considered in establishing goals and objectives for resource management. When Visual Resource Management (VRM) class objectives are designated for the lands in the RMP, management actions and allowable uses are determined that reflect the VRM class objectives.

The VRI class values reflect the quality of the visual resource, but they are not the sole determinant of how the visual resources on the lands are to be managed; the BLM manages lands for a variety of purposes, and preservation of scenic values is only one of many factors to consider in determining land management objectives. The VRI class values must be considered when determining VRM objectives in the RMP process, but they are not intended to automatically become VRM class designations.

VRM classes are determined through careful analyses of other resource values, and other potential land uses and demands. The VRM class determination is based on a full assessment that evaluates the VRI in concert with needed resource uses and desirable future outcomes. The VRM class designations may be different than the VRI classes assigned in the inventory and should reflect a balance between protection of visual values and meeting America's energy and other land use or commodity needs.

VRM Classes and Objectives

The VRM classes set VRM objectives for lands in each class, as well as the level of visual change in the landscape character that is allowed as a result of proposed management activities. The objectives and allowed levels of change for each of the four VRM classes are as follows:

VRM Class I Objective: To preserve the existing character of the landscape. Allowed Level of Change: This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

VRM Class II Objective: To retain the existing character of the landscape. Allowed Level of Change: The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

VRM Class III Objective: To partially retain the existing character of the landscape. Allowed Level of Change: The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

VRM Class IV Objective: To provide for management activities which require major modification of the existing character of the landscape. Allowed Level of Change: The level of change to the characteristic landscape can be high. Management activities may dominate the view and may be the major focus of viewer attention. However, the impact of these activities should be minimized through careful siting, minimal disturbance, and repeating the basic elements of form, line, color, and texture within the existing setting.

Project Conformance with VRM Class Objectives

Once the VRM class is determined for a tract of BLM-administered land in the RMP, BLM policy requires that proposed management activities, such as cattle grazing, or constructing and operating a utility-scale renewable energy facility on that tract, must meet the requirements of the VRM class. Disclosure of impacts to the visual values of the project area and conformance with the VRM class requirements is determined through the Visual Contrast Rating process during the environmental impact analysis for the project.

If the Visual Contrast Rating process confirms that the project conforms to the VRM class objectives and the project is allowed, a concerted effort must still be made to reduce the visual contrasts, even if the proposed project meets the VRM class objectives. If the contrast rating determines that, as proposed, the project will not conform to the VRM class objectives, additional visual impact mitigation must be implemented until the project does comply with the VRM class requirements. If additional mitigation will not result in the project meeting VRM class requirements, the project is not permitted. However, in some circumstances the BLM may consider amending the RMP to change the VRM class objective.

The Forest Service's Scenery Management System (SMS) is similar to the BLM's VRM system. Scenic attractiveness as defined in the SMS consists of the following three levels: (1) distinctive, (2) typical, and (3) indistinct. Distinctive scenic attractiveness is defined by areas where landforms, vegetation patterns, water characteristics and cultural features combine to provide unusual and outstanding scenic qualities. The SMS specifies five scenic integrity objective levels (SIOs) ranging from "very high," "high," "moderate," "low," to "very low." SIOs are used for project planning, analysis, implementation, and monitoring work. [14]

Land Exchanges, Acquisitions, and Conveyances

Periodically, land exchanges occur as the result of federal actions (e.g., the Dingell Act [15] or Emery County Public Land Management Act [16]) or as need arises for the Utah State Institutional Trust Lands Administration (SITLA) [17]. In the event of a land trade, it is important that the consequences of the trade be taken into consideration. For example, when SITLA trades lands with the BLM, grazing permittees operating through the BLM are then required to lease from SITLA. These consequences could potentially displace a ranching family when other uses for a given SITLA parcel are explored and considered (e.g. utility scale solar). Operators with existing leases/permits should be given priority and if they are displaced they should be mitigated accordingly.

Other purposes could include, but are not limited to the following:

The Recreation and Public Purpose Act (RPPA), which allows the State of Utah, or jurisdictions within the state, to receive up to 25,600 acres per year. [18]

The Small Tract Act, which was enacted in 1983 "to help the Forest Service resolve land disputes and boundary management problems for parcels that generally were small in scale (less than ten acres) with

land values that did not exceed $150,000. Eligible lands for sale, exchange, or interchange included National Forest System lands encumbered by an encroachment like a house or fence; roads or road rights-of-way in excess of Forest Service transportation needs; and "mineral survey fractions," or small parcels of National Forest System lands interspersed with or adjacent to lands transferred out of federal ownership under mining laws. [19]

Utah Division of Wildlife Resources: Conservation Easements [20]

Since the first property acquisition in 1909, the Utah Division of Wildlife Resources (DWR) has been acquiring and managing land across Utah for wildlife, habitat, and wildlife-related recreation opportunities. These properties are not multiple-use properties like BLM or Forest Service lands. Furthermore, it is important to research what access and recreational opportunities are permitted on each property prior to visiting the location.

The DWR owns approximately 460,000 acres of fee-title property, which includes Wildlife Management Areas, Waterfowl Management Areas and access points for hunting and fishing across 28 of the state's 29 counties.

The DWR also holds partial interest rights through access easements and conservation easements, or through management agreements on more than 150,000 acres across the state. This type of land conservation allows private landowners to maintain ownership and control of their land, while allowing DWR to manage the property for crucial habitat and wildlife purposes. These easement quantifications include only conservation easements and angler access agreements—not Utah Mitigation and Conservation Commission lands managed by the DWR.

The DWR also carries out a successful walk-in access program, which creates agreements with private landowners to allow their property to be open to hunters, anglers, and wildlife recreators. The walk-in access program brings recreational opportunities on more than 38,000 acres and almost 40 miles of stream access to Utahns across the state.

Additionally, DWR holds an access agreement that keeps 3.4 million acres of Utah trust lands open to hunters and anglers. Property acquisition and land management efforts are funded by Utah state hunting and fishing license sales, a federal excise tax on equipment, wildlife-oriented grants, outside group partnerships, and generous donations.

Each year, DWR works on dozens of new land projects, partnering with private landowners, other state agencies and wildlife-focused organizations to acquire or preserve land for wildlife purposes. The DWR is committed to continuous efforts to serve the people of Utah as the trustee and guardian of the state's protected wildlife and habitat.

Economic Considerations

Land use related to agriculture, livestock and grazing, mineral extraction, and recreation and tourism has resulted in economic benefits for the State of Utah.

The federal government makes payments in lieu of taxes (PILT) directly to county governments to help offset foregone property tax revenues due to nontaxable federal lands within their boundaries. The payments are made annually in June for tax-exempt federal lands administered by the BLM, NPS, Forest Service, USFWS, and for federal water projects and some military installations. The formula used to compute the payments is based on the amount of federal land within an affected county; population, with less populous counties paid at a higher per-capita rate than more populous counties; prior-year payments

from other federal land-payment programs, such as secure rural schools, mineral lease revenues and grazing receipts; the existence of state laws directing county payments from federal land agencies to a particular purpose (pass-through requirements); and the Consumer Price Index. Local governments may use their PILT payment for any governmental purpose. All 29 counties in Utah collectively receive PILT payments from the federal government. In 2023, Utah received $46,208,003 in PILT payments for approximately 33 million acres of federal land. [21]

The Great American Outdoors Act (GAOA) [22] was adopted in March 2020 to provide financial assistance to public land-management agencies to address the maintenance backlog in order to protect Utah's natural resources and provide safe and reliable access to the public in order to enjoy their public lands.

> The Great American Outdoors Act (GAOA, Act) is a historic investment in the protection and sustainment of our public lands and Bureau of Indian Education (BIE)-funded schools. The Act established the National Parks and Public Land Legacy Restoration Fund (LRF) to address overdue maintenance needs. GAOA also permanently authorized funding for the Land and Water Conservation Fund (LWCF) — a separate fund aimed at safeguarding our natural areas and cultural heritage.
>
> By addressing the maintenance backlog, federal agencies are ensuring that visitors and staff are safe and comfortable as they access our national parks, public lands and roads, national wildlife refuges, and BIE-funded schools. The Interior Department and bureaus are planning and executing important projects through the Great American Outdoors Act and hope the public will take the time to explore the projects to see how this significant legislation is benefiting visitors and their communities across the country.

Federal land-management agencies in Utah have received several million dollars since the passing of the GAOA and have initiated 12 projects in Utah thus far [23]. ~~The proportion of funds received has far outweighed by the contributions made by companies operating in Utah on public lands into the fund.~~

Goals, Objectives and Policies

Goal(s):

- The State of Utah is invited and involved in all coordination related to land-use planning, designations, acquisitions, dispositions, trades, and other actions that impact Utah's public lands.

Objectives:

1. Agree with federal agency resource management planning on public lands to involve active participation from state agencies, local government, and affected private individuals as contributing members. When possible, state and local governments must be included as members of the interdisciplinary teams for each project. State and local governments should also be designated as cooperating agencies to the maximum extent possible. All federal policies and management plans acknowledge and consider the cultural, economic, and environmental importance of agriculture to the state and its inhabitants.
2. Encourage federal agencies to work with state and local governments to increase flexibility and reduce the time required to implement projects affecting federal lands. The environmental impact statement and environmental assessment processes must be expedited to reduce repetition and lengthy delays.
3. Promote land uses on federal lands consistent with the principles of multiple use and sustained yield as directed by the FLPMA and the Multiple Use and Sustained Yield Act of 1960.

4. Foster trusting relationships with local BLM range conservationists and forest rangers to improve the management of federal lands within the state. Return the majority of decision-making authority to local BLM and Forest Service personnel for site specific projects.
5. Call upon federal land agencies to consider allowing for the production of food and fiber where feasible on federal lands, including planting crops and using the ground for animal forage. Foster working relationships between the agricultural community and community leaders in areas where urban expansion is conflicting with agricultural land use. Although Utah is trending toward urban expansion, it is vital that agricultural interests are seriously considered and compromises that satisfy all parties are reached through collaborative processes.
6. Improve education and support applications for Agricultural Protection Areas, Conservation Easements, and both Grassland and Wetland Reserves from local producers.
7. Avoid loss of private lands within the county boundaries as measured by acreage and fair market value.
8. Improve communication and coordination among various federal, state, tribal, and local land-use authorities.
9. Encourage disposal of federal lands, where appropriate, to support community growth and community needs.
10. Minimize impacts of development and land use changes on local governments, infrastructure, and community services.
11. Ensure that adjacent land uses and land-use restrictions do not deny private property owners the right of fair use, access to, and enjoyment of their property.
12. Discourage or eliminate land-use restrictions or special designations that restrict economic growth and activity, especially on federal lands.
13. Designate GAOA funding for maintaining current lands and ensure that new land acquisitions are in full coordination and cooperation with the State of Utah and the county in which the property or easement is to be acquired.
14. Better coordinate local community and federal agency planning, both on paper, in-person, and on the ground. Incorporate planning processes of other agencies to help streamline the efforts. Develop joint plans that carry actions across management borders. Plans and management objectives to coordinate include (but are not limited to):
    - Fire prevention and management plans
    - Transportation and access plans
    - Water resource management
    - Development standards in the wildland-urban interface
    - Utility plans
15. Protect the interests of the State prior to and during the creation, planning, or implementation of any actions related to the Antiquities Act and/or the implementation of said Act to create a National Monument.
16. When considering National Monument designations, recognize and protect access to public roads, existing and potential mining claims, grazing rights, private property rights, etc.
17. Oppose the Bureau of Land Management use of the National Landscape Conservation System (NLCS) to remove discretionary uses from public lands.
18. FLPMA multiple-use and sustained yield mandates must be protected and adhered to in any designation.
19. Require that the designation of any portion of public lands greater than 5,000 acres must be coordinated with the state and local governments before taking effect (see Utah Code § 63L-2-3(3)).
20. Ensure that federal land management agencies adhere to their Congressionally approved Acts (e.g. FLPMA, NFMA, NEPA).
21. Ensure that Areas of Critical Environmental Concern (ACECs) are created only after an official publicly-visible land use planning process and substantive state and local cooperation.

22. Wildlife is declared property of the state under Utah Code § 23A-1-102 which reads that, "Wildlife existing within this state, not held by private ownership and legally acquired, is the property of the state."
23. Oppose the elevation of conservation and protection to become an equal priority with multiple-use and sustained yield on public lands as required by Congress, via FLPMA.
24. The concepts of "intact landscapes" (or intactness) is likely to run counter to the multiple-use mandates in FLPMA and be inconsistent with state and county resource management plans.
25. Ensure that traditional cultural knowledge (e.g. ranching knowledge) is given the same level of considerations as indigenous knowledge.

Policies:

- Support maximized land use for its citizens, industries, and government purposes. Land use should be determined or influenced to the greater degree by those who are most affected by management decisions. Local voices should carry the greatest weight when deciding on land use approaches.
- Encourage federal agency resource and land management planning on public lands to involve active participation from state agencies, local government, and affected private citizens as contributing members.
- Call upon federal land-management agencies to work closely and cooperatively with the State of Utah to ensure access to public lands. Because approximately 63 percent of Utah consists of federal lands, the state's livelihood is substantially affected by the policies of federal land management agencies. As such, it is vital that federal land management agencies should:
    - Include state-agency personnel as members of interdisciplinary teams when developing land use plans.
    - Provide the State of Utah a constructive role in drafting land use plans.
- Support the concept of multiple-use and sustained yields on public lands. Federal lands should be managed to produce the maximum yield of timber, forage, recreation, and minerals at sustainable levels. Agriculture is an integral part of the multiple-use concept.
- Call upon the BLM and Forest Service to avoid participation in sue and settle agreements with non-governmental organizations when such settlements affect land use within Utah without first properly consulting the State of Utah.
    - Utah opposes the culture of sue and settle as a means to limit access to public lands, slow down range improvement projects, and drain limited resources from land management agencies.
- Grazing allotment animal-unit months (AUMs) within the state should remain at or above current levels unless a scientific need for temporary reduction is demonstrated to the satisfaction of State of Utah officials.
    - In the case that AUMs are temporarily reduced, these reductions shall be reinstated at the earliest possible moment once vegetative health has been restored to its previous levels.
- Oppose passive land-management practices that negatively impact forage production, maintenance of natural habitat, and native ecosystems. The State of Utah also opposes passive management that leads to greater risk of catastrophic wildfires.
- Support the designation of official roads, trails, and paths that allow access for all public land users.
- Protect access across federal land to all SITLA parcels.
- Federal lands shall be available for disposal when lands are difficult to manage or consist of isolated tracts, when such disposal meets the important public objective of community expansion or economic development, or when the disposal would serve the public interest.

- Support national interest in energy independence and bridge the gap between production and consumption by ensuring that public lands remain open for oil and gas exploration and production.
- As a sovereign entity, the State of Utah requires extensive coordination and the opportunity for substantive involvement in the proclamation, planning, or implementation of all components related to the creation of National Monuments by means of the Antiquities Act.
- National Monuments must "be confined to the smallest area compatible with proper care and management of the objects to be protected."
    - Any designation, monument or not, greater than 5,000 acres must be coordinated with state and local government prior to the creation of the designation.
- Provide reasonable protection to objects requiring protection.
    - Reasonable protection should not be translated to mean the maximum amount of protection possible.
- Oppose any Areas of Critical Environmental Concern (ACECs) that are not created through publicly-visible land use planning efforts and/or that do not include state and local government cooperation. Full coordination, consistency review, and consultation should be granted to state and local governments prior to implementation of any ACECs.
- The State has primacy of wildlife, and wildlife parts (e.g. shed antlers), located within the State of Utah.
- Cooperating agency (NEPA) relationships and coordination (FLPMA) relationships are not the same. Inviting the State to participate as a cooperating agency doesn't meet the coordination requirements under FLPMA.
- Federal agencies must allow state and local governments sufficient time and resources to provide substantive comments as cooperating agencies and as part of coordination.
- It is the policy of the State that conservation does not have equal footing with multiple-use and sustained yield mandates on public lands as defined in FLPMA by Congress.
- Conservation can not be implemented at the exclusion of other Congressionally approved uses.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

State Land Use Authority

Municipal Land Use, Development, and Management Act

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

State of Utah Resource Development Act

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21. *https://www.doi.gov/gaoa*
22. *https://www.doi.gov/gaoa-project-data*

LAW ENFORCEMENT

Introduction

The federal government owns and administers certain lands in Utah under the auspices of the U.S. Bureau of Land Management (BLM), U.S. Forest Service (Forest Service), National Parks Service (NPS), U.S. Bureau of Reclamation (BOR), and the U.S. Fish and Wildlife Service (USFWS). These "public lands"' are held by the federal government in a proprietary interest only. Accordingly, federal law-enforcement authority on public lands is limited to the authority delegated to it by the U.S. Constitution, specifically by Article IV, Section 3, Clause 2 (i.e., the Property Clause). Federal law enforcement is, therefore, limited to the enforcement of rules and regulations which are "needful"' for the protection of the public lands. The State of Utah, as sovereign within its borders, retains full police powers on the public lands to enforce its civil and criminal laws and ordinances in the protection of the public's health, safety, and welfare.

Questions have arisen with respect to the authorities of federal law-enforcement agents, rangers, officers, and county sheriffs to enforce state and federal laws on the public lands. This has led to breakdowns in coordination and cooperation between federal and county law enforcement agencies. Much of the needed coordination and cooperation can be established if state laws and county ordinances are enforced as state and county law, rather than as federal law adopted through federal regulations. This change in approach could be implemented through deputization of federal agents, rangers, and officers by county sheriffs pursuant to Utah Code Annotated Section 53-13-106.9 and 10.

Economic Considerations

In light of rapid growth throughout Utah and increased outdoor recreation on public lands, the need for law enforcement and emergency medical services has never been more important. The funding associated with providing these essential services is balanced against a variety of sources, and filling these positions with trained professionals can prove challenging for agencies.

Goals, Objectives, and Policies

It is the desire of the State of Utah to restore proper coordination and cooperation, and to better serve the public, by implementing a system of county-specific, law-enforcement agreements between county officials and each of the federal agencies that have management authority within counties, (i.e., the BLM, Forest Service, NPS, BOR, and USFWS), whereby duties and responsibilities are established and clearly defined. Such law-enforcement agreements will be facilitated and directed through law enforcement agreements between the State of Utah and the BLM, Forest Service and NPS. The negotiation of the terms and conditions of county-specific law-enforcement agreements will be left to each county and applicable local or regional federal agencies. However, the following basic principles shall govern:

1. The county sheriff is the chief law enforcement officer throughout the county, including on the public lands, and is charged with the following duties: (1) protect the lives, property, and rights of all people, (2) maintain order, and (3) enforce all state laws and county ordinances.

2. To the maximum extent feasible, law-enforcement efforts on the public lands shall be coordinated with the county sheriff.

3. Enforcement of all state laws and county ordinances, including arrest, investigation and prosecution, shall be under state law and state courts.

4. State laws and county ordinances shall not be enforced on the public lands by federal agents, rangers, or officers unless such agents have been deputized by the county sheriff, which would eliminate the need to adopt state laws and county ordinances as federal law through regulation.

5. Any deputized federal agent, ranger, or officer making an arrest under state law or county ordinance shall, as soon as practicable, notify the county sheriff of the arrest and will in all cases turn the investigation and prosecution of the offense over to county law-enforcement authority.

6. Should a federal agency determine that assistance is necessary in enforcing federal laws on the public lands, the federal agency may offer such enforcement to the county sheriff, who may choose whether to accept such an offer as well as the terms under which the offer is accepted.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Safety Code

§ 53-2a. Emergency Management Act

LIVESTOCK AND GRAZING

Introduction

Livestock is generally defined as domesticated animals raised in an agricultural setting to create food, fiber, labor, or other products. According to Utah state code, livestock means cattle, swine, equines, sheep, camelidae, ratites, bison, goats, and domesticated elk [1]. Grazing is defined as a method of feeding livestock, whereby domestic animals consume plant material and convert it into meat, milk, and other products. The practice of raising livestock and grazing animals is considered part of agriculture.

Livestock and grazing in Utah is important for the natural, cultural, social, and economic benefits it provides. Since the mid-nineteenth century, a variety of livestock including cattle, sheep, and horses, have been and will continue to be a mainstay of Utah's agricultural economy. Many "century farms" have been designated throughout Utah. The State of Utah considers agriculture a large part of its history, customs, and culture.

The *Livestock Grazing in Utah: History and Status* (2008) report states, "Livestock have been commercially grazed on lands in Utah for more than 150 years. The earliest record of grazing was by a herd of cattle owned by Miles Goodyear in the early 1840s. Native Americans probably grazed sheep and horses before that time. Grazing of lands by cattle and sheep in Utah increased rapidly after 1847, following the arrival of the pioneers in the Salt Lake Valley."

Throughout the early settlement period of Utah, as well as the western frontier in general, livestock grazing on federal or "public" land was undertaken without restriction. Cattle and sheep flourished on the mountain grasses, and livestock numbers soared. However, with the unregulated grazing came problems. Overgrazing, particularly by large sheep herds, denuded the land in many areas of Utah, causing erosion and watershed disasters. Constant conflicts between livestock owners arose over the use of the land and who owned the rights to graze where and when. In response to these problems, Congress passed the Taylor Grazing Act in 1934. This led to the creation of grazing districts, through preference rights, in which grazing use was apportioned and regulated. The Division of Grazing was created within the U.S. Interior Department to administer the grazing districts. This division later became the U.S. Grazing Service and was headquartered in Salt Lake City. In 1946, the Grazing Service was merged with the General Land Office to become the U.S. Bureau of Land Management (BLM). Similar legislation was later passed under the name Granger-Thye Act (1950) to regulate grazing on National Forest System lands.

After the passage of the Taylor Grazing Act, the Grazing Service, through advisory boards, created an adjudication process to determine where, when, and what type of livestock grazing would occur on public rangelands. To receive an allotment through this process, the stockman was required to have:

(1) "commensurate base property" on which livestock could graze when not using federal lands,
(2) an economically viable livestock operation, and
(3) be members of the local community and support the local economic stability of the community.

With the passage of the Taylor Grazing Act came a new management structure for regulating grazing and protecting natural resources. To control animal movement and enhance grazing activity, fencing and water developments were put in place. Forage surveys were implemented to balance resource demands with range productivity and carrying capacity. The ranchers who utilized the land had a greater vested interest in their stewardship of those lands as grazing rights were created.

By the 1960s, regulation of public lands began to tighten as ever more restrictive federal policies were enacted and management goals began to change. Laws such as the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), National Forest Management Act (NFMA), and Federal Land Policy and Management Act (FLPMA) diverted management attention away from grazing and forage production to "environmental protection" concerns raised by special interest groups. The result has been endless environmental studies, a backlog of litigation, ongoing bureaucratic delays, heavily prioritized management of riparian areas, sensitive species and special land-status designations, and far less emphasis on range improvement activities and forage production.

Today, federal agencies regulate livestock grazing in a manner aimed at achieving and maintaining the health of the land and sustaining resources. To achieve desired conditions, the agencies use forest and rangeland health standards as a guide. Standards describe specific conditions needed for long term sustainability, such as the presence of streambank vegetation and adequate canopy cover. Guidelines are developed to direct management strategies that achieve or maintain healthy lands and ecosystems as defined by the standards. Grazing management strategies designed to attain these standards may include periodic rest, rotation, or deferment from specific allotment usage; water developments; and vegetation treatments that increase forage production.

Current authorized grazing levels were established from 1940 to 1965, during which time the BLM completed livestock forage inventories to establish estimated grazing capacity. These levels have been adjusted over the years to accommodate fluctuations in production capabilities and use by other species. Livestock grazing is regulated by the use of Animal Unit Months (AUMs), or Herd Months (HMs) on the forest. The AUM quantifies the amount of forage needed to sustain one cow or five sheep for 1 month, while an HM is simply an occupancy measurement. One hundred AUMs/HMs would equate to 100 cows for 1 month or 10 cows grazing for 10 months. Since 1940, data from the BLM indicate that grazing AUMs for livestock have been reduced by more than two-thirds, from 2,749,000 to 675,000 AUM's in 2009 [2]. Almost as dramatic, HM numbers on Forest Service lands over the same time period have been reduced by half [3]. These reductions in AUMs/HMs from the federal agencies are a result of burgeoning regulatory restrictions, modified terms and conditions on grazing permits, inflexibility within federal policies, and numerous rangeland factors including the following: uncontrolled pinyon/juniper expansion, noxious weed invasion, altered fire regimes, reduction in the sheep industry, expansion of wildlife populations, and the overpopulation of wild horses (*please refer to the section on Wild Horses and Burros in this plan*). A new modern threat is the effort of special interest groups to eliminate grazing on public lands through aggressive marketing, lobbying, and litigation.

During the 2006 Utah legislative session, in response to declines in grazing, the Rangeland Improvement Act was passed. The bill provided for the establishment of a State Grazing Advisory Board and six regional advisory boards to improve the grassroots voice of both private and public land grazers. A new division was then established within the Utah Department of Agriculture and Food, known as the Utah Grazing Improvement Program (GIP). The mission of GIP is to "improve the productivity, health and sustainability of our rangelands and watersheds." The GIP program operates under the basic belief that "well planned and managed livestock grazing is the most important landscape scale tool for maintaining healthy rangelands, watersheds, and wildlife habitats" and that "healthy rangelands contribute to a healthy livestock industry and productive rural economies."

Grazing is one of the earliest and most important uses of public lands in Utah. This form of land use continues to be important on those same lands today. *Livestock Grazing in Utah: History and Status*, a 2008 study of grazing in Utah by the Public Lands Policy Coordinating Office, showed that livestock and livestock products accounted for 75 percent of the total agricultural cash receipts in the state. This study gave clear evidence of the importance of public land grazing to individual livestock producers and the industry as whole, by showing (1) the number of animals raised by permit holders was much higher than

those without permits; (2) ranching operations with permits were more dependent on livestock production that those without; (3) permittee operations commonly involved more than one family, while non-permittee operations were single-family businesses; (4) most livestock operations were multi-generational family businesses, especially permittee-based operations; (5) livestock producers buy and sell locally, which impact local economies more directly than other business; (6) grazing public lands reduced producers' dependency on hay as a source of feed; (7) livestock grazing has a positive influence on fire suppression; and (8) the cattle industry has become the dominant sector in Utah agriculture.

Historically, Utah's rangeland has been highly utilized for livestock grazing and remains an important resource for the ranching industry today. Cattle and sheep ranchers typically graze during the spring and summer months in upland ranges administered by the Forest Service, BLM, and SITLA. In fall, cattle and sheep are generally moved to lower rangeland to graze crop aftermath in irrigated, private fields and are fed hay in winter. Other ranchers utilize private rangelands year-round. Ranchers are challenged with limited water and watering facilities, invasive and noxious weeds, and yearly changes to grazing permit numbers and durations.

Findings

Livestock Grazing in Utah: History and Status states, "Rangelands in Utah are primarily administered by the Bureau of Land Management (BLM) and Forest Service (FS) [4]. Data from the BLM indicate that use by domestic livestock has declined more than two-thirds over time [5]. Most of this decline has been associated with the reduction of the sheep industry. Similar data for the FS indicates that declines in the use of FS lands have not been as dramatic as on BLM lands, but usage of FS lands today is about half what it was 60 years ago."

The report also explains that every Utah livestock producer identified by ~~the Utah office of~~ the National Agricultural Statistics Service (NASS), as well as out-of-state operators with permits to graze public lands in Utah, were sent a survey that was designed to obtain information not available elsewhere. Analysis of this data indicates the following:

The number of animals owned by permittees is much larger than those owned by non-permittees. Permittee operations are generally more dependent on livestock production than are non-permittees.

Most livestock operations have been owned by the same family for many years (commonly more than 50 years), and a large portion plan to have a family member operate the ranch in the future. This is especially true of permittee ranches.

A large portion of livestock producer sales are made to local firms, but an even larger percentage of their purchases are from local firms. As a result, firms in communities where livestock production is a large portion of the area's economic activity are intimately concerned with the health of the livestock industry.

Pasture is the primary source of feed for non-permittee livestock operators when they are not being fed hay (winter), while forage from public lands is the most important source of feed for permittee operators [6]. Pasturelands are an important source of feed for all operators, but use of federal lands allows permittees to reduce their dependence on hay, or more expensive feed sources. Without the use of federal lands, many ranching operations in Utah could not be sustained as economically viable. The most critical period of use of public lands for most permittees was during the summer.

The amount of federally permitted AUMs/HMs in Utah declined four-fold between 1940 and 2005 [7]. On BLM land, 2,749,000 AUMs were available in 1940, but this number was reduced to fewer than 675,000 AUMs in 2009 [8]. On Forest Service land, the AUMs/HMs available decreased from 2.7 million

in 1940 to 614,000 in 2008 [9]. In response to these declines, the Utah legislature passed the Rangeland Improvement Act, which established the Utah Grazing Improvement Program [10]. The goals of the act are to strengthen Utah's livestock industry, improve rural economies, enhance the environment, and to promote efficient multiple-use management of rangeland resources.

Animal agriculture in Utah represents the single largest sector of farm income in Utah. At a value of more than $1 billion, 25 of the state's 29 counties report livestock as the dominant agricultural sector. [11]

Utah ranchers are challenged with limited water and watering facilities on rangelands, especially in grazing areas in the lower elevations, which receive little precipitation. The same problem exists for wildlife. Many existing watering facilities are runoff catchment facilities or unlined ponds. Water in these facilities is usually lower in quality and has a higher concentration of dissolved solids, specifically soluble salts. Historically, cattle have also watered out of open canals used for water distribution. However, the ongoing transition from open canals and ditches to sprinkler irrigation has eliminated many open canals, leaving ranchers with fewer options for watering livestock while also reducing watering facilities for wildlife. Partnerships must be developed between ranchers, wildlife managers, and land managers to create more watering facilities for livestock as well as wildlife. The Carbon Canal Winter Water project serves as an example of successful partnering in order to improve watering facilities [12]. Such partnerships will result in greater distribution of wildlife and livestock, which will also result in improved utilization of rangeland vegetation and fewer impacts to private cropland.

Utah's rangeland is infested with cheat-grass, annual mustard weed, and sagebrush. The higher elevations are covered with pinion and juniper trees. Range condition inventories suggest they are producing approximately 50 percent of their potential. The main resource concerns consist of degradation and removal of native plant species, introduction of invasive species (weeds), juniper encroachment, and sheet and rill erosion.

Economic Considerations

A 2016 report published by Utah State University details the significant contributions of agriculture to the state economy. The combined agricultural processing and production sectors account for 15 percent of Utah's total economic output, or $21.2 billion, after adjusting for multiplier effects. [13]

From 1970 to 2015, direct cash receipts from livestock and products increased from $1.28 billion to $1.57 billion, a 17.5 percent increase [14]. Cash receipts from livestock and products constituted 73 percent of all farm business cash receipts, making livestock the driver behind most of Utah's agricultural economic growth. These direct cash receipts do not reflect the full amount of economic growth provided by livestock and its products due to the multiplier effect that cash receipts have once they are spent within the community.

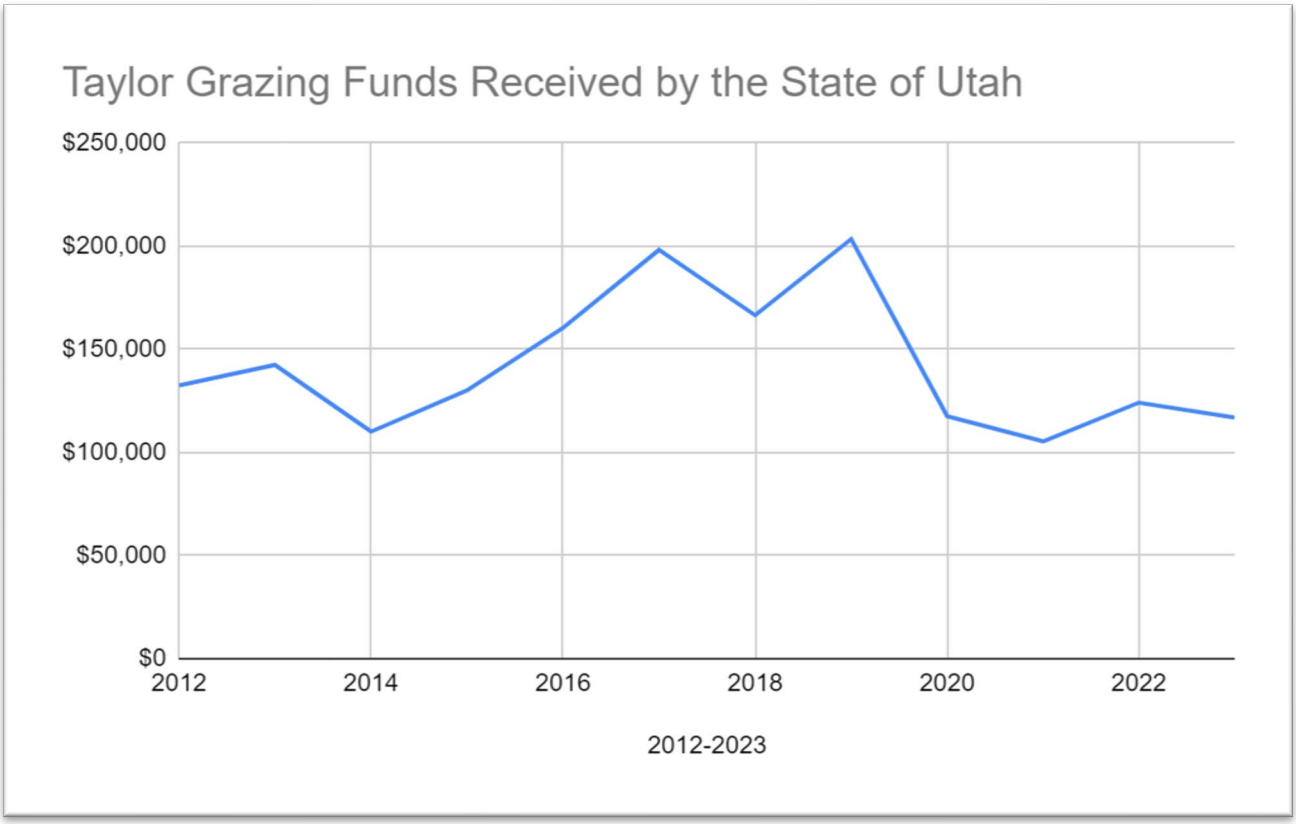
In total, Utah has an estimated 1,289,000 AUMs/HMs between BLM and Forest Service land. The total economic impact of an AUM/HM in 2013 was roughly $100 [17]. Using these conservative estimates, the economic impact of federal AUMs/HMs is more than $128 million in Utah. Consequently, federal agencies' land-management policies directly affect a substantial portion of Utah's economic growth [15]. For example, BLM's reductions in AUMs from historic levels constitutes an annual economic loss of roughly $207 million. Forest Service AUM/HM reductions from historic levels have resulted in an annual economic loss of more than $208 million. Overall, land-management decisions by federal agencies have resulted in a total annual economic loss of $415 million. [16]

The estimated $128 million in annual economic value, as well as the estimated annual economic loss of $415 million, of federal AUMs/HMs are concentrated in Utah's rural counties. Rural counties have the

highest percentage of federally owned land in the state. The economic value that AUMs/HMs and livestock bring to Utah's rural counties is vital because residents in those areas have a much lower median household income compared to the more-populated areas of the state [18]. The decline in federal AUMs/HMs has financially impacted Utah's rural counties. Agriculture and livestock grazing contribute substantially to these rural economies through local buying and selling as well as employment. In addition, other industries that have traditionally spurred economic growth in rural Utah (e.g., logging and mining) vary substantially, leaving rural communities with economic uncertainty. Agriculture and grazing have provided a stable, year-round industry upon which rural economies can rely without significant booms and busts.

Utah Department of Agriculture and Food receives a small share of Taylor Grazing funds from AUM fees to be used for range improvements.

From 2012 to 2023, the State received the following amounts from the Taylor Grazing funds:



In 2021, animal-production jobs averaged an annual salary of $38,526 [National average: $44,463] while crop-production jobs averaged $32,762 [National average: $40,116], for an overall average of $35,933 [19]. From 1990 to 2020, wages increased by 32.8 percent in animal production and 51.7 percent in crop production [20]. Operators in animal production average the highest pay within the farming and agricultural industry. ~~Animal producers average $31,573 annually while the overall farm average is only $28,792. From 1990 to 2015, the average annual wages of animal producers in Utah has increased by 17.5 percent, from $26,867 to $31,573.~~

Utah's level of agricultural employment is at approximately the same level as 1970, showing a relatively stable number of jobs within the industry. Currently, farm jobs constitute approximately 1.0 percent of Utah's total employment, contributing 20,552 jobs to Utah's economy [21]. Of the total agricultural

employment, 15,766 jobs (0.8 percent of total employment) are farm proprietors [22]. The majority of individuals employed in agriculture are small business owners who create jobs and generate revenue within the more-rural and generally less-affluent areas of the state.

~~As of 2015, Utah's level of agricultural employment is at the same levels as 1970, showing a relatively stable number of jobs within the industry. Currently, farm employment constitutes 1.1 percent of Utah's total employment, contributing 20,550 jobs to Utah's economy. Of the total agricultural employment, 16,177, or 0.9 percent of total employment, are farm proprietors.~~

The majority of individuals employed in agriculture are small business owners who create jobs and generate revenue for the more rural and generally poorer areas of the state.

Utah's Watershed Restoration Initiative [23]

Utah's Watershed Restoration Initiative (WRI) provides a balancing influence that promotes wildlife values and supports agricultural needs. Significant investments have been made through WRI to improve rangeland health and watershed conditions. In fiscal year 2014, the Utah Legislature contributed $3.95 million to WRI. Ninety-one participating partners completed restoration of 112,987 acres of uplands and 55 miles of stream and riparian areas,
leveraging the legislative funds by a factor of 7-to-1. Grazing fees paid by allotment owners and sportsmen-generated funding, which plays an important role in the WRI. Counties in general appreciate the benefits that are enabled through WRI habitat restoration projects. The long-term results of the WRI will be measured in reduced wildfire acreage and suppression costs, reduced soil loss from erosion, reduced sedimentation and storage loss in reservoirs, improved water quality and yield, improved wildlife populations, reduced risk of additional federal listing of species under the Endangered Species Act, improved agricultural production, and resistance to invasive plant species. To participate effectively, counties need their staff to attend meetings of the WRI regional teams, expressing their views and advocating for the kinds of watershed restoration efforts they feel are most important.

Goals, Objectives, and Policies

All federal agency resource management planning on public lands must involve active participation from state agencies, local government, and grazing permittees as contributing members. When possible, state and local governments must be included as members of the interdisciplinary teams for each project. All federal policies and management plans must acknowledge and consider the cultural, economic, and environmental importance of the livestock industry to the state and its inhabitants.
In order to be consistent with State Code 63L-11-302 § 13, the subsequent goals, objectives, and policies have been revised through coordination with stakeholders to balance the foraging needs of livestock and wildlife.

Goal(s):

- Balance the grazing and livestock needs on public lands in an equitable manner that benefits livestock producers, wildlife populations, and the natural environment.

Objectives:

1. Ensure that AUMs/HMs within Utah remain at or above current levels.
2. Employ range improvements and forage restoration projects to return active AUMs/HMs to permitted levels.

3. Utilization is not a land health standard. It is scientifically inappropriate to incorporate utilization as a land health standard. It is equally inappropriate to use utilization as a compliance metric.
4. Oppose the relinquishment, retirement, or restriction of AUMs in favor of conservation, wildlife, and other uses, and the transfer of AUMs to wildlife for supposed reasons of rangeland health.
5. Uphold the preference for domestic grazing over alternate forage uses in established grazing districts while upholding practices that optimize and expand forage for grazing and wildlife.
6. Grazing within the state of Utah should be performed according to best grazing practices and sound scientific management of local environments. Livestock operators should be given maximum flexibility concerning seasons of use, stocking rates, and rangeland improvement decisions.
7. Call upon federal agencies to reduce the time required to implement range improvements, grazing permit renewals, and adjustments to stocking rates and seasons of use. Encourage expedited environmental documentation (environmental impact statements and environmental assessments) to give livestock operators more certainty and flexibility in their operations.
8. Encourage National Environmental Policy Act processes that establish a reasonable set of desired conditions for grazing allotments and allow permittees maximum flexibility in stocking rates, range improvements, and seasons of use in managing to those standards.
9. Improve vegetative health on public and private lands through range improvements, prescribed fire, vegetation treatments, and active management of invasive plants and noxious weeds.
10. Actively remove pinyon-juniper encroachment due to its substantial consumption of water and its detrimental effect on sagebrush, other vegetation, grazing, and wildlife [24].
11. Foster trusting relationships with local BLM rangeland specialists and Forest Service rangers, and state agency personnel to improve the management of federal lands within the state.
12. Return the majority of decision-making authority to local BLM and Forest Service personnel, rather than locations and persons outside of Utah.
13. Protect historic trailing rights, as these rights are critical for ingress and egress by livestock producers moving livestock on the range.

Policies:

- Because approximately 60 percent of Utah is made up of federal lands, the state's livelihood is substantially affected by the policies of land management agencies. As such, it is the state of Utah's policy that federal land management agencies work closely and cooperatively with the state to ensure access to public lands.
    - Include state agency personnel as members of interdisciplinary teams when developing land use plans.
    - Allow the state more of a constructive role in drafting land use plans, rather than a reactionary role.
- Support the concept of multiple-use and sustained yields on public lands. Livestock grazing is an integral part of the multiple-use concept. Reductions of livestock numbers through frivolous lawsuits and barriers to infrastructure improvements and maintenance necessary for effective grazing management are unacceptable. It is the State of Utah's policy:
    - That BLM and Forest Service do not participate in sue and settle agreements with other organizations without properly consulting the state.
    - To oppose the culture of sue and settle as a means to limit access to public lands, slow down range improvement projects, and drain limited resources from land management agencies.
- Support and value the ranching industry as an integral part of Utah's history, culture, and heritage. Ranching and agriculture are recognized as a cultural resource within the state of Utah.

- Adopt a stance of not only "no-net-loss" with regard to grazing AUMs/HMs on federal lands, but also a stance that supports the expedited return of all permitted AUMs/HMs to active status at the earliest opportunity.
    - Active AUMs/HMs within the state must remain at or above current levels unless a scientific need for temporary reduction is demonstrated to the satisfaction of state officials.
    - Employ strategic and targeted annual rangeland health evaluations as a tool for returning all permitted AUMs to active status as range conditions improve.
    - In the case that AUMs/HMs are temporarily reduced, these reductions are reinstated at the earliest possible moment once vegetative health has been restored to its previous levels.
- Support the use of the best-available science to establish grazing AUM/HM levels.
    - In the case of increased forage availability and upward stable vegetative trends, the state supports a subsequent increase in domestic livestock AUMs/HMs.
    - Effective monitoring must occur to achieve healthy rangelands and a vibrant diversified economy in Utah.
- Encourage upward and stable trends in vegetation and soil condition on public lands in Utah.
    - This is best achieved through active management by federal agencies and public land users of all federal lands including national forests, national parks, areas of critical environmental concern, and wilderness areas.
    - The state supports rapid removal of all invasive plant species and noxious weeds on both public and private lands.
    - The state supports the active removal of pinyon-juniper encroachment on other ecosystems, such as decadent sagebrush, due to its consumption of water, detrimental effects on vegetation and available forage, and its negative effects on wildlife habitat.
- Supports prompt approval by land management agencies of all range improvements, increased water infrastructure, and vegetation treatments to benefit domestic livestock, wildlife, and consequently the health of federal lands.
    - Livestock operators are encouraged to employ sustainable best management practices in managing their livestock to improve the health of public lands in the state of Utah.
    - Livestock operators are also encouraged to monitor and keep records of forage yield, utilization rates, the class of livestock being run, exact dates of use, and additional information concerning land health to help facilitate continued and increased livestock grazing on public lands.
    - Support the active management of wild horse and burro populations to remove excessive populations from rangelands. The current population of wild horses and burros within the state is unacceptable and needs to be managed to appropriate management levels (AML).
        - *please refer to the Wild Horses and Burros section in this plan*
- Assume a policy preference for domestic grazing over alternate forage uses in established grazing districts, while upholding management practices that optimize and expand forage for grazing and wildlife.
    - The state supports quickly and effectively adjusting wildlife population goals and population census numbers in response to variations in the amount of available forage caused by drought or other climatic adjustments, giving due regard to the needs of the livestock industry and the need to protect the decline of a wildlife species to a point of listing under the terms of the Endangered Species Act.
    - When rangeland improvement practices increase a grazing allotment's forage beyond the total permitted forage use that was allocated to that allotment in the last federal land use plan or allotment management plan still in existence as of January 1, 2005, the state supports allocating a reasonable and fair portion of the excess to excess to wildlife as recommended by a joint, evenly balanced committee of livestock and wildlife

representatives that are appointed and constituted by the Governor for that purpose. These decisions will be consistent with Title 23A (Utah Wildlife Code) and the authority granted to the Wildlife Board and Title 4 (Utah Agricultural Code).
    - Wildlife habitat needs to be managed in a manner that improves vegetative health, maintains adequate forage at permitted levels for domestic livestock, and ensures proper water quality.
    - The state opposes the relinquishment of AUMs/HMs as well as the transfer of AUMs/HMs for conservation, wildlife, supposed rangeland health and other uses.
    - In established grazing districts, AUMs/HMs that have been reduced due to rangeland health concerns should be restored to livestock when rangeland conditions improve, and should not be converted to wildlife or other uses.
    - Managing predators to appropriate levels is vital to ensure that ranchers do not face losses through predation of livestock. Predators that repeatedly prey on livestock should be relocated or be eliminated and ranchers compensated for their losses.
- The designation of endangered species or critical habitat must be proven through scientifically sound evidence. This research should be conducted in collaboration and partnership with the State of Utah.
    - All industries must be considered and collaborated with when considering the designation of an endangered, sensitive, or any other type of at-risk species.
    - Collaboration should include consideration of the economic and social costs in making any endangered, threatened, or sensitive species determinations.
    - Proven unoccupied critical habitat for endangered, threatened, or sensitive species does not need to be managed as if the species are present.
- Support private ownership of water rights.
    - Adequate private water rights for livestock and agricultural uses is supported and protected by the state.
    - Grazing permit renewals shall not be withheld by federal agencies as a means to acquire water rights within the state.
    - Water Rights held by federal agencies where beneficial use is maintained by grazing domestic livestock shall be expressly reserved and used for domestic livestock grazing on allotments and subject to forfeiture if grazing is reduced or eliminated.
    - The state will support the Grazing Improvement Program and any associated projects that improve range conditions, water availability, or other grazing improvement activities.
- Recognize and support the use of public lands grazing as a tool to manage wildfire risk. Through grazing, fuel loads are reduced, resulting in a decreased risk of catastrophic wildfires.
- Support the use of targeted grazing alongside other forms of treatment to suppress, manage, and eradicate noxious weeds. Invasive and noxious weeds reduce rangeland health and available forage for livestock and wildlife.
- Support the use of the "Good Neighbor" program to partner with federal agencies to better manage forage, fiber, and water on federal lands in Utah.
- Support policies such that, when range-monitoring data are collected from "key areas" or important ecological sites chosen to represent the effects of grazing, the information cannot be extrapolated to represent the area as a whole, and shall not be used for establishing range trends or influencing management actions.
- Follow the provisions of R.S. 2477, in which claims shall be resolved in Utah's counties as expeditiously as possible.
- Develop policies in which monitoring systems are developed to separate resource use by species (e.g., wild horses, wildlife, or livestock) to inform management decisions. If a resource problem is occurring, the source of the problem must be positively identified in order to tailor a proper management response.
- The State does not support the permanent retirement of any grazing allotment.

- Insist that vacant grazing allotments are assigned to permittees affected by fire, large energy development projects, or other resource-disrupting activities that will cause economic disruption to permittees.
- Livestock trailing rights and easements must be protected to ensure the viability of ranching operations. Such trails are critical for moving livestock across rangelands and to markets.
- There are established Utah Grazing Agricultural Commodity Zones (Utah Code 63J-8-105.8) in the counties of Beaver, Emery, Garfield, Kane, Piute, Iron, Sanpete, San Juan, Sevier, Washington, and Wayne for the purpose of:
    (a) preserving and protecting the agricultural livestock industry from ongoing threats;
    (b) preserving and protecting the history, culture, custom, and economic value of the agricultural livestock industry from ongoing threats; and
    (c) maximizing efficient and responsible restoration, reclamation, preservation, enhancement, and development of forage and watering resources for grazing and wildlife practices and affected natural, historical, and cultural activities.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:
(a) movement of people, goods, and services across public lands;
(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:
(i) livestock operations and improvements;
(ii) solid, fluid, and gaseous mineral operations;
(iii) recreational opportunities and operations, including motorized and non-motorized recreation;
(iv) search and rescue needs;
(v) public safety needs; and
(vi) access for transportation of wood products to market;
(c) access to federal lands for people with disabilities and the elderly;
(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Department of Agriculture

§ 4-2-102. *Department created.*
(1) There is created within the state government the Department of Agriculture and Food.
(2) The department created in Subsection (1) is responsible for the administration and enforcement of all laws, services, functions, and consumer programs related to agriculture in this state as assigned to the department by the Legislature.

Uniform Agriculture Cooperative Association Act

§ 3-1-1. *Declaration of policy.*
"It is the declared policy of this state, as one means of improving the economic position of agriculture, to encourage the organization of producers of agricultural products into effective associations under the control of such producers, and to that end this act shall be liberally construed."

Livestock Dealers' Act

§ 4-7-102. *Purpose declaration.*
The Legislature finds that the public interest requires regulation of the sale of livestock between the producer and a person who purchases livestock for resale to protect the producer from unwarranted hazard and loss in the sale of livestock.

§ 4-7-104. *Unlawful to act as an agent or dealer without license—Exception.*
Except as exempted by Section 4-7-105, no person may act as an agent or dealer in this state without being licensed under this chapter.

Agriculture Fair Trade Act

§ 4-8-102**.** *Purpose declaration.*
(1) The Legislature finds and declares that in order to preserve the agricultural industry of this state it is necessary to protect and improve the economic status of persons engaged in the production of products of agriculture.
(2) To carry out the policy described in Subsection (1), the Legislature determines it necessary to regulate the production and marketing of such products and to prohibit unfair and injurious trade practices.
(3) This chapter shall be liberally construed.

Conservation Commission Act

§ 4-18-102. *Findings and Declarations – Duties.*

(1) In addition to the policy provided in Section 4-46-101, the Legislature finds and declares that:
(a) the soil and water resources of this state constitute one of the state's basic assets; and
(b) the preservation of soil and water resources requires planning and programs to ensure:
(i) the development and use of soil and water resources; and
(ii) soil and water resources' protection from the adverse effects of wind and water erosion, sediment, and sediment related pollutants.

(2) The Legislature finds that local production of food is essential for:
(a) the security of the state's food supply; and
(b) the self-sufficiency of the state's citizens.
(3) The Legislature finds that sustainable agriculture is critical to:
(a) the success of rural communities;
(b) the historical culture of the state;
(c) maintaining healthy farmland;
(d) maintaining high water quality;
(e) maintaining abundant wildlife;
(f) high-quality recreation for citizens of the state; and
(g) helping to stabilize the state economy.
(4) The Legislature finds that livestock grazing on public lands is important for the proper management, maintenance, and health of public lands in the state.
(5) The Legislature encourages each agricultural producer in the state to operate in a reasonable and responsible manner to maintain the integrity of soil, water, and air.
(6) The department shall administer the Utah Agriculture Certificate of Environmental Stewardship Program, created in Section 4-18-107, to encourage each agricultural producer in this state to operate in a reasonable and responsible manner to maintain the integrity of the state's resources.
(7) The Legislature finds that soil health is essential to protecting the state's soil and water resources, bolstering the state's food supply, and sustaining the state's agricultural industry.

Plant Pest Emergency Control Act

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MINING AND MINERAL RESOURCES

Introduction

Mineral resources are raw materials extracted from the earth and used to manufacture many of the products that make modern society possible. Minerals resources are used in the manufacture and production of buildings, roads and highways, automobiles, electricity, and countless other goods and benefits for consumers. Mineral resources require varying levels of effort, processing, and refining, which are often dictated by their end use. As society changes and advances, additional mineral resources will be required. For instance, the transition to renewable energy will require substantial additional production of copper, lithium, cobalt, rare-earth elements (REEs), and others.

The abundant mineral resources in Utah have proven to be a great benefit to the people of Utah and the United States for more than 170 years. The production of salt from the Great Salt Lake and lime products were some of the state's first commercial products, which resulted from operations that began shortly after Mormon settlers arrived in the Salt Lake Valley in 1847. Most of the buildings constructed after 1872 at Fort Douglas were constructed of sandstone from nearby Red Butte Canyon, and many other homes and buildings throughout the state were constructed of various types of stone from other quarries [1]. Commercial-scale production of metals, consisting primarily of gold and silver, began in 1865. Copper and lead production reached commercial levels in 1870 and, together with the precious metals, reached a total value of over $1 million dollars that year [2]. The late 1800s also saw the development of Utah's famous Bingham mining district. After the transcontinental railroad was completed in 1869, a number of branch lines were constructed, and this contributed to the increase in metal production that pushed total extractive industry values to more than $100 million by 1917 [3]. Simultaneously, a number of large smelters were constructed in the Salt Lake Valley, mostly just after the turn of the century. These new facilities helped to establish Utah as a major regional mining and smelting center by the early 1900s. Since that time, Utah's mining industry has continued to expand and is an important producer of numerous mineral resources.

Currently, mining in Utah occurs within a complex configuration of federal, state, and privately-owned lands. As a result, regulation and development of Utah's mineral resources are managed by various state and federal agencies, including the following: the Utah Division of Oil, Gas and Mining (DOGM); U.S. Bureau of Land Management (BLM); U.S. Forest Service (Forest Service); Utah Department of Environmental Quality; Utah School and Institutional Trust Lands Administration; and Utah Division of Forestry, Fire and State Lands.

Mining in Utah is regulated primarily by DOGM. Their mission is to regulate the exploration and development of coal and non-coal minerals in a manner which [4]:

- encourages responsible reclamation and development;
- protects correlative rights;
- prevents waste; and
- protects human health and safety, the environment, and the interests of the state and its citizens.

In 1975, the Utah Legislature assigned DOGM the responsibility for administration of the Mined Land Reclamation Act. The act's primary function was to "prevent conditions detrimental to the general safety and welfare of the citizens of the state of Utah" that could result from activities of the mining industry in

the state. Permitting, inspection, and enforcement procedures initiated by the act ensure proper mine operation and the reclamation of affected lands. The act also made it illegal for mines to be abandoned without reclamation.

Implementation of the Mined Land Reclamation Act was initially paid for solely with Utah state general funds. A specific law to address the reclamation of coal mines, the Utah Coal Mining and Reclamation Act, was passed in 1979, and in 1981 Utah received primacy for the regulation of coal mining and reclamation under the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). In March 1987, DOGM assumed sole responsibility under a cooperative agreement for permitting, inspection, and enforcement with respect to mining on federal lands in Utah. Federal money is now provided for regulation of coal mining and reclamation on federal and nonfederal lands. Funds for the regulation of non-coal minerals exploration and development continue to come primarily from Utah's general fund but are supplemented by a modest permit-fee program implemented in 1998.

The DOGM's Abandoned Mine Reclamation Program (AMRP) conducts reclamation of abandoned mine sites under Title IV of SMCRA. Funds for this program come from appropriations of federal fees paid by the coal industry, based on a per-ton produced rate. Modest funding agreements with private and federal partners also supplement some of the work in the Abandoned Mine Reclamation Program. The AMRP works to protect the public from the dangers of old mines by sealing off access to openings and cleaning up waste. Old mining sites can be intriguing to the public but can be unstable, contain dangerous gases, and present other hazards. Today there are an estimated 17,000 mine openings scattered across Utah. [5]

The Minerals Program within DOGM regulates all non-coal mining operations in the state with a few exceptions. The mission of the Minerals Regulatory Program is to regulate exploration for, and development and reclamation of, non-coal mineral resources of the state in conformance with the Utah Mined Land Reclamation Act, UCA 40-8 in a manner which [6]:

- supports the existence of a viable minerals mining industry to preserve the economic and physical well-being of the state and the nation;
- safeguards the environment while protecting public health and safety; and
- achieves the successful reclamation of lands affected by mineral mining activities.

From Rio Tinto's Bingham Canyon mine, the largest open-pit mine in the state, to small operations mining for trilobite fossils, the Minerals Program staff works to ensure mining operation procedures are followed. This includes verifying operators work within their permit boundaries, ensuring that mining operations pose no threat to public safety or the environment, and holding appropriate reclamation fees or bonds in the event that they are needed.

The Utah Geological Survey's (UGS) mission is to provide "timely scientific information about Utah's geologic environment, resources, and hazards," and it acts as the primary repository for mineral resource information across the state. The UGS generates, collects, compiles, and distributes mineral-resource data and information to public, private, and government users. In those roles, the UGS conducts original research on Utah's mineral resources but also preserves existing data made available from other sources, such as industry. In 2020, the UGS produced Circular 129, *Critical Minerals of Utah*. Much of the data in this section is derived from this report. [7]

The UGS has partnered with the BLM to provide a Mineral Resources web application that includes critical minerals and other mineral occurrences in Utah. [8]

Findings [9]

Utah hosts a variety of mineral resources and produces significant quantities of base metals, precious metals, and industrial minerals. The U.S. Geological Survey (USGS) ranked Utah 8th in the nation for nonfuel (metals and industrial minerals) mineral production value in 2020, accounting for nearly 4 percent of the U.S. total [10]. Utah consistently ranks in the top 10 states for production value of nonfuel minerals.

The UGS estimates that the production value of Utah's mines, excluding coal, was $3.2 billion in 2020. Base-metal production contributed $1.5 billion to that total and includes copper, magnesium, beryllium, and molybdenum. Notably, copper accounted for 57 percent of Utah's base-metal production value in 2020. Precious metals produced in Utah include gold and silver, and 2020 production was valued at $350 million. Utah also produced several industrial mineral commodities, including sand and gravel, crushed stone, salt, potash, cement, lime, phosphate, lithium, uintaite (Gilsonite®), clay, and gypsum. The estimated value of Utah's industrial mineral production in 2020 was $1.4 billion.

Notably, Utah is home to the Bingham Canyon mine, which is a world-class copper-molybdenum-gold porphyry deposit. The great majority of Utah's copper, gold, and silver production, and all of its molybdenum production, comes from the Bingham Canyon mine. The mine and associated refineries and facilities are located on the west bench of the Salt Lake Valley in the Oquirrh Mountains. Utah also remains the only state to produce magnesium metal, beryllium concentrate, potassium sulfate, and uintaite (Gilsonite®); of these mineral commodities, magnesium and beryllium are included in the USGS's 2022 list of critical minerals [11]. Lithium, also deemed a critical mineral, was produced in Utah for the first time in 2020, making Utah one of only two lithium-producing states.

Currently, there are more than 400 non-coal mines with active permits from DOGM statewide [12]. The metals and industrial minerals sections below detail the most significant mineral resources mined in Utah.

Metals

Copper. Copper is the largest single commodity contributor to Utah's non-fuel mineral portfolio. The Bingham Canyon mine is, by far, the primary producer of copper in Utah, and in 2020 it produced 309 million pounds (154,000 short tons), which was valued at $864 million. Smaller producers have intermittently operated in San Juan and Beaver counties in recent years. Utah copper is used to create various alloys for numerous products, including electrical wiring, electronic components, and pipe for plumbing, refrigeration, and heating systems.

Magnesium. Utah is home to the U.S. Magnesium plant in Tooele County, which is the only facility producing magnesium metal from a primary source within the United States. Magnesium chloride-rich brine is derived from Great Salt Lake and is converted to magnesium metal using evaporation and an electrolytic process. The plant has a production capacity of approximately 70,000 tons of magnesium metal per year. This metal is used in industrial applications, such as a constituent of aluminum-based alloys for aerospace and defense applications, and also to add strength, decrease weight, and increase corrosion resistance of alloys for desulfurization of iron and steel. Other potential magnesium resources are located in the Great Salt Lake Desert/Bonneville Salt Flats, Sevier Lake, and the Paradox Basin.

Beryllium. Utah currently remains the sole producer of beryllium ore in the United States. Materion Natural Resources, Inc., extracts bertrandite, a beryllium mineral, from the Spor Mountain area in Juab County, and then produces bertrandite concentrate at their mill in Millard County. The beryllium mill processes the bertrandite ore into beryllium hydroxide, which is then shipped out of state for further refining. In 2020, beryllium production from Utah totaled 333,840 pounds (167 tons), having a value of $94 million. The Spor Mountain mine is the largest producer of beryllium in the world, accounting for approximately 63 percent of the world's production in 2020. The proven and probable reserves at Spor

Mountain are estimated to be enough to maintain mining at current production levels for another 75 years. Beryllium is an essential component in aerospace and defense applications due to its light weight and its ability to withstand significant temperature variations and mechanical distortion. It is also an important component for automotive and consumer electronics, telecommunications infrastructure, and energy applications.

Gold and Silver. Most of Utah's gold and silver are produced from the Bingham Canyon mine. However, lesser amounts of both metals are also produced at the Kiewit (Tooele County) and Trixie (Juab County) mines. Utah produced 175,043 troy ounces of gold in 2020 valued at $310 million. Utah produced 2.2 million troy ounces of silver in 2020 valued at $44 million.

Molybdenum. Molybdenum is produced in Utah exclusively from the Bingham Canyon mine. In 2020, Bingham produced 45,000,000 pounds (22,490 tons) of molybdenum, valued at $408 million. Molybdenite, the ore mineral of molybdenum, is not refined at Bingham Canyon. The molybdenite is concentrated, dried, and shipped to other refineries in Arizona and Mexico. Molybdenum is used primarily in alloys, particularly in the stainless-steel alloys that are widely used in the petroleum industry.

Iron. Utah intermittently produces iron from the Iron Springs district in Iron County and recently resumed production following a shutdown in 2014. The Iron Springs district has historically been the largest iron producer in the western United States. Iron mineralization at the Black Iron open-pit mine, which restarted operations in 2020, occurs as massive magnetite skarn/replacement deposits adjacent to Miocene monzonite laccoliths.

Industrial Minerals

Potash. Utah is one of only two potash-producing states in the country, and three locations in Utah produce potash. Compass Minerals in Ogden produces potassium sulfate from Great Salt Lake brine, Intrepid Potash-Wendover produces potassium chloride from shallow subsurface brines in the Great Salt Lake Desert, and Intrepid Potash-Moab produces potassium chloride from a solution mine targeting deep, subsurface evaporites of the Pennsylvanian-age Paradox Formation. In 2020, potash production in Utah totaled 461,000 short tons, which was valued at $227 million. Uniquely, Utah produces two types of potash: potassium sulfate and potassium chloride. Potassium sulfate has a significantly higher (+$376 per ton in 2020) market value than potassium chloride. As previously noted, Utah is the sole domestic producer of potassium sulfate. The primary use of both types of potash is fertilizer; however, potash is also used in the production of soap, glass, ceramics, and batteries, and it is a component in drilling mud used in the oil and gas industry.

Sand and Gravel, Crushed Stone, and Dimension Stone. Sand and gravel, crushed stone, and dimension stone are produced by many private, county, state, and federal entities in Utah. These commodities are produced from several types of unconsolidated deposits. Sand and gravel and crushed stone, known generically as construction aggregate, are widely used for concrete aggregate, road construction, asphalt aggregate, fill, and for other construction uses. During 2020, approximately 40 million short tons of sand and gravel were produced in Utah, worth an estimated $309 million, and about 14 million short tons of crushed stone were produced, worth $105 million [13]. Several thousand tons of dimension stone were also produced. A strong construction market in Utah, particularly in the residential sector, has kept demand for construction aggregates relatively high for the past several years.

Salt. Utah has extensive salt resources. Salt produced in Utah is used for a variety of purposes including road deicing, water treatment, and agricultural and industrial applications. One operation in central Utah, Redmond Minerals, also produces food-grade salt from their underground operation. Utah salt production in 2020 amounted to approximately 3.3 million short tons and had a production value estimated at $207

million. About 76 percent of the salt was produced from Great Salt Lake brine by three operators that use evaporation ponds for production: Compass Minerals Ogden, Cargill Salt, and Morton International. The remaining 24 percent came from Redmond Minerals, Intrepid Potash-Moab, Intrepid Potash-Wendover, and Willow Creek Salt. Redmond Minerals and Willow Creek Salt use conventional methods to mine rock salt, and Intrepid uses evaporation ponds to produce salt. Intrepid Potash-Wendover primarily extracts salt from shallow subsurface brines, and Intrepid Potash-Moab solution mines salt from deep subsurface salt beds.

Portland Cement, Lime, and Limestone. Multiple mining operations in Utah mine limestone for purposes beyond construction aggregate to create value-added products such as Portland cement and lime. Ash Grove Cement and LafargeHolcim produced about 1.8 million short tons of Portland cement in Utah during 2020, having an estimated value of $207 million. Ash Grove Cement operates the Leamington quarry and plant east of Leamington in Juab County, whereas LafargeHolcim operates the Devils Slide quarry and plant east of Morgan in Morgan County. Besides mining limestone for Portland cement, Ash Grove and Holcim also produce small amounts of sandstone, clay, and shale, which are lesser feedstock for their cement plants. During 2020, Graymont Western U.S. was the sole producer of lime in Utah, and they produced high-calcium quicklime and dolomitic quicklime from their quarry and plant in the Cricket Mountains in Millard County. Lime is used for flue gas desulfurization, steel production, and a variety of other construction, chemical, and industrial applications. Limestone is also mined for flue-gas desulfurization at coal-fired power plants and "rock dust," used to coat the walls of coal mines to keep coal dust from accumulating.

Phosphate. Utah is one of four states in the country that produces phosphate rock. Most of the phosphate rock mined domestically is used to manufacture phosphoric acids to make ammonium phosphate fertilizers and animal feed supplements. Simplot Phosphates is the major phosphate producer in Utah, mining the Meade Peak Member of the Permian Phosphoria Formation. Their phosphate operation is 12 miles north of Vernal in Uintah County. In 2020, the mine produced nearly 3.2 million short tons of ore, yielding about 1.2 million short tons of phosphate concentrate after processing. The concentrate is transported in slurry through a 96-mile underground pipeline to the Simplot fertilizer plant near Rock Springs, Wyoming. A few thousand tons of organically certified phosphate is produced from another mine in Utah County.

Uintaite (Gilsonite®). Uintaite, also known as Gilsonite®, is a shiny, black, solid hydrocarbon that occurs in a swarm of narrow, but laterally and vertically extensive veins in the Uinta Basin. It has been mined since the late 1880s, mostly in Utah with some minor production in the Colorado part of the basin. In 2020, American Gilsonite Company and Table Rock Minerals, LLC, were the only producers of uintaite, both located in Uintah County. Over the past decade, uintaite production from the Uinta Basin has ranged up to about 85,000 short tons per year, depending on market conditions. Utah is the only place in the world that contains large deposits of uintaite, which has been shipped worldwide for use in numerous and diverse products including asphalt paving mixes, coatings, inks, and paints [14]. The oil and gas industry has also used uintaite as an additive in drilling fluids. Uintaite helps control fluid loss and seepage, increases wellbore stability, prevents loss of circulation, and stabilizes shale.

Clay and Shale. Clay and shale production (including bentonite, common clay, high-alumina clay, and expanded shale) in Utah totaled at least 341,000 short tons in 2020. Clay and shale are produced at various small and large mines, commonly on an intermittent basis. Bentonite was produced by Western Clay and Redmond Minerals. Uses for bentonite include well drilling and foundry operations, various civil engineering applications, and litter-box filler. Some of the largest producers of clay and shale products are Utelite (expanded shale), Interstate Brick (common clay), Ash Grove Cement (high-alumina clay), and LafargeHolcim (high-alumina clay). In Utah, common clay is used mostly to make bricks, whereas high-alumina clay is most commonly used to make Portland cement. Applied Minerals, Inc.,

intermittently produces small amounts of specialty clay (halloysite) and iron oxide from the Dragon mine in the Tintic Mountains. Expanded shale in Utah is produced by Utelite at their quarry and plant near Wanship in Summit County. Expanded shale is a lightweight aggregate used mainly by the construction industry. The material is used in roof tile, concrete block, structural concrete, and horticulture additives, as well as for highway construction and geotechnical fill.

Silica and industrial sand. Silica and industrial sand produced in Utah are used for flux and frac sand. Production in Utah during 2020 had an estimated value of about $19 million. On Stansbury Island, Bolinder Resources mines quartzite from the Devonian-Mississippian Stansbury Formation as a source of industrial silica that is used as a flux at the Kennecott smelter. North of Vernal, Ramsey Hill Exploration produces frac sand from Quaternary unconsolidated mixed alluvial and eolian deposits. Frac sand is relatively pure silica sand that is used for hydraulic fracturing stimulations in oil and gas wells, and Ramsey Hill supplies this sand for local use in the Uinta Basin.

Gypsum. Utah has significant gypsum resources, and gypsum produced in Utah is used primarily in raw or crude form by regional cement companies as an additive to retard the setting time of cement and by the agriculture industry as a soil conditioner. Lesser amounts of the higher-value calcined gypsum are used to make wallboards. Four operators reported combined gypsum production in Utah of about 553,000 short tons in 2020, the estimated value of which was $6.6 million. The four Utah gypsum producers were Progressive Contracting, Inc.; United States Gypsum Co.; Sunroc Corp.; and Diamond K Gypsum. Two gypsum wallboard plants are located near Sigurd in Sevier County, but only one is currently active.

Lithium. For the first time in 2020, lithium was produced in Utah by U.S. Magnesium as a byproduct. Lithium is concentrated along with magnesium in U.S. Magnesium's solar evaporation ponds, and as part of the magnesium-refining process, lithium is separated from magnesium. U.S. Magnesium has been stockpiling lithium ore from this process for many years. Their estimated capacity for lithium production is about 10,000 tons of lithium carbonate per year. Lithium is used primarily in batteries, but is also used in ceramics, glass, lubricating grease, pharmaceuticals, and other applications. Other potential lithium resource areas in Utah include the Paradox Basin, Sevier Lake, and the Great Salt Lake Desert.

Coal

(See Energy Resources Section)

Exploration and Development

Exploration and development activity for mineral resources in Utah remains an important pursuit. Exploration and development involve locating a potential mineral deposit, acquiring a land position, defining the potential mineral resources (which includes mapping, sampling, and drilling), economic evaluation, permitting, and other activities. Utah has a long history of exploration for metallic resources, and exploration is currently taking place in many of Utah's mining districts [15] for copper, gold, silver, lead, and zinc. Recent exploration for industrial mineral commodities includes fluorspar, lithium, frac sand, potash, pozzolan, and phosphate.

Critical Minerals and Rare Earth Elements (REEs)

Critical Minerals. In 2022, the USGS designated 50 non-fuel minerals as critical minerals [16]. Critical minerals are defined as those necessary for economic or national security and are dependent on a supply chain that is vulnerable to disruption. As of early 2022, Utah produces six of these critical minerals (i.e., lithium, beryllium, magnesium metal, platinum, palladium, and tellurium) [17]. Platinum, palladium, and

tellurium are all produced as byproducts from the Bingham Canyon mine. The production of lithium, beryllium, and magnesium metal is discussed above.

In addition to the six produced critical minerals, Utah hosts established resources of seven more (i.e., fluorspar, vanadium, aluminum, indium, gallium, germanium, and zinc). Ares Strategic Mining is currently developing the Lost Sheep fluorspar mine in Juab County, with plans to begin production in 2022. It would be the largest fluorspar producer in the United States. Other recent activities in Utah related to critical minerals have included exploration for vanadium, indium, and lithium. The 2018 critical mineral list also included potash, helium, and rhenium, all of which Utah produces, but, based on the USGS's updated criteria for inclusion as critical minerals, they were removed from the list [18]. Also, although it was on the 2018 critical mineral list, uranium was not evaluated for inclusion on the 2022 critical minerals list because it is a fuel mineral—Utah has significant uranium resources. Utah does not currently produce uranium, but it does host the country's only active uranium mill.

Rare Earth Elements (REEs)

No significant REE deposits have historically been found in the state of Utah. Minor modern exploration has re-evaluated previously deprioritized targets (e.g., Lake Bonneville beach gravels in Juab County). Byproduct REE production from existing mine tailings, such as the beryllium tailings at Spor Mountain or coal ash stockpiled at coal-fired power plants, may be possible and is the subject of current research.

Critical Materials

In 2023, the U.S. Department of Energy Development (DOE) began the process of creating a "Critical Materials Assessment" to account for minerals not included on the critical minerals list. Uranium was excluded from this list and the USGS Critical Minerals list. These lists are updated every three years. [19] It is problematic that landscape-scale federal designations make America's uranium supply inaccessible. This is particularly true in Utah and Arizona, both of which are nearest to the only uranium mill in the United States. The recent creation of a national monument in Arizona increased the dependency of the United States on foreign enriched uranium providers – a market that is primarily controlled by China and Russia.

The Strategic Vision for the Office of Nuclear Energy and the U.S. Department of Energy states that "Nuclear is one of the most resilient, environmentally sustainable, and reliable energy sources on the grid today… nuclear provides approximately 20 percent of our electricity, more than 55 percent of our clean energy, and supports about half a million American jobs."

Economic Considerations

The mining industry is an important contributor to Utah's economy. As previously noted, Utah ranked 8th in the United States for value of nonfuel (metals and industrial minerals) mineral production in 2020, and the total value of those commodities produced in 2020 was approximately $3.2 billion. The metal and industrial mineral industries paid nearly $66 million in property taxes during 2020 and more than $13 million (in fiscal year 2020) in mining-related severance taxes. All extractive industries, including oil and gas, paid nearly $45 million in federal mineral lease disbursements in fiscal year 2020. About 1 percent of Utah's gross domestic product came from the mining industry in 2019—1.4 percent if oil and gas are included [20]. According to the Utah Department of Workforce Services, about $390 million in wages were earned in 2020 by mining employees in Utah.

Utah will continue to regulate the exploration and development of minerals in a manner that encourages responsible reclamation and development; prevents waste; and protects human health and safety, the

environment, and the interests of the state and its citizens. The State of Utah will advance Utah's mineral development sectors through planning, policy, and engagement with the mining industry, the public, and stakeholders.

Products from the mining industry are integral to every Utahns' lifestyle and standard of living, and they support the nation's economy. From the sand and gravel used to build roads and lay foundations for homes and buildings, to coal and uranium used to generate more than half of the nation's electricity, to the copper wire that connects billions of computers to global networks, this country's economy and way of life depend on the vital resources provided by mining. Because of its importance to society, mineral resource development in Utah is supported by state policy. The following statements describe the state's positions on mineral resources and mineral development on state and federal lands within the State of Utah.

Goals, Objectives, and Policies

Goal(s):

- Promote responsible and sustainable stewardship and development of Utah's mineral resources.

Objectives:

1. Protect and expand access to significant mineral resources, including critical minerals and REEs, for current and future generations of Americans.
2. Encourage the mining, transportation, and processing of mineral resources in Utah, including critical minerals and REEs.
3. Support the investigation and processing of mine tailings and new mineral resources to extract critical minerals and REEs, while avoiding undue environmental harm.
4. Ensure that the UGS has adequate funding to investigate and make needed data publicly available. This process may include the need to hire additional employees to do research, collect and synthesize data, and generate reports.

Policies: critical materials/rare earth elements/uranium

- Encourage the exploration and production of critical minerals and REEs.
- Oppose land-use plans or designations that impede access to important mineral resources to include the ability to mine, produce, process, or transport those resources.
- Oppose any land use restrictions or designations that could impede mineral-resource development and production prior to the federal government funding and completing a comprehensive mineral resource assessment of areas subject to such restriction or designation.
- Support federal initiatives to reduce the nation's reliance on imported mineral resources.
- Encourage the Department of Energy and Utah States Geological Survey to recognize the importance of uranium for economic prosperity and national defense.
    - Encourage federal agencies to include uranium on critical mineral and critical material lists even though it is classified as a fuel mineral under the Energy Act of 2020.
    - Oppose federal designations that would withdraw areas rich in uranium, critical minerals, rare earth elements, or critical materials from mining activity.
- Support streamlined and expedited processes in National Environmental Policy Act (NEPA) compliance and permitting, so that mineral resources can be accessed, produced, processed, and transported in a timely manner.
- Support legislation and policies that facilitate exploration and development of the mineral resources in Utah.

- Support responsible and environmentally conscious mining for mineral resources on lands managed by the State of Utah, BLM, and Forest Service.
- Do not support the withdrawal of lands managed by the BLM or the Forest Service from available mineral extraction unless the proposed mineral withdrawal is agreed upon through coordination with the state and counties within which the proposed mineral withdrawal is located.
- Engage with federal land management agencies on all mining-related projects to promote the responsible mining of mineral resources.
- Supports a positive working relationship between the federal land-management agencies and the DOGM to promote responsible mining of the mineral resources that support Utah's economy and quality of life, while safeguarding Utah's environment.
- Included state agency personnel as members of interdisciplinary teams preparing NEPA documents affecting mineral resources in Utah.

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(a) movement of people, goods, and services across public lands;

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(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Mines and Mining (Title 40)

Utah Geological Survey (§ 79-3)

Utah Energy Act (§ 79-6)

Concurrent Resolution Highlighting Utah's Rare Earth Mineral Position

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NOXIOUS WEEDS

Introduction

In 1971, the Utah Legislature passed the Utah Noxious Weed Act, Title 4, Chapter 17 into law. After enactment of the law, the Utah Department of Agriculture and Food (UDAF) adopted rules and regulations to guide its implementation [1]. The Noxious Weed Act is administered by the UDAF, and its enforcement is the responsibility of county commissioners, assisted by their respective county weed boards and the county weed supervisor.

Giving enforcement authority to county weed boards establishes a bottom-up approach, with the local elected officials and those assisting them being closest to the people making the majority of the decisions. The custom of maximizing local management to achieve the best results has proven extremely effective in Utah, and is part of the state's weed-management culture. Local elected officials and their respective weed boards and county supervisors have taken an educational and cooperative approach to assist landowners.

As defined by the Utah Noxious Weed Act a "noxious weed" is "any plant the commissioner (Utah Commissioner of Agriculture and Food) determines to be especially injurious to public health, crops, livestock, land, or other property [2]." County commissioners also have authority and do declare plants as county "noxious weeds." Often, noxious weeds are very invasive, nonnative plant species with undesirable biological characteristics that enable them to spread rapidly on land that has been properly or poorly managed.

Findings

Invasive noxious weeds are a threat to Utah's ecosystems, waterways, agricultural production, land health, and public safety. The areas of most concern are riparian areas, cropland, rangeland, and forestland. Development, global human travel, movement of equipment and animals, and various recreational activities continually bring new invasive weeds into the state.

Noxious weeds are easily spread through contaminated agricultural machinery, livestock feed, hay, straw, soils, sod, nursery stock, and manure. Preventive measures begin by thoroughly cleaning agriculture machinery and equipment (which has come in contact with weeds) before it is transported to other locations. Vehicles transporting seed, feed, and other agricultural materials should take measures to prevent spilling and spreading materials during transport. Transportation of topsoil, fill materials, construction equipment, recreation, and wildlife can also spread weeds.

Areas of land in all of Utah's 29 counties are infested with at least one of the 54 state-designated noxious weeds. When a new invasive species is found, it is mapped, classified, and added to an early detection and distribution (EDD) online mapping database and is then considered for designation as a noxious weed. It is likely that some potentially dangerous noxious weeds have, so far, escaped detection.

The State Noxious Weed list of 54 species and prioritization categories is as follows:

CLASS 1A: EARLY DETECTION RAPID RESPONSE (EDRR) WATCH LIST

Declared noxious weeds and invasive weeds that are not native to Utah, are not known to exist in the state but pose a serious threat, and should be considered a very high priority.

CLASS 1B: EDRR

Declared noxious and invasive weeds not native to Utah that are known to exist in the state in very limited population, pose a serious threat to the state, and should be considered as a very high priority.

CLASS 2: CONTROL

Declared noxious and invasive weeds not native to Utah that pose a threat to the state and should be considered a high priority for control. Weeds listed in the control list are known to exist in varying populations throughout the state. The concentration of these weeds is at a level where control or eradication may be possible.

CLASS 3: CONTAINMENT

Declared noxious and invasive weeds not native to Utah that are widely spread. Weeds listed in the containment noxious weeds list are known to exist in various populations 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.

CLASS 4: PROHIBITED

Declared noxious and invasive weeds, not native to Utah, 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 commissioner designates as having the potential or are known to be detrimental to human or animal health, the environment, public roads, crops, or other property.

COUNTY LISTED WEEDS

Each county in Utah may have different priorities regarding specific state-designated noxious weeds and is therefore able to reprioritize these weeds for their own needs.

The weed specialist coordinates weed-control activities among the county weed organizations and agricultural field representatives. Surveys of serious weed infestations are conducted and control programs are developed through county supervisors, county weed boards, and various landowning agencies. The weed specialist and inspectors work continually with extension and research personnel, encouraging the use of the most effective methods to control the most-serious weed infestations.

The negative impacts of noxious weeds on other resources are well known and significant. These include the following:

- Weed infestations can create monocultures that eliminate diverse plant communities.
- Watersheds dominated by noxious weeds are less efficient in absorbing and storing water, which results in increased runoff, flooding, and soil erosion.
- Noxious weed infestations can reduce forage production and quality for all herbivores and habitat for birds and animals.
- Some noxious weeds are poisonous and injurious to animals.
- Noxious aquatic weeds can obstruct irrigation systems, clog machinery, destroy fish habitat, contribute to flooding, and negatively impact recreational use of waterways.
- Noxious weeds can cause physical injury or irritation to people, pets, and livestock.
- Fire is a control method often used to treat phragmites, but the resulting smoke may lead to air quality issues, which must be considered.

- Many noxious weeds, such as cheatgrass, are very flammable and increase the risk of wildfires. After a fire burns a weed-infested area, the weeds often recover before native plants and are thus able to dominate native plant species by taking over water and soil resources.

If left unchecked, noxious weeds can spread at average rates of 3 to 60 percent annually. In addition, new class-1B noxious weeds have been recently found and declared noxious in Utah [3]. These include: elongated mustard, garlic mustard, ventenata, and viper grass. Because 64 percent of land in Utah is federally owned, a significant responsibility for noxious weed control and management rests with federal land-management agencies. These federal agencies are required by the Utah Weed Control Act, their respective organic acts, and their management plans to take responsibility for and control invasive noxious weeds on lands they administer. However, these agencies have not yet budgeted a reasonable amount of funding nor allocated the necessary human resources to adequately address the magnitude of their noxious weed problem.

Each of the state's 29 counties have an active Local Weed Control Program in place. These local programs are responsible for noxious weed management within their respective boundaries with help from partners such as the UDAF. ~~Examples of some local weed control programs include:~~

- ~~Morgan County Weed Program~~
- ~~Salt Lake County Weed Control Program~~
- ~~Tooele County Road Department~~
- ~~Weber County Weed Department~~

Cooperative Weed Management Areas (CWMAs): These provide weed control across large areas, like watersheds, and without specific consideration of land ownership, to more effectively treat weed infestations. CWMAs are also 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.

There are currently 23 CWMAs in Utah, divided by region. Some excellent examples of CWMAs and their partners within the Wasatch Front Regional Council area include:

- Bonneville CWMA**.** Tooele County, Salt Lake County, Utah Department of Transportation (UDOT), US Bureau of Land Management (BLM), and U.S. Forest Service (Forest Service)
- Weber River CWMA. Weber County, Davis County, Antelope Island, Utah Department of Wildlife Resources, UDOT, and BLM
- Squarrose CWMA. Tooele County, Forest Service, Utah School and Institutional Trust Lands Administration, and Utah State University, and BLM

Economic Considerations

Weeds create significant economic impacts. Weeds compete with crops and reduce the quality of food, feed, and fiber. During the 1950s, agricultural producers lost about $5.1 billion per year to reduced crop yield and quality, and to the cost of weed control. This value doubled by 1979. During the 1980s, farmers spent more than $3 billion annually for chemical weed control and about $2.6 billion for cultural, ecological, and biological methods of weed control. During this time, about 17 percent of crop value was being lost because of weed interference and the cost of weed control [4].

More recently, in the United States agricultural sector, losses and control costs associated with weeds in crops, pasture, hay, and range were estimated to be approximately $33 billion per year. In non-crop sectors (e.g., turf, and ornamental landscaping), losses and control costs totaled about $1.5 billion per year. [5]

Production agriculture and the associated processing sector accounts for more than 15 percent of Utah's economy. [6]

In addition, Utah's heritage as a western state has attracted countless visitors to experience the western lifestyle and see Utah's rangelands. The expansion of noxious weeds threatens the lifestyle, custom, and culture of Utah's people. Without active, effective weed control and management, Utah's cropland, rangeland, forestland and private property will become much less productive and biologically diverse.

The importance of herbicides as a weed-control and weed-management tool cannot be overstated. It is estimated that losses in the agricultural sector would increase about 500 percent without the use of herbicides. [7]

In Utah, the value of yield losses in crops due to weeds varies annually as the price of the commodity fluctuates. However, the percentage yield loss of some significant crops in the state has been estimated as [8] shown in the tables below:

Although the total cost to manage noxious weeds in Utah is not known, noxious weeds have a severe impact on multiple industries in Utah, including agriculture, tourism, and private property. The state legislature appropriates about $2.0 million annually for the UDAF-administered Invasive Species Mitigation Program for projects to control and manage noxious weeds throughout Utah.

Best Management Practices and Implementation

The invasion of noxious weeds and undesirable invasive plant species into the state should be reversed, their presence eliminated, and their return prevented. State land managers, local governments, and property owners are responsible for controlling weed species on the state's noxious weeds list, and local weed species of concern if necessary. Weed control includes both lands under local management (roads, rights-of-way, 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, and seek reimbursement or apply liens for the work.

Handling the issue of invasive plants in Utah is an ongoing effort. Nonnative plants will be part of the landscape throughout Utah's future. Strategies and tools can be implemented to reduce the state's susceptibility to new invasions and empower all of us to reduce the effects of weeds. The development of an invasive species program can be based on the application of Dr. Steve Dewey's Biological Wildfire Model as applied to weeds [9]. The key elements are as follows:

1. Prevention
2. Early Detection and Rapid Response
3. Management of Established Populations
    a. Identify the perimeter
    b. Eradicate satellite populations
    c. Contain and suppress main population
4. Revegetation or Rehabilitation
5. Protect Defensible Spaces

All federal agency resource-management planning on public lands must involve active participation from state agencies, local government, and local property owners as contributing members.

When possible, state and local governments must be included as members of the interdisciplinary teams for each project. All federal policies and management plans acknowledge and consider the cultural, economic, and environmental importance of agriculture and recreation on public lands and the threat that noxious weeds pose.

Increased education is needed for recreation, tourism, the general public, K-12 schools, elected officials, and state agencies concerning the harmful effects of noxious weeds and how to prevent their spread when vacationing and recreating.

Further research is needed on cost-effective ways to control and manage noxious weeds, track and monitor them, and rehabilitate treated areas.

The use of EDD Maps should be mandated, which is the established comprehensive noxious weed mapping system broadly accepted by the State of Utah Weed Committee, and is used by the Utah Department of Agriculture and Food, and Utah's counties to map and assess the current condition of noxious weeds in Utah. These EDD Maps should be used to monitor, track, and document the spread of noxious weeds by obtaining and inputting accurate data in a timely manner.

Additional mapping and monitoring information is needed to identify and quantify areas that are infested with noxious weeds, what types of weeds are present, and the location of noxious weeds in Utah. Improved monitoring will help the state improve an accurate online map database of noxious weeds in Utah.

- Identify and record GPS locations of noxious and invasive weed species.
- Accurately calculate the total number of acres for priority weeds.
- Determine how fast noxious weeds are spreading by comparing weed inventories over time.
- Identify boundaries of newly invading species.

Increase emphasis on prevention as a strategy to manage noxious weeds in Utah. Prevention is the most effective tactic to fight noxious weeds. Healthy ecological systems with well-established native plants are much less susceptible to invasive and noxious plants. Consequently, proper and active land management to establish healthy ecosystems is one of the first steps to preventing noxious weeds.

- Track invasive species via EDD Maps in neighboring counties and states and share information through partnerships with Utah Weed Committee, Utah Weed Control Association and county weed supervisor association.
- Develop and use weed control and management guidelines, and educational materials (public, highway and construction companies, nurseries, railroads, etc.).
- Regulate known pathways for invasive species (e.g., federal agencies requiring washing of equipment, requirements for rinsing watercraft when transporting between waterbodies and weed-free seed and forage programs).
- Encourage development of weed-invasion risk-analysis in federal and statewide planning efforts.
- Encourage Utah's project and land-planning teams to include analysis of what potential new invaders are likely to occur and identify where, based on ecological conditions, the most susceptible areas for future invaders are.

Early detection and rapid response (EDRR) are vital as noxious weeds spread into new ecosystems. The earlier that county, state, and federal agencies detect and treat noxious weed infestation, the better the management outcome will be. As noxious weeds become more established in new areas, they destroy native ecosystems and are more difficult and expensive to treat.

- Use and keep updated the 1A EDDR watch list for the state and for counties with high probabilities of new invasive noxious weed problems.
- Use the established EDD Map online network for reporting new invasive species.
- Encourage routine and systematic surveys as part of all weed programs.
- Map invasive species and high-risk areas.
- Provide resources to land managers for proper identification.

Quicker responses to the presence of all noxious weeds in Utah is necessary to minimize damage to ecosystems, efficiently use limited funds, and prevent land health degradation.

- Use the coordinated "decision support system" provided by the State of Utah Weed Committee, Utah Weed Supervisors Association Executive Committee, Utah Weed Control Association Executive Committee, county weed boards, Utah State University (USU) Extension and CWMAs (or other partner groups) to help set noxious weed priority.
- Distribute "Weed Alerts" through communication networks, mailings, and websites.

More-integrated weed management is necessary to improve the management of noxious weeds. Because land in Utah is administered or owned by federal, state, and private owners, effective weed management requires an integrated approach. Due to the nature of noxious weeds, management must occur on all land within the state, or effective management will provide few results. The Utah strategic weed-control plan promotes an integrated approach, where "prevention is the best method" of weed management. Consider each of the following action items when developing an integrated weed-management plan:

- Weed reproduction and dispersal
- Weed ecology
- Plant competition
- Biological weed control
- Chemical weed control
- Preventive weed control
- Cultural weed control
- Mechanical (physical) weed control
- Integrated pest management
- Targeted livestock grazing [10]

Establish immediate revegetation or rehabilitation after treatment. This is the only way that land will not continue to be susceptible to noxious weeds. Alongside treatment, the establishment of healthy ecosystems is the most effective way of preventing the spread of noxious weeds.

- Obtain a knowledge of the system
- Properly identify the problem weed
- Plant species with the end result in mind
- Develop a plan for each situation
- Evaluate yearly success

Improve education, regulation and enforcement of the Utah Noxious Weed Act. Proper education and enforcement are vital to ensure that effective management on state and private ground occurs. Appropriate sufficient resources to adequately manage noxious weeds. Resource appropriation is vital to properly manage noxious weeds in Utah. The state legislature appropriated $2.0 million to fight noxious weeds in 2021, which helps private landowners. Federal dollars must also prioritize effective weed management to maintain healthy public lands, manage the spread of noxious and invasive weeds, and reduce the risk of catastrophic wildfire.

Goals, Objectives, and Policies

- Support efforts to improve education concerning noxious weeds. All industries, including tourism, agriculture, government and elected officials, the general public, and youth must understand the negative effects of noxious weeds and how to prevent their spread.
- Support collaboration between experts in the field and researchers. Through innovation and improved technology, weed-management techniques will improve and become more efficient.
    - Included among this research should be the use of integrated types of weed management. Only by utilizing every management tool will the State of Utah and its partners be able to effectively manage noxious and invasive weeds.
- Support the use of established online mapping database resources (EDD Maps) to better understand what areas of the state are afflicted with noxious weeds.
    - In addition to mapping, the State of Utah supports active monitoring to ensure that information is accurate and to ensure that priority is given to the right areas within the state.
- Support prevention as one of the best methods of managing noxious weeds.
- Support education as one of the key tools for prevention alongside healthy ecosystems. Managing land to ensure its health helps prevent the establishment of invasive and noxious species.
- Supports proactive management of noxious weeds. Effective management by federal, state, and private entities is vital to protect agriculture, rangelands, and private property.
    - The state supports efforts to ensure that noxious weeds are detected early to reduce the risk of ecosystem degradation, crop and rangeland damage, and higher costs to manage established weed communities.
    - In addition to early detection, the state supports rapid response efforts on private, state, and federal land. Faster responses allow agencies to more effectively eliminate new noxious weed infestations.
- Support adequate funding to combat the spread of noxious weeds. In addition, the state supports the removal of noxious weeds from affected areas and rehabilitation of affected areas post treatment. Weed treatments and rehabilitation must occur on federal land as well, to prevent the spread of weeds from public to private and state land.
- Mandate the post-treatment revegetation and rehabilitation of areas that have been invaded by noxious weeds. The goal after treatment is to return the area to a desirable species composition if possible. As native vegetation is re-established, the risk of future invasions of noxious weeds decreases.
- Support and value the agricultural industry as an integral part of Utah's history, culture, and heritage. All types of agriculture are recognized as a cultural resource in Utah that is threatened by noxious weeds.
- Support and enhance the capabilities of state agencies to actively manage watersheds, riparian areas, and wetlands to remove tamarisk, Russian Olive, phragmites, and other invasive species.
- Promote partnering with federal programs and agencies to comprehensively remove invasive species and leverage funding opportunities at larger scales.
- Require federal agencies to add herbicides to federal agency approved lists when they are approved by the EPA (e.g. herbicides to treat cheatgrass).

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(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

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(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Agriculture Fair Trade Act

§ 4-8-102. *Purpose declaration.*

(1) The Legislature finds and declares that in order to preserve the agricultural industry of this state it is necessary to protect and improve the economic status of persons engaged in the production of products of agriculture.

(2) To carry out the policy described in Subsection (1), the Legislature determines it necessary to regulate the production and marketing of such products and to prohibit unfair and injurious trade practices.

(3) This chapter shall be liberally construed.

Conservation Commission Act

§ 4-18-102. *Findings and Declarations – Duties.*

(1) In addition to the policy provided in Section 4-46-101, the Legislature finds and declares that:

(a) the soil and water resources of this state constitute one of the state's basic assets; and

(b) the preservation of soil and water resources requires planning and programs to ensure:

(i) the development and use of soil and water resources; and

(ii) soil and water resources' protection from the adverse effects of wind and water erosion, sediment, and sediment related pollutants.

(2) The Legislature finds that local production of food is essential for:

(a) the security of the state's food supply; and

(b) the self-sufficiency of the state's citizens.

(3) The Legislature finds that sustainable agriculture is critical to:

(a) the success of rural communities;

(b) the historical culture of the state;

(c) maintaining healthy farmland;

(d) maintaining high water quality;

(e) maintaining abundant wildlife;

(f) high-quality recreation for citizens of the state; and

(g) helping to stabilize the state economy.

(4) The Legislature finds that livestock grazing on public lands is important for the proper management, maintenance, and health of public lands in the state.

(5) The Legislature encourages each agricultural producer in the state to operate in a reasonable and responsible manner to maintain the integrity of soil, water, and air.

(6) The department shall administer the Utah Agriculture Certificate of Environmental Stewardship Program, created in Section 4-18-107, to encourage each agricultural producer in this state to operate in a reasonable and responsible manner to maintain the integrity of the state's resources.

(7) The Legislature finds that soil health is essential to protecting the state's soil and water resources, bolstering the state's food supply, and sustaining the state's agricultural industry.

Plant Pest Emergency Control Act

Aquaculture Act

§ 4-37-102. *Purpose statement--Aquaculture considered a branch of agriculture.*

(1) The Legislature declares that it is in the interest of the people of the state to encourage the practice of aquaculture, while protecting the public fishery resource, in order to augment food production, expand employment, promote economic development, and protect and better utilize the land and water resources of the state.

(2) The Legislature further declares that aquaculture is considered a branch of the agricultural industry of the state for purposes of any laws that apply to or provide for the advancement, benefit, or protection of the agricultural industry within the state.

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OUTDOOR RECREATION, TOURISM, AND FILM

Introduction

In 2019, travelers in Utah spent $10.06 billion (up from $8.4 billion in 2016) [1], which generated $732 million in state tax revenue and $607 million in local tax revenue (a total of $1.34 billion) [2]. Travel and tourism in the state employs 141,500 Utahns [3]. While many business travelers come to Utah for meetings and conventions, one of the main reasons tourists come to Utah is for outdoor recreation. Utah boasts 14 world-class ski and summer resorts featuring The Greatest Snow on Earth®, The Mighty Five® national parks, 9 national monuments, 2 national recreation areas, 6 national forests, 46 state parks, and multiple nationally recognized scenic byways.

Outdoor recreation generates ~~contributes~~ more than $6.1 ~~12~~ billion to Utah's economy and accounts for 67,000 jobs ~~employs more than 122,000 people~~. Recreation generates hundreds of ~~$856~~ millions in state and local tax revenue and ~~$3.6~~ billions of dollars in wages and salaries. Many outdoor recreation equipment companies have relocated or formed in Utah due to the state's friendly business climate and proximity to nearly all types of outdoor recreation. A recent study found that the number-one reason that technology sector employees moved to Utah was for outdoor recreation opportunities and access to wilderness and public lands. [4]

The former Utah Office of Outdoor Recreation is the first office of its kind in the country and subsequently became the Utah Division of Outdoor Recreation (UDOR), a division of the Utah Department of Natural Resources. The Division's mission is to ensure health, safety, enjoyment, and economic benefit through life-enriching, high quality outdoor recreation for all of Utah's residents and visitors. The UDOR works with other government agencies to maintain a nationwide recreation management standard and ensure that Utah's natural assets can serve Utahns ~~sustain economic growth~~ for generations ~~years~~ to come. The UDOR administers the Utah Outdoor Recreation Grant (UORG), OHV Recreation ~~Fiscal Incentive~~ Grant, Recreational Trails Program, and the Land and Water Conservation Fund, which helps build tourism in communities around Utah with the construction, ~~and~~ expansion, and maintenance of outdoor recreation amenities.

Over the past 100 years, Utah has been a destination for film, television, and commercial production and thousands have been filmed in Utah, including *Butch Cassidy and The Sundance Kid, Thelma & Louise,* and *Footloose, episodic series Yellowstone, Touched by an Angel* and *Westworld*. A 2023 study shows that 37% of Utah visitors indicate that they are aware of films and/or TV shows filmed in Utah – and say that these films/TV shows had some influence on their decision to visit the state.

Findings

Utah's travel and tourism industry—the hardest-hit industry by the COVID-19 pandemic—experienced a healthy recovery statewide, particularly in Utah's rural areas. [5]

Utah's ski and snowboard industry achieved a record-setting 7.1 ~~5.8~~ million skier days in the 2022-2023 season, up from the previous record of 5.8 ~~3~~ million skier days, which was set during the 2021-2022 season (a 22% increase). Ten of Utah's resorts are located less than 1 hour from Salt Lake City International Airport. Accessibility and the quality of the snow are the top two selling points for Utah's ski and snowboard industry. Utah's resorts undergo infrastructure improvements every year. A record-breaking year of snowfall – with 44 powder days – brought more people to Utah's resorts than ever before, spending more than $2.54 billion.[6] ~~Improved snowmaking capability has made many of the~~

~~resorts less dependent on natural snowfall, but the number of skier visits is usually higher in positive snow years.~~

Utah's Mighty Five national parks total visitation was approximately 10.7 million visitors in 2019 and 7.8 million visitors in 2020 [7]. Utah is unique in that it boasts so many national parks that are so close to each other. Utah's national parks are gems that drive both domestic and international visitation.

Utah state park visitation in 2019 was approximately 8 million visitors and jumped to more than 10 million visitors in 2020 despite the COVID-19 pandemic. In 2021, the Utah Legislature appropriated more than $120 million dollars to create Utahraptor State Park and Lost Creek State Park, along with funding improvements to camping, parking, and day-use amenities statewide at the other 44 existing state parks. Additionally, the Utah Division of Parks has recently added a new designation of state monuments to their management portfolio. [8]

National parks nationwide are dealing with increased visitation and shrinking budgets. They have a backlog of maintenance and infrastructure projects, and many lack sufficient staffing. County and state tourism agencies and other stakeholders, together with park personnel, are encouraging visitors to (1) visit Utah's national and state parks (rather than visiting only the most popular locations), (1) visit during the shoulder seasons (rather than only in peak months), and (3) come better prepared for activities within the park. Stakeholders are also encouraging visitors to stop at national monuments, historic sites, state parks, and scenic byways, rather than visiting only the national parks. The June 2020 passage of the Great American Outdoors Act (GAOA) [9] will incrementally provide funding to federal land-management agencies to assist with reducing the facility and infrastructure improvement backlog nationwide. Funds for the GAOA are generated by royalties collected from the oil and gas industry. The Utah Legislature funds the Outdoor Adventure Infrastructure Restricted Account through 1% of the State sales and use tax to go toward outdoor recreation infrastructure.

There is created within the GO Utah office the Utah Office of Tourism [10], which is required to:

(a) be the tourism development authority of the state;
(b) develop a tourism advertising, marketing, branding, destination development, and destination management program for the state;
(c) receive approval from the board under Subsection 63N-7-202(1)(a) before implementing the program described in Subsection (3)(b);
(d) develop a plan to increase the economic contribution by tourists visiting the state;
(e) plan and conduct a program of information, advertising, and publicity relating to the recreational, scenic, historic, cultural, and culinary tourist attractions, amenities, and advantages of the state at large;
(f) encourage and assist in the coordination of the activities of persons, firms, associations, corporations, travel regions, counties, and governmental agencies engaged in publicizing, developing, and promoting the tourist attractions, amenities, and advantages of the state;
(g) conduct a regular and ongoing research program to identify statewide economic trends and conditions in the tourism sector of the economy; and
(h) ensure that any plan or program developed under this Subsection (3) addresses, but not be limited to, the following policies:
    (i) enhancing the state's image;
    (ii) promoting the state as a year-round destination;
    (iii) encouraging expenditures by visitors to the state; and
    (iv) expanding the markets where the state is promoted.

~~The Utah Film Commission falls under the umbrella of the Utah Office of Tourism and assists producers with multimedia projects, including projects on public lands.~~

As part of the Governor's Office of Economic Opportunity, the Utah Film Commission markets the entire state as a destination for film, television, and commercial production by promoting the use of professional local crews and talent, support services, Utah locations, and the Motion Picture Incentive Program. The office also serves as a liaison to the film industry, facilitating production needs across the state.

Visitors also come to Utah for activities such as road cycling, mountain biking, fishing, boating, whitewater rafting, OHV riding, boating, rock climbing, hunting, and other types of recreation. Many rural counties in Utah are more dependent on tourism than counties along the Wasatch Front, but some lack sufficient infrastructure (hotels, restaurants, signage, shopping, etc.) to provide the type of experience that would attract larger numbers of visitors.

Additionally, recreation opportunities, tourism, and film production have been limited and restricted by cumbersome permitting processes and timelines for guides, outfitters, filmmakers, and other groups attempting to work with federal land-management agencies to obtain required permits.

Economic Considerations

The tourism, recreation, and film industries are major drivers of Utah's economy. Without Utah's travel and tourism industry, it is estimated that each Utah household would have had to pay an additional $1,200 in state and local taxes to maintain the same level of government services [11]. In 2019, visitor spending generated close to $462 million in total income tax revenue that was allocated to Utah education funding. Approximately $65 million in total tourism-generated motor-fuel tax revenue was directed to Utah's transportation system and associated infrastructure. An additional $525 million in total state sales tax revenue was deposited in Utah's general fund where it was used to pay for essential services, including the following:

- Health and human services
- Corrections, courts, and the justice system
- Public safety
- Economic development programs

The UORG, which is administered by the UDOR, helps build tourism in communities around the state with the construction and expansion of outdoor recreation amenities. New trails and other outdoor recreational opportunities aid in local economic development. Communities have found that having nearby recreation opportunities improves the quality of life of local citizens, helps to attract new residents, and can lead to an increase in local property values. Businesses, ~~especially high-tech firms~~, consider having nearby outdoor recreation amenities as "absolutely vital" to attracting and keeping high-value employees.

From 2021-2023, Utah's film industry generated $1.83 billion in economic impact in the state through the production of film, television series and commercials, much of which occurs in rural counties. On average, productions spend between $100,000 and $250,000 per day, many of which come to the state during the off-season, keeping hotels and restaurants and the people they employ busy.

Goals, Objectives, and Policies

Goals:

Ensure public safety in outdoor recreation, promote the sustainability and resiliency of Utah recreational opportunities, which attract millions of visitors annually and contribute significantly to the physical and mental health of Utah residents and to state and local economies.

OBJECTIVES

- Ensure that Utah is prosperous. This requires a diversified and enduring economy. To achieve this goal, the State of Utah must pursue the development of the recreational economy.
- Ensure that promoting one economic sector does not unduly constrain another.
- Maintain Utah's beauty. This means the State of Utah must care for and protect the state's natural treasures in a balanced and sustainable manner.
- Ensure Utahns are ~~that Utah is~~ healthy. Physical activity and stress relief—both associated with recreation—are keys to good physical and mental health. Encouraging active lifestyles can reduce health care costs and increase personal well-being.
- Create accessible recreation opportunities in Utah. A range of outdoor amenities must be physically and financially accessible to people of diverse incomes, abilities, and interests. In addition, the State of Utah must ensure Utahns' ability to access and enjoy traditional outdoor recreational areas is not unduly affected by commercial expansion.
- Promote ~~Build~~ an ethic of public lands stewardship and build a sense of community in Utah. The backpacker and the OHV rider, the rural rancher and the urban cyclist, the energy executive and the environmentalist—all are part of Utah and care about the state's future. What unites Utahns is greater than what divides us ~~them~~. The State of Utah must identify and build on shared values and create a Utah where all can enjoy the elevated quality of life this state offers. The State emphasizes a responsible recreation and stewardship ethic through both youth and adult education and education promotion. This has benefits for natural resource protection and reduction in search and rescue calls.
- Ensure that Utah's residents and visitors recreate safely and responsibly in order to reduce the burden on local search and rescue providers.

Resource management objectives that will benefit Utah's tourism, recreation, and film industries include:

- Maintain easy access to Utah's ski and summer resorts and public lands.
- Improve air quality.
- Build relationships with the U.S. National Park Service (NPS), U.S. Bureau of Land Management (BLM), U.S. Forest Service (Forest Service) and other federal and state agencies and local stakeholders to provide a satisfying visitor experience on Utah's public lands.
- Ensure Utah's lakes, reservoirs, rivers, and streams are clean and healthy, while protecting riparian areas.
- Assist Utah communities in improving tourism, outdoor recreation, and film infrastructure.
- Preserve Native American architecture, artifacts, pictographs and petroglyphs.
- Conserve and actively manage wildlife.
- Improve relationships between state and federal land-management agencies to streamline the permitting process for film, television and commercial ~~multi-media~~ productions in order to attract more film companies to Utah, particularly rural Utah, to showcase the beauty of our natural resources and to provide economic support for the industry and Utah communities.

Policies

- Encourage input from key stakeholders on matters related to outdoor recreation, tourism, and public land management.
- Encourage Congress to provide more financial support to national parks and public lands, and help eliminate maintenance backlogs and improve the visitor experience.
- Encourage Congress to allow more flexibility for how federal funding can be utilized.
- Plan for the future of Utah's recreation, tourism, and film industry with a long-term outlook.
- Ensure balanced and responsible use and development of Utah's public lands. Utahns value their public lands, which support a range of uses, including resource development, recreation, wildlife habitat, grazing, and environmental services. With diverse uses comes some conflict. The State of Utah should approach public-land issues with a proactive, creative, and collaborative approach to find the right balance among the uses, all of which are important.
- Encourage education about the benefits of multiple-uses for public lands (e.g., recreation and other public-land uses are compatible and not exclusive).
- Through public processes, identify the most-valued recreational areas in Utah and explore how to optimize the recreational experience for visitors to those areas.
- Resolve claims associated with Revised Statute 2477 (Section 8 of the Mining Act of 1866) in Utah's counties as expeditiously as possible and with consideration of access to popular recreational areas.
- Call upon the Forest Service and BLM to involve the State of Utah as a cooperating agency in management plans and other management processes, and to seek to implement the State of Utah's recreational vision to the greatest extent possible. The federal government should seek wide support for the finished plans to minimize subsequent opposition and contention.
- Encourage county and regional stakeholders to resolve the state's many longstanding public lands issues in Utah, such as wilderness designations, infrastructure rights-of-way, and water development.
- Recognize Utah's coming challenges and make outdoor recreation a part of the state's strategic planning, legislation, and infrastructure development.
- Collaborate with Utah universities and colleges to expand the reach of recreational programs into the broader community, especially secondary schools, which would help strengthen and expand the outdoor recreation workforce.
- Support linking Utah communities through the creation of trail systems to meet the recreational needs of all visitors and citizens, including youth and groups with special needs.
- Support the continuation of the UORG (and other grant and funding options) to promote and fund outdoor recreation infrastructure on Utah's federal, state, and private land.
- Educate and foster relationships with stakeholders ranging from the Utah State Legislature and Governor's Office to local governments, tribal governments, and federal agencies.
- Make recreation a priority on federal lands, improving recreational access, and removing unnecessary barriers so all Americans can enjoy outdoor recreation experiences.
- Encourage federal legislation that would streamline the permitting processes for guides and outfitters.
- Support access to public lands for multiple uses, including the utilization of public lands for film, television and commercial ~~multi-media~~ productions.
- Federal land management agencies shall work expeditiously with the Film Commission and production companies to permit film, television and commercial ~~multi-media~~ productions on public lands under the multiple-use mandates required by the federal government.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Natural Resources

§ 79-4. *State Parks.*

§ 79-5. *Recreational Trails*

§ 79-7. *Outdoor Recreation Act.*

§ 79-8. *Outdoor Recreation Grants.*

§ 41-22. Off Highway Vehicles Act

§ 73-18. State Boating Act

Recreational, Tourist, and Convention Bureaus

§ 17-31-2. *Purposes of transient room tax and expenditure of revenues--Purchase or lease of facilities-- Mitigating impacts of recreation, tourism, or conventions--Issuance of bonds.*

Economic Opportunity Act

§ 63N-4. *Rural Development Act.*

§ 63N-7. *Utah Office of Tourism.*

§ 63N-8. *Motion Picture Incentives.*

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PIPELINES AND INFRASTRUCTURE

Introduction

For the purposes of this planning document, pipelines and infrastructure are defined as the primary physical structures and facilities used to transport and store raw materials, energy, water, utilities, products, and people within and across Utah. This chapter will focus on pipelines, electrical transmission, telecommunications, vehicle and rail transportation, and other major infrastructure.

Electrical Transmission

Electrical transmission infrastructure is primarily constructed and operated by private utility companies, cooperatives, and interlocal utilities to convey high-voltage electricity from a generation source to load-center substations, where it's transformed into lower-voltage electricity for distribution to end-users. Major components of electrical transmission infrastructure include transformers, towers, foundation materials, and conductors (transmission lines). High-voltage transmission can be either alternating current (AC) or direct current (DC). Alternating current, the most commonly used form of transmission, has the ability to convert to different voltages using a transformer, whereas DC is not easily converted. Typical voltage for transmission ranges from 69 Kilovolt (kV) up to 500 kV. Table 1 shows the right-of-way width needed for electrical transmission, which varies by line voltage and maintenance requirements.

Table 1: Recommended right-of-way (ROW) width for electrical transmission lines by voltage class.

Line Voltages (in Kv)	Typical ROW Total Widths (in feet)
69	75-100
115	100-125
138	100-150
161	100-150
230	125-200
345	150-225
500	150-250

Source: BLM West-Wide Energy Corridor Guidebook (HDR et al. ND).

Electrical transmission systems from individual utility companies (including those in Utah) are interconnected to the entire electrical network of generation facilities and transmission grids across the western United States. Utah is part of the Western Electricity Coordinating Council (WECC) in the geographic region called the Western Interconnection, one of three major electric interconnections that operate independently of each other within the United States. The Western Interconnection and the PacifiCorps East (PACE) Balancing allows load-balancing throughout the network. That is, power generated by utilities with excess generation capacity can be provided to utilities that cannot meet their peak load demand (EIM 2021). The Western Energy Imbalance Market (EIM) is a wholesale energy trading market where bulk power can be purchased and sold (EIM 2021). Because the EIM connects multiple generators in a marketplace, individual utilities can buy electricity to meet peak demand at reasonable rates. Renewable energy generators can also sell excess power capacity through the EIM instead of resorting to curtailment (Larsen 2018).

For information on the process of identifying and permitting the construction of electricity transmission infrastructure on federal land, refer to the Utility Corridor section.

Legal context

The Federal Powers Act of 1921 (16 U.S.C. § 12), as amended, provides for federal oversight of the bulk electrical transmission system by the Federal Energy Regulatory Commission (FERC). The Energy Policy Act of 2005 (among other items) enables FERC to facilitate transmission planning to meet the needs of utilities serving retail customers. In 1996, FERC issued Order No. 888, which opened all interstate transmission lines for use by any power generator to transmit power across the bulk transmission grid, provided the power generator pays tariffs to the transmission line utility owners. This is known as the Open Access Transmission Tariff (OATT). The FERC's Order No. 889, sets standards of conduct for power generators utilizing OATT transmissions with additional reforms Order No. 890 and Order No. 890-A in 2007.

Natural Gas Pipelines

Natural gas pipelines are constructed by private utility companies to move natural gas from production areas to end users (54 Utah Code § 13). Gathering pipelines move extracted raw materials from wellheads to processing plants, where natural gas is separated from other gases, hydrocarbon gas liquids, and water. The refined natural gas is then pressurized and added to the mainline transmission system, which consists of large-diameter, high-pressure pipelines. Compressor stations along the network maintain pressure and move product down the line to storage areas, major industrial consumers, power plants, shipping ports, and distribution companies. From there, distribution transmission systems operate with smaller-diameter lines and lower pressure. Finally, service lines transport natural gas to the end users.
This planning document focuses on pipeline infrastructure located within designated utility corridors (typically major transmission lines), but may also include some gathering and distribution lines. More information on natural-gas production and distribution from the US Energy Information Administration (EIA) can be found here.

For information on the process of identifying and permitting the construction of natural gas pipeline infrastructure on federal land, refer to the Utility Corridor section.

Legal context

The Natural Gas Act (15 U.S.C 15B § 717) enabled the federal regulation of companies transporting and distributing natural gas both intrastate and interstate. The Public Law 109–468 (2006), an amendment to 49 U.S.C § 60101, provides enhanced environmental and safety protection in the transportation and handling of national energy products. This includes the construction and demolition of pipelines for the purpose of transporting oil and gas products.
The Pipeline and Hazardous Materials Safety Administration (PHMSA) exercises authority under the Pipeline Safety Act (49 U.S.C. § 60101) to prescribe minimum safety standards governing the location, design, construction, operation, and maintenance of liquefied natural gas facilities in or affecting interstate and foreign commerce. Whereas FERC serves as the lead federal agency for satisfying compliance with the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321) for liquefied natural gas facilities subject to its jurisdiction (McIntyre 2018).
Utah Code § 54-13 provides for state control over the regulation of intrastate pipeline transportation while (Utah Code §17-53-223(1)(A)) grants counties the authority to supplement state and federal safety laws with its own regulations for oil and gas transmission so long as they are not repugnant to state or federal law (BMP 2021).

Oil Pipelines

Oil pipelines are very similar to natural gas pipelines in that the products are transported through networks of pipes and pump stations from production areas to consumers. First, the raw material (in this case, crude oil) is gathered from wellheads and moved downstream through trunkline pipelines to refineries, which separate the oil into numerous petroleum products. From the refinery, pipelines are used to transport petroleum products to various destinations for local use or export to other markets. A third product, called hydrocarbon gas liquid (HGL) is a secondary product created during the processing of natural gas. Because HGL is a liquid petroleum product, pumped through pipelines in a manner similar to oil, it is included in this section. More information on oil production and distribution from the EIA can be found here.

For information on the process of identifying and permitting the construction of oil and gas pipeline infrastructure on federal land, refer to the Utility Corridor section.

Legal context

The PHMSA exercises authority under the Pipeline Safety Act (49 U.S.C. § 60101) to prescribe minimum safety standards governing the location, design, construction, operation, and maintenance of liquefied natural gas facilities in or affecting interstate or foreign commerce. Whereas FERC serves as the lead federal agency for satisfying compliance with NEPA (42 U.S.C. § 4321) for liquefied natural gas facilities subject to its jurisdiction (McIntyre 2018). Similar to natural gas pipelines, Utah Code § 54-13 provides for state control over the regulation of intrastate pipeline transportation while (Utah Code §17-53-223(1)(A)) grants counties the authority to supplement state and federal safety laws with its own regulations for oil and gas transmission so long as they are not repugnant to state or federal law (BMP 2021).

Hydrogen Pipelines

In contrast to oil and natural gas, which are extracted from the earth, hydrogen is a manufactured product. Hydrogen gas can be manufactured from fossil fuels such as natural gas ("grey hydrogen") or coal ("brown hydrogen"), or it can be created from water using electrolysis. When the electricity used in the electrolysis process is derived from a renewable energy source, the resulting hydrogen is known as "green hydrogen." Hydrogen can also be produced from biomass.

Pipelines and other infrastructure used to transport hydrogen are similar to those used to transport natural gas. Large-diameter pipes are first used in the transmission of high-pressure hydrogen gas. When blended with natural gas (at up to 15 percent hydrogen), existing natural gas pipelines can be used instead of installing separate hydrogen pipelines, however the infrastructure must be retrofitted to handle the higher operating pressure and smaller particle sizes of hydrogen gas (NREL 2013)

For information on the process of identifying and permitting the construction of hydrogen gas pipeline infrastructure on federal land, refer to the Utility Corridor section.

Legal context

The PHMSA exercises authority under the Pipeline Safety Act (49 U.S.C. § 60101) to prescribe minimum safety standards governing the location, design, construction, operation, and maintenance of liquefied natural gas facilities in or affecting interstate or foreign commerce. Whereas FERC serves as the lead federal agency for satisfying compliance with NEPA (42 U.S.C. § 4321) for liquefied natural gas facilities subject to its jurisdiction (McIntyre 2018). The US Department of Transportation (DOT), through PHMSA, has regulated hydrogen pipelines since 1970 via 49 CFR § 192. This code of regulation

stipulates that a minimal level of safety standard needs to be met when transporting natural and other gasses. Regulations apply to pipeline construction, material standards, operations, and maintenance of pipeline structures.

Similar to natural gas pipelines, Utah Code § 54-13 provides for state control over the regulation of intrastate pipeline transportation while (Utah Code §17-53-223(1)(A)) grants counties the authority to supplement state and federal safety laws with its own regulations for oil and gas transmission so long as they are not repugnant to state or federal law (BMP 2021).

Water Pipelines

For the purposes of this planning document, water pipelines consist of substantial infrastructure projects used to transport large quantities of water over long distances through varying terrain and elevations from reservoirs and rivers to major population centers and agricultural users.

Legal context

The Colorado River Compact created the Upper and Lower Colorado River Basin. In the Upper Colorado River Basin Compact of 1948, Utah is allocated 23 percent of the upper basin water allotment, which totals 1.73 million acre-feet. The Colorado River Storage Project Act (Public Law 485, 70 Stat. 105) was enacted to authorize the Central Utah Project (CUP) among many other such development projects within the Colorado River Basin. Congress enacted the Central Utah Project Completion Act (CUPCA) (P.L. 102-575) on October 30, 1992, providing policy guidance and direction for completing the CUP, including transferring all construction responsibilities from the BOR to the Central Utah Water Conservancy District, while retaining federal oversight. The Ute Indian Unit was de-authorized by the 1992 CUPCA (DOI 2021a).
All water use within the State of Utah is governed by Utah Code, Title 73. With respect to the Bear River, the Bear River Compact of 1958 divides the river into three main divisions: the Upper Division, Central Division, and Lower Division. The compact grants the State of Idaho the first right to develop and deplete 125,000 acre-feet in the Lower Division, the State of Utah the second right to develop and deplete 275,000 acre-feet in the Lower Division, and divides the next 150,000 acre-feet of water depletion equally between Utah and Idaho in the Lower Division. The compact then divides Bear River water in excess of the above allocations between Utah and Idaho, with Idaho receiving 30 percent and Utah 70 percent in the Lower Division. The compact further designates 36,500 acre-feet of "Original Compact Storage" above Bear Lake and allocates Utah 17,750 acre-feet of storage.

The Bear River Development Act (Utah Code § 73-26) directs the Utah Division of Water Resources to "develop the surface waters of the Bear River and its tributaries through the planning and construction of reservoirs and associated facilities as authorized and funded by the Legislature." The "associated facilities" include pipelines, pump stations, and reservoirs. The Bear River Development Project will provide 220,000 acre-feet of water to four Water Conservancy Districts (WCD). These are the Bear River WCD (which is allocated 60,000 acre-feet), Cache WCD (60,000 acre-feet), Jordan Valley WCD (50,000 acre-feet), and Weber Basin WCD (50,000 acre-feet) (UDWR 2021).

The Lake Powell Pipeline Development Act of 2006 (Utah Code § 73-28) authorized the construction of the pipeline to utilize a portion of Utah's water allocation from the Colorado River with the intention of delivering water from Lake Powell to Washington County.
For information on the process of identifying and permitting the construction of water pipelines on federal land, refer to the Utility Corridor section.

Telecommunications

Telecommunications refer to the infrastructure used to transmit and distribute electronic information. For this study, the discussion of telecommunications will focus on broadband infrastructure, typically transmitted through fiber optic cable, used by service providers to connect consumers to the Internet, which allows large quantities of digital information to be transmitted at high speeds.

Legal context

Coordination of highway and broadband information is regulated by Utah Code § 63N-3-501 (2020), which dictates the collection and maintenance of broadband data from providers and private or public entities.

For the purposes of telecommunication installation, utility access to the US interstate highway system, including the right-of-way areas, is regulated by Utah Code § 72-7-108 and Utah Administrative Rule § 907-64. These regulations facilitate longitudinal access to or use of any part of the right-of-way of a highway on the interstate system.

The placement and relocation of utility facilities that conflict with the construction or maintenance of highways (which applies to any and every facility, utility, or other structure not owned by the State of Utah) falls under the Utility Accommodation Rule (Utah Administrative Rule § 930-7). Utah Code § 54-23 instructs railroads to allow fiber optic carriers to cross under railroad rights-of-way for a fee provided certain safety conditions and no federal laws are violated.

For information on the process of identifying and permitting the construction of telecommunication infrastructure on federal land, refer to the Utility Corridor section.

Transportation Infrastructure

Transportation infrastructure is the backbone network of major roads, highways, railroads, and other infrastructure used to transport goods and services within and across Utah. For the purposes of this planning document, the roads and highways managed by the Utah Department of Transportation (UDOT) and major railroads are considered.

Legal context

A significant portion of the funding for construction of highways in Utah comes from the Federal-Aid Highway Program administered by the Federal highway Administration (FHWA) (CRS 2021). However, each state is required to have a Department of Transportation which is charged (among other things) with determining which construction projects are funded. The UDOT was established to have the authority and responsibility for planning, research, design, construction, maintenance, security, and safety of state transportation systems (Utah Code § 72-1-201)). This includes the preparation and adoption of standard plans and specifications for the construction and maintenance of state highways.

Other Infrastructure

Other infrastructure includes mechanical wastewater treatment facilities, sewer collection systems, sewage lagoons, and stormwater systems. The vast majority of these systems in Utah are owned and operated by local municipalities and service districts. For information on the process of identifying and permitting the construction of infrastructure on federal land, refer to the Utility Corridor section.
Legal context

The Federal Water Pollution Control Act of 1972, commonly referred to as The Clean Water Act 40 CFR § 1, Subchapters D, N, and O (Parts 100-140, 401-471, and 501-503), gives the Environmental Protection Agency (EPA) the federal authority to set standards for allowable pollutants for point and nonpoint source discharge into waterways. The Utah Water Quality Act as amended establishes a framework for State oversight of water quality.

Findings

Electrical Transmission

The majority of electricity generation and bulk energy transmission capacity in Utah is owned by PacifiCorp (note: Rocky Mountain Power is owned by PacifiCorp). According to company statistics, PacifiCorp serves 948,000 customers in Utah across 26 counties (Cox 2021).

Other power generators and distributors in Utah include the Utah Rural Electric Cooperative Association (URECA), Utah Municipal Power Agency (UMPA), and Intermountain Power Agency (IPA).

The URECA is a collective of nine local power generators and transmission companies from six states. Utah members of the cooperative include Deseret Power Electric Cooperative, Dixie Power, Garkane Energy, and Moon Lake Electric Association. Combined, they service about 70,000 utility meters and 250,000 consumers in Utah (J. Peterson, URECA, personal communication, 10/28/2021).

The UMPA comprises the communities of Levan, Manti, Provo, Salem, and Spanish Fork. In 2013, UMPA generated approximately 26 percent of its electricity and purchased the other 74 percent from the Colorado River Storage Project, Deer Creek, PacifiCorp, Deseret Power, and spot markets (UMPA 2013).

The IPA sells power to 23 municipal customers across the state as well as URECA members in Utah, Nevada, and Wyoming. They also sell power to municipal customers in California.
These power co-ops and associations make use of the OATT, provided by FERC Order numbers 888 and 889, to purchase transmission capacity on PacifiCorp's transmission infrastructure to provide power to their customers without having to install their own transmission lines.
Within and across Utah, PacifiCorp's infrastructure provides the majority of electrical transmission capacity. Other transmission infrastructure owners include the IPP, which owns a 500kC DC transmission line that services its California customers. Figure 1 shows the major existing transmission lines in Utah while Table 2 shows the approximate length of transmission line by voltage class.

The majority of future planned utility transmission infrastructure in Utah will be owned by PacifiCorp. Their 2021 Integrated Resource Plan describes new transmission projects intended to (1) strengthen the backbone of Utah's energy grid for future energy loads, (2) improve interstate energy market connections through the Western EIM, and (3) change generation sources to include greater renewable contingents. Pacificorp's IRP includes the Energy Gateway South project, which consists of a 416-mile 500 kV AC transmission line from Aeolus, Wyoming to Mona, Utah with an estimated completion date of October 2024.

The proposed TransWest Express Transmission Project consists of 732 miles of high-voltage transmission lines. The project consists of a 500 kV DC line from Sinclair, Wyoming to Delta, Utah and a 500 kv AC line from Delta to southern Nevada. This transmission line will eventually provide 3,000 megawatts of transmission capacity, which will be generated by wind power in Wyoming (TransWest Express 2021).

The URECA has indicated they have no new transmission projects planned in the near future (Peterson 2021).

When planning for new utility-scale solar developments, considerations should be made for the inversion of DC power generated from solar arrays prior to connection to the AC bulk power grid.

Another consideration for the planning of electrical transmission in Utah includes future chokepoints or bottlenecks in transmission-line capacity. This issue has been studied with respect to electrical transmission in the 2021 Utah Transmission Study, which determined that (under scenarios of high renewable energy buildout in southern Utah) electrical transmission needs might exceed capacity (Energy Strategies 2021).

Resilience and redundancy of electrical transmission are issues that have been identified by stakeholders. Many rural locations in Utah are served by single transmission lines, referred to as "radial transmission lines." Radial transmission lines are the least costly option for providing some remote locations with electrical power, but they also leave those areas vulnerable to utility disruptions because of their lack of redundancy. Additional transmission connections are costly not only because of their construction costs, but also due to the expense and time required to place utility corridors on federal lands. Refer to the Utility Corridor section for more information.

Other locations experiencing issues with expanding electrical transmission capacity and redundancy are Dixie Power and Rocky Mountain Power in Washington County. Dixie Power's current transmission line (which supplies electricity to Washington County) runs through BLM land on which critical desert tortoise habitat has been designated. This land-use change prohibits upgrades to the existing transmission line, which has resulted in the need to locate alternative transmission corridor locations (J. Peterson, URECA, personal communication).

Figure 1: Major electrical transmission lines in Utah (HIFLD 2021).

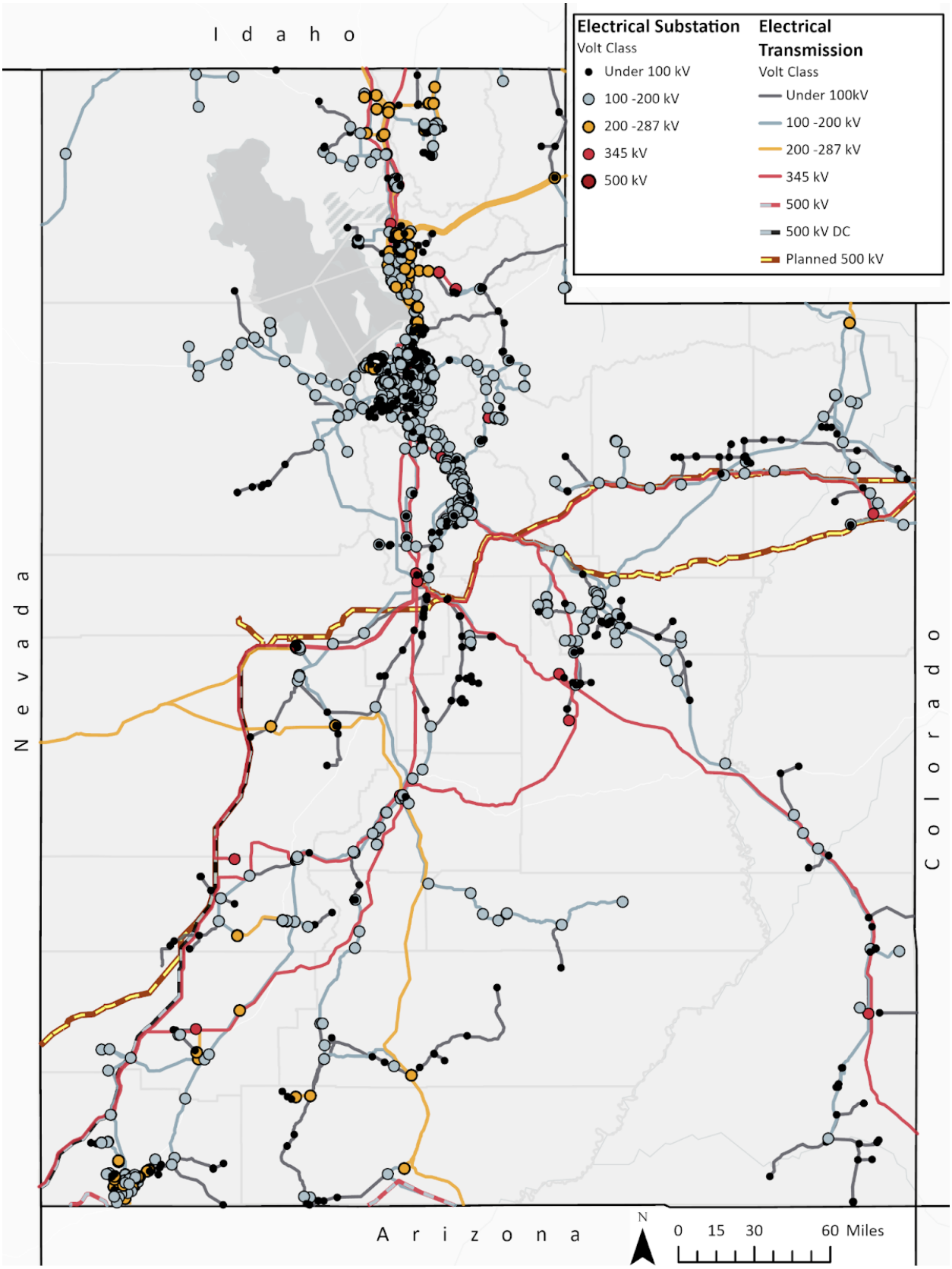

Idaho
Nevada
Colorado
Arizona
Electrical Substation
Volt Class
Under 100 kV
100 -200 kV
200 -287 kV
345 kV
500 kV
Electrical Transmission
Volt Class
Under 100kV
100 -200 kV
200 -287 kV
345 kV
500 kV
500 kV DC
Planned 500 kV
N
0 15 30 60 Miles

Table 2: Electrical transmission line length by type and voltage class.

Alternating Current (AC) Transmission Line Length		Substations
Kilovolt Category	**Miles**	**Count**
Under 100	2,292	596
100-161	3,642	641
220-287	1,005	109
345	2,218	27
500	45	0
Direct Current (DC) Transmission Line Length		**Substations**
500	207	1
Permitted Transmission Line Length		**Permitted Substations**
Gateway South 500 kV AC	186.6	N/A
TransWest Express 500 kV AC/DC	418.7	N/A
Grand Total	**10,014**	**1,374**

Natural Gas Pipelines

Natural gas production in Utah is located primarily in Uintah and Grand counties (Vanden Berg 2020). Multiple interstate pipelines cross through Utah to transport natural gas from principal producing basins in Colorado, Utah, and Wyoming, to consumer markets in other states, and for export to foreign markets around the world. Figure 2 shows existing natural gas pipelines in Utah.

The majority of local natural gas transmission infrastructure in Utah is provided by Dominion Energy. The company owns 20,189 miles of transmission and distribution lines and has 1,090,000 customers (Dominion Energy 2020). Dominion Energy produces a large portion of the gas it sells to customers, but it also purchases natural gas from other interstate pipeline companies for delivery to residential, commercial, and industrial customers.
Major natural gas pipelines in Utah include those found in table 3.

Natural gas can also be produced from renewable sources to create a product known as “renewable natural gas” (RNG). A recent pilot project developed by Dominion Energy and Smithfield Foods (near Milford, Utah) converts methane from pig farms into RNG for distribution to Dominion Energy customers (Bioenergy Insight 2020).

Figure 2: Major natural gas pipelines in Utah (EIA 2020a).

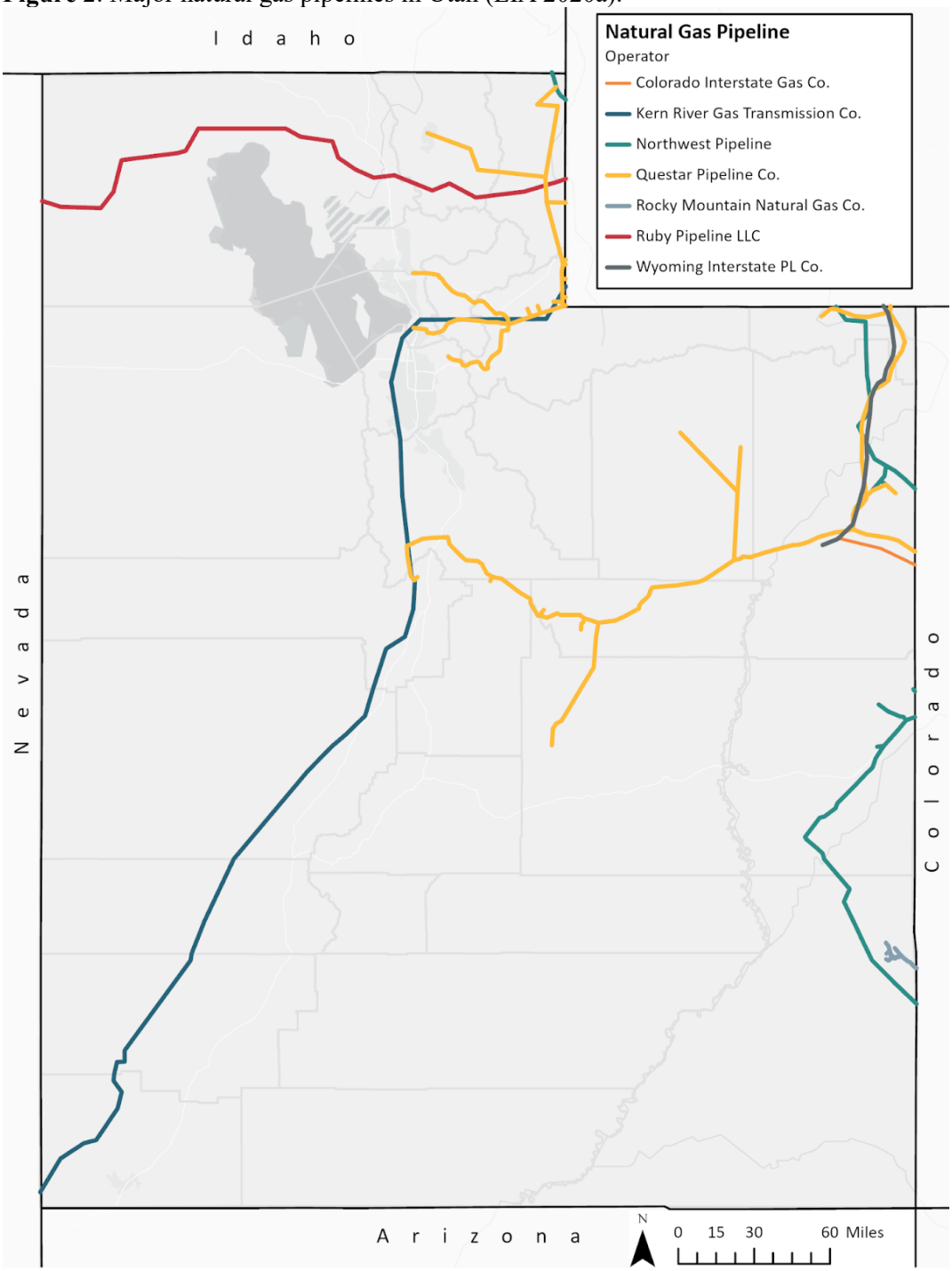


Table 3: Utah natural gas pipelines in Utah by operator.

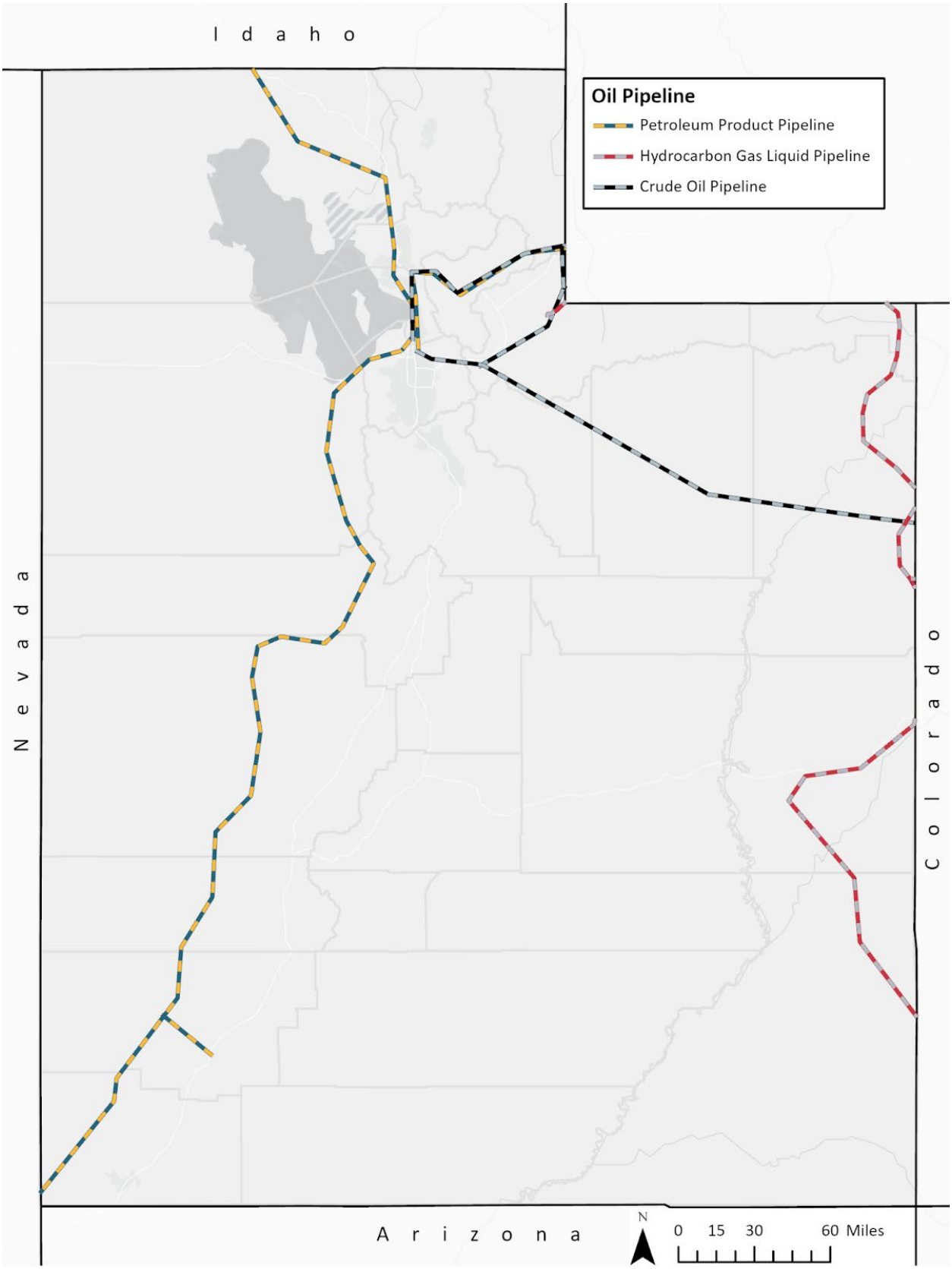
Natural Gas Pipeline	
Operator	**Total (miles)**
Colorado Interstate Gas Co.	25
Kern River Gas Trans Co.	364
Northwest Pipeline	219
Questar Pipeline Co.	664
Rocky Mountain Natural Gas Co.	22
Ruby Pipeline LLC	178
Wyoming Interstate PL Co.	80
Grand Total	**1,552**

Source: U.S. Energy Information Administration), U.S. Natural Gas Interstate and Intrastate Pipelines (EIA 2020a.)

Oil Pipelines

According to the Utah Geologic Survey (UGS), Utah is consistently one of the top 15 oil-producing states in the United States (Chidsey 2021). In their recent circular, Utah's Energy Landscape, the UGS reported the majority of oil production in Utah is occurring in Duchesne, Uintah, and San Juan Counties. Oil produced from wells in the Uinta Basin and further east in Colorado is transported in oil pipelines and trucks to refineries in Salt Lake City. Crude oil produced in San Juan County is transported in pipelines south to refineries in New Mexico. Crude oil from Canada and Wyoming is delivered through pipelines to Salt Lake City for refining. Pipelines transport some petroleum products refined in Salt Lake City to other parts of Utah and out-of-state markets. The Tesoro pipeline transports products to the northwestern states, while the UNEV line supplies Cedar City and Las Vegas. Table 4 shows the lengths of oil pipelines by product type and operator.

Figure 3: Major oil pipelines in Utah (EIA 2020b).


Idaho
Oil Pipeline
Petroleum Product Pipeline
Hydrocarbon Gas Liquid Pipeline
Crude Oil Pipeline
Nevada
Colorado
Arizona
N
0 15 30 60 Miles

1

Table 4: Utah oil pipeline length by product type and operator.

Oil Pipelines			
Type	**Operator**	**Pipeline**	**Total (miles)**
Crude Oil	Holly Energy	Frontier Aspen Pipeline	73
	Holly Energy	Salt Lake Crude Pipeline	162
	Plains All American Pipeline	Rocky Mountain	50
Hydrocarbon Gas Liquid	Enterprise Products	-	235
Petroleum Product	Chevron Pipeline Co.	Salt Lake Products	108
	Phillips 66 Pipeline	Pioneer	76
	UNEV Pipeline	UNEV Pipeline	342
Grand Total			**1045**

Source: U.S. Energy Information Administration, U.S. Crude Oil Pipelines, HGL Pipelines, and Petroleum Pipelines (2020b).

Hydrogen Pipelines

Presently, Utah has no pipelines designated for transporting compressed hydrogen because the demand for hydrogen as a fuel source is limited. One anticipated major hydrogen user in Utah is the IPP facility near Delta, which is scheduled for 2025 to begin energy generation from a fuel mixture of 70 percent natural gas and 30 percent hydrogen (Intermountain Power 2021). Eventually, their energy production will be converted to 100-percent green hydrogen. Related to this IPP development is a utility-scale hydrogen storage project that is intended to supply IPP with green hydrogen that will be generated on site.

Broader use of hydrogen, such as for motor vehicles and freight transport, is uncertain at this time. Wide-spread adoption of hydrogen as a transportation fuel would require a distribution network, either through pipelines or by tanker trucks, to fueling stations throughout the state to alleviate drivers' "range anxiety."

Water Pipelines

Two primary water pipelines and water development projects utilize (or plan to utilize) water allocated to Utah from the Colorado River Compact, CUP, and the Lake Powell Pipeline.

The CUP is a complex, transbasin water development and delivery infrastructure project that provides water storage and conveyance within the Uintah Basin and Wasatch Front of Utah. The CUP consists of four units--water projects that, when combined, comprise the entirety of the CUP. The Bonneville Unit is the primary unit. It enables transport of water from the Uinta Basin to the Wasatch Front. Within the Bonneville Unit is the Diamond Fork system. This system comprises the Diamond Fork Pipeline, which delivers 101,900 acre-feet of water to the Wasatch Front (DOI 2021b).

The Lake Powell Pipeline Project is a proposed pipeline project that would convey up to 83,756 acre-feet of water from Lake Powell for use in Washington County (LPP 2021). A draft environmental impact

statement for the project was developed by the BOR. The Southern Alternative route proposed for the pipeline and associated power transmission infrastructure from Lake Powell to St. George would utilize a portion of Section 368 energy corridors through northern Arizona.

The Bear River Development Act instructs the utilization of waters allocated to Utah in the Bear River Compact. To this end, the 2019 Bear River Development Report outlines planning and studying aspects of developing these water resources for the State of Utah. The report determined that the need for water may not occur until 2050, but corridors needed for pipelines for conveyance of the water as well as storage locations should be acquired in the near future.

Within Iron County, several projects have been proposed. The Pine Valley Water Supply Project (PVWS), as proposed, is a 66-mile pipeline that would bring water pumped from groundwater wells in the West Desert (known as “Pine Valley") to Cedar Valley (BLM 2021). The proposed pipeline operated by the Central Iron County Water Conservancy District would transfer about 15,000 acre-feet of water per year (CICWCD 2021). Approximately 42.6 miles of project length is located on BLM lands and would require a 50-foot-wide right-of-way. A second water project in Iron County is the Airport Recharge Project, which is intended to pump surface waters into a local aquifer in an attempt to recharge the overdrawn groundwater (UDWR 2021).

Telecommunications

The State of Utah is committed to deploying and expanding broadband and making it accessible across the entire state. To this end, the 2020 Utah Broadband Plan identifies a series of goals to meet that goal. As of June 2021, 94 percent of Utah has access to broadband Internet service with speeds of 100 mbps or faster. Approximately 68 percent of Utahns have access to fiber-optic services with a State Broadband Access Ranking of 29th in the United States (BroadbandNow 2021).

The widespread access to high-speed Internet service across rural Utah is due in large part to the UDOT Fiber Program. For the last 20 years, UDOT has been working to install a robust fiber optic network along state highways to connect traffic cameras, digital road signs, weather stations, and other sensors to provide real-time traffic updates (UDOT ND). This fiber-optic backbone also provides access for private companies to connect to broadband Internet networks and provide high-speed Internet to their customers. UDOT established a Public Private Partnership with private telecom companies to connect communities while expanding UDOT’s Intelligent Transportation System.

The UDOT’s existing fiber-optic network consists of approximately 3,808 miles of cable (UDOT 2021a). A fiber-optic priority assessment revealed that 309 miles of fiber-optic network has been proposed with an additional 317 miles to meet existing needs (UDOT 2021b). Approximately 105 miles of fiber-optic network are in progress, with another 146 miles scheduled for installation (as of November 2021).

Other Infrastructure

There are 36 mechanical water-treatment plants in Utah. These range in capacity from 0.25 million gallons per day (mgd) in Oakley City to 75 mgd at the Central Valley Water Reclamation Facility in Salt Lake City. Statewide, wastewater treatment plants are operating at 65 percent of capacity (WFWQC 2019).

A total of 29 sewer lagoons, which discharge treated effluent into waters of the State of Utah, serve a population of 73,500 people. Another 49 wastewater treatment facilities and lagoons are non-discharging operations that use evaporation, percolation and land disposal to handle wastewater and serve a population of 132,500 people (Krouth 2019, DWQ 2022).

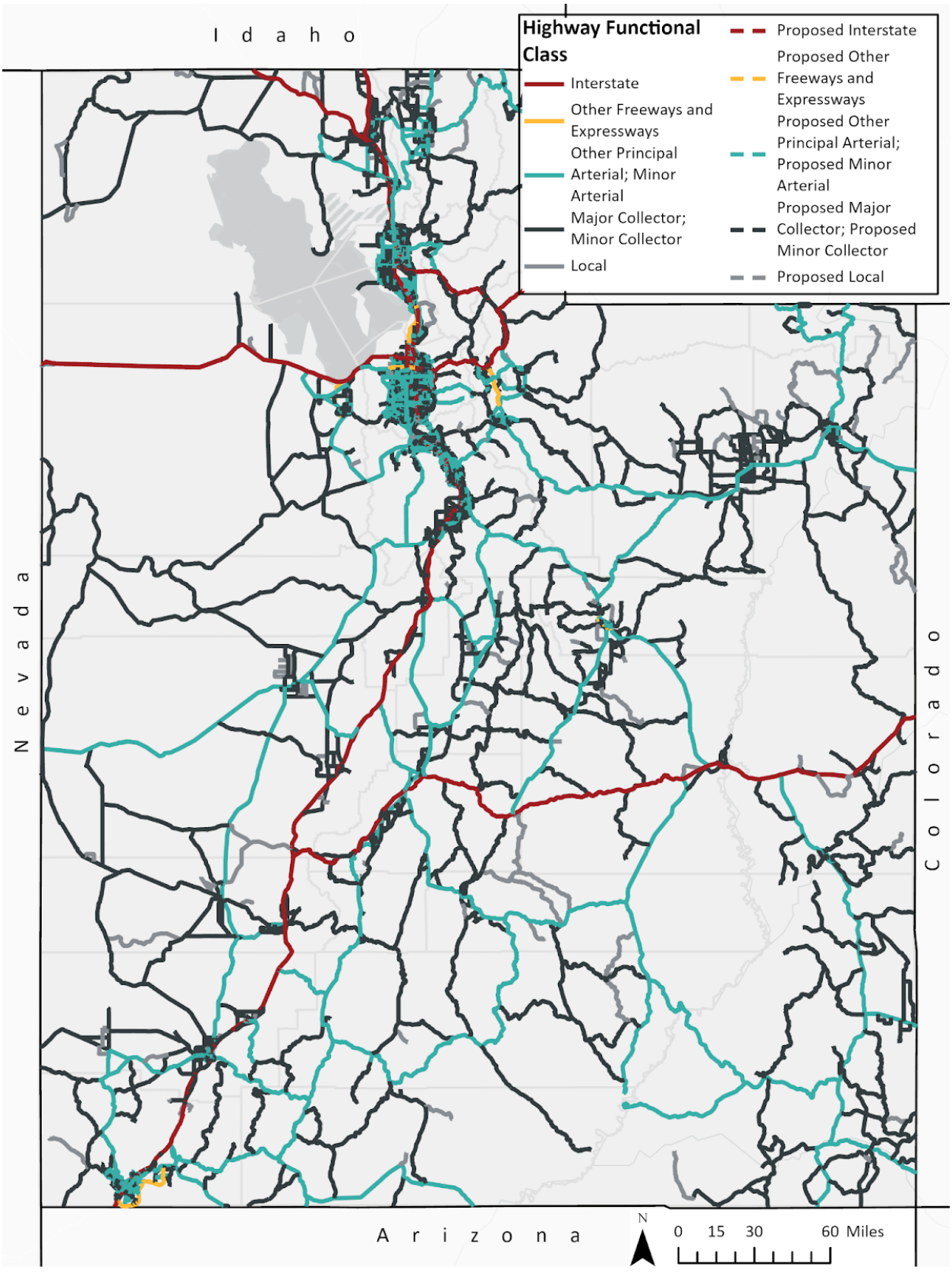
A 2019 study of existing sewer pipelines across Utah estimated there are 12,202 miles of sewer pipeline in the state with an average age of 35 years. The same study estimates that 7,320 miles of pipeline will need to be relined or replaced by 2060, and an additional 2,567 miles of new pipeline will need to be installed in the same timeframe (Forsgren 2019).

A 2019 study of stormwater pipes across Utah estimated there are 4,673 miles of existing stormwater pipes in the state with an average age of 29 years. The study estimates that 2,395 miles of this pipeline will need to be replaced by 2060, and another 956 miles will need to be installed in the same time period to accommodate new population growth (Forsgren 2019).
Water discharged into state waterways from mechanical wastewater treatment plants, sewage lagoons, and stormwater systems are subject to clean-water standards established by the EPA and the Utah Division of Water Quality. Those standards are defined here.

Transportation Infrastructure

The planning, construction, and maintenance of US interstate highways, state highways, and some local roads in Utah are completed through collaboration with UDOT. Roadway planning occurs during the compilation of the Unified Transportation Plan. The planning process is a unification of multiple transportation plans across the state including local governments, rural planning organizations, metropolitan planning organizations, transit districts/authorities, and UDOT. Construction of new federal and state roadways and bridges as well as upgrades to existing infrastructure is prioritized during the planning process and ultimately approved by the Utah Transportation Commission appointed by the Governor. Maintenance of roadways within UDOT's jurisdiction is carried out through a system of maintenance facilities placed strategically across the state.

Figure 4: Existing roadways length by functional class (UDOT, 2022).


Idaho
Nevada
Colorado
Arizona
Highway Functional Class
Interstate
Other Freeways and Expressways
Other Principal Arterial; Minor Arterial
Major Collector; Minor Collector
Local
Proposed Interstate
Proposed Other Freeways and Expressways
Proposed Other Principal Arterial; Proposed Minor Arterial
Proposed Major Collector; Proposed Minor Collector
Proposed Local
N
0 15 30 60 Miles

1

Table 5: Existing and planned roadway length by functional class.

Roadway Length		
Functional Class	**Existing Total (miles)**	**Planned Total (Miles)**
Interstate	2,314.5	0
Other Freeway and Expressway	151.9	25.2
Other Principal Arterials & Minor Arterial	3,928.7	98.7
Major Collector & Minor Collector	8,406.4	97.1
Local (UDOT only)	1,016.6	0.0
Grand Total	**15,818.1**	**204.6**

Source: Utah Department of Transportation, roadway functional class (UDOT, 2022)

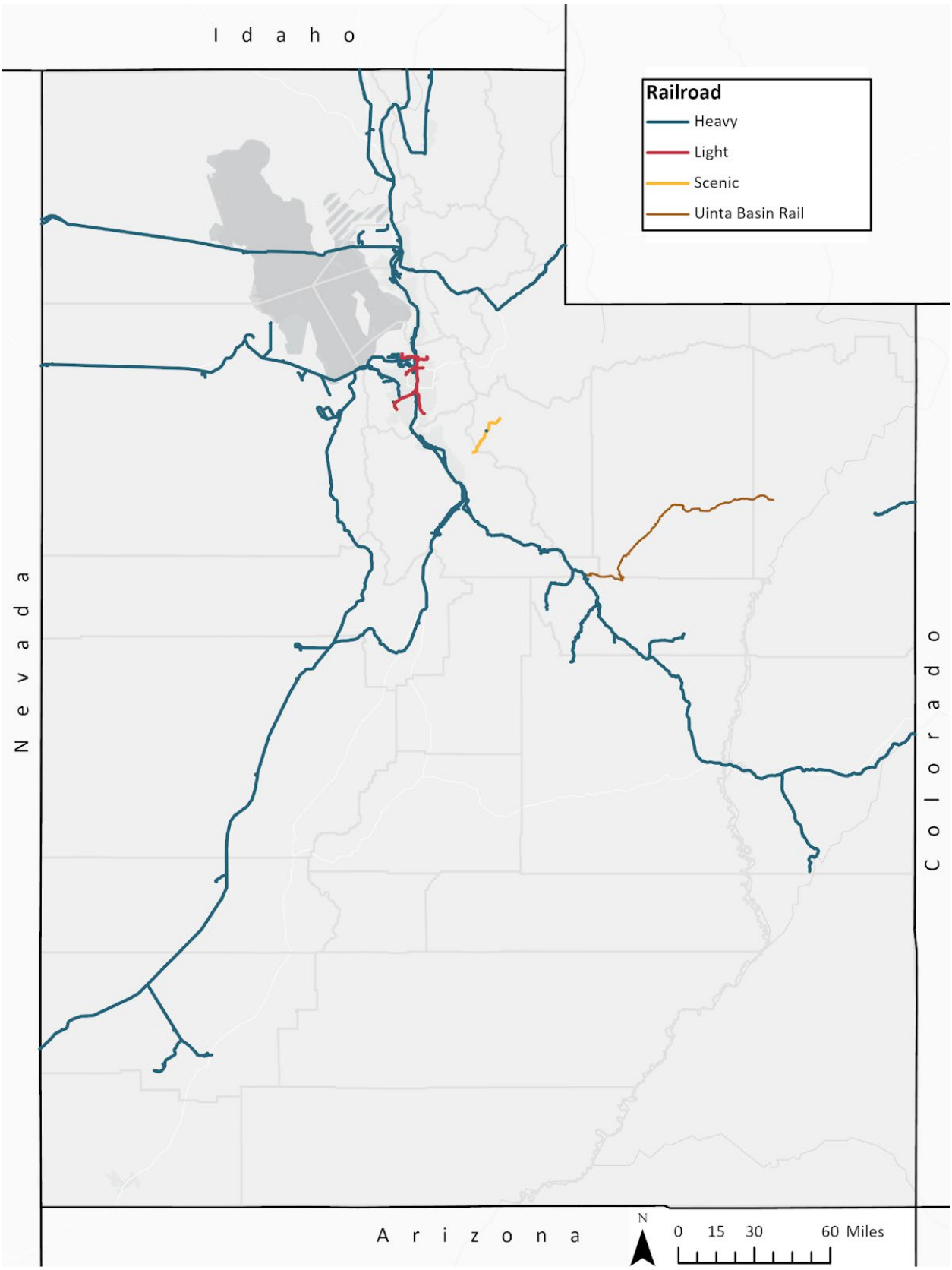
The Utah Freight Plan addresses issues and needs specific to the statewide highway and multimodal freight networks. The UDOT, in conjunction with the Utah Transit Authority, also compiled the Utah State Rail Plan, a plan for freight and passenger rail transportation in Utah.
Finally, Utah is in the planning process to site and construct a new rail connection between the Uinta Basin and the existing interstate railroad network. The preferred route would travel from Kayune, Utah, to Myton, Utah, passing south of Duchesne along US Highway 191 through Indian Canyon. About 12 miles of the route would be through USFS land, which required preparation of an environmental impact statement. The USFS issued a draft Record of Decision on October 26, 2021, to allow the project to proceed on forest land. On December 15, 2021, the federal Surface Transportation Board granted final approval for construction and operations of the Uintah Basin Railway. On July 14, 2022, the USFS signed the final Record of Decision authorizing the Uintah Basin Railway.

Table 6: Existing railroad track length by type.

Track Length	
Type	**Total (miles)**
Heavy Rail	2,609
Light Rail	102
Scenic Rail	18
Grand Total	2,729

Source: Utah Geospatial Resource Center data portal, railroads (UGIC 2017).

Figure 5: Existing railroad track length by type (UGRC 2017).


Idaho
Railroad
Heavy
Light
Scenic
Uinta Basin Rail
Nevada
Colorado
Arizona
N
0 15 30 60 Miles

Economic Considerations

Electrical Transmission

Rocky Mountain Power and its parent company PacifiCorp employ more than 1,800 people in Utah.

Lack of sufficient generation resources during peak demand puts utilities and customers at risk of high prices from the energy market during emergencies. This happened in Texas during February 2021, during which a winter storm and freezing temperatures disrupted one third of Texas's power generation capacity, resulting in astronomical power costs over just two days (Hersher 2021). A robust transmission system can reduce the potential for this kind of problem because transmission connects multiple generation sources across large regions.

Natural Gas Pipelines

Natural-gas distribution companies employ as many as 700 employees in Utah (DWS 2021) with Questar Gas (now Dominion Energy) being the largest natural gas company in the state.

Oil Pipelines

Sinclair Oil in Salt Lake City employs 1,200 people (Kolmar 2021).

Hydrogen Pipelines

Hydrogen has only limited use within Utah. This may change in the future if hydrogen is adopted as a transportation fuel or as a large-scale component of utility-scale electricity generation.

Water Pipelines

According to the 2020 Statewide Water Infrastructure Plan, over the next 50 years, the State of Utah and municipal water providers will need to spend $20.6 billion to repair and replace existing infrastructure and another $17.6 billion for new infrastructure and to develop new water supplies for future growth (BRWCD et al. 2020). The five river basins with the highest estimated costs are Bear River Basin, Kanab Creek/Virgin River Basin, Weber River Basin, Utah Lake Basin, and the Jordan River Basin.

The construction cost of the Pine Valley Pipeline Project is estimated at $254 million. The Bear River Development Project could cost between $1.5 billion and $2.8 billion, depending on the ultimate project design constructed (UDWR 2019). The Lake Powell Pipeline is estimated to cost between $1.5 billion and $3.2 billion (Utah Water Law 2016.).

Telecommunications

The Utah Broadband Advisory Council considers broadband essential to economic success (UBAC 2020). Broadband is essential for Utah businesses because it allows them to be nationally and internationally competitive. The technology also promotes entrepreneurship, attracts investments, and supports state and municipal governments. The partnerships developed through the UDOT Fiber Program have saved the state an estimated $105.8 million while connecting many parts of Utah to high-speed Internet service.

Other Infrastructure

According to a recent study by the Utah Department of Environmental Quality, the present value of existing wastewater treatment facilities in Utah is estimated to be $4 billion (Reclaim 60 ND). However, wastewater conveyance and treatment facilities must be maintained to operate effectively. Utah faces an additional cost of $5.3 billion for infrastructure renewal and replacement, and another $1.3 billion for upgrades to meet future regulatory requirements. New infrastructure required to meet the needs of population growth across Utah is expected to cost $2.1 billion. Over the next 40 years, the total cost for wastewater treatment has been estimated to be $8.7 billion (Reclaim 60 ND).

In addition to wastewater treatment facility costs, other infrastructure must be replaced or upgraded over the next 40 years. Wastewater pipelines represent a cost of $4.3 billion, sewer lagoons are expected to cost $432 million, and stormwater-collection systems are estimated to cost $1.3 billion (Reclaim 60 ND).

Transportation Infrastructure

The Unified Plan determined a total of $108.5 billion would be needed between 2019 and 2050 to fund the maintenance of current infrastructure, to expand capacity of existing roads, and to build new roads. This estimate also includes funds for upgrading transit and railway infrastructure (UDOT et al. 2021). Funding for the construction and maintenance of major highway infrastructure is provided by federal and state funds, which are generated from fuel taxes, vehicle registrations, and general funds.

Goals, Objectives, and Policies

Goals:

In light of Utah's arid environment and the world's changing climate conditions, the need for sufficient and reliable water, energy, and critical resources, the need for storage and related infrastructure is ever increasing. Therefore, to ensure Utah's ongoing drought resilience, energy security, and to provide for current and future needs, the State supports efforts to build and invest in necessary infrastructure, including additional pipelines, dams, reservoirs, above and below- ground storage facilities, and other feasible infrastructure.

Objectives:

1. Provide statewide economic opportunities and resilience for Utah communities.
2. Develop and allow pipelines and sufficient infrastructure to meet Utah's current and future needs.
3. Ensure that project continuity issues on public lands do not inhibit project implementation.
4. Explore opportunities for above and below-ground water storage statewide at different scales, finalize projects that have been proposed and vetted, and complete projects that were never constructed.
5. Support tribal pipeline and infrastructure projects that receive federal appropriations.
6. Conduct feasibility studies to prioritize water storage and pipeline projects and become proactive in order to capitalize on high water flows during flood years.
7. Improve techniques and the utilization of aquifer storage and recovery.
8. Efficient and timely delivery of water and energy resources without damaging infrastructure.
9. Support innovative and proven technologies to line earthen and concrete canals in order to reduce water loss and increase transportation efficiency.
10. Increase pipeline capacity and availability to decrease evaporation and unnecessary loss.
11. Form partnerships with stakeholders and obtain funding from the Bureau of Reclamation to form partnerships that benefit communities.

12. Support counties and water conservancy districts in applying for grants to improve water delivery systems.
13. There may be a future need to supply hydrogen along major highway arteries. There are several different methods of utilizing hydrogen opportunities that need to be further studied and strategically implemented.
    - Avoid hydrogen production that requires excessive water consumption.
14. Investigate and strategically support and implement hydroelectric production by using new technology such as in-pipe hydro systems within existing and future pipelines.
15. When feasible, and in the best interest of the state or local communities, encourage the maintenance required to avoid decommissioning hydroelectric power facilities.
16. Develop infrastructure projects aimed at recharging depleted aquifers.
17. Encourage xeriscaping policies, incentive programs, and educational campaigns to reduce water usage and reliance.
18. Increase watershed yields through active management of forests and other vegetated areas.
19. Support programs like Shared Stewardship and the Watershed Restoration Initiative to enhance water yields.
20. Support the implementation of the Utah State Water Plan and Utah's Coordinated Action Plan for Water.
21. Strategically promote watershed restoration and flood abatements after wildfires to improve soil retention, improve water quality, and reduce downstream impacts caused by flooding, siltation and debris flows.
22. Incorporate silt traps and other mechanisms to trap silt upstream and keep it from entering water treatment plants and downstream reservoirs that will ultimately need to be dredged when their storage capacity is reduced.
23. Mitigate the "use-it-or-lose-it mentality" by providing alternative options to water consumers (e.g. water banking or short-term leasing).
24. Support innovation to make existing and future water storage and delivery systems more efficient, reliable, safe, climate friendly, and sustainable.
25. Support a network for the distribution of natural gas, crude oil, and refined petroleum products to domestic and foreign markets.
26. Develop agreements with federal agencies to make it possible to maintain and improve dams, impoundments, and other facilities on federal lands with limited access in a timely and economically feasible manner. It is not economically feasible to transport equipment and supplies by helicopter.
27. Encourage the use of Advanced Metering Infrastructure (AMI) to quickly identify water leaks reducing wasted water. The technology also allows remote monitoring and manipulation (valves, flow rates, pressure, etc.) of water conveyance infrastructure.
28. Work to include pipeline and infrastructure projects in federal land use plans.

Policies:

- The State supports coordinated efforts across all agencies, governments, tribal nations, and other land ownerships on infrastructure projects to minimize delays.
- The State encourages and requests federal appropriations for water infrastructure, including pipelines, water storage, and aquifer recharge.
- The State supports active forest management to increase water yields and water quality.
- The State supports active forest management to decrease water quality issues from wildfire, flooding, etc., which impacts water storage, water treatment, and water delivery systems.
- The State supports the plans and strategies presented by the Shared Stewardship Program, Watershed Restoration Initiative, and the Utah Division of Water Resources.
- The State will support the Utah Watershed Council Act.

- The State encourages water conservation measures, education, and incentives.
- The State supports maintaining access to water in the Colorado River and its access to state and county-owned shares that have not been fully exercised as a result of access and transportation limitations.
- The State supports the development of pipelines from the natural gas and crude oil producing areas to refineries, export terminals, or to other associated transportation systems.
- The State discourages natural gas vent pipes (e.g. pig lines) in close proximity to electrical transmission and distribution lines, or any other non-compatible operations.
- The State supports federal appropriations for methane capture while maintaining safety protocols.
- The State supports the effort to conserve water by creating hydrogen through natural gas, coal, and other sources.
- The State supports creating a strategy to provide consumers with hydrogen access along major transportation arteries, if or when markets support this energy transfer option in the future.
- The State supports and encourages the maintenance and development of pipelines and infrastructure that improve the state's market share and improve the quality of life for Utahns, provided such can be maintained and developed in a sustainable manner.
- The State opposes the creation of pipelines and infrastructure to remove water resources from the state of Utah in order to transport it to other states.
- The State expects pass-through pipelines and associated infrastructure to continually benefit the citizens of Utah and communities.
- The State desires unimpeded and timely access to water storage facilities on federal lands to feasibly improve and maintain infrastructure in an effort to address water storage needs.
- The State supports the completion of the Central Utah Project as originally proposed to fulfill all promises made to Uintah Basin counties to mitigate for the transfer of water to the Wasatch Front.
- The State supports projects that conserve water by the lining of ditches and canals.
- The State supports the preservation of existing hydroelectric facilities and construction of new facilities, including in-pipe hydro systems and other innovative technologies.
- The State supports the construction and operation of pipelines and other infrastructure to enable the production and transportation of mineral resources from federal lands.
- The State supports making strategic amendments to federal land use plans to allow for future water storage, pipelines, and infrastructure on public lands.
- Oppose special designations on federal land that would prohibit the establishment of corridors for pipelines and associated infrastructure.
- Support and promote the planning, construction, and maintenance of pipelines and infrastructure to transport resources from their point of origin to the consumer.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Utah Energy Act

§ 79-6-301. *State energy policy.*

Public Utilities - Title 54

Railroads - Title 56

Transportation - Title 72

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

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PREDATOR MANAGEMENT

Introduction

The Utah Division of Wildlife Resources (UDWR) recognizes predator management as an important tool available to UDWR staff and that of the Utah Department of Agriculture and Food (UDAF) and U.S. Department of Agriculture Wildlife Services personnel, when needed. The UDWR strives to ensure that predatory species populations continue to inhabit Utah while at the same time addressing impacts predators have on prey species, the public, and the state's economic interests.

Findings

The primary agent for predator management to protect livestock from predation is UDAF in cooperation with the U.S. Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services (WS) [1]. This cooperative program protects livestock from coyotes, and in cooperation with UDWR, includes cougars, black bears, eagles, and wolves that cause damage to livestock. In the absence of these protective programs, for example, annual lamb losses are estimated to be as high as 30 percent, whereas the WS program kept losses below 9 percent in fiscal year 2019 (the most recent year data is available). Cougars and bears cause an estimated 19 percent of lamb predation in the state, which generally occurs during the summer, when sheep are grazed on high-elevation mountain ranges. Utah Code 23-13-3 provides that wildlife is declared the property of the state. The UDWR has been given authority to manage "protected" wildlife. Predator damage is managed through hunting permits, reimbursement for livestock damage, issuing depredation permits to producers to take cougars when they suffer chronic losses, and through assistance of UDAF/WS [2]. In addition to these efforts, the Utah Legislature has enacted programs to address coyote damage to mule deer populations. One of these programs is an incentive program that pays coyote hunters $50 dollars for each coyote turned in to UDWR. In FY23 this incentive program removed 3,726 coyotes. Another program focuses on coyote predation in areas where mule deer give birth and raise fawns. This program funds targeted removal efforts in partnership with WS and the UDAF. Funds are also provided as a match to counties for removal of coyotes that benefit both livestock and wildlife. ~~In fiscal year 2021, these programs resulted in the removal of 6,154 coyotes.~~

Economic Considerations

Livestock production contributes significantly to the economy of counties and communities throughout Utah. Agriculture generated $2,122,720,000 in cash receipts in Utah in 2020 [3].

Livestock production, including cattle, domestic turkeys, and sheep, are the primary agricultural industries, and accounted for 70 percent of all agricultural cash receipts statewide in 2017 [4].

In fiscal year 2020, Utah cattle and calf inventory totaled 820,000 head. Beef cow replacement heifers were estimated at 85,000 head, and other heifers not intended for replacement totaled 60,000. The inventory of steers weighing 500 pounds or more was 80,000 head. Calves weighing less than 500 pounds totaled 65,000 head, and the 2019 calf crop was 400,000. The number of cattle lost to predators each year is unavailable; however, calves are vulnerable when on the range. The beef industry is Utah's largest agricultural economic driver, bringing in nearly $499 million in cash receipts in fiscal year 2019 alone. [5]

Because the livestock herds are migratory and use federal, state, and private lands, the numbers of livestock fluctuate by county and time of year.

During fiscal year 2020, Utah breeding sheep inventory, including replacement lambs, totaled 285,000 head. The sheep and lambs kept for breeding numbered 240,000 head, and ewes for breeding (1-year-old and older) totaled 195,000 head. The 2019 lamb crop was 230,000 head, and lambs for breeding replacement were estimated at 38,000 head, and 1-year-old and older totaled 7,000 head. Market sheep and lambs were estimated at 45,000 head. Utah sheep ranchers lost 40,000 sheep and lambs to all causes during 2019, but the largest single cause of death in lambs before docking was coyotes, which killed 5,400 head, accounting for about 32 percent of all lamb losses before docking. Coyotes also accounted for the largest number of lambs killed after docking, totaling 6,700 head, or about 45 percent losses after docking. Losses of sheep 1-year-old and older to coyotes were 2,100 head. The total loss in dollar value in the sheep industry caused by predators was $3.4 million in fiscal year 2020. [6]

Goals, Objectives and Policies

Goals:

The primary focus of predator management in Utah is (1) reducing or mitigating for damage to livestock from coyotes, black bear, and cougar; and (2) protecting mule deer populations and other wildlife populations (threatened and endangered species) from declines caused by cougars, bears, coyotes, raptors, ravens, and small mammalian predators.

Objectives and Policies

Since 2012, predator management programs have been able to reduce sheep and lamb losses from 27,600 to 20,400, reducing the economic loss from $8.5 million in 2012 to $3.4 million in 2020. These successes are encouraging, but the UDWR, WS, and UDAF continue to work with producers to address depredation conflicts and provide tools to eliminate individual predators that target livestock.

Improve the efficiency of responses to predator attacks

Once predators begin to prey on domestic livestock, they often continue to return to ~~follow~~ the herd or band, which increases losses for specific producers. Sheep bands are especially vulnerable to predators. An increase in personnel and efficiency to reduce the response time in predator attacks is a necessity to prevent increasing economic losses for Utah's livestock producers. The UDAF's trappers are spread thin due to unfilled positions and a lack of funding. Returning trappers to historic employment numbers in the state will help improve predator management within the state.

Predators are being managed under certain circumstances

If predator populations are limiting UDWR's ability to reach other wildlife management objectives, wildlife officials may choose to implement predator-management plans. The UDWR continues to direct financial resources to WS for coyote predator-management efforts in areas where mule deer give birth and raise fawns. In addition, the UDWR oversees a bounty program on coyotes killed and turned in. For each eligible coyote killed, a hunter or trapper receives $50. The UDWR provides over $1 million dollars to these efforts each year.

The Utah Legislature recently enacted a law that enables the director of the UDWR to take immediate action when predatory species are limiting the ability of prey populations to meet objectives. Under this new legislation, the UDWR will establish predator management plans to reduce predator population densities on units where ungulates are significantly below their population objectives due to either direct predation or during population declines that follow natural events and predators are slowing or preventing prey populations from increasing back to objective. ~~In 2021, 36 of 53 cougar management units have~~

~~established predator management plans to address concerns with mule deer and bighorn sheep populations.~~ In addition, the legislature changed the management of cougars in Utah to allow unlimited hunting year-round to people who purchase a hunting or combination license.

~~In addition to these efforts, the UDWR director has enacted a "spot-and-stalk" cougar hunting opportunity for hunters each year from July 1 to June 30. During this hunt, a hunter may not use dogs to pursue or harvest a cougar.~~

UDWR implements predator management in certain units

The UDWR manages predators in specific units, for the following species and situations:

- Ravens, coyotes, red foxes, and badgers, all of which prey on sage-grouse and their eggs
- Raccoons and red foxes, which prey on waterfowl and their eggs (foxes take nesting hens and eggs)
- Cougars that prey on adult mule deer or bighorn sheep
- Coyotes that prey on mule deer fawns or pronghorn fawns

Of these programs, the one that targets coyotes is the largest and most costly for UDWR. Appropriately targeting critical fawning areas and timing predator removal to occur just prior to coyote pair bonding and mule deer fawning is essential for reducing the impact that coyotes have on fawn survival. In Utah, targeted management from aircraft ~~targeted contracts~~ allows removal of coyotes from fawning grounds from March through August, and the coyote bounty program is most effective during the coyote breeding season (January–March).

Coyote Bounty Program

Utah's Mule Deer Protection Act went into effect in July 2012. The primary goal of the program was to remove coyotes from areas where they may prey on deer fawns. The Utah Legislature set aside $500,000 from the state's general fund to pay individuals to kill coyotes in Utah. To process the payments and track harvest and participation, UDWR created Utah's Predator Control Program. This program took the place of previous coyote-bounty programs administered by participating counties.

The UDWR established locations throughout the state where program participants can check-in coyotes for a $50 payment. Participants must use a smartphone application to log each coyote killed, which records the location of the kill as well as other data required for payment. Coyotes removed and turned in for payment, as well as the amount of compensation paid each year can be found in the table below. The bounty program likely increased the number of coyotes killed in Utah and provided government-supplied economic rewards to individuals and businesses throughout the state.

YEAR	COYOTES REMOVED	COMPENSATION AMOUNT
2013	7,592	$379,600
2014	9,835	$491,750
2015	9,801	$490,050
2016	10,518	$525,900
2017	11,502	$575,100

2018	10,589	$529, 450
2019	8,232	$411,600
2020	4,109	$205,450
2021	4,991	$249,550
2022	3,472	$173,600
2023	3,726	$186,300

The Coyote Bounty Program is essential to protect wildlife and livestock in Utah. Increasing the efficiency of this program to mitigate losses is vital for the economic benefits that wildlife and livestock bring to the state. Improving both the efficiency and productivity of this program through improved marketing, increased funding, and a larger number of hunters is greatly supported by the State of Utah and the Wildlife Board.

Black bears and wolves present different management challenges

Two additional wildlife species can at times exhibit predatory behavior in Utah: black bears and wolves. Both of these species are managed under specific plans (i.e., the Utah Black Bear Management Plan and Utah Wolf Management Plan).

Bears

Black bears occur in stable, healthy populations across certain parts of Utah. Normally, they don't occur in the mountain ranges of the western deserts. Black bears are omnivores, and the majority of their diet consists of plant material and, at certain times of the year, insects and insect larvae. When black bears prey on mammals, they commonly target mule deer that are either scavenged or (during early summer) newborn fawns. Mule deer fawn studies in New Mexico and Colorado attributed between 3 and 4 percent (respectively) of fawn mortality to black bears.

Wolves

Wolves exhibit behavior patterns, such as cooperative hunting in packs, which clearly distinguish them from bears and other predators. By any measure, wolves are highly effective and efficient predators. Currently, there are no established breeding populations of wolves in Utah. However, there are occasional transients and migrants.

The status of wolves under the Endangered Species Act (ESA) in Utah has changed repeatedly in the last decade and is again under review. Currently (7/2023), wolves in the majority of the state are considered endangered. Wolf management in Utah is dictated by the 2010 Wolf Management Act (S.B. 36). The law directs DWR to prevent any packs of wolves from establishing within the delisted portion of Utah which is the zone north of 1-80 and east of 1-84. Wolves outside of the delisted area are endangered and fully protected under the ESA. As required by the Wolf Management Act, UDWR requests that the USFWS remove any wolves from the listed part of the state. It is the policy of the state of Utah to legally advocate and facilitate the delisting of wolves in Utah under the ESA and the return of management authority to the state.

~~As of January 2021, wolves were delisted throughout Utah and are on longer regulated under the Endangered Species Act. The Utah Wolf Management Plan outlines Utah's strategies and protocols for managing wolves statewide. Under state management, wolves are a protected species. While there is currently no state-administered hunt for wolves,~~ In the delisted area, Utah livestock producers have options to protect livestock from wolf depredation and may be compensated if a wolf attacks their animals. The UDWR has given authority to the WS to act on UDWR's behalf to resolve livestock depredation incidents that involve wolves.

Cougar and Bear Livestock Depredation

Black bears can cause site-specific depredation problems among livestock, especially domestic sheep bedded down for the night during the summer months. It has been confirmed that black bears were responsible for the loss of 22~~95~~ ewes and 129~~255~~ lambs in fiscal year 2022~~1~~. Black bears were confirmed to have killed ~~two~~ one calf in fiscal year 2022. Total value of losses to black bears in fiscal year 2022 was $47,352 ~~64,255.~~

Although cougars prey primarily on adult deer, they are opportunistic predators and can also cause site-specific livestock depredation problems. Cougars were verified as responsible for the loss of ~~184~~143 ewes and ~~428~~289 lambs in fiscal year 2022. Eight ~~Ten buck sheep and two~~ goats were also confirmed as killed by cougars in fiscal year 2022. Total value of confirmed losses was $133,712 ~~114,485~~. Livestock depredation incidents are immediately referred to UDAF/WS staff who specialize in removal of specific predators associated with depredation incidents. Wildlife Services confirms losses to predation by bears or cougars. It should be noted that confirmed losses are based on what producers or UDAF/WS agents find in the field, and may not represent total losses to a producer caused by cougars or bears. The UDWR provides compensation to ranchers with documented livestock losses attributed to cougars and bears. The UDWR also issues increased public cougar and bear permits, as well as permits to producers to take bears ~~and cougars~~ causing damage in areas with chronic livestock losses caused by predation from these species. Producers can now remove cougars year-round with a hunting or combination license under new legislation.

The State of Utah is fully committed to managing predators to improve the survival rates of mule deer and to reduce the number of livestock lost to predators. Increased efficiency and resources for wildlife services and other predator management programs are a priority to protect agriculture, wildlife, and the economic benefits that both bring to the State of Utah.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

> **§ 63L-11-303.** *Findings to be recognized and promoted.*
>
> *23(d) provisions for predator control initiatives or programs under the direction of state and local authorities should be implemented; and*

Utah Code (Title 23A). *Wildlife Resources Code of Utah.*

§ 23A-14-203. *Taking red fox or striped skunk*

§ 23A-8-201. *Procedure to obtain compensation for livestock damage done by bear, mountain lion, wolf, or eagle.*

§ 23A-8-202. *Livestock depredation by predators.*

§ 23A-11-402. *Rulemaking authority, coordination, and administration for predator control.*

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RIPARIAN AREAS

Introduction

The U.S. Fish and Wildlife Service defines riparian areas, in a mapping context, as, "plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways)." Riparian areas are found in the transitions between wetland and upland areas and can have distinctly different plant species than adjacent areas or similar species that exhibit more robust or vigorous growth. [1]

Riparian areas are typically dependent on a natural hydrologic regime, especially annual and episodic flooding. Riparian areas occur within the flood zone of rivers, on islands, on sand or cobble bars, and immediately adjacent to streambanks and lakeshores. They can take the form of large, wide areas on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches.

Riparian areas commonly support specialized vegetation associated with surface or subsurface moisture. Riparian resources include wetland areas that require prolonged saturation of soils and include certain vegetative species dependent upon saturation (see Wetlands section), though many ~~most~~ riparian areas do not qualify as wetlands. Riparian resources are commonly located along major streams, drainages, and spring sites. They occur more frequently in forests and areas that receive more precipitation than arid lowlands.

Findings

Properly functioning riparian areas help maintain the quality and quantity of water in adjacent lakes and streams, which may be used for both culinary and agricultural purposes. Riparian areas also (1) support habitat for migratory birds, raptors, and fish; (2) support forage and browse for wildlife, wild horses, and livestock; and (3) provide numerous recreation opportunities. Riparian wetlands can also help slow and detain floodwaters, which may reduce flood risk.

Riparian areas occur as long strips of vegetation adjacent to streams, lakes, reservoirs, and other inland aquatic systems that affect or are affected by the presence of water. This vegetation contributes to unique ecosystems that perform a variety of ecological functions. Riparian areas are classified either as lotic riparian resources (flowing water streams and rivers) or lentic riparian resources (non-flowing wetlands, meadows, lakes, and reservoirs).

Riparian resources are described through reference to the Properly Functioning Condition (PFC), which is a qualitative analysis used to assess the condition of riparian areas developed by the Bureau of Land Management. The term is used to describe the assessment process and define the potential functional capacity a particular riparian area could reach with appropriate management practices. PFC is a state of resiliency that measures the potential for an area to produce anticipated ecologic values. Riparian areas that are not reaching the functional capacity determined to be PFC are at risk of losing these values. Functioning condition is rated by category to reflect ecosystem health as follows:

Proper Functioning Condition. When adequate vegetation, landform, or large woody debris is present to dissipate energy associated with (1) high flow; (2) filter sediment, capture bedload, and aid floodplain development; (3) improve flood water retention and groundwater recharge; (4) develop root masses that stabilize stream banks against cutting action; (5) develop diverse ponding and channel characteristics; and (6) support greater biodiversity.

Functioning at Risk. Riparian areas that are in functioning condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Nonfunctional. Riparian areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and therefore are not reducing erosion, improving water quality, etc.

Unknown. Riparian areas that have not been inventoried or where there is insufficient information to make any form of determination.

Riparian areas meet PFC when a stream channel exhibits morphology and functionality similar to riparian areas in the planning area that have not been substantially altered by outside influences. These areas would have vegetation capable of attenuating flood flows, reducing erosion, and creating conditions suitable for the long-term and vigorous occupation of native vegetation on streambanks or in wetlands.

Riparian areas also can be monitored using quantitative short-term and long-term indicators. This monitoring procedure evaluates indicators for long-term trend, including vegetative composition near the water's edge, woody species regeneration, streambank stability, channel and water width and depth, and substrate composition. The procedures also help determine if short-term management practices are meeting allowable-use criteria. Examples of short-term indicators include woody species use, stubble height, and streambank alteration.

Vegetation in riparian areas is a dominant characteristic and includes trees, shrubs, sedges, and grasses. Invasive vegetation is common within riparian areas and often consists of exotic trees (e.g., Russian olive and tamarisk) and other noxious species (e.g., Russian knapweed and purple loosestrife). Generally, the upland vegetation surrounding riparian systems is different, definable, and ranges from grasslands to forests. In recent decades, pinyon and juniper have also invaded riparian areas, putting additional pressure on limited water resources.

Grass species and communities are a major component in most riparian and wetland areas. A mix of grasses can normally be found in riparian areas, with wide variability in the number of species, extent, and location. Depending on the degree of inundation or saturation, grasses can include obligate wetland species where sufficient saturation occurs yearlong, facultative wetland grasses, or upland grass species.

Riparian ecological systems contain early, mid-, and late-seral riparian plant associations. They also contain non-obligate riparian species. Cottonwood communities are early, mid-, or late-seral, depending on the age-class of the trees and the associated species. Mature cottonwood occurrences do not reach a climax stage and do not regenerate in place, but regenerate by "moving" up and down a river reach. Over time, a healthy riparian area with appropriate ecological site conditions supports all stages of cottonwood communities. Riparian ecosystems are extremely susceptible to fire because they support native woody species that are fire intolerant. This may result in catastrophic loss to fire, especially when an area is subsequently invaded by exotic species (e.g., tamarisk).

Associations in this ecological system are adapted to soils that may be flooded or saturated throughout the growing season. They may also occur in areas with soils that are only saturated early in the growing season, or intermittently. Typically, these associations are tolerant of moderate-intensity ground fires and late-season livestock and wildlife grazing. Most appear to be relatively stable types, although in some areas these may be impacted temporarily by intensive livestock grazing.

Causal factors for riparian areas not meeting PFC vary. These factors are inside and outside management control, and in most cases, no single factor is responsible for conditions less than PFC. Common causal factors include (in no particular order of importance) dewatering, drought, incised channels, excessive erosion/sedimentation because of poor upland conditions (e.g., pinyon-juniper woodland expansion), OHV use, wildlife and livestock grazing, and invasive species encroachment.

Land managers emphasize maintenance of riparian areas and wetlands. Management actions and projects have been implemented to improve riparian conditions, including planting willows to reintroduce a native-woody species component, stream-bank stabilization, sediment reduction, flood attenuation, and vegetative recovery in riparian areas and wetlands. Restoration projects that use simple low-cost materials to add structure to streams and mimic natural functions have become increasingly popular, particularly beaver dam analog projects that use manmade dams to help slow the flow from streams, capture sediment, and restore riparian areas. Agencies have also initiated adaptive livestock and wildlife management actions to balance grazing and resource protection.

The Utah Wildlife Action Plan (WAP) is a wildlife planning document compiled by from the DWR and partners that identifies native sensitive species and key habitats in need of conservation attention, and pinpoints threats, limiting factors and crucial data gaps for species and their habitats. The plan provides strong, clear guidance for improving habitats and strengthening wildlife populations, and, if fully implemented, can help reduce and prevent listings under the federal Endangered Species Act. Projects that address threats to key habitats are prioritized for funding under the Watershed Restoration Initiative's prioritization process. The current version of the WAP, which covers the period from 2015 to 2025, lists forested and shrub-scrub wetlands as key habitats; these wetlands are usually found in riparian areas. Riparian areas more broadly are not listed in the WAP due to the lack of any readily available spatial data showing the extent of riparian areas in Utah. However, the next version of the WAP, currently under development, will include riparian areas as a key habitat.

The Governor's Coordinated Water Action Plan was released in November 2022. "Instream flows and riparian and aquatic ecosystems" is identified as one of the key policy issues in the Healthy Waters and Watersheds section of the plan due to challenges in maintaining enough instream flow to support healthy wildlife and riparian vegetation. The Plan noted the need for 1) identification of the thresholds needed to maintain viable fish and wildlife populations, 2) functioning water markets and resources to allow for water rights transactions to secure instream flows, and 3) adequate measuring devices to ensure that water reaches its intended destination. The plan notes the need to protect riparian areas given their high value relative to the small geographic area they cover; Action 4 in the Healthy Waters section is to "prioritize and target land conservation and restoration in riparian corridors, floodplains, and other areas with high values for watershed health, wildlife habitat, and public access and recreation." Key tasks under this action that could benefit riparian areas include 1) "invest state and federal funds, and encourage public-private partnerships to purchase conservation easements or compensate producers for development rights restrictions in key watersheds and riparian areas with multiple benefits" and "determine how to include riparian and watershed health into County Resources Management Plans and community land use plans and ordinances."

The terms "riparian" and "wetland" are sometimes used interchangeably. Wetlands are regulated by the federal government under the Clean Water Act and are defined based on indicators related to hydrology, vegetation, and soils. Wetlands can be adjacent to streams and lakes or more isolated, such as some spring systems in Utah. Many riparian areas in Utah meet the technical definition of wetland but some areas do not. Some local governments in Utah have enacted ordinances to protect riparian areas and floodplains from development to protect functions and values that their communities rely on and help eliminate costly flood damage.

~~Wetland systems are listed as key habitats in the current version of the WAP, which goes through 2025, and will remain prominent in the next version, which is currently in development.~~

Economic Considerations

Riparian area vegetation is a key factor in reducing downstream flooding. As flood water flows through a vegetated area, the plants resist the flow and dissipate its energy, increasing the time available for water to infiltrate into the soil and be stored for use by plants. Flooding is the most expensive geologic hazard in Utah; 16 major flood events since 1923 have caused more than $1.3 trillion in damage. [2]

Healthy riparian areas can improve fish and wildlife populations, which have an impact on recreational usage and economic benefits. Many species of greatest conservation need in Utah as identified in the WAP are dependent on riparian areas; maintaining healthy riparian areas can decrease the chances of costly Threatened and Endangered Species listing decisions. Increased vegetation from healthy riparian areas can have impacts on grazing as a result of increased forage.

Property values in riparian areas have a significant price premium.

Goals, Objectives, and Policies

Goal(s):

Actively manage and maintain healthy riparian areas that contribute to healthy watersheds, safe communities, and resilient ecosystems.

Objectives:

1. Employ active management to improve and enhance riparian resources to provide for appropriate physical, biological, and chemical function.
2. Meet or make progress toward attainment of the Utah Standards and Guidelines for healthy Rangelands according to riparian site capability.
3. Prioritize and manage riparian areas to attain desired future conditions for riparian- related resources (e.g., fishery habitat, water quality, wildlife and livestock forage, and soil stability).
4. Manage riparian areas for the mutual and maximum benefit of wildlife, livestock, and special-status species.

Policies:

- Support the use of structural and non-structural improvements in unstable water courses to restore riparian areas properly functioning/desired future conditions.
- Engage with federal land-management agencies to support active management of healthy riparian areas on federal land.
- Attain an optimal mix of native and desirable nonnative species to support desired ecological conditions and a properly functioning ecosystem.
- Support the removal of invasive species from riparian areas on public lands.
- Work cooperatively with federal land-management agencies and livestock producers to determine the appropriate level and type of livestock grazing to occur in riparian areas on public land.
- Work cooperatively with federal land-management agencies and livestock producers to determine the appropriate balance of uses in riparian areas between wildlife, domestic livestock, and feral animals such as wild horses.

- Support the responsible management of riparian areas to accommodate successful livestock production while protecting riparian health.
- Request monitoring protocol to identify which ungulates are impacting riparian zones.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Water and Irrigation - Title 73

References:

1. https://www.fws.gov/program/national-wetlands-inventory/classification-codes
2. https://geology.utah.gov/hazards/flooding/

THREATENED AND ENDANGERED SPECIES

Introduction

Threatened and endangered species refers to plants, animals, and other living organisms that are, to some level, threatened by extinction as defined by the federal Endangered Species Act of 1973 (ESA).

States hold primary management authority for fish and wildlife species found within their borders. However, once a species of plant or animal becomes federally listed under ESA, the federal government holds the primary management authority for that species. The ESA recognizes that our rich natural heritage is of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people," and further expresses concern that many of the Nation's native plants and animals are in danger of becoming extinct.

The stated purpose of the ESA is to protect and recover threatened and endangered species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service (USFWS) and the U.S. Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for ESA listed terrestrial and freshwater organisms found in Utah.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined "species" to include, subspecies, varieties, and, for vertebrates, distinct population segments.

What may not be immediately apparent is that Utah has hundreds of native species, some of which are in decline. Utah's goal is to manage native wildlife species and their habitats to help prevent listings under the ESA (see link). Once a species is listed under the ESA, a state's ability to manage listed species is diminished and the range of options for managing lands and waters where that species occurs substantially narrows. Utah's Endangered Species Mitigation Fund (ESMF) provides a state match for USFWS State Wildlife Grant Funding (SWG); these two funding sources help Utah to conserve ESA-listed species and other species in need of conservation attention. The Wildlife Action Plan (WAP) is Utah's ESA listing prevention roadmap ~~tool~~. The WAP identifies species in need of conservation attention, the key habitats that they rely upon, and threats to the species. Projects completed through the Utah Watershed Restoration Initiative (WRI) work to protect and restore these key habitats and alleviate threats to species in need of conservation. To date, the state and its partners have spent more than $281 million dollars through the WRI on conservation of wildlife habitat in Utah.

Findings

There are currently 46 federally listed threatened and endangered species in Utah. Of the species listed, 21 are animals, and 25 are plants. Since the ESA became law in 1973, only 1 percent of listed species have been delisted due to recovery [1]. That means many of the species that become listed in Utah will likely remain federally listed for a significant amount of time. Further, for most federally listed species in Utah, the USFWS has yet to develop a recovery plan identifying what conservation actions must occur to delist the species. Keeping species from being listed as threatened or endangered under ESA is the goal in Utah. This ensures Utah has healthy populations on the landscape and the state retains management authority. The Division of Wildlife Resources (DWR) and its partners have been successful in preventing more than 20 species listings in the last few decades, and this success is largely because of funding provided through ESMF (boreal toad video).

Section 9 of the ESA prohibits "taking" of any endangered or threatened species and the parts or products of listed animals and plants cannot be possessed, taken, or transported without special permission of USFWS [2]. This prohibition applies both to private and public actions or activities [3]. "Take" is defined as actions that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect listed species or any to attempt to engage in such conduct [4]. "Taking" of a species includes willfully harming an endangered or threatened animal [5]. It also includes habitat destruction or degradation that significantly interferes with an animal's essential breeding, feeding, or shelter seeking behavior [6]. However, Section 10 of the ESA allows for non-federal entities to apply for permission to incidentally take a listed species in the course of an otherwise lawful activity.

When a species is federally listed, the USFWS can designate "critical habitat" and develop a recovery plan [7]. Critical habitat consists of specific areas where the physical and biological features exist that are (1) essential to the conservation of a species, and (2) require special management considerations or protection. This includes not only occupied habitats but may also include areas outside the species' current range when they are considered to be important to the species' survival and recovery. Critical habitat may be designated on federal, state or private lands. However, activities on state or private lands are not restricted by the ESA unless they directly harm the listed species or there is some type of federal involvement which would require consultation under Section 7 of ESA between the USFWS and the responsible federal party. Recovery plans are documents that list what should take place to recover a species to the point that it is no longer threatened or endangered under the ESA.

In addition to critical habitat, federal agencies can designate Areas of Critical Environmental Concern or ACECs where special management attention is needed on federal land to protect important historical, cultural, and scenic values, or fish and wildlife or other natural resources. Anyone can nominate an ACEC during the federal land-use planning process, but designations must be based on the best available information and science. These determinations are made during the land-use planning process and are subject to public review and comment.

Economic Considerations

Species listing can have serious economic impacts to the state and its communities. The passage of H.B. 359 during the 1997 General Session created the Endangered Species Mitigation Fund program (ESMF). The legislation established a Species Protection Account, now outlined in Utah Code 79.2.203. This account sets aside money to help facilitate conservation, and the program distributes funds through competitive grants to projects that promote species recovery and conservation.

One of the program's primary efforts is to down-list or delist species listed under the ESA and prevent new federal listings. Highly successful, the program has on multiple occasions helped prevent federal listings and the economic harm that often accompanies them.

The U.S. Department of Interior estimated that the potential direct costs from the recovery plans of all listed species were about $4.6 billion in 1990 [8]. Similarly, the federal government has spent at least $1 billion dollars a year on ESA listing and delisting efforts each year since 2010 [9]. In 2015, the USFWS spent $745,774 on Utah prairie dog conservation efforts alone [10].

Utah has spent more than $183 million on protection of sage grouse to prevent federal listing. However, according to the Utah Office of Energy Development, federal listing of sage grouse as endangered could cost the state more than $41.4 billion in lost economic development. The State of Utah has also spent more than $189 million dollars on restoring habitat that benefits many threatened, endangered, and other species throughout Utah. Species listing, however, would result in a much larger cost to Utah citizens

because of the non-monetary cost of limitations on resource use and development. DWR therefore strives to prevent species listings under the ESA.

Goals, Objectives, and Policies

Goal(s):

- The primary objective of the Endangered Species Mitigation Fund is to direct funds toward the protection, conservation, and recovery of federally listed species and species of greatest conservation need as identified in the Utah Wildlife Action Plan.

Objectives:

1. Work with stakeholders and partners and continue to implement recommendations from the Utah WAP 2015–2025 to conserve species and their habitat to prevent federal listings.
2. Identify and minimize the threats to species in need of conservation to ensure healthy and robust populations in Utah.
3. Assist the USFWS in developing recovery plans for federally listed species in Utah. The recovery plans should contain quantifiable recovery goals for the target species. Identify and maintain wildlife migration corridors for all species in need of conservation.
4. Work with USFWS to identify means of increasing the effectiveness of species recovery activities throughout the state.
5. Restore habitat for species in need of conservation along with all other wildlife through the Watershed Restoration Initiative.
6. In consultation with the USFWS, local governments, and state agencies, develop a delisting strategy for all listed species in Utah and work to eliminate threats to those species.
7. Engage with statewide and local efforts to ensure wildlife values are incorporated into planning efforts.
8. Ensure state control and management of species not listed as threatened or endangered.

Policies:

- Enact policies regarding the recovery of federally threatened and endangered species based on the best available, site-specific, biological, and social scientific knowledge and information.
- Manage species in need of conservation based on the best available, site-specific, biological, and social scientific knowledge and information.
- Recognize the State of Utah, its resource agencies, and local governments as partners with federal agencies in the recovery of federally listed species.
- Develop Federal Recovery Plans in collaboration and consultation with citizens, federal, state, and local governments, and include specific and measurable goals for recovering threatened and endangered species.
- Base all actions taken under the ESA on the best scientific information available.
- Encourage and incentivize landowners, when possible, to enter into voluntary conservation agreements to conserve threatened, endangered and other species in need of conservation. Successful completion of conservation agreements can eliminate the need for listing the species and assist with down-listing or delisting species already on the ESA.
- Work with legislatures to identify potential funding sources for the recovery of species in need of conservation.

- Withhold support for species recovery outside of the species' historic range and habitat.
- Support mitigation banking programs as a way to offset impacts to threatened and endangered species, species at risk, and their habitats.
- Withhold support for actions to list any species as a threatened or endangered species under the ESA until verifiable scientific data have been available to the public that demonstrates the following:
    - the need for the designation;
    - that protections cannot be provided by other methods; and
    - that the area in question is truly unique compared to other area lands.
- Withhold support for the designation of ACECs until the relevant federal agency complies with the State Code referenced below.
- For the most accurate population estimates, the State and Federal government must include all threatened, endangered, or other species in need of conservation found on both private and public land in population estimates or counts.
- Species not listed as threatened or endangered under the protections of the Endangered Species Act be under the management authority of the State of Utah and be managed according to the Utah Wildlife Action Plan.

State Code

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(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

(6) the state's support for designation of an Area of Critical Environmental Concern (ACEC), as defined in 43 U.S.C. Sec. 1702, within federal land management plans will be withheld until:

a. it is clearly demonstrated that the proposed area satisfies all the definitional requirements of the Federal Land Policy and Management Act of 1976, 43 U.S.C. Sec. 1702(a);

b. it is clearly demonstrated that:

1. the area proposed for designation as an ACEC is limited in geographic size; and

2. the proposed management prescriptions are limited in scope to the minimum necessary to specifically protect and prevent irreparable damage to the relevant and important values identified, or limited in geographic size and management prescriptions to the minimum required to specifically protect human life or safety from natural hazards;

c. it is clearly demonstrated that the proposed area is limited only to areas that are already developed or used or to areas where no development is required;

d. it is clearly demonstrated that the proposed area contains relevant and important historic, cultural or scenic values, fish or wildlife resources, or natural processes which are unique or substantially significant on a regional basis, or contain natural hazards which significantly threaten human life or safety;

e. the federal agency has analyzed regional values, resources, processes, or hazards for irreparable damage and potential causes of the damage resulting from potential actions which are consistent with the multiple-use, sustained-yield principles, and the analysis describes the rationale for any special management attention required to protect, or prevent irreparable damage to, the values, resources, processes, or hazards;

f. it is clearly demonstrated that the proposed designation is consistent with the plans and policies of the state and of the county where the proposed designation is located as those plans and policies are developed according to Subsection (3);

g. it is clearly demonstrated that the proposed ACEC designation will not be applied redundantly over existing protections provided by other state and federal laws for federal lands or resources on federal lands, and that the federal statutory requirement for special management attention for a proposed ACEC will discuss and justify any management requirements needed in addition to those specified by the other state and federal laws;

h. the difference between special management attention required for an ACEC and normal multiple-use management has been identified and justified, and any determination of irreparable damage has been analyzed and justified for short-term and long-term horizons;

i. it is clearly demonstrated that the proposed designation:

1. is not a substitute for a wilderness suitability recommendation;

2. is not a substitute for managing areas inventoried for wilderness characteristics after 1993 under the Bureau of Land Management interim management plan for valid wilderness study areas; and

3. it is not an excuse or justification to apply de facto wilderness management standards; and

j. the conclusions of all studies are submitted to the state, as a cooperating agency, for review, and the results, in support of or in opposition to, are included in all planning documents;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

References:

1. https://ecos.fws.gov/ecp/report/species-listings-by-state?stateAbbrev=UT&stateName=Utah&statusCategory=Listed
2. https://www.fws.gov/laws/endangered-species-act/section-9
3. https://www.fws.gov/laws/endangered-species-act/section-9
4. https://www.fws.gov/laws/endangered-species-act/section-9
5. https://www.fws.gov/laws/endangered-species-act/section-9
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7. https://www.fws.gov/laws/endangered-species-act/section-9
8. *U.S. Fish and Wildlife Service 1990*
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10. https://www.fws.gov/library/collections/endangered-and-threatened-species-expenditures-reports#:~:text=The%20Endangered%20Species%20Act%20

UTILITY CORRIDORS

Introduction

Utility corridors are linear tracts of land set aside for the placement of above and below-ground infrastructure that transports and conveys raw materials, processed materials, and energy. Utility corridors include the areas necessary for the maintenance and access of utilities infrastructure. Common infrastructure found in utility corridors includes electrical transmission lines, petroleum pipelines, natural gas pipelines, water pipelines, wastewater, transportation infrastructure, and telecommunications conduit. A utility corridor (also known as a "right-of-way" or "easement") may be located on private, state, and federal public lands. The width of a utility corridor depends on the type of utilities within the corridor and the maintenance requirements of its infrastructure. For example, a utility corridor for a small water pipeline may be just 20 feet wide, while a corridor with co-located high-voltage transmission lines and high-pressure natural gas pipelines may be hundreds of feet wide.

When utility corridors are constructed on federal land in Utah, it's most often on land administered by the US Bureau of Land Management (BLM) or US Forest Service (USFS), because these agencies administer large land tracts and are governed by the most-accommodating land-use regulations. However, utility corridors sometimes must cross federal land, which are governed by more-restrictive regulations. This may include land administered by the National Park Service, US Fish and Wildlife Service (USFWS), US Department of Defense, US Department of Energy, or Bureau of Reclamation (BOR).

Constructing utility corridors on federal land requires compliance with a number of federal laws and regulations, which vary depending on which agency administers the land in question. Laws and regulations also apply when locating utility corridors on state and private lands, but these are typically less complex than those that apply to federal lands, and they are not discussed here.
There are also regulations associated with siting utility corridors across tribal lands that will need to be adhered to when crossing tribal lands in consultation with the tribal governments.

Legal context

The primary federal laws regulating utility corridor placement on BLM and USFS lands are the Federal Land Policy and Management Act of 1976 (FLPMA) for BLM and National Forest Management Act of 1976 (NFMA) for the USFS. Both FLPMA and NFMA require the federal agencies to complete resource management plans that list and describe future goals and objectives for managing lands within their jurisdictions. These documents include any proposed locations for utility corridors.

Federal agency decisions regarding utility corridors must comply with the National Environmental Policy Act of 1969 (NEPA), which stipulates that all projects with the potential to impact the environment must be evaluated via an environmental assessment, environmental impact statement, and other documentation. Regulatory laws that require avoidance, minimization, and possibly mitigation include but are not limited to:

- The Antiquities Protection Act of 1993, which protects significant cultural resources, historic properties, and paleontological resources from negative impacts.
- The Clean Water Act of 1972, which, among other requirements, regulates the discharge of pollutants and fill material into certain jurisdictional waters (also known as "waters of the United States").
- The Endangered Species Act, which is administered by USFWS, regulates potential project impacts to threatened and endangered species.

Section 368 of the Energy Policy Act of 2005 directs federal agencies to designate energy corridors on federal lands in the western United States. This set of regulations was enacted with the goal to "improve reliability, relieve congestion, and enhance the capability of the national grid to deliver electricity" (BLM ND). In compliance with this directive, both the BLM and USFS in Utah have identified utility corridor locations and amended their resource management plans to accommodate the placement and construction of the designated corridors. The original section 368 corridors were published in 2009; however, in 2022, a final report was issued to address concerns challenged by environmental organizations. The proposed changes in this report were minimal in Utah.

Findings

Corridors for utility infrastructure are commonplace in Utah, crossing private, state, tribal, and federal lands. On BLM lands, existing utility corridors are usually identified in land-use plans for each BLM field office. The plans that are pertinent to Utah can be found on the BLM's planning website, which can be accessed here. For Forest Service lands, existing utility corridors are identified in the forest plan of each individual national forest. For lands owned by state entities, such as Utah School and Institutional Trust Lands Administration (SITLA), Utah Division of Wildlife Resources, or private landowners, utility corridors are typically identified as easements on land-title documents. This information can be found at individual county recorder's offices.

To establish new utility corridors on state lands, such as those owned by SITLA, the office may issue easements for up to 30-year terms, which can be acquired through the application process outlined here. Utility corridors on tribal lands require compliance with rules administered by the Bureau of Indian Affairs. Utility corridors on private lands require negotiation with individual landowners to establish specific conditions, recordable easement deeds and financial compensation.

In addition to crossing federal lands, proposed utility corridors (regional or transmission) can encounter potentially unexpected federal jurisdictions that require review and compliance with federal environmental laws and regulations. These should be identified early in the corridor planning process to prevent project delays. These may include:

US Bureau of Reclamation water delivery infrastructure. In addition to lands surrounding reservoirs, the USBOR owns over 8,000 miles of canals and aqueducts in the western US with around 1,000 miles occurring within urbanized areas. Use or occupancy of reclamation land, facilities, or waterbodies requires authorization under federal regulations specified in 43 CFR 429.

- Section 408 Civil Works Projects. The U.S. Army Corps of Engineers (USACE) retains authority to review and approve 408 Permissions for crossings of certain flood control and other projects. USACE maintains a map of levee projects with information about whether they were federally funded or not, and a list of local government partners that can be contacted to determine permitting needs. In Utah this includes Salt Lake County, Sevier County, Beaver County, and Davis County.
- State Wildlife Management Areas were acquired with federal funds. Utility easements through state lands that were acquired with funds from the federal Wildlife and Sport Fish Restoration Program require review and approval from the USFWS Regional Director. The approval decision may require a NEPA process. The Utah Division of Wildlife Resources should be contacted to determine requirements for a specific location.
- Non-project use of lands licensed for a hydropower project by the Federal Energy Regulatory Commission (FERC). Lands associated with hydroelectric dams and facilities may be operated under a FERC license. A third-party request for easement or right-of-way on these lands may require the licensee to apply for a license amendment from FERC. Approval of the amendment

may in turn require compliance with federal environmental laws and regulations (FERC 2015). The licensee of a particular facility should be contacted to determine requirements.

Establishing a new utility corridor on or through federal land for electrical transmission, pipelines, and other utility infrastructure is a major undertaking that may require years to complete. The design, analysis, public involvement, and documentation required by federal regulations are very complicated. Consider also that regulations and compliance can vary between jurisdictions, regions, and even within agencies. Navigating these processes and protocols can be extremely challenging.

Recognizing the complex nature of placing utility corridors on public lands, and in light of the growing need for energy grid improvements, Congress passed the Energy Policy Act of 2005. Section 368 of the act directs federal agencies to: (1) designate energy corridors on federal lands in 11 western states; (2) establish procedures to ensure that additional corridors are identified and designated as necessary; and (3) expedite applications to construct or modify oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. These corridors are referred to in this document as "Section 368" energy corridors.

Section 368 energy corridors may facilitate some utility transmission needs in Utah, however, there are other considerations for utility corridor planning. Even though an environmental impact statement was completed for the Section 368 energy corridor designation, standard NEPA analysis procedures must occur again before any utility infrastructure is permitted for construction. The new round of analyses will use specific information about structure types, placement, and disturbance limits to determine potential impacts from the proposed project.

Section 368 energy corridors are only identified on federal lands, typically those under jurisdiction of the USFS or the BLM. In some cases, the Section 368 energy corridors may overlap with corridors identified in local RMP and Forest Plans. Siting utility infrastructure within locally designated corridors is less complicated because the corridors have already been defined as a permitted use and will not require a rewrite or modification of existing RMP or Forest Plan as would otherwise be required.
Some portions of Section 368 corridors have potential conflicts with existing land use designations, Wilderness Study Areas for example, or critical wildlife habitat. These areas are designated as Corridor of Concern. Other concerns for Section 368 energy corridors include the challenges of siting transmission infrastructure on private and state land inholdings embedded along designated Section 368 energy corridors, as well as where corridors cross out of federal lands (Fisher 2021). Furthermore, designated Section 368 energy corridors traverse only a portion of Utah, leaving the majority of the state too far from the corridors to be useful, especially for smaller transmission and distribution systems.

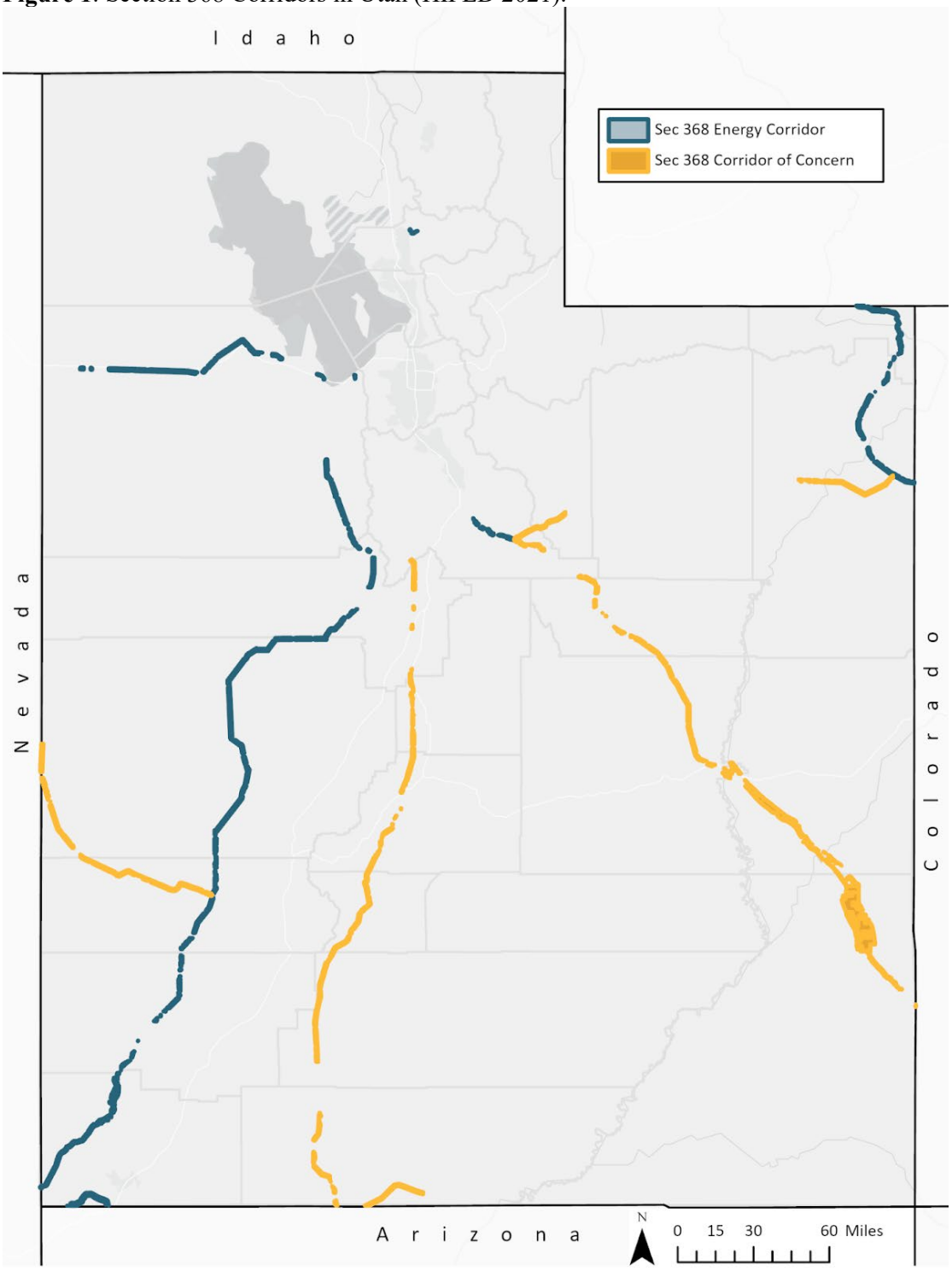
Table 1: Section 368 Energy Corridors by designated use, local designation, concern, and length.

Corridor Name	Designated Use	Local Designation	Corridor of Concern	Total Miles
44-239	Multimodal, default 3500' width	No	No	48.3
66-209	Electric only, default 3500' width	Yes	No	5.7
66-212	Multimodal, default 3500' width	No	Yes	62.7

66-212	Multimodal variable width	No	Yes	42.5
66-259	Multimodal variable width	No	Yes	18.1
68-116	Multimodal, default 3500' width	No	Yes	20.2
110-114	Multimodal, default 3500' width	No	Yes	68.2
113-114	Multimodal, default 3500' width	Yes	No	59.6
113-114	Multimodal variable width	Yes	No	14.5
113-116	Multimodal 5280' width	Yes	No	13.2
114-241	Multimodal, 2000' (3500' for Alt 2)	Yes	No	12.6
114-241	Multimodal, default 3500' width	No	No	120.9
116-206	Multimodal, 2000' (3500' for Alt 2)	Yes	Yes	8.6
116-206	Multimodal, default 3500' width	No	Yes	98.5
126-133	Multimodal, default 3500' width	No	No	4.7
126-218	Multimodal, default 3500' width	No	No	45.9
126-258	Multimodal, default 3500' width	No	Yes	24.5
256-257	Multimodal variable width	Yes	No	2.7
Grand Total				**671.4**

Source: U.S. Department of Interior, Bureau of Land Management, West-Wide Energy Corridor Information Center (BLM, 2009).

Figure 1: Section 368 Corridors in Utah (HIFLD 2021).



Utah's utility corridors and their capacity to accommodate existing and future utility needs was identified as a concern by Utah's Public Lands Policy Coordination Office. The issue of electrical transmission was examined in the 2021 Utah Transmission Study, which concluded that (under scenarios of high renewable energy buildout in southern Utah) transmission needs might exceed transmission capacity (Energy Strategies 2021). However, the study did not address the specific placement of new infrastructure or

whether Section 368 energy corridors would be used. Another study by the National Renewable Energy Laboratory (NREL) looked at proposed pipeline construction within Section 368 energy corridors and found that new pipeline construction in Utah is unlikely (O'Neill et al. 2018). Additionally, the only major natural gas transmission pipelines planned for construction in Utah are a 24-mile pipeline from Central Gate Station (on the Kern River pipeline) to St. George and to the Intermountain Power Plant (which will not utilize Section 368 energy corridors) (Dominion Energy 2020), and a new lateral connection from the Kern River Pipeline near Holden, Utah, to the Intermountain Power Plant near Delta (Kern River 2020).

According to a regional transmission capacity study completed by the NREL, electrical transmission projects under development will largely meet projected future transmission demands according to their most-likely future demand scenario. However, under some scenarios, future need for new electricity transmission in Utah might exceed the capacity of Section 368 energy corridors, especially when considering the future demand for renewable energy development and transmission (O'Neill et al. 2018). Furthermore, when considering co-location within corridors, the issues of siting electric transmission and pipeline projects within the same corridor can require significant separation distances, which may lead to congested corridors with only a few projects. For example, according to NREL, "The location of steel pipelines in the vicinity of AC transmission facilities results in mutual electrical interference problems that can produce damaging effects on both facilities and potentially the public," (BLM ND).

Economic Considerations

Power generation in the western United States is transitioning from carbon-based fossil fuels to renewable energy. And while power plants in Utah still use coal and natural gas to supply a significant portion of energy generation, the amount of wind and solar power generated is increasing every year. Additionally, policies to increase the component of renewable energy coming from the federal, state, and local governments as well as consumer demands, are likely to increase the demand of renewable energy over the coming decade.

Utah has abundant potential for renewable energy generation, as identified in the Utah Renewable Energy Zone study. However, these resources are not always near existing transmission infrastructure. As power generators move to develop these renewable resources, there is a need to simultaneously develop the transmission infrastructure needed to convey power to the electric grid. PacifiCorp has plans to invest over $1 billion to build additional transmission lines to strengthen the high-capacity transmission backbone across their service area (Cox 2021). However, additional corridors for lower-voltage transmission will still be needed to connect local renewable projects to the primary electric grid.
Primary economic consideration for utility corridors is the lengthy time periods and high costs required to navigate the federal permitting and compliance processes to place utilities on federal lands. The recent experience of PacifiCorps' development of the Gateway South transmission project (which crossed federal lands both within and outside of Section 368 energy corridors) took over 10 years to complete (Cox 2021). Such long time periods reduce the ability of utility companies to respond to rapidly changing energy policies, such as carbon reduction goals and development of Utah's renewable energy.
The challenging nature of placing utilities across federal lands has economic implications for Utah and local governments. For communities that have only one supply line for utilities (e.g., electricity, natural gas, fiber optic), increasing the capacity within an existing utility corridor to provide for growing communities is problematic. Also, attempts to provide redundant utilities to increase robustness and reliability of a given service can be hampered by the lack of multiple utility corridors to connect infrastructure.

Goals, Objectives, and Policies

Goal:

Proactively plan, coordinate, and provide for the maintenance of existing corridors and future development of new utility corridors across federal and state lands to meet projected state growth and demand.

Objectives:

1. Meet often with utility companies, cooperatives, the Utah Division of Public Utilities and other applicable state and federal agencies to coordinate efforts related to existing and future utility corridors.
2. Protect access for utility companies to maintain and improve infrastructure and corridors.
    - Including the removal of vegetation within and around infrastructure and corridors.
3. Expedite federal approval processes and policies for the maintenance of utility corridors and new construction projects.
4. Support Bureau of Land Management instruction memorandums (e.g. Utah IM-2021-004) that allows utility companies to have additional flexibility to access infrastructure and utility corridors for maintenance purposes and to reduce the risk of wildfire impacts on the utility.
5. Maintain and update wildland fire protection plans to reduce the risk of wildfire in utility corridors.
6. Avoid, minimize, and mitigate challenges that utility corridors may present to cultural resources and threatened, endangered, and sensitive species.
7. Provide redundancy and physical separation for utility facilities needed to serve all populated areas of Utah.
8. Work with federal and state agencies and tribes to identify utility corridors needed to access and deliver to foreign or domestic markets, all forms of traditional mineral resources, critical minerals, and renewable energy resources.
9. Coordinate various needs and demands with respect to the limited disturbance caps in Greater sage grouse management areas.
10. Work with federal agencies to identify opportunities to increase disturbance caps and seek out additional mitigation opportunities related to threatened, endangered, and sensitive species by providing proactive management and habitat improvements.
11. Continue participating in the Section 368 (Westwide) corridor planning process and development.
12. Ensure that sufficient utility corridors are available to provide essential utilities to rural areas of the state including areas with current or future federal designations (e.g. national monuments and roadless areas).
13. Promote feasibility studies for different types of utility transmission, distribution, and collection infrastructure.
14. Support innovation to make existing and future utility corridor infrastructure more efficient, reliable, safe, climate resilient, and sustainable.
15. Support a network of utility corridors for the distribution of crude and refined petroleum products to foreign and domestic markets.
16. Support the development of rail systems where gaps in service exist.
17. Provide access to fiber optic resources in rural Utah and Tribal communities, or equivalent (e.g. StarLink)
18. Ensure that needed water resources are capable of being delivered through existing and future utility corridors in order to meet the needs of the state's citizens.

19. Preserve the ability to provide a supply of hydrogen to highway arteries; potentially via natural gas pipelines.
20. Explore opportunities for distribution and production of commercial products like ice and dry ice from CO2.

Policies:

- The State of Utah is an "any-of-the-above" energy state and utility corridors must be preserved and developed to transport the complete range of energy resources.
- The State supports the Office of Energy Development's recommendations provided in the Utah Transmission Study, Utah Energy Innovation Plan, and other reports.
- The State supports expedited corridor planning and approvals to address critical infrastructure needs (refer to Executive Order 13807, Section 5(g)).
- Support development of utility corridors to accommodate pipelines from the natural gas and crude oil producing areas to refineries, export facilities or to other transportation networks.
- Federal agencies shall recognize and aid utilities in implementing wildland fire protection plans required of qualified utilities under Title 54-24-201 of the Utah Code.
- Interstate transmission lines should provide access for utilization of energy by citizens of the state of Utah, or supply significant and continual incentives that benefit the citizens of the state.
- Utility corridors are needed in the state of Utah to maintain affordable, reliable, abundant, and dispatchable energy at all times.
- The State will support minimizing impacts to prime and unique soils and irrigable acres to the maximum extent possible when new utility corridors are being considered.
- The State discourages natural gas vent lines (e.g. pig lines) in close proximity to electrical transmission and distribution lines, or other non-compatible operations.
- Every effort should be made to ensure that wildland fires are not caused by utility providers.
- Support the development and maintenance of effective rail system corridors to support efficient commercial material and energy distribution to markets and diversify economies.
- The State supports federal appropriations for methane capture while maintaining safety protocols.
- The State seeks to maintain itself as a net energy exporter by protecting utility corridors, distribution networks and access to domestic and international markets.
    - Including the movement of products by rail, pipeline, and other infrastructure.
- The State recognizes the economic and educational importance of internet access.
- The State recognizes that utility infrastructure within established corridors and along major highways is congested and new areas need to be analyzed and established as corridors to facilitate future growth and demand.
- The State will support utility companies in being able to maintain vegetation near and around utility corridors to mitigate risks that could potentially cause wildland fires.
- Oppose special designations on federal land that would prohibit the establishment of new utility corridors.
- Support and promote the planning, construction, and maintenance of new transmission lines to support new renewable energy generated by nuclear and geothermal power plants.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Utah Energy Act § 79-6-301. *State energy policy.*
Public Utilities - Title 54

Railroads - Title 56

Transportation - Title 72

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

References:

[BLM] Bureau of Land Management. ND. West-Wide Energy Corridor Guidebook. HDR, National Renewable Energy Laboratory. 64pg.

[BLM] U.S. Department of Interior Bureau of Land Management. 2009. West Wide Energy Corridor Information Center, Energy Corridor maps and Geospatial Data, Energy Corridor Geospatial Data Download. GIS data, downloaded 02/26/2022. https://corridoreis.anl.gov/maps/.

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[FERC] Federal Energy Regulatory Commission, Division of Hydropower Administration and Compliance. 2015. Compliance Handbook.

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O'Neill, Barbara, D. Gagne, J. Cook, & T. Greco. 2018. Energy Futures Synthesis for West-Wide Section 368 Energy Corridor. US Department of Energy Office of Energy Efficiency & Renewable Energy, National Renewable Energy Laboratory. Golden, Colorado. Technical Report NREL/TP-5D00-71464, 25pg.

WATER RIGHTS

Introduction

Water is both an opportunity in Utah and a limitation, and it must be managed intelligently. Utah's Water Rights Law, Title 73 states water is the "property of the public" and rights are granted to put it to "beneficial use" [1]. The code emphasizes "beneficial use is the basis, the measure and the limit to the use of water in this state" [2]. Utah water law is based on "prior appropriation." When several people use water from the same source, "the one first in time is first in rights" [3].

The Utah Division of Water Rights (UDWRi) administers Utah's water right laws. This includes appropriation, distribution, and adjudication of surface and groundwater [4 (a) (b) (c)]. In addition, dam safety, stream alterations, and well drilling are regulated by UDWRi [5(a) (b)]. An extensive website allows access to all water rights, dam, stream alteration, and well databases with full GIS mapping and graphical search capabilities. The website is structured to reflect the office organization and is an excellent resource.

The Utah state engineer directs the UDWRi. The state engineer is appointed by the governor with consent of the state senate and serves a 4-year term [7]. Utah state code states, "The state engineer shall be responsible for the general administrative supervision of the waters of the state and the measurement, appropriation, apportionment and distribution of those waters" [8].

Findings

All waters of the state are owned exclusively by the State of Utah in trust for its citizens. These waters are subject to appropriation for beneficial use and are essential to the future prosperity of Utah and the quality of life within the state. As set forth in Section 73-1-3, this beneficial use shall be the basis, the measure, and the limit of all rights to the use of water in the state. A "water right" is a right to divert water from its natural source to use it beneficially. The defining elements of a typical water right will include a:

- defined nature and extent of beneficial use,
- priority date,
- defined quantity of water allowed for diversion,
- specified point of diversion and source of water, and
- specified place of beneficial use.

Responsibilities and Functions

The UDWRi administrative responsibilities are divided into categories as follows:

Water Right Applications and Records

The state engineer approves all applications to use water in the state and maintains a comprehensive set of water right records, assembled from the state engineer's application-approval responsibility.

Distribution

Water is distributed to water users by priority. The state engineer has authority to require that the amount of water diverted is measured. Where many users are competing for water from the same source, the state engineer appoints a water commissioner to oversee the day-to-day distribution of water.

Adjudication

The courts have jurisdiction to adjudicate ownership and validity of water rights. The state engineer assists in this effort through investigations that compile proposed determinations of water rights for decree by district courts (Utah Code §73-4-1).

Well Drilling

The UDWRi regulates water-well construction by licensing, registering, and overseeing construction activities of water-well drillers and drill-rig operators. This also includes jurisdiction and authority for geothermal resources (Utah Code § 73-22-1).

Enforcement

The UDWRi investigates and prosecutes violations of water right statutes with orders, fines, and litigation, if necessary.

Dam Safety

The UDWRi approves construction and inspects public and private dams. Inspections are based on a dam's hazard rating for loss of life and property.

Stream Channel Alterations

The UDWRi administers alterations to natural streams under terms of the Utah code in conjunction with a general regional permit from the U.S. Army Corps of Engineers.

Water Resource Studies

Water resources conducts quality/quantity studies of various river basins and hydrologic areas of the state in conjunction with the Utah Geological Survey, the U.S. Geological Service, Utah State University, and others.

Compacts and Agreements

Groundwater Management Plans are created for areas throughout Utah to promote wise use of the groundwater, protect existing water rights, and address water -quality issues and over-appropriation of groundwater. The creation, requirements, management, purpose, and effects of these plans are explained in Section 73-5-15 of the Utah State code.

The UDWRi is the regulatory agency that oversees groundwater recharge and recovery projects in Utah. These projects are sometimes referred to as aquifer storage and recovery (ASR). Section 73-3b of the Utah State code, the Groundwater Recharge and Recovery Act, details the application, monitoring, and reporting processes required to operate a recharge and recovery project.

Administrative Rules

Groundwater Management Plans

UDWRi Objectives

The Mission of UDWRi is to provide order and certainty in the beneficial use of Utah's water. The objective of UDWRi is to provide opportunities for waters of the state to be used beneficially in an orderly way. The Utah State Engineer maintains records of water rights, accepts and approves applications for new water uses, and supervises the allocation of the existing water supply to the water - right holders respective to each water- right priority. In most populated areas of the state, the water resources are fully allocated. New uses in these areas are accommodated by changing rights to existing uses to serve the new uses. The UDWRi has the authoritative role to administer the process of water transfers from current to future proposed uses. The State Engineer's objective in this process is to guarantee that hydrologic systems maintain balance and that existing water rights are not impaired by new uses.

Economic Considerations

In July 2017, at the request of the governor of Utah, a Water Strategy Advisory Team proposed a recommended State Water Strategy. The Water Strategy states "Utah faces a daunting challenge. We have the distinction of being both one of the driest states in the nation and one of the fastest growing. At the convergence of those two realities is the challenge of providing water for a population that is projected to nearly double by 2060 while maintaining strong farms and industries and healthy rivers, lakes, wetlands, and aquifers. This challenge is magnified by climate projections from the State Climatologist that show a significant decrease in Utah's snowpack, which presently provides more annual water storage capacity than all of Utah's human-made reservoirs combined" [9]. A healthy economy is dependent on an available supply of water to meet future demands.

Goals, Objectives, and Policies

Goal(s):

Ensure the protection and legal utilization of water rights in Utah.

Objectives and Policies:

- Develop and use Utah's entitlement to interstate rivers for the benefit of all citizens. All water rights desired by the federal government must be obtained through the state water appropriation system.
- Recognize Utah's water laws of prior appropriation doctrine and beneficial use as the legal basis for perfecting all water rights for the use of all water within the state.
- Support timely and appropriate negotiated settlement of federally reserved water right claims for both Native American trust lands and other existing federal reservations, and oppose any future designation of public lands that does not quantify any associated federally reserved water rights.
- Promote accurate water use measurement, tracking, enforcement, and reporting.
- Oppose federal agencies conditioning any permit, lease, or other land-use agreement on the permanent transfer, relinquishment, or other impairment of any water right.
- Support voluntary projects that improve water quality and quantity, and those that increase the dependability of the water supply.
- Ensure any recovery plan, habitat management plan, critical habitat designation, or any other plan proposing an "in-stream flow" requirement adequately considers local existing and anticipated future water uses, local custom and culture, and local economic and individual needs and follows Utah Code Ann. §73-3-30.
- Consider additional water-storage facilities in Utah that ensure present and future growth and protection of Utah Water Rights pursuant to the Colorado River Compact.
- Oppose projects that would transfer water from Utah to other states.

- Prioritize locally led efforts to monitor and improve water quality and (where feasible) complete them in conjunction with existing state and federal agencies with the same mandate.
- Use the Utah Constitution and Utah statutes as the legal basis for the acquisition of water rights and water use in the state, including the right to divert unappropriated waters.
- Protect privately held water rights from encroachment and/or coerced acquisition.
- Land-use improvements and practices that promote healthy drainages and watersheds should be implemented.

The State of Utah will consider the issuance of a water right after analysis of several factors, including the following:

- Availability of unappropriated water at the source.
- Proposed appropriation will not impair existing water rights.
- Proposed appropriation of water is physically and economically feasible at the location.
- Proposed appropriation is not monopolistic or based on speculation.
- Whether the proposed appropriation is in the public interest and promotes public welfare.
- Whether the proposed appropriation will adversely affect the natural stream environment or public recreation.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Water and Irrigation (Title 73)

References:

1. https://le.utah.gov/xcode/Title73/Chapter1/73-1-S15.html
2. https://le.utah.gov/xcode/Title73/Chapter1/73-1-S3.html
3. https://le.utah.gov/xcode/Title73/Chapter3/73-3-S1.html
4. *See Utah Code §73-3-1, §73-4, §73-5*
5. *See Utah Code §73-5a-201, §73-3*
6. https://www.waterrights.utah.gov/
7. https://le.utah.gov/xcode/Title73/Chapter2/73-2-S1.2.html
8. https://le.utah.gov/xcode/Title73/Chapter2/73-2-S1.html
9. https://envisionutah.org/utah-water-strategy-project

WATER QUALITY AND HYDROLOGY

Introduction

Water quality is a vitally important natural resource in Utah owing to the state's uneven distribution of precipitation and reliance on clean water for municipal, industrial, and agricultural uses. Utah's mountainous areas receive the majority of precipitation falling as rain and snow, while the populated areas in valley bottoms are relatively arid. Water quality is very good in Utah's mountainous areas, but tends to decline as it travels downstream because of impacts from a variety of inputs including municipal, industrial, agricultural, and natural sources.

The goal of water quality protection and improvement programs is to preserve the use of water for all of its designated uses, as defined in Utah Administrative Code R317-2-6. Designations include water use for domestic purposes (Class 1), recreational use and aesthetics (Class 2), use by aquatic wildlife (Class 3), agricultural use (Class 4), and a special designation for Great Salt Lake (Class 5). Given that most high-quality water has generally already been put to use, future demands will be met by ensuring that Utah's water is not degraded, which prevents its downstream.

The Utah Department of Environmental Quality, Division of Water Quality (DWQ) is responsible for ensuring that pollutants from anthropogenic sources do not impair the designated uses of Utah's waters. The DWQ's mission is "to protect, maintain and enhance the quality of Utah's surface and underground waters for appropriate designated uses; and protect the public health through eliminating and preventing water related health hazards which can occur as a result of improper disposal of human, animal or industrial wastes while giving reasonable consideration to the economic impact." This is accomplished through several programs administered by DWQ and its partner agencies, including permitting programs, enforcement activities, voluntary cleanup efforts, financial assistance programs, education and outreach activities, and scientific investigations as stipulated in the federal Clean Water Act and the Utah Water Quality Act [1].

Ultimately, it is the responsibility of individuals to ensure that water quality is protected. This includes those who work for governmental agencies and the elected officials who provide leadership in their communities. Highly visible actions, such as municipal and industrial discharges and construction projects, are closely regulated, while it is the smaller yet widespread and numerous actions that can have very significant effects on water quality. Therefore, promoting a culture of stewardship for Utah's streams and lakes is critical for sustaining one of Utah's most precious resources.

Findings

In 2022, Utah's Coordinated Action Plan for Water was released. Previous water-planning efforts have identified more than 200 unique recommendations to better secure Utah's water future [2]. The implementation of many of these recommendations will require changes to state water law, other legislative actions, or partnerships with non-state entities. The intent of Utah's Coordinated Action Plan for Water is to identify specific actions that Utah's executive branch can undertake immediately to help move some of these many recommendations forward.

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404

requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

The basic premise of the program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. In other words, when a permit is applied for to impact waters of the United States, the applicant must first show that steps have been taken to avoid impacts to wetlands, streams, and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

Proposed activities are regulated through a permit-review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers U.S. Environmental Protection Agency (EPA) website, which evaluates applications under a public-interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) guidelines, regulations set forth by the EPA. Some states have assumed this permitting authority and regulate these activities.

For most discharges that will have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or state basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met. For example, minor road activities, utility line backfill, and bedding are activities that can be considered for a general permit. States also have a role in Section 404 decisions, through state program general permits, EPA website, water quality certification, or program assumption.

Water Quality

The DWQ released a biennial report on the state of Utah's waters, and the results illustrate the challenges faced [3]. The report identifies new impairments in several waterbodies. Twenty percent of the assessed freshwater lake acreage failed to meet water-quality standards for their designated uses, while 4 percent is meeting some designated uses. The high percentage of waters not fully assessed reflects the fact that the state's largest lake, Great Salt Lake, represents 74 percent of the lake acreage in the state and requires additional study to perform assessments. While 21 percent of Utah's stream miles assessed met water quality standards, 47 percent did not. Another 32 percent had insufficient data to make a determination and will require additional monitoring.

The DWQ compiles water quality data every 2 years in an integrated report (IR) to identify whether the water quality in Utah's lakes, rivers, and streams supports a particular waterbody's designated uses. These uses include drinking water, recreation, agriculture, waterfowl, fish, and other aquatic life. Data collected in the San Juan River, a Utah waterway impacted by the Gold King Mine spill, led the DWQ to list two segments of the river as impaired for metals. Improved assessment methods for harmful algal blooms (HABs), a nutrient-fueled increase in toxic cyanobacteria that can harm people and pets, resulted in the listing of Utah Lake as impaired for recreation uses due to HABs.

The IR does contain some bright spots, including new sources of data, tailored strategies for restoring and protecting water quality that move beyond a one-size-fits-all approach, and a draft methodology for analyzing high-frequency dissolved oxygen data, a critical component of aquatic health.

While it is likely that new water-quality concerns will be identified in the future as monitoring efforts expand and analyses improve, the State of Utah should also recognize its achievements in improving the

health of streams and lakes through responsible regulation and voluntary efforts. Rivers that were once used as open sewers and dumping grounds have been cleaned up and are now home to nature trails and boating activities. Reservoirs that had accumulated nutrients to the point that they turned bright green every summer are now supporting thriving fisheries. Water pollution incidents that once went unreported and unresolved with long lasting public health and ecological impacts are now promptly responded to and appropriately resolved. Although many challenges remain, the State of Utah has demonstrated that restoration efforts work and need to be expanded in light of increasing growth and development.

Hydrology [4]

Winter snowpack accounts for the majority of Utah's water supply. For example, 85 percent of the annual runoff from the Colorado River basin originates as snowmelt. Throughout Utah, much of the annual streamflow is directly attributable to springtime melting of snow accumulation from the previous winter; however, there are also lower-elevation areas that experience snowmelt throughout the winter and spring. Winter snowpack generally peaks in March through April in alpine areas. During the early spring, gradual melt rates result in annual hydrographs having rising limbs of characteristically low slope. As the temperatures rise, the slope of the hydrograph rapidly rises with the majority of runoff experienced between May and July (depending on elevation and latitude). This runoff is captured and stored for late-season use in reservoirs and is also the primary source of recharge to aquifers as it flows from the mountain ranges into the valleys.

Primary Sources of Precipitation

There are three primary sources of precipitation in Utah. The major source is the Pacific Ocean. During fall and winter months, orographic lifting and cooling of Pacific air masses laden with moisture results in precipitation either as rain or snow. Winter precipitation generally falls as snow in higher elevations. In the spring and early summer, moisture from the Gulf of Mexico and subtropical Atlantic Ocean becomes important. Most of the summertime moisture is provided by subtropical or monsoonal air masses arriving from the Gulf of Mexico.

Frontal activity associated with low-pressure systems is responsible for much of the winter precipitation in the northern Rocky Mountains. Summer precipitation, much of which ends up as evapotranspiration in the semiarid parts of the state, is mostly influenced by convective activity. The distance of the northern Rocky Mountain region from the coasts typically results in cold, dry snowpack. Significant energy is required to raise the temperature of the snowpack to the isothermal and melting stage; as a result, the snowpack tends to remain well into spring. Rainfall generally does not contribute sufficient energy to drive snowmelt, until perhaps very late in the season.

High elevations in the central Rocky Mountains receive most of this region's annual precipitation as winter snowfall. Pacific frontal systems bringing most of the winter moisture to this region can arrive from the west, northwest, or southwest, and this influences the distribution of precipitation. Westerly tracks are orographically lifted to some extent by the Wasatch Plateau in Utah and are lifted further by the ranges along the Continental Divide in central Colorado, resulting in the heaviest precipitation west of the Continental Divide. Northwesterly tracks are lifted by the Wasatch Range, the Uinta Mountains in Utah, and by the ranges along the Continental Divide in north-central Colorado, resulting in heavier precipitation at these locations. The lower-elevation areas of the central Rockies receive considerably less precipitation; most of the region's snowpack storage is concentrated in the higher mountains.

Measurement and Estimation of Snowpack, Streamflow, Groundwater, and Reservoir Capacity

Water-resource managers forecast the amount of seasonal runoff based in part on estimates of the amount of snow accumulation, or snow water equivalent (SWE), across a watershed or region and in part on forecasts of future precipitation. Estimates of SWE and snow-covered area (SCA) are used for a variety of purposes that are vital to the economy of a region, including: reservoir management, snow load maps, annual precipitation maps (for planning), drought monitoring, fish and game management, recreation (e.g., skiing, river trips), and avalanche forecasting.

Historically, the Natural Resource Conservation Service (NRCS) has been charged with coordinating snow surveys or point measurements of SWE. It also prepares seasonal water supply outlooks in the western United States and Utah. Predictions of water availability in Utah are made by inventorying snowpacks in winter and early spring using measurements at dozens of snow courses, including many snowpack telemetry (SNOTEL) sites, which provide continuous data. The remaining sites are manual and are visited monthly. Empirical relationships between these observations and measured streamflow are used to forecast streamflow throughout the West. [5]

Streamflow measurements are gathered primarily by the U.S. Geological Survey (USGS), which maintains a vast network of stream gauges throughout the West and in Utah. The USGS also regularly monitors groundwater throughout the state through a network of monitoring wells. [6]

Reservoir capacity is measured by a variety of agencies, with the most comprehensive list of measurements gathered monthly by NRCS. [7]

Climate Variability

Future climate variability and change are expected to result in major changes in the partitioning of snow and rainfall and the timing of snowmelt, which will have important implications for water use and resource management in Utah. It is therefore important to understand the processes controlling snowmelt runoff for both water resources as well as other resource management purposes.

Economic Considerations

A healthy environment is essential for continued growth and prosperity in Utah. But increased growth means increased amounts of pollution unless common pollution controls are put into place, and these entail additional costs. Balancing the cost of pollution controls versus the benefits to human health and the environment is an important consideration in any action undertaken by the DWQ and the governor-appointed Utah Water Quality Board, which establishes water pollution-control rules. As federal grant funds are generally no longer readily available to help construct new and replace outdated pollution-control infrastructure, costs have shifted to the responsible entities. Therefore, it is imperative for DWQ to explain the need for pollution controls so that elected officials and their constituents are satisfied that expenditures for pollution controls are warranted.

A significant water-quality concern identified both within Utah and nationally is the phosphorus and nitrogen pollution that results from a variety of sources, including agricultural land uses, urban stormwater, municipal wastewater-treatment facilities, and air deposition. In 2010 these concerns led Utah, in tandem with many other states, to ban dishwashing detergents that contain high levels of phosphorus. This ban resulted in a noticeable decrease in effluent phosphorus concentrations from wastewater treatment facilities. Agricultural sources of nutrient pollution are also being addressed through the establishment of comprehensive nutrient-management plans, which provide the proper means of

storing and using fertilizers (including livestock manure) to ensure this valuable resource is put to good use—rather than washed downstream where it can cause public-health and environmental harm.

Discharge from wastewater treatment facilities remains one of the most significant sources of nutrient loading into Utah's surface waters, especially along the densely populated Wasatch Front. To begin addressing this issue, the DWQ proposed an adaptive-management approach that sets a technology-based limit of 1 mg/L of total phosphorus in wastewater effluent [8]. This moderate level of phosphorus reduction was established after extensive research on what the estimated costs to communities and individual rate payers would be to achieve this limit. A companion study was also completed, which demonstrated the restoration benefits of nutrient removal and the willingness of Utah citizens to pay for the benefit of improved water quality. [9]

The take-home message from all of these analyses is that Utahns place a high priority on maintaining water quality for future generations and are willing to pay upwards of $271 million a year to improve waters threatened by increasing levels of nutrients. In terms of economic benefit, the economic study estimated that Utah residents spend from $1.4 to $2.4 billion a year on trips to the state's waters for recreational activities, making a significant contribution to the state's economy. [10]

Goals, Objectives, and Policies

Goal(s):

Work to preserve and improve water quantity, water quality, and appropriate hydrological functions.

Objectives:

The objective of Utah's water-quality program is to protect and improve the quality of Utah's water resources for the benefit of all who live, work, and recreate here. Water quality is essential to sustain our health, our economy, and quality of life. Given the limited availability of water in many areas of the state, and the potential for degradation arising from its use, it is important that everyone appreciate their role in ensuring that this vital resource is available for current and future generations.

Water-quality standards published in Utah Administrative Code R317-2-7 set the maximum concentration of pollutants that still support a waterbody's designated uses [11]. Standards are the metric used by DWQ to assess whether streams and lakes are supporting their designated uses or are impaired. Waters are assessed every 2 years, and those that do not meet standards are listed as impaired and identified in the Integrated Report of Water Quality [12]. Impaired waters are required by Section 303(d) of the federal Clean Water Act to have a total maximum daily load (TMDL) analysis completed for the pollutant(s) of concern.

Utah prioritized its list of impaired waters for TMDL development to focus on water-quality concerns that are most important to Utah. The primary goal was to identify impaired waters that have the greatest potential to impact public health [13]. A common measurement used to determine the potential for water to cause sickness is *Escherichia coli (E. coli)*, because its presence in water can indicate fecal contamination. Eleven water bodies within the Jordan River watershed were identified with E. coli impairments and have been prioritized for TMDL development by 2022. Other priorities are waterbodies impaired by metals such as cadmium and arsenic. Such impairments are toxic to aquatic life, and impairments for low dissolved oxygen are characteristic of nutrient enrichment that can eventually result in toxic algae blooms in lakes and reservoirs.

In conjunction with its Watershed Protection Program, which guides the watershed planning and TMDL process, DWQ maintains a memorandum of understanding (MOU) that implemented the nonpoint source pollution water quality program. In addition to DWQ, signatories include the Utah Department of Agriculture and Food (UDAF), Utah Division of Forestry Fire and State Lands (FFSL), Utah Division of Wildlife Resources, U.S. Department of Agriculture, U.S. Forest Service Intermountain Region, U.S. Department of the Interior, U.S. Bureau of Land Management, and the National Park Service within Utah. The purpose of the MOU is to coordinate state and federal agency activities for nonpoint source water quality protection, monitoring, and improvement activities on state and federal lands.

In addition to identifying individual agency roles, responsibilities, and authorities, the Utah Nonpoint Source MOU commits to the following mutual agreements:

- Cooperate in the protection, restoration, enhancement and management of water resources in Utah to the extent of each agency's authority, expertise, and resources.
- Comply with the federal Water Pollution Control Act (Clean Water Act, Pub. L. No. 92-500, 86 Stat. 816 (1972)) Section 208, (33 U.S.C. § 1288) and with the nonpoint source control Sections (319 and others) of the Clean Water Act, (33 U.S.C. § 1329), and applicable executive orders.
- Implement the Standards of Quality for Waters of the State, Utah Admin. Code R. 317-2, on federal lands.
- Implement the Utah Nonpoint Source Pollution Management Plan and conduct applicable activities and programs consistent therewith, and participate with DWQ in updating such plans or developing new addendums.
- Coordinate pollution-control and abatement programs particularly as they relate to implementation of TMDLs on impaired waterbodies.
- Develop cooperative and/or complementary water-quality monitoring systems for water quality assessments and determination of TMDLs, share technical expertise, and promote research on water-quality management practices.
- Coordinate water-quality monitoring activities and cooperate in the collection, analysis, and processing of water-quality samples when the efforts are mutually beneficial to federal land-management agencies and the State of Utah.
- Develop and implement best management practices (BMPs) for activities and uses of forest and rangelands with intent to meet state water quality standards.
- Annually review selected projects for BMP implementation and effectiveness. A review team will include representatives from the DWQ, UDAF, FFSL and relevant federal land-management agencies.
- Cooperate across administrative boundaries to maintain or improve water quality where possible. Cooperative efforts include sharing data and collaborating on project planning and implementation efforts.

The ultimate goal of Utah's water-quality program is to protect and improve water quality to the point that all designated uses are supported. The State of Utah has made significant strides in many areas, but many challenges still exist. One of the most significant of these challenges is to maintain current levels of water quality, particularly within the rapidly urbanizing Wasatch Front, and in the face of increasing pollution loads associated with development and population growth. Nevertheless, these challenges can be overcome by employing low-impact development principles to mitigate stormwater impacts associated with development and enhanced treatment technologies to offset increased quantities of wastewater.

Policies:

Utah's water-quality policy is defined by statute in the Utah Code Section 19-5-103, which establishes the makeup and responsibilities of the Utah Water Quality Board [14]. The board's membership is designed

to represent various interest groups of the water quality community and members' terms are staggered. Voting members are appointed by the governor of Utah with the consent of the state senate. The board comprises the following: representatives of the special-service districts, two government representatives who do not represent the federal government, one representative from the mineral industry, one representative from the manufacturing industry, one representative for agricultural and livestock interests, one representative from the public who represents an environmental nongovernmental organization or represents community interests and not industry, and one representative trained and experienced in public health. The ninth member of the Water Quality Board is the executive director, or a department employee designated by the director, who is a non-voting member except in order to break tie votes among voting members.

The DWQ is the administrative arm of the board. Rules governing how it administers programs delegated by the U.S. Environmental Protection Agency (EPA) and responsibilities assigned by the Water Quality Board are identified in Utah Administrative Code, Title R317. These programs include the Utah Pollution Discharge Elimination System and Ground Water Protection program; which establishes the regulation of point-source discharges into surface- and groundwater (respectively); the State Revolving Fund program, which provides loans for wastewater collection and treatment systems; and certification programs for wastewater professionals.

Guidelines are also provided by the EPA for delegated programs that are negotiated and implemented through an annual performance partnership agreement with the Department of Environmental Quality. These negotiations provide Utah an opportunity to communicate the state's priorities and how they correspond with federal law, federal priorities and funding requirements. Regular communication and coordination between DWQ and EPA on expectations and performance of Utah's water-quality program is essential for maintaining the state's primacy in implementing these programs without undue oversight or interference at the federal level.

As Utah's population grows the demands on water quality also increase significantly. Utah's water-quality program must seek to meet those demands while reducing the burden on taxpayers through continuous improvement of practices and procedures. To foster the public's trust and collaboration in protecting and improving water quality the State of Utah must eliminate activities that don't advance the state's mission, and more effectively perform those activities that do by implementing innovations that advance quality, efficiency, and effectiveness.

Utah has a long history of taking the initiative and working cooperatively to address difficult problems that benefit its communities and state as a whole. The DWQ works diligently to ensure that all vested stakeholders have a seat at the table to cooperatively find pragmatic, collaborative, and fair solutions to modern environmental concerns. By ensuring everyone affected by an issue has a voice in the process the State of Utah will be more effective in achieving long lasting and meaningful results.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Wildlife Resources Code of Utah

Environmental Quality Code of Utah

Water Quality Act

§ 19-5-104. *Powers and duties of board.*

§ 19-5-105.5. *Agriculture water.*

§ 19-4-110. *Local jurisdiction over water supply systems.*

§ 19-4-112. *Limit on authority of department and board to control irrigation facilities--Precautions relating to non-potable water systems.*

§ 19-4-113. *Water source protection ordinance required.*

§ 19-5-107. *Discharge of pollutants unlawful--Discharge permit required.*

§ 19–5–114. *Spills or Discharges of Oil or Other Substance— Notice to Director.*

§ 19–5–116. *Limitation on Effluent Limitation Standards for Bod, SS, Coliforms, and PH for Domestic or Municipal Sewage.*

§ 19-5-117. *Purpose and construction of chapter.*

§ 19-5-119. *State permits not required where federal government has primary responsibility.*

Water and Irrigation

Utah Forest Practices Act

§ 65A-8a-105. Division to promote implementation of Forest Water Quality Guidelines

Conservation Commission Act

WETLANDS

Introduction

A wetland is land that is flooded or has a high water table during the growing season on a permanent or seasonal basis. Wetland hydrology is highly variable—wetlands may only be wet some years during all or part of the growing season, including spring flooding from snowmelt or late summer flooding from monsoonal rains. In general, wetlands are wet long enough to have distinct soils and vegetation and include habitats such as wet meadows, marshes, playas, fens, and willow thickets. Wetlands provide habitat for many plants and animals in Utah, perform important functions to help keep our water clean and lessen the impact of floods, and support recreational activities such as bird watching and waterfowl hunting. Because of their importance, wetlands are protected by federal regulations, and many agencies and individuals are interested in conserving and restoring wetlands in Utah.

State agencies in Utah have a large role in managing, protecting, and researching wetlands in the state. Wetlands in Utah are overseen by multiple entities. Wildlife agencies manage many ~~the majority~~ of publicly owned wetlands—federal refuges are run by the U.S. Fish and Wildlife Service (USFWS) and state waterfowl management areas are managed by the Utah Division of Wildlife Resources (DWR). The Utah Division of Forestry, Fire, and State Lands (FFSL) is also responsible for the majority of the wetlands on sovereign lands associated with Great Salt Lake and Utah Lake, and with riparian areas of larger rivers. Many state agencies also hold conservation easements to protect wetlands, usually in association with other goals of the agency, such as protecting habitat for ~~sensitive~~ wildlife in need of conservation attention or maintaining public access to recreational locations. The Utah Geological Survey (UGS) and the Division of Water Quality (UDWQ) have periodically obtained Wetland Program Development Grants from the Environmental Protection Agency (EPA) to conduct research projects to increase information about Utah's wetlands. ~~UDWQ's assessment work has focused on determining The Division of Water Quality (UDWQ) has conducted assessments at wetlands associated with Great Salt Lake to determine whether the wetlands associated with Great Salt Lake are meeting their beneficial use of habitat support for waterfowl and shorebirds. The UGS has focused more broadly on~~

~~The Utah Geological Survey (UGS) conducts wetland research and updates wetland mapping for the state. The UDWQ and UGS jointly developed the Wetland Program Plan, a document to guide state activities related to the federal Core Elements of a State or Tribal Wetland Program, which was developed by the Environmental Protection Agency (EPA). Wetland regulation is conducted at the federal level, with the U.S. Army Corps of Engineers (USACE) taking the lead on most regulations.~~

Wetland regulation is primarily conducted at the federal level, though some local governments in Utah have enacted ordinances to protect wetlands within their jurisdiction. Under the Clean Water Act, the Army Corps of Engineers (USACE) regulates wetlands that are considered Waters of the U.S. The state can play a role in federal wetland permitting in several ways, including providing input to federal agencies on expected impacts of larger permitting decisions and being involved in mitigation projects to compensate for impacted wetlands. UDWQ also issues Section 401 certifications to certify that federally issued permits comply with applicable state water quality regulations.

The wetlands section of UGS's website provides background information on wetlands in Utah, including their distribution in the state, importance to wildlife, the functions they provide, and how they are managed on private lands [1]. The website includes links to UGS reports on wetlands and to external resources, including educational activities and regulatory guidance. There are also links to two wetland applications, one with searchable data on wetland field assessment data [2] and the other that displays the most up-to-date spatial data showing the extent and type of wetlands in Utah [3].

Findings

Vegetated wetlands are rare in Utah, occupying less than 1 percent of the land surface. ~~occupy approximately 1 percent of the landscape in Utah.~~ The most well-known of these wetlands are those that fringe Great Salt Lake (GSL); these extensive marshes, mudflats, and meadows make up roughly 32% of the state's vegetated wetlands and provide crucial stop-over, wintering, and nesting habitat for millions of shorebirds and waterfowl. Wetlands throughout Utah are very important in providing critical habitat, unique recreation and aesthetic opportunities, and water sources in this arid state. Wetlands also protect downstream aquatic systems by removing excess nutrients and other pollutants. ~~This relatively uncommon resource occurs in all ecosystems, creating a number of distinct wetland types including marshes, fens, playas, and lake-fringe wetlands. Though wetlands constitute a minor component of the landscape, they provide diverse ecosystem services, including flood attenuation, water quality enhancement, sediment storage, and nutrient cycling, as well as providing critical habitat for wildlife and economic and aesthetic values for people.~~

Because so many of Utah's wetlands are located around GSL, recent legislation and research focused on bringing water to GSL include wetland considerations. The Great Salt Lake Advisory Council was established by HB 343 and is coordinated and assisted by representatives from the Departments of Environmental Quality and Natural Resources. The Council advises the Governor on the science and policy of GSL and approves spending royalty money for research on the lake's ecosystems. Additionally, the DWR GSL Ecosystem Program manages the avian and aquatic community of GSL, including gathering environmental data from the lake's ecosystems and conducting bird surveys. The Division of Forestry Fire and State Lands guides the GSL Technical Team, which guides data gathering and dissemination efforts. The GSL Water Quality Strategy developed by DWQ in 2014 highlights many administrative rule changes and data gaps needed to protect the water quality of GSL.

Wetland health in Utah has been studied by agencies including the UGS, UDWQ, EPA, and the Bureau of Land Management to better understand the current condition and common stressors impacting our wetlands. Common stressors identified in these studies include noxious weeds and other non-native plant species, overgrazing, altered hydrology, and landscape fragmentation. Fortunately, many wetland systems are fairly resilient and are still able to provide habitat or help protect water quality even when impacted by these stressors. However, these studies do not adequately capture information about the biggest threat to wetlands—wetland loss due to conversion to other land types. The U.S. Fish and Wildlife Service estimates that Utah lost 30% of its wetland area from the 1780s to the 1980s, but we do not have a good estimate for how much additional wetland area since then has been lost to development, water diversion or long-term drought.

The Utah Wildlife Action Plan (WAP) is a wildlife planning document compiled by the DWR and partners that identifies native species and key habitats in need of conservation attention, and pinpoints threats, limiting factors and crucial data gaps for species and their habitats. The plan provides strong, clear guidance for improving habitats and strengthening wildlife populations, and, if fully implemented, can help reduce and prevent listings under the federal Endangered Species Act. Projects that address threats to key habitats are prioritized for funding under the Watershed Restoration Initiative's prioritization process [4]. Wetland systems are listed as key habitats in the current version of the WAP, which goes through 2025, and will remain prominent in the next version, which is currently in development.

~~Five aquatic habitats are listed as key aquatic habitats in the plan, including aquatic-forested, aquatic-scrub-shrub, riverine, emergent, and open water.~~

Utah's wetlands are included in the definition of Waters of the State (UAC R317-1-1). All Waters of the State have a narrative water quality standard that applies to them, prohibiting degradation to aesthetics, the development of toxic conditions, and change to the biological community (UAC R317-2-7.2). Most wetlands in Utah are not assigned to any beneficial use category and do not have any numeric water quality criteria developed to evaluate whether they can meet their uses. UDWQ does not evaluate wetland water quality as part of their Integrated Report that assesses the quality of surface waters in the state and identifies waterbodies not meeting water quality standards.

~~While the definition found under R317 does not include mention of the word wetlands, the definition does include ponds, marshes, springs, and all other bodies of surface and underground water that are not confined to one individuals' property.~~

~~There is no standard definition of a wetland. The USFWS, the agency that manages the nationwide spatial data on wetlands, includes both unvegetated areas, such as playas and mudflats, and areas without true soils, such as aquatic beds, in its definition of wetlands. In contrast, the USACE, the primary regulatory agency for wetlands in Utah, classifies areas as wetlands only if they have evidence of three wetland indicators—hydrology, soils, and vegetation (though the USACE regulates many non-wetland aquatic features as well).~~

~~The State of Utah uses mainly wetland vegetation to define wetlands, stating in its water quality rules that wetlands are "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Utah's water quality rules also state that "'waters of the State' includes 'wetlands' as defined in the federal Clean Water Act."~~

Wetland program plans are voluntary plans that state agencies can develop to establish overall wetland program goals and identify a course of action to move towards meeting those goals during the timeline covered by the plan. The EPA reviews and approves the plans, and actions identified in the plans have a higher likelihood of receiving funding from Wetland Program Development Grants. The most recent plan for Utah is Utah's Wetland Program Plan—2018-2023, developed by UDWQ and UGS. The goal of this plan is to "increase the amount and availability of scientific data on Utah's wetlands by continuing to build and deploy scientifically-based tools to assess wetland health and to afford greater protection by determining wetland-specific beneficial uses and criteria to protect those uses." UGS will pursue funding to develop a new version of the plan to cover future years. The most recent approved wetland program plans can be found on the EPA's website.

Research conducted by UDWQ under Wetland Program Development Grants has focused on assessing wetlands around Great Salt Lake to determine whether the wetlands associated with Great Salt Lake are meeting their beneficial use of habitat support for waterfowl and shorebirds [5]. The UGS has conducted large watershed and ecoregion-based surveys to evaluate the health of wetlands more generally and also conducts wetland mapping projects to update wetland spatial data. Wetland mapping follows guidelines established by the U.S. Fish and Wildlife Service and final data products are submitted to the National Wetland Inventory (NWI). Other wetland studies conducted by the UGS include hydrologic monitoring of critical wetlands, remote sensing analysis to understand vegetation and hydrology trends over time, and development of plant identification resources.

Utah House Bill 118 (2022) directed the UGS to explore the potential for an In-Lieu Fee (ILF) mitigation program to improve wetland resources in Utah. An ILF program would allow entities seeking Clean Water Act permits to pay a fee to mitigate impacts to streams and wetlands rather than having to develop their own mitigation plans. The UGS delivered a final report to the legislature in May 2023, finding that

an ILF program would both benefit wetland and stream resources in Utah and streamline the permitting process for applicants. The UGS recommended that the state pursue funding to hire a program coordinator who could develop the program details and steer the program through the USACE approval process.

Only wetlands considered Waters of the U.S. (WOTUS) are regulated under the Clean Water Act. The WOTUS definition has been subject to court cases and varying rules developed under different federal administrations, dating back to at least the 1980s. In May 2023, the U.S. Supreme Court issued a decision in the case of Sackett vs. EPA that sets a new standard for which wetlands are considered WOTUS, narrowing the definition to include only wetlands that have a continuous surface connection with other waterbodies considered WOTUS where it is difficult to determine where the other waterbody ends and the wetland begins. Depending on how it is implemented by USACE, this ruling has the potential to greatly reduce the number of regulated wetlands in Utah (and the need for an ILF program). Some states are considering enacting or strengthening their own regulations regarding wetlands to protect important functions they value.

The Governor's Coordinated Water Action Plan was released in November 2022. "Wetlands, waters of the U.S., and permitting" is identified as one of the key policy issues in the Healthy Waters and Watersheds section of the plan due to the changing definition of WOTUS and the fact that existing regulations only protect wetlands from development, not from water loss. Action 4 of the Healthy Waters section is to "prioritize and target land conservation and restoration in riparian corridors, floodplains, and other areas with high values for watershed health, wildlife habitat, and public access and recreation." Key tasks under this action that could benefit wetlands include 1) purchasing conservation easements in areas with multiple benefits; 2) working with local governments to include riparian and watershed health in land use plans and ordinances; and 3) evaluating whether the state should start a wetland mitigation program. The Water Action Plan also talks about the need for more research to better understand critical thresholds in our aquatic systems.

~~The Utah Geological Survey (UGS) conducts wetland research and updates wetland mapping for the state. The UDWQ and UGS jointly developed the a document to guide state activities related to the federal Core Elements of a State or Tribal Wetland Program, which was developed by the Environmental Protection Agency (EPA).~~

~~The extensive marshes, mudflats, and meadows surrounding Great Salt Lake are the most well-known wetlands in Utah, as they make up roughly 32 percent of the state's vegetated wetlands and provide crucial stop-over, wintering, and nesting habitat for millions of shorebirds and waterfowl. Wetlands throughout Utah are very important in providing critical habitat, unique recreation and aesthetic opportunities, and water sources in this arid state. Wetlands also protect downstream aquatic systems by removing excess nutrients and other pollutants.~~

~~State agencies involved in Utah's wetland program are focused on developing an integrated approach that will improve wetland conservation, management, and protection efforts statewide. Both the UGS and UDWQ work to coordinate a comprehensive strategy for monitoring and managing wetlands consistent with state environmental and natural resource goals. Current efforts are focused on developing a portfolio of scientifically validated tools to describe the abundance, health, and function of wetlands, as well as updating Utah's water quality standards to effectively protect wetlands. These tools will be incorporated into wetland monitoring protocols with the ultimate goal of assessing the ambient condition of a random selection of the state's wetlands every year. Wetland condition information will be made available to state and federal agencies to improve understanding of baseline wetland conditions, develop benchmarks for wetlands restoration and mitigation, prioritize wetland restoration and protection activities, and inform the development of wetland-specific water quality standards.~~

There are four main components to Utah's Wetlands Program Plan:

1. Mapping and landscape planning: Developing data, tools, and methods that allow wetland data to be better incorporated into landscape-scale planning, including mapping to support planning and monitoring efforts.
2. Monitoring and assessment: Developing and deploying methods to evaluate the condition, function, and beneficial use attainment of Utah's wetlands.
3. Water-quality standards: Defining science-based beneficial uses for Utah's wetlands with appropriate criteria and assessment methods.
4. Outreach, coordination and data dissemination: Increasing wetland awareness and use of wetland data through improved data accessibility, better outreach material, and continued collaboration with interested stakeholders.

The Utah Wildlife Action Plan (WAP) is a planning document from the DWR that identifies sensitive species and pinpoints threats, limiting factors and crucial data gaps for species and their habitats. The plan provides strong, clear guidance for improving habitats and strengthening wildlife populations. It is a strategic tool that, if fully implemented, can help reduce and prevent listings under the federal Endangered Species Act. Five aquatic habitats are listed as key aquatic habitats in the plan, including aquatic-forested, aquatic-scrub-shrub, riverine, emergent, and open water. Projects that address threats to these key habitats are prioritized for funding under the Watershed Restoration Initiative's prioritization process.

The UDWQ and UGS have prepared the "Utah's Wetland Program Plan 2018–2023" to guide UGS and UDWQ's wetland program development activities through 2023, and serve as a tool for communication and collaboration with other state and federal agencies, and non-governmental groups involved in wetland research, conservation, and protection. This plan will be used by UGS and UDWQ to secure financial resources, gain stakeholder acceptance, and organize partnerships to complete a wide range of statewide program development tasks.

Wetland Mapping and Spatial Data

Knowing the location and extent of wetland resources is the first step to implementing appropriate conservation and management strategies. Today, spatial datasets are fundamental research tools, and though wetland spatial data are available now at the state scale in Utah, much of the data are dated and do not accurately represent existing wetland resources.

The UGS is taking the lead in updating wetland spatial data following the USFWS's National Wetland Inventory (NWI) mapping guidelines. The U.S. Bureau of Land Management has also funded new wetland mapping in large parts of the state. The most up-to-date spatial data can be found on the UGS wetlands mapper, and data can be downloaded from AGRC or the NWI webpage.

Wetland Monitoring and Assessment

The USFWS estimates that Utah lost 30 percent of its wetland area from the 1780s to the 1980s. Wetland loss results from a variety of activities, including water diversions, artificial drainage, and conversion of wetlands to agricultural or developed lands. Wetland loss can be further exacerbated by declining water levels in periods of prolonged drought. Remaining wetlands are frequently exposed to a number of stressors that can negatively impact them and their ability to provide the functions and values the state relies on.

~~With approximately 30 percent of its wetland acreage lost since the late 1700s, many wetlands in the state continue to be at risk from human-caused disturbances. Monitoring and assessment data are vital for understanding Utah's wetlands and supporting more focused conservation efforts by land managers. Wetland assessments provide information about the type and distribution of wetlands, their health, potential functions and values, and disturbances that may impact them. Assessments can be conducted at the landscape scale using spatial data and remotely sensed data, or in the field by evaluating soil, water, plants, wildlife, and other characteristics. Wetland monitoring typically involves repeated sampling at the same sites to evaluate whether characteristics are changing over time, such as a decrease in noxious plant species following a weed treatment or declining water levels due to nearby water diversions.~~
~~The UGS has developed the field-based Utah Rapid Assessment Protocol (URAP) to provide a general understanding of the condition and potential function of Utah's wetlands using simple, observable metrics that reflect more complex processes. The protocol evaluates wetland condition using a series of metrics organized into five categories (landscape context, hydrologic condition, physical structure, vegetation structure, and vegetation composition) and also entails the collection of functional attributes, plant community, water quality, soil profile, and stressor data. The UGS has applied URAP to wetlands in the Jordan River, Bear River, and Weber River watersheds, and in the West Desert, Snake Valley, and the north slope of the Uinta Mountains. The UGS continues to work on calibrating and validating the protocol. Some data from the field surveys can be found online in the UGS Wetland Plant Application.~~
~~The UGS also conducts long-term monitoring to track changes in surface-water levels at wetlands of special concern. Shallow wells referred to as piezometers, equipped with pressure sensors, have been installed in Snake Valley and Tule Valley in Utah's west desert and at two wetland complexes in Juab County. Data on year-round water levels collected by these sensors can be used to better understand natural and artificial water fluctuations and ensure that wetlands maintain adequate water for sensitive species.~~

~~The UDWQ has focused most assessment efforts to date around Great Salt Lake and has developed probabilistic surveys of two classes of GSL wetlands—impounded and fringe-complex wetlands. Impounded wetlands represent areas where dikes, berms, ditches, and culverts have been constructed to control the inflow and outflow of water through wetlands. These wetlands are often intensively managed and occur as large, shallow ponds that range in size from 20 to more than 500 acres. Since 2004, a significant amount of work has gone into the development of a multi-metric index of integrity (MMI) for impounded wetlands associated with the Great Salt Lake. The impounded MMI developed by UDWQ has four components: the condition of submerged aquatic vegetation, the composition of plant-dependent benthic macroinvertebrates, the extent of nuisance algal mats, and water chemistry. Fringe wetlands are often (but not always) associated with impounded wetlands, and occur where freshwater flows over very gently sloping portions of the exposed lakebed. Fringe wetlands are often found below the outlets from impounded wetlands, from wastewater treatment facilities, and from other low-gradient surface channels or small streams. More information about the UDWQ assessment program can be found online.~~
~~Many other organizations in Utah are involved in wetland monitoring and assessment, including the U.S. Forest Service and U.S. Bureau of Land Management.~~

Economic Considerations

Societal benefits of wetlands include increased water quantity, reduced costs of water purification, reduced flood damage, reduced erosion, and increased hunting, fishing, and recreational opportunities. Most of these benefits are difficult to quantify because the costs are realized only when wetlands are lost. It is difficult to evaluate, for example, the increase in water-purification costs Salt Lake City would incur if wetlands in Big and Little Cottonwood Canyons were removed, or how many more homes would have been damaged by flooding in 2011 if there were no wetlands along the Ogden and Weber Rivers. Recreational use, on the other hand, brings in revenue when wetlands are present through purchase of hunting and fishing supplies, license fees, and travel-related expenditures. Recreational use around Great

Salt Lake, such as bird watching, boating, and waterfowl hunting, is estimated to have an economic effect of over $130 million annually as of 2010; almost all of that use is tied to recreational activities in wetlands. Millions of migratory birds representing almost 260 species visit Great Salt Lake wetlands every year as they migrate between the arctic and South America. Some feed and rest in the wetlands to prepare for their long migration, while other species nest and mate in the wetlands during spring.

Wetland management focuses on water management and invasive species control. Around Great Salt Lake, water supplies are scarce and managers impound water within wetlands to extend the amount of time they are flooded. Wetland managers expend significant resources trying to remove and prevent the spread of the invasive grass, such as *Phragmites australis* ssp. *australis*, around the Great Salt Lake and Utah Lake.

Many species of greatest conservation need in Utah as identified in the WAP are dependent on wetlands areas; maintaining healthy wetlands areas can decrease the chances of costly Threatened and Endangered Species listing decisions. Many wetlands are located along streams and rivers and play a role in storing and slowing floodwaters. Flooding is the most expensive geologic hazard in Utah; 16 major flood events since 1923 have caused more than $1.3 trillion in damage. [6]

Increasing growth in Utah has led to increased pressure to develop on land containing wetlands. ~~The USACE regulates fill and discharge into so-called jurisdictional wetlands, those which are considered Waters of the United States. The definition of Waters of the United States has been changed several times recently by the federal government and has been subject to numerous lawsuits, leading to a lack of certainty regarding which wetlands will be regulated at any given time.~~ The permitting process under the federal Clean Water Act does not prohibit impactful activities in wetlands, but examines the potential impacts of a project and how to avoid, minimize, or mitigate any impacts. Permitting can increase the cost of new development—from consulting fees for wetland delineation, to wetlands permit costs, to the cost of mitigation itself. In some cases, local jurisdictions have enacted their own rules regarding wetlands to prevent loss of the ecological functions provided by these systems. These rules can include requiring buffers between development and wetlands or ordinances that protect wetlands within the floodplain. However, under Utah Code 10-9a-521, "a municipality may not designate or treat any land as wetlands unless the United States Army Corps of Engineers or other agency of the federal government has designated the land as wetlands," which prevents local governments from developing their own definition of wetland. The USACE definition of what constitutes a wetland has been stable, relying on indicators of hydrology, vegetation, and soils, unlike the definition of WOTUS.

Goals, Objectives, and Policies

- Work with federal land-management agencies to implement the principles of Utah's Wetland Program Plan on public lands managed by the federal government.
- Support a combination of active water management where necessary (e.g., Great Salt Lake) and maintaining or restoring natural hydrology when possible to support wildlife habitat and healthy functioning of aquatic ecosystems.
- Cooperate and coordinate with federal land-management agencies on all federal projects relating to the management of wetlands.
- Support the thoughtful management of the scope, intensity, duration, and species of livestock grazing to minimize potential negative impacts and, in some cases, mimic natural ecological processes, to support sensitive aquatic wildlife species and aquatic habitats.
- Support the use of mechanical treatments, controlled burns, livestock grazing, and other tools to control invasive plants and other plant species that compromise wetland health, in accordance with best available practices and support use of early detection- rapid response programs to detect invasive weeds before they become a problem.

- Encourage avoidance of wetland impacts before mitigation and restoration are considered. If avoidance is not possible, mitigation of impacts to wetlands is required.
- Coordinate with groups responsible for protecting and managing wetlands, including public and private wildlife managers, regulatory agencies, and interested stakeholders.
- Identify opportunities to ensure long-term protection for high priority wetlands that provide multiple benefits, such as recreation, wildlife habitat, and flood control.
- Federal agencies shall work with state resource experts on the siting of roads and residential and commercial developments adjacent to floodplains and wetlands.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Environmental Quality Code of Utah

Water and Irrigation (Title 73)

References:

1. 1https://geology.utah.gov/water/wetlands/
2. https://geology.utah.gov/apps/wetlandplants/
3. https://geology.utah.gov/apps/wetlands/index.html
4. https://wildlife.utah.gov/pdf/WAP/Utah_WAP.pdf
5. https://deq.utah.gov/water-quality/wetlands-program/wetlands-program
6. https://geology.utah.gov/hazards/flooding/

WILD AND SCENIC RIVERS

Introduction

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve rivers with outstanding natural, cultural, and recreational values in free-flowing condition for the enjoyment of present and future generations (16 U.S.C. §1271). The act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

Rivers may be designated as wild and scenic by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or state agency. Wild and scenic designation may be granted to river segments; the status need not include the entire river and may include tributaries. For federally administered rivers in the lower 48 states, to protect river-related values, the designated boundaries generally average one-quarter mile (from either bank) in length. Outside of national parks and in Alaska, designated boundaries average one-half mile (from either bank).

Rivers can be classified as wild, scenic, or recreational.

Wild River Areas are rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic River Areas are rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational River Areas are rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Regardless of classification, rivers in the National Wild and Scenic Rivers System are administered with the goal of protecting and enhancing the values for which they were designated. Designation neither prohibits development nor gives the federal government control over private property. Recreation, agricultural practices, residential development, and other uses may continue. Protection of the river is provided through voluntary stewardship by landowners and river users and through regulation and programs of federal, state, local, or tribal governments. In most cases, not all land within designation boundaries is, or will be, publicly owned, and the act limits how much land the federal government is allowed to acquire from willing sellers. Visitors to these rivers are cautioned to be aware of and respect private property rights.

The act purposefully strives to balance dams and other construction at appropriate sections of rivers with permanent protection for some of the country's most outstanding free-flowing rivers. To accomplish this, it prohibits federal support for actions such as the construction of dams or other instream activities that would harm the river's free-flowing condition, water quality, or outstanding resource values. However, designation does not affect existing water rights or the existing jurisdiction of states and the federal government over waters as determined by established principles of law. [1]

Findings

The Virgin River (including its tributaries in Beartrap Canyon, Deep Creek, Goose Creek, Kolob Creek, LaVerkin Creek, Middle Fork Taylor Creek, North Fork Virgin River, Oak Creek, Shunes Creek, Smith Creek, and Willis Creek) was the first designated Wild and Scenic River in Utah, under the management of the National Park Service (NPS) and the U.S. Bureau of Land Management (BLM). On the Virgin River, 145.4 miles are wild, 11.3 miles are scenic, and 12.3 miles are recreational, for a total of 169.3 miles. The Virgin River received its Wild and Scenic River designation as part of the Omnibus Public Lands Management Act of 2009 (P.L. 111-11).

The second Wild and Scenic River designation in Utah was granted to portions of the Green River on March 12, 2019, by the John D. Dingell, Jr. Conservation, Management and Recreation Act (Public Law 116-9). The designation includes 5.3 miles of wild river (from the boundary of the Uintah and Ouray Reservation south to the Nefertiti boat ramp), 49.2 miles of scenic river (in Labyrinth Canyon from Bull Bottom south to the Emery-Wayne County line) and 8.5 miles of recreational designation (from the Nefertiti boat ramp through Gray Canyon south to Swasey's boat ramp) for a total of 63 miles.

Federal land-management agencies periodically analyze rivers and streams within their boundaries for inclusion into the National Wild and Scenic Rivers System. Such considerations are open to comment from the state, local governments, and the public. Several river segments in Utah have been deemed eligible or suitable for designation but have yet to be formally designated by Congress.

Economic Considerations

Considerations include the tradeoff between increases in recreation and tourism and the potential economic loss of future river development. A 2008 report for the Public Lands Policy Coordinating Office by Utah State University, "Impacts of Wild and Scenic River Designation," made the following observations: [2]

1. There exist no ex ante-ex post examinations of the effects that wild and scenic designation have on recreation activities.

2. One study statistically examined trends in property values adjacent to a designated river but found no statistical evidence that designation had a significant effect on those values.

3. There are some anecdotal reports in some studies that a designation effect does occur according to managers of those rivers. No scientific or statistical evidence supports those observations.

4. Evidence from two studies relative to recreators' knowledge of the status of the wild and scenic rivers being used suggests that users' knowledge varied widely. However, a large majority of users in both studies reported that designation had preserved the quality of the riverine environment.

5. In one ex ante study of the value (contingent valuation) of potential designation, Colorado respondents' willingness to pay for designation of 11 rivers was significant.

6. Non-recreation impacts identified in the key informant survey included those on water rights, private land uses, and public land uses.

7. In general, because the law specifies that existing water rights will not be impacted, no

evidence of impact on those rights from designation was found. There is currently one case in litigation relative to unallocated—excess water production on the Lemhi River in Idaho.

8. In several cases, priority dates for potential upstream uses that were senior to the federal reserved water rights for the designated segment(s) of the river were guaranteed in the specific designation act or amendment to the act.

9. Some private land has been obtained by condemnation, although not in the western United States, because of the legal limits placed on land purchase by the act.

10. Scenic easements have been obtained by the managing agency through condemnation of private property, without specific limit in the act. Agency regulation of activities on those easements has occurred, including limiting both physical and use modifications.

11. The existence of a local (county or regional) planning and/or zoning commission usually provides local input to private land management. Where no zoning exists, the managing federal agency may control private property uses.

12. There is some evidence of limited ability to construct flood protection on private property in the state of Washington. In general, however, respondents were satisfied with the designation and felt little impact on their private land.

13. Some public land uses (federally permitted uses) have been affected by designation. At least one placer mining claim has been closed and others have been regulated (particularly gravel operations).

14. The largest issue to date appears to be grazing in riparian areas. Several court cases have determined that grazing fails to maintain the water quality in the designated segments and grazing has been eliminated in those areas.

15. To date, timber harvest does not appear to have been affected by designation (although timber harvest on federal land has continued to decline for other reasons).

16. It is the opinion of the researchers that, in order for local users and landowners to maintain their property rights and privileges, local citizens, local officials, and state officials should become involved in the designation process more deeply than simply providing comments on designation plans. Official committees or task forces made up of local residents and officials, state officials, and federal managers should be formed to determine what segments are recommended to Congress to be designated.

Goals, Objectives, and Policies

- Be actively involved in all studies or plans that may consider or evaluate eligibility or may recommend inclusion of rivers in the National Wild and Scenic River System.
- Be actively involved in all federal legislation that could result in designation of wild or scenic rivers within Utah.
- Potential reservoir sites in Utah should be protected from designation as wild and scenic rivers.
- Enact policies on the assumption that any instream water right created by the designation of wild and scenic rivers is junior to all absolute and conditional water rights existing before the special designation is finalized.

- Identify wild and scenic rivers based on their regional and national significance rather than on their local significance. These selections should be supported by data that clearly show such selection will not negatively impact the ability of agriculture and other industries to access the water it needs and the State of Utah or its political subdivisions to develop water supplies and other resources to meet future needs. Where such impacts are unavoidable, a plan to mitigate such impacts should be presented.

Policies Pertaining to Proposed Wild and Scenic Rivers

Official state policy regarding new wild and scenic rivers is found in Utah Code § 63L-11-303 (4). The State of Utah will coordinate with federal land-management agencies in order to ensure that the duly adopted policies contained in Utah Code § 63L-11-303 (4) are incorporated into the analysis and decision making of federal land management agencies.

Policies Pertaining to the Virgin River Wild and Scenic River:

- Coordinate and cooperate with the BLM and the NPS in the management of the designated wild, scenic, and recreational segments of the Virgin River and its tributaries.
- Advocate for the protection of the Virgin River's wild, scenic, and recreational qualities within the designated segments without infringing on private property rights or the sustained multiple use of public lands surrounding the Virgin River.
- Oppose the designation of new segments of the Virgin River as "Wild and Scenic Rivers" unless a proposed designation complies with Utah Code § 63L-11-303
- Oppose any actions taken in the management of the Virgin River that would infringe on valid water rights or the jurisdiction of the Utah Division of Water Rights.

State Code

State Code changes periodically and the current code can be located online at www.le.utah.gov. The following are selected portions of the Utah State Code and do not represent every potential legal reference in the Code related to this section of the State Resource Management Plan or the administration of public lands.

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(4) the state's support for the addition of a river segment to the National Wild and Scenic Rivers System, 16 U.S.C. Sec. 1271 et seq., will be withheld until:

(a) it is clearly demonstrated that water is present and flowing at all times;

(b) it is clearly demonstrated that the required water-related value is considered outstandingly remarkable within a region of comparison consisting of one of the three

physiographic provinces in the state, and that the rationale and justification for the conclusions are disclosed;
(c) it is clearly demonstrated that the inclusion of each river segment is consistent with the plans and policies of the state and the county or counties where the river segment is located as those plans and policies are developed according to Subsection (3);
(d) the effects of the addition upon the local and state economies, agricultural and industrial operations and interests, outdoor recreation, water rights, water quality, water resource planning, and access to and across river corridors in both upstream and downstream directions from the proposed river segment have been evaluated in detail by the relevant federal agency;
(e) it is clearly demonstrated that the provisions and terms of the process for review of potential additions have been applied in a consistent manner by all federal agencies;
(f) the rationale and justification for the proposed addition, including a comparison with protections offered by other management tools, is clearly analyzed within the multiple-use mandate, and the results disclosed;
(g) it is clearly demonstrated that the federal agency that has management authority over the river segment and that is proposing the segment for inclusion in the National Wild and Scenic River System will not use the actual or proposed designation as a basis to impose management standards outside of the federal land management plan;
(h) it is clearly demonstrated that the federal land and resource management plan containing a recommendation for inclusion in the National Wild and Scenic River System:
(i) evaluates all eligible river segments in the resource planning area completely and fully for suitability for inclusion in the National Wild and Scenic River System;
(ii) does not suspend or terminate any studies for inclusion in the National Wild and Scenic River System at the eligibility phase;
(iii) fully disclaims any interest in water rights for the recommended segment as a result of the adoption of the plan; and
(iv) fully disclaims the use of the recommendation for inclusion in the National Wild and Scenic River System as a reason or rationale for an evaluation of impacts by proposals for projects upstream, downstream, or within the recommended segment;
(i) it is clearly demonstrated that the agency with management authority over the river segment commits not to use an actual or proposed designation as a basis to impose Visual Resource Management Class I or II management prescriptions that do not comply with the provisions of Subsection (24); and
(j) it is clearly demonstrated that including the river segment and the terms and conditions for managing the river segment as part of the National Wild and Scenic River System will not prevent, reduce, impair, or otherwise interfere with:
(i) the enjoyment of the state and the state's citizens of complete and exclusive water rights in and to the rivers of the state as determined by the laws of the state; or
(ii) local, state, regional, or interstate water compacts to which the state or any county is a party;

References:

1. https://www.rivers.gov/wsr-act.php
2. https://extension.usu.edu/iort/research/impacts-of-wsr-designation

WILDERNESS

Introduction

In 1964, the passage of the Wilderness Act gave Congress the authority to declare wilderness areas as part of a National Wilderness Preservation System. The passage of the Wilderness Act gave the U.S. Forest Service (Forest Service) 10 years to review areas that might be eligible for designation as national wilderness areas and make recommendations to Congress. Similarly, the U.S Bureau of Land Management (BLM) had 15 years after the passage of the Federal Land Policy and Management Act of 1976 (FLPMA) to make similar recommendations to Congress.

Congress has generally not made designation decisions in most areas. Areas recommended for wilderness by the BLM are generally managed for non-impairment of their wilderness characteristics and are known as Wilderness Study Areas (WSAs). The BLM recommended approximately 86 WSAs to Congress in June 1992, in accordance with FLPMA.

The Utah Wilderness Act of 1984 designated 12 wilderness areas within Utah's national forests, and added these wilderness areas to the National Wilderness Preservation System (Public Law 98-428, § 102(a)). Congress declared that the Forest Service had completed the second roadless area review and evaluation program (better known as RARE II) with Utah (Id, at § 201(a)(1)). Upon completion of RARE II, Congress found that areas not designated as wilderness in the Utah Wilderness Act must be managed for multiple-use in accordance with the National Forest Management Act of 1976 (NFMA) (Public Law 98-428, §201(b)(3)). The NFMA required the Forest Service to review wilderness options under RARE II at the revisions of the forest management plans (Id, at § 201(b)(2)).

The John D. Dingell, Jr., Conservation, Management, and Recreation Act (Public Law 116-9) created several additional wilderness areas in Emery County, Utah. This included 653,722 acres of wilderness on 17 units of BLM-administered land and 7,433 acres of wilderness on Forest Service-administered land.

The Wilderness Act prescribes management to ensure that the land is "unimpaired for the future use and enjoyment as wilderness" (16 USC 1131). Only Congress may designate wilderness or change the status of wilderness areas. Wilderness areas are designated within existing federal public land.

Wilderness areas generally do not allow motorized equipment, motor vehicles, mechanical transport, temporary roads, permanent structures, or installations. Motorized equipment and equipment used for mechanical transport may be allowed in certain circumstances such as search and rescue. The Wilderness Act also prohibits permanent roads and commercial enterprises, although commercial services are allowed "to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes" of the wilderness area. Livestock grazing is allowed in wilderness areas. The Wilderness Act acknowledges the need to provide for human health and safety, protect private property, control insect infestations, and fight fires.

Over the years, the Forest Service and BLM have repeatedly sought to manage additional areas as de facto wilderness areas using titles such as "roadless areas," wildlands," and "lands with wilderness characteristics.". These administrative actions to manage multiple-use lands as de facto wilderness are outside the authority of the Wilderness Act and FLPMA.

Findings

As of July 2022, the State of Utah holds [1]:

- 51 wilderness areas, covering approximately 2 million acres.
- 77 BLM WSAs, covering approximately 2.8 million acres.

Large areas of Utah's national forests are managed as "roadless areas" under Forest Service rules, while the Forest Service continues to conduct "wilderness inventories" of multiple-use forest lands in search of additional lands with wilderness character.

Pursuant to BLM administrative guidance, the BLM periodically conducts inventories for "lands with wilderness characteristics" of BLM multiple-use land outside of wilderness areas and WSAs.

Economic Considerations

Wilderness areas attract some recreational spending while prohibiting most forms of multiple-use. Economic impacts of specific wilderness areas depend on the size of the wilderness area and the forms of multiple-use that existed prior to the wilderness designation. Environmental and social benefits or costs of wilderness areas are typically not captured in economic data.

Goals, Objectives, and Policies

Goal(s):

The State of Utah recognizes that management of existing wilderness is defined by federal law as codified in the Wilderness Act. Management of wilderness areas should conform with the Wilderness Act without being more restrictive on human activities than the Wilderness Act requires. Management of WSAs is similarly codified in FLPMA, and management of WSAs should conform with FLPMA without restricting human activities or mechanical activities more than FLPMA requires.

Management of wilderness areas and WSAs should provide for the public's enjoyment of existing wilderness areas and WSAs.

Objectives and Policies:

*(See also **Utah Code 63L-11-303**, Findings to be recognized and promoted)*

1. Support the continued management of wilderness areas as wilderness, in accordance with the Wilderness Act when management provides for public enjoyment and active management under the act.
2. Recognize BLM WSAs recommended by the BLM during or before June 1992 in accordance with FLPMA.
3. Oppose the recommendation of new WSAs subsequent to June 1992.
4. Actively participate in all public land-management planning activities.
5. Oppose any legislation introduced in Congress to designate additional wilderness areas except for legislation introduced by a member of Utah's congressional delegation.
6. Oppose the designation of additional roadless areas in Utah.
7. Support targeted forestry, fire, and watershed management in roadless areas through coordination with federal agencies to allow for healthy forests, reduced wildfire risk, and to create reliable and resilient watersheds.
8. Oppose any legislation introduced in Congress to designate additional wilderness areas unless such legislation is supported by the respective county commission or county council in the county impacted by the proposed legislation.
9. Actively participate with federal partners in making wilderness management plans.

10. All wilderness management plans must provide access for the elderly and physically disabled individuals to the fullest extent possible provided by law.
11. Oppose the management of non-wilderness federal lands as de facto wilderness, including "wildlands," "lands with wilderness characteristics," "wilderness inventory areas," and other such administrative designations.
12. Oppose the review of additional Forest Service lands for wilderness designation, except for the reviews expressly provided for in the Utah Wilderness Act of 1984 (§201(b)). [2]
13. Conduct wilderness management that provides for continued and reasonable access to and development of valid, existing private-property rights within the area, and provide for full use and enjoyment of those rights.

State Code

Utah Code § 63L-11-302. *Principles to be recognized and promoted.*

(2) managing public lands for wilderness characteristics circumvents the statutory wilderness process and is inconsistent with the multiple-use and sustained-yield management standard that applies to all Bureau of Land Management and United States. Forest Service lands that are not wilderness areas or wilderness study areas;

Utah Code 63L-11-303, *Findings to be recognized and promoted.*

Areas of Critical Environmental Concern

(6) the state's support for designation of an Area of Critical Environmental Concern (ACEC), as defined in 43 U.S.C. Sec. 1702, within federal land management plans will be withheld until:
(a) it is clearly demonstrated that the proposed area satisfies all the definitional requirements of the Federal Land Policy and Management Act of 1976, 43 U.S.C. Sec. 1702(a);
(b) it is clearly demonstrated that:
(i) the area proposed for designation as an ACEC is limited in geographic size; and
(ii) the proposed management prescriptions are limited in scope to the minimum necessary to specifically protect and prevent irreparable damage to the relevant and important values identified, or limited in geographic size and management prescriptions to the minimum required to specifically protect human life or safety from natural hazards;
(c) it is clearly demonstrated that the proposed area is limited only to areas that are already developed or used or to areas where no development is required;
(d) it is clearly demonstrated that the proposed area contains relevant and important historic, cultural or scenic values, fish or wildlife resources, or natural processes which are unique or substantially significant on a regional basis, or contain natural hazards which significantly threaten human life or safety;
(e) the federal agency has analyzed regional values, resources, processes, or hazards for irreparable damage and potential causes of the damage resulting from potential actions which are consistent with the multiple-use, sustained-yield principles, and the analysis describes the rationale for any special management attention required to protect, or prevent irreparable damage to, the values, resources, processes, or hazards;
(f) it is clearly demonstrated that the proposed designation is consistent with the plans and policies of the state and of the county where the proposed designation is located as those plans and policies are developed according to Subsection (3);
(g) it is clearly demonstrated that the proposed ACEC designation will not be applied redundantly over existing protections provided by other state and federal laws for federal lands or resources on federal lands, and that the federal statutory requirement for special management attention for a proposed ACEC

will discuss and justify any management requirements needed in addition to those specified by the other state and federal laws;
(h) the difference between special management attention required for an ACEC and normal multiple-use management has been identified and justified, and any determination of irreparable damage has been analyzed and justified for short-term and long-term horizons;
(i) it is clearly demonstrated that the proposed designation:
(i) is not a substitute for a wilderness suitability recommendation;
(ii) is not a substitute for managing areas inventoried for wilderness characteristics after 1993 under the Bureau of Land Management interim management plan for valid wilderness study areas; and
(iii) it is not an excuse or justification to apply de facto wilderness management standards; and
(j) the conclusions of all studies are submitted to the state, as a cooperating agency, for review, and the results, in support of or in opposition to, are included in all planning documents;

Roadless Areas

(11) the state opposes any additional evaluation of national forest service lands as roadless or unroaded beyond the forest service's second roadless area review evaluation and opposes efforts by agencies to specially manage those areas in a way that:
(a) closes or declassifies existing roads unless multiple side-by-side roads exist running to the same destination and state and local governments consent to close or declassify the extra roads;
(b) permanently bars travel on existing roads;
(c) excludes or diminishes traditional multiple-use activities, including grazing and proper forest harvesting;
(d) interferes with the enjoyment and use of valid, existing rights, including water rights, local transportation plan rights, R.S. 2477 rights, grazing allotment rights, and mineral leasing rights; or
(e) prohibits development of additional roads reasonably necessary to pursue traditional multiple-use activities;

Wilderness

(13) the state's support for any recommendations made under the statutory requirement to examine the wilderness option during the revision of land and resource management plans by the United States Forest Service will be withheld until it is clearly demonstrated that:
(a) the duly adopted transportation plans of the state and each county within the planning area are fully and completely incorporated into the baseline inventory of information from which plan provisions are derived;
(b) valid state or local roads and rights-of-way are recognized and not impaired in any way by the recommendations;
(c) the development of mineral resources by underground mining is not affected by the recommendations;
(d) the need for additional administrative or public roads necessary for the full use of the various multiple uses, including recreation, mineral exploration and development, forest health activities, and grazing operations, is not unduly affected by the recommendations;
(e) analysis and full disclosure are made concerning the balance of multiple-use management in the proposed areas, and that the analysis compares the full benefit of multiple-use management to the recreational, forest health, and economic needs of the state and the counties to the benefits of the requirements of wilderness management; and
(f) the conclusions of all studies related to the requirement to examine the wilderness option are submitted to the state for review and action by the Legislature and governor, and the results, in support of

or in opposition to, are included in any planning documents or other proposals that are forwarded to the United States Congress;

References:

1. https://wilderness.net/default.php
2. https://www.govinfo.gov/content/pkg/STATUTE-98/pdf/STATUTE-98-Pg1657.pdf

WILDLIFE

Introduction

Utah Code § 23A-1-102 provides that Utah's wildlife is the property of the state. The Utah Division of Wildlife Resources (DWR) has been given authority to manage protected wildlife. Wildlife includes brine shrimp and crayfish; mollusks; and vertebrate animals (fish, amphibians, reptiles, birds, and mammals) living in nature. Wildlife does not include feral and domestic animals such as cats, dogs, etc. All wildlife within the state are protected [1], except as outlined in Utah Code § 23A-1-43 Rare species and those subject to federal listing under the federal Endangered Species Act of 1973 are referenced more fully in the chapter entitled "Threatened and Endangered Species" Although fish are legally considered "wildlife," fisheries and angling-related benefits for local economies are addressed in the "Fisheries" chapter.

Wildlife and wildlife habitat contribute to a productive natural environment. Wildlife improves Utah's quality of life and provides a rich source of aesthetic enjoyment, inspiration, and outdoor recreation for many people. Healthy wildlife populations can have a positive impact on the economy, while influencing how people experience the benefits of their private property. Most people support efforts to find a balance between habitat requirements of wildlife populations and economic activities of people. Wildlife is important socially and economically, and contributes to activities such as: hunting, photography, and wildlife viewing.

Findings

The DWR's mission is to serve the people of Utah as trustee and guardian of the state's protected wildlife. As such, the DWR and State of Utah seek to maintain sustainable, viable, and diverse wildlife populations that are valuable to all citizens of Utah. More than 600 vertebrate wildlife species currently occur in Utah. Many of those wildlife species are found on public lands throughout Utah.

Wildlife species such as deer, elk, moose, antelope, bighorn sheep, and mountain goats provide hunting and viewing opportunities on public and private land. Wildlife is managed for biological diversity and species health while providing hunting opportunities when applicable. The DWR seeks to manage and minimize species impacts to private and public lands. The DWR establishes management plans for many wildlife species, including big game species, predator species, upland game, and game fowl [2]. The DWR also assists the U.S. Fish and Wildlife Service (USFWS) in establishing management plans for some migratory birds, such as Canada geese, sandhill cranes, and American white pelicans.

Economic Considerations

Wildlife and the associated recreation tied to wildlife in Utah attracts many who enjoy fishing, hunting, and wildlife watching. According to a 2016 USFWS survey, 103 million Americans 16 years and older (nearly 4 out of 10 people) participated in wildlife-related recreation in 2016 and spent $156.9 billion dollars [3]. In Utah, expenditures on wildlife-related recreation totaled $1.87 billion, with $1.17 billion spent on fishing and hunting and $701 million spent on wildlife watching [4]. Not only do these activities support thousands of jobs in related industries and businesses, they generate significant financial support to help manage wildlife and improve habitat.

Thriving populations of big-game animals will, at times, cause some level of damage to farming and ranching operations, by competing with domestic livestock for available forage, or by damaging crops, fences, and irrigation equipment. A number of methods can be applied to mitigate such damage, including wildlife harvest and removal, issuance of landowner permits, development of conservation leases (which involve remuneration or other forms of compensation for depredation,) and direct monetary compensation for agricultural damages. Although depredation mitigation review and appeal procedures apply and are used as needed, the total amount of compensation that can be provided to landowners to prevent or compensate for damages may not exceed the funding amounts appropriated by the legislature for fencing material and compensation for damaged crops, fences, and irrigation equipment (State Code § 23A-8-405 (4)(a))[5].

Utah's Watershed Restoration Initiative (WRI) [6] focuses on improving three ecosystem values: (1) watershed health and biological diversity, (2) water quality and yield, and (3) opportunities for sustainable uses of natural resources. Significant investments have been made through the WRI to improve rangeland health and watershed conditions. Since the program's creation in 2006, the WRI has improved nearly 2 million acres in Utah. In fiscal year 2020, the Utah Legislature contributed $6.2 million to the WRI. Eighty-six participating partners completed restoration of 110,041 acres of uplands and 166 miles of stream and riparian areas, leveraging the legislative funds by a factor of 14-to-1. Sportsman-generated funding plays an important role in the WRI. Counties in general appreciate the benefits realized through WRI habitat-restoration projects. The long-term results of the WRI will be measured in reduced wildfire acreage and suppression costs, reduced soil loss from erosion, reduced sedimentation and storage loss in reservoirs, improved water quality and yield, improved wildlife populations, reduced risk of additional federal listing of species under the Endangered Species Act, improved agricultural production, and resistance to invasive plant species.

To participate effectively, counties must task their staff to attend meetings and field tours of the WRI regional teams, expressing their views and advocating the watershed restoration efforts they feel are most important. For more information on the WRI program, including dates and times of upcoming regional team events, please visit the WRI website at watershed.utah.gov.

The Utah Wildlife Migration Initiative (MI), founded in 2017, identifies and protects connective corridors that allow fish and wildlife to migrate to necessary habitat areas around the state. The mission is to document, preserve, and enhance wildlife movement for species throughout Utah using state-of-the-art tracking and data-management technologies, strong collaborative partnerships, and compelling outreach. The MI uses state-of-the-art technology to identify the following:

- Migration and movement patterns
- Wildlife stopover sites
- Priority areas that can reconnect fragmented habitat ranges
- Locations that allow wildlife species to safely move from one large habitat area to another

Although predator management is discussed under a separate chapter entitled "Predator Management," the Wildlife Damage Compensation Act [7] should be mentioned because it provides a mechanism by which livestock owners may obtain compensation for livestock damage by bears, mountain lions, wolves, or eagles. In this case, livestock means cattle, sheep, goats, and turkeys.

Goals, Objectives, and Policies

- Expand wildlife populations and conserve species of greatest conservation need by protecting and improving wildlife habitat.

- Manage current populations or establish new populations of wildlife in suitable habitats in Utah, as outlined in approved management plans.
- By 2024, increase the mule deer populations in Utah to 404,900, as conditions allow.
- Improve the quality and quantity of vegetation for mule deer on a minimum of 500,000 acres of crucial range by 2024.
- Provide a diversity of high-quality hunting and viewing opportunities for wildlife species throughout Utah.
- Manage fish and game populations to meet management-plan objectives, and expand quality fishing and hunting opportunities throughout Utah.
- Manage species in need of conservation to prevent listing under the Endangered Species Act of 1973.
    - Every effort should be rendered to keep management of species at the state level.
- Work with constituencies to achieve broad-based support for wildlife programs within the state by demonstrating the value of wildlife to all citizens of Utah.
- Increase public awareness in Utah of wildlife as a "quality-of-life" issue in order to expand the issue's support base and achieve stable funding.
- Improve communications with wildlife organizations, public officials, private landowners, and government agencies to obtain support for wildlife in Utah.
- Expand programs to recruit and retain Utah's young hunters, anglers, and wildlife watchers.
- Produce and maintain the desired vegetation for wildlife and domestic livestock forage on public and private lands throughout Utah.
- Avoid, mitigate, minimize, or compensate for damages to private land occurring when Utah's wildlife populations are above targeted management-plan objectives.
- Work with landowners, the federal government, and private organizations to conserve valuable wildlife habitat in Utah and winter range along the wildland-urban interface.
- Minimize negative impacts from wildlife on private lands in Utah.
- Work with local governments and federal agencies to identify and conserve crucial wildlife habitat and migration corridors throughout Utah, including migratory bird stopover locations.
- Utilize the best available science and wildlife management techniques to manage wildlife populations throughout Utah.
- Work with universities and constituency groups to study and better understand wildlife populations throughout the State.
- Develop mechanisms and policies to incentivize private landowners throughout Utah to conserve valuable wildlife habitat.

General Guidelines

The process for determining the balance among competing uses and establishing the best wildlife management policies is described in state law. This process is founded on an open, public dialogue concerning wildlife issues. Five regional advisory councils (RACs) are active across the state, each consisting of 12–15 members nominated by various interest groups and selected by the Utah Department of Natural Resources' leadership. Members represent agriculture, sportsmen, non-consumptive wildlife, locally elected public officials, federal land agencies, and the public at large. The duty of each RAC is to hear input and recommendations, gather data, and evaluate expert testimony, and then make informed policy recommendations to the Wildlife Board.

The Utah Wildlife Board is composed of individuals nominated by a committee selected by the governor of Utah, which reflects representation by diverse groups, including non-consumptive wildlife interests, the agriculture industry, sportsmen groups, federal land-management agencies, the Utah Association of Counties, and range-management specialists. From this list of nominees, the governor of Utah appoints seven Wildlife Board members with the consent of the Utah Senate.

The Wildlife Board is responsible for considering RAC input and recommendations. The Wildlife Board must provide written explanations if they reject recommendations or positions submitted by a RAC. The Wildlife Board uses public input, the recommendations of the RACs, and the assembled facts to make determinations and establish the policies best designed to accomplish the purposes and fulfill the intent of the state's wildlife laws. The Wildlife Board generates wildlife management policy and exercises its powers by promulgating administrative rules and issuing proclamations and orders under Utah Code.

- Ensure that federal land-management decisions are coordinated with and consistent with state wildlife management.
- Encourage agency support of state-sponsored initiatives or programs designed to stabilize wildlife populations that may be experiencing a scientifically proven decline in numbers.
- Encourage development of wildlife-crossing structures to provide safe passage across roads and other movement barriers.
- Support the review of development plans on private property to take wildlife-movement corridors and wintering habitats into account during project design.

State Code

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Public Lands Planning

§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Wildlife Resources Code of Utah (Title 23A)

Utah Division of Indian Affairs Act

§ 9-9-213. *Concurrent state and federal jurisdiction over hunting, trapping, or fishing offenses on reservations.*

(1) With respect to any of the offenses enumerated in this chapter, over which federal courts may have lawful jurisdiction, the jurisdiction of the courts of the state of Utah shall be concurrent and not exclusive.

(2) It shall be the duty of the courts of the state of Utah to order delivery to the proper authorities of the federal government for prosecution, any offender there to be dealt with according to law or regulations authorized by law, where such authorities consent to exercise jurisdiction lawfully vested in them over the said offender.

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WILD HORSES AND BURROS

Introduction

The State of Utah supports active management of wild horse and burro populations through a combination of the application of approved contraception methods and the removal of excess populations. The current population of wild horses and burros in Utah is unacceptably large and must be reduced to appropriate management levels (AML) established by the U.S. Bureau of Land Management (BLM).

The native horse species of North America were extirpated near the end of the Pleistocene epoch, between 7,500 to 12,000 years ago. Evidence suggests that a global cooling event led to the extinction of many large mammal species during that time period, including wooly mammoths, American camels, dire wolves, saber tooth cats, and wooly rhinos. This event might have led to the demise of the horse species had it not been for the Bering Land Bridge, which connected Alaska and Siberia at the time and allowed the horses to migrate to Europe and Asia.

Spanish explorers and settlers introduced many forms of livestock to the vast rangelands of North America in the 16th century. Because the Spanish word for "stray" is *Mustengo*, the stray and fugitive horses of the Spaniards would later become known as "mustangs," which is how North American wild horses are referred to today. Hence, in the mid-1800s, the American West was explored, settled and powered by "horsepower." As commerce and transportation of goods and people expanded, the breeding of horses and burros became essential for the success of businesses, families, communities, and states. The horse became highly valued. Demand for horsepower created a very strong commodity market for horses and burros. Horses were often the most expensive domestic animal—during the 1870s, the cost of cattle averaged $20.00 per head, a work horse $150.00, and a saddle horse $200.00, or more. The demand for horsepower created a population boom of equines in North America, from no horses in the early 1600s to more than 21,000,000 by 1920. Currently, there are approximately 3 million horses in America.

In the western United States, the free-range policy of the late 1800s and early 1900s resulted in large herds of horses on the range. Settlers and ranchers released domestic animals onto areas of open range, then collected the animals to train and sell as demand and opportunity dictated. Selected breeds were released onto the range to create animals that would meet specific requirements required for the U.S. Army Cavalry Remount program, Pony Express mounts, freight animals, ranch horses, pack animals, etc. Accordingly, these managed herds grew by the millions to meet the demands of a growing nation.

What are now referred to as "wild horses" (a construct of the Wild Horse and Burro Act) are actually the remnants of these range herds of domestic horses and burros, which were bred and managed by local ranchers to meet specific commodity markets until the early 1900s.

Today, large numbers of unbranded and unclaimed feral horses can be found on public lands administered by the U.S. Secretary of Interior through the U.S. Bureau of Land Management (BLM), U.S. States Secretary of Agriculture through the U.S. Forest Service (Forest Service), and state-owned trust lands administered by the Utah School and Institutional Trust Lands Administration (SITLA). Wild horses, as they are now perceived, are not native to America's rangelands. They are feral animals; however, for planning purposes those found on certain federal lands are referred to as wild free-roaming horses and burros to be consistent with 16 United States Code (U.S.C.) 1331(b).

The BLM and Forest Service, under the authority of the Wild Free-Roaming Horse and Burro Act (Public Law 92-195) of 1971 (WFRHBA), are responsible for the protection, management, and control of wild horses and burros on certain public lands in Utah. The act requires federal agencies to "manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural

ecological balance on the public lands" [1]. Additionally, federal land managers must consult with Utah wildlife agencies and take into consideration the needs of wildlife in their management decisions. Land managers must also ensure that free-roaming wild horse and burro populations are in balance with traditional multiple-use activities and managed accordingly.

Following the passage of the WFRHBA, the BLM inventoried wild horse populations in Utah from 1971 to 1974. These inventories found wild horses in 19 areas, which were subsequently designated as "herd areas," which remain in place today. Through the federal land-use planning process, 19 wild horse herd management areas (HMAs) were established upon the originally designated herd areas. Each HMA shares the name of the herd area in which it is located. The BLM and Forest Service do not manage portions of the original herd area outside the HMA boundaries for wild horses. Some herd area and HMA boundaries coincide with human-made boundaries, such as fences, and natural features, such as cliffs and canyons, but most are not restrictive and allow the animals unrestricted movement across the established boundaries.

Findings

National Findings

The following national findings related to wild horse and burro management in the United States were derived from the Wild Horse and Burro Management: Overview of Costs published by Congressional Research Services on July 13, 2022.

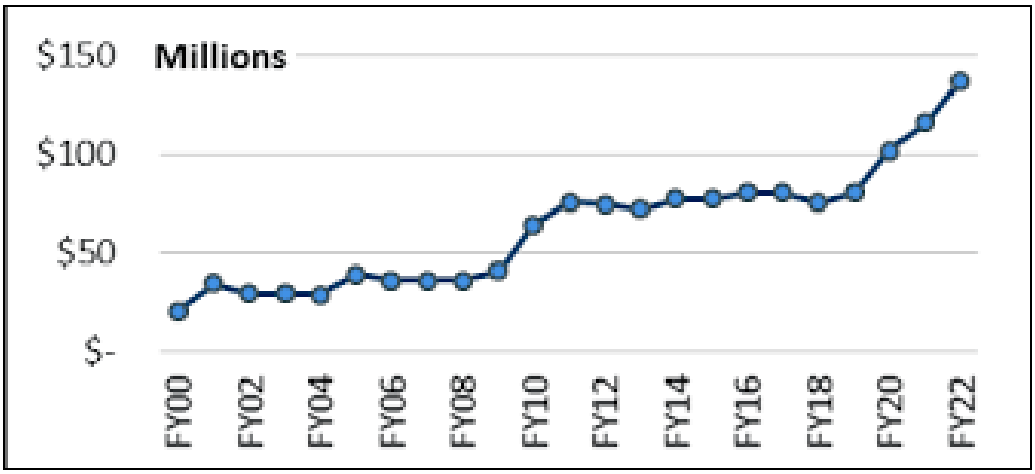
The BLM has set the upper limit for the AML for all wild horse and burro herds on BLM lands at 26,785 animals. As of March 2022, there were an estimated 82,384 animals on BLM lands—more than triple the current AML—and more than double the 40,605 on-range estimates from 2013. However, the 2022 on-range estimate is 13 percent lower than the 2020 high of 95,114 animals. The decrease was the result of increased removals, fertility control, and other factors as the result of additional federal funding being allocated for herd management. [2]

In fiscal year 2021, "Off-range holding accounted for $77.7 million (64%) of expenditures, composed of $35.0 million for long-term care and $42.7 million for short-term care. The next-largest portion, $15.1 million (12%), was expended for program support and overhead. Placement into private care, through adoptions and sales, was $14.7 million (12%). Another $8.5 million (7%) was used for gathering animals on the range. The remaining $6.2 million (5%) was expended for varied purposes (including <1% for fertility control)."[3]

For fiscal year 2022, the appropriation for BLM management of wild horses and burros was $137.1 million, 18 percent higher than that of fiscal year 2021 ($115.7 million). The increase was intended to support "an aggressive, non-lethal population control strategy" as set out in a May 2020 BLM report, according to the explanatory statement on the fiscal year 2022 appropriations law. This strategy includes increased removals, long-term holding, and fertility control. Fiscal year 2022's funding was more than six times fiscal year 2000's amount ($20.4 million) and more than double fiscal year 2010's amount ($64.0 million), in nominal dollars.

Figure 1 depicts BLM's annual funding.

Figure 1: BLM Appropriations for Wild Horse and Burro Management (fiscal year 2000–2022)



For fiscal year 2021, expenditures totaled $122.2 million. Figure 2 shows fiscal year 2021 expenditures by activity. Off-range holdings accounted for $77.7 million (64%) of expenditures, composed of $35.0 million for long-term care and $42.7 million for short-term care. The next-largest portion, $15.1 million (12%), was expended for program support and overhead. The cost of placement into private care, through adoptions and sales, was $14.7 million (12%). Another $8.5 million (7%) was used for gathering animals on the range. The remaining $6.2 million (5%) was expended for various purposes (including <1% for fertility control).

The BLM typically charges a minimum of $125 per adoption of a trained animal and $25 per untrained animal, but the average cost for the BLM to complete an adoption (or sale) was estimated in 2020 at about $1,500. This cost includes activities to make the animals more marketable, such as training, advertising, and transporting. It does not include the $1,000 incentive BLM has paid individuals for each untrained animal they adopt (since March 12, 2019). The cost of adoptions was considerably less than the lifetime cost of off-range care; in 2020, BLM estimated its savings on average to be $24,000 per animal.

Long-term holding typically is used for older animals and those with less potential for adoption or sale; the average cost was estimated in 2020 at about $2 per animal, per day. By comparison, the cost of short-term corral facilities was about $5 per animal, per day. Short-term facilities are more expensive due in part to hay costs, veterinary services, and farrier services to prepare the animals for adoption or sale and, in some cases, to the costs of salaried employees of the BLM.
The most common fertility-control method was estimated (in 2020) to cost roughly $2,500 per mare, including gathering, treatment, and short-term holding. Under this treatment, an immunocontraceptive agent—Porcine Zona Pellucida (PZP)—is typically applied during periodic gathers to remove excess animals from the range. Mares are captured, treated with PZP, and released to the range. PZP generally is most effective for only 1 year.

GonaCon is an immunocontraceptive vaccine that was developed and is used by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) in the management of certain wildlife and feral vertebrate animal populations. The State of Utah supports both the use of PZP-22 and GonaCon contraceptives in wild horse and burro herd management. However, the State of Utah takes the position that when comparing the two, GonaCon would likely be a more effective plan to manage HMAs to proper AML.

GonaCon is EPA-approved, inexpensive, and has been shown to be safe for mares and the environment. Even without booster treatments, GonaCon provides 3–4 years of effectiveness compared to the PZP treatment, which is effective for only 1–2 years. One downside to using GonaCon is that horses must

receive a booster shot for maximum effectiveness, which requires holding the animals for 30 to 45 days until the second shot can be administered. Although it would be burdensome to feed and water mares in pens for 30 to 45 days, it would likely save money in the long run. PZP-22 is a 2-year contraceptive at best, with other sources claiming that a single treatment of PZP may have an effectiveness period of as little as 1 year.

As federal land managers carry out their duty to manage and protect wild horses and the lands upon which they live, it is important to develop and use a variety of humane fertility control methods that can slow herd growth and reduce the need to gather excess animals and pay for their care. In 2020, the BLM began using specialized intrauterine devices (IUDs). These flexible, soft, Y-shaped IUDs are made from medical-grade silicone and were specifically designed for use in horses. IUDs have been shown to be humane, safe and effective for horses and are supported by peer-reviewed research published in Animal Reproduction Science and in the Journal of Wildlife Management. The research indicates that "if wild horses have the same IUD retention rates as were seen in pasture trials (75% for 2 breeding seasons), about half of IUD-treated mares could still be contracepted for up to 5 years later" [4]. Accordingly, the State of Utah is supportive of the utilization of IUDs.

State of Utah Findings

Many of Utah's HMAs are showing signs of over-utilization of forage and water, indicating their inability to support current populations of wild horses. In some areas, the wild horses have moved outside HMAs, negatively impacting private or other federal land, especially in riparian habitat and vegetation treatment areas.

Population management is critical in balancing herd numbers with forage resources. Studies have demonstrated that growth rates of wild horses approach 20 percent, or more, in many horse populations. This rapid increase in population is affecting the condition of the range in and around HMAs, and it increases competition for resources between wild horses, cattle, and a variety of wildlife, including sensitive species. Despite being mandated by law, consultation between federal land managers and the Utah Division of Wildlife Resources (DWR) regarding wild horse management is lacking.

The BLM and Forest Service are required by the WFRHBA to manage populations within appropriate management levels through wild-horse removals and other-population control methods "(achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural controls on population levels))" [5]. Ideally, these removals would take place every 3 to 4 years on each HMA to meet population objectives. Excess horses are put up for adoption, but the majority are placed in pastures or permanent holding facilities costing the federal government in excess of $77 million per year. Generally speaking, only young animals (2 years old and younger) are adopted by the public, leading the BLM to increase the number of off-site holding corrals.

Euthanasia was allowed prior to 1980, but since that time, Congress has prohibited the use of federal funds to euthanize excess horses, other than those that are sick or lame. Implementing a full suite of contraceptive methods would assist in reducing reproduction rates.

As herd population numbers have increased, the condition of grazed vegetation and water resources in HMAs have decreased because of the non-selective way that wild horses feed, which also negatively impacts the ecosystem. Domestic livestock producers who run cattle in the same ecosystems are required to adhere to strict grazing management plans that outline grazing periods, timing, and rotation of animals. These principles are the basis of sound range management. Unfortunately, wild horses and burros are not managed with the same principles, which leads to a disproportionate amount of damage. Grazing permittees are routinely required to reduce Animal Unit Months (AUMs) to compensate for the

overpopulation of wild horses. Horses are also known to drive away competing livestock and wildlife from springs during drought years. This trend will only escalate as wild horses are allowed to increase without adequate active management.

The BLM in Utah manages 19 wild horse and burro herd management areas on nearly 2.4 million acres. The combined appropriate management level for all HMAs in the state is 1,956 animals. Utah has two contracted off-range corrals for wild horses (3,750), one off-range corral/pasture for wild burros (2,000), and one BLM corral facility (300) with a total holding capacity of 6,050 animals. As of May 18, 2022, these facilities are currently housing and caring for approximately 2,745 animals (2,455 horses and 290 burros). As of May 18, 2022, Utah also has one off-range pasture currently caring for approximately 476 wild horses near Fountain Green, Utah. Since 1971, the BLM has removed approximately 17,942 animals from public rangelands in Utah as part of its efforts to maintain healthy horses and burros on healthy public rangelands. BLM Utah has placed 9,288 wild horses and burros into private care since 1971. Animals removed from public rangelands are offered to the public for adoption; unadopted animals are cared for on open pastures for the rest of their lives. [6]

The Free Roaming Equids and Ecosystem Sustainability Network (FREES), located at Utah State University, is a group of diverse organizations working for a common goal of "healthy herds of free-roaming equids (wild horse and burros) on healthy rangelands." FREES seeks to enhance communication and engage diverse stakeholder groups in meaningful dialogue as they work to achieve equid and ecosystem sustainability. In 2021, FREES completed a survey titled U.S. Knowledge and Opinions of Free-Roaming Horses in 2020, which improved the State of Utah's understanding of public knowledge and how to guide future management. [7]

Forecast

Based on existing trends, wild horses will continue to encroach in areas outside the designated HMAs. The continued growth and expansion of resident herds will create increased stress on rangeland vegetation conditions and negatively impact overall herd health through reductions in viable forage areas. Persistent drought conditions will reduce water, forage availability, and habitat for wild horses, depleting the already stressed range.

Long-term wild-horse management objectives are designed to maintain wild horse populations within appropriate management levels while providing for the health of the wild horses and a healthy ecological balance with other resources. Under current conditions, wild horses are dying on the range from thirst and starvation, permitted livestock are being removed through the reduction of permitted AUMs, and the range is being destroyed.

Economic Considerations

The overall goal is to reach and maintain the identified appropriate management level for each HMA. Current management policies are failing, and wild horse populations continue to grow 20 percent per year, depleting ranges that will take years and millions of dollars to restore.

These impacts include, but are not limited to: decreased biodiversity in both plants and animals, decreased water yield and water quality; encroachment of woody and non-edible plants such as pinyon and juniper; increased erosion from both wind and water; decreased air quality due to dust particle pollution; unavailability of water for wildlife due to excess wild horses.

Direct monetary costs of excess wild horses include but are not limited to: restoration costs of rangeland treatments and re-seeding under arid and semi-arid conditions; loss of AUMs resulting in lost income and

unsustainability of ranching operations; and, negative economic impacts to communities reliant on agriculture.

The funding allocated and utilized to reduce populations on HMAs has been clearly articulated in the **Findings** section above.

Goals, Objectives, and Policies

Goal(s):

- Support *The Path Forward* strategy for management of wild horses and burros in Utah. This strategy calls for an upfront investment in gathers and fertility control that will eventually release the BLM from the costly cycle of roundups and holdings, while reducing the number of horses and burros on the range and making progress towards the agency-determined AML.
- Achieve and maintain the identified AML for each HMA.

Objectives:

1. Conduct targeted gathers and removals at densely populated HMAs to reduce herd sizes and make progress towards AMLs in Utah's wild horse and burro populations.
2. Treat gathered horses and burros with population-growth-suppression tools prior to being returned to the range. Reversible methods must be administered to an appropriate percentage of mares (generally close to 90%) to control populations, with some flexibility depending on modeling of range and herd parameters.
3. Relocate horses and burros in holding facilities, and those taken off the range, to large, cost-effective, humane pasture facilities funded through public-private partnerships.
4. Promote adoptions of wild horses to reduce captive populations and costs. The BLM is currently spending $2,250 ($3,250 with incentive) per adopted horse to promote adoptions that ultimately provide considerable cost savings to the agency. Adoptions save the BLM $1,850 per horse, per year [8]. Investing in the adoption process can reduce or eliminate up to $46,000 in lifetime costs associated with off-range holding of a horse.
5. Reanalyze AML on Utah HMAs.
6. Support efforts to gather, remove, and implement contraception methods in Utah's wild horse and burro populations.

Policies:

- Support wild horses in existing HMAs at appropriate management levels.
- Wild horses and burros should be managed for viable, healthy herds that will result in the thriving natural ecological balance (including standards and guidelines for rangeland health) and multiple-use, sustained yield.
- Immediately remove wild horses from private lands when notified of their presence as directed in the WFRHBA.
    - Immediate removal should be conducted in such a manner so that the animals will not return to the private lands from which they are removed.
- Immediate removal of wild horses and burros in trespass shall coincide with the same time frame granted to allotment owners or wildlife that is in trespass, 72 hours.
- Support the use of long-term fertility control as a means to reduce the growth rate of wild horses and burros in Utah. This is most effective once AML is achieved. Both gather-and-removal and contraception efforts must be simultaneously implemented.

- Support the restoration of AUMs to domestic livestock as wild horse populations are brought to AMLs and rangeland conditions improve.
- Consider any equine animal released from private lands, individuals, tribes, or neighboring lands onto public lands after 1971 "estray" as defined by Utah Code, Title 4 chapter 25, and deal with such animals accordingly.
- Support the Comprehensive Animal Welfare Program (CAWP) for the treatment of horses involved in gathers, off-site holding, fertility control, and adoption.
- Support the adoption of wild horses and burros and the gifting of horses to non-governmental organizations, or other proven organizations willing to provide humane care should adoptions fail.
- As directed by the WFRHBA, require federal agencies to consult with "the wildlife agency of the State wherein such lands are located in order to protect the natural ecological balance of all wildlife species… particularly endangered wildlife species" [10]. Meaningful consultation is not regularly occurring which needs to be corrected. The UDWR has experts and data ready to assist federal land managers in meeting their obligation of reducing negative impacts to sensitive and non-sensitive wildlife habitat throughout Utah.

State Code

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§ 63L-11-302. *Principles to be recognized and promoted.*

§ 63L-11-303. *Findings to be recognized and promoted.*

(3) transportation and access routes to and across federal lands, including all rights-of-way vested under R.S. 2477, are vital to the state's economy and to the quality of life in the state, and must provide, at a minimum, a network of roads throughout the resource planning area that provides for:

(a) movement of people, goods, and services across public lands;

(b) reasonable access to a broad range of resources and opportunities throughout the resource planning area, including:

(i) livestock operations and improvements;

(ii) solid, fluid, and gaseous mineral operations;

(iii) recreational opportunities and operations, including motorized and non-motorized recreation;

(iv) search and rescue needs;

(v) public safety needs; and

(vi) access for transportation of wood products to market;

(c) access to federal lands for people with disabilities and the elderly;

(d) and access to state lands and school and institutional trust lands to accomplish the purposes of those lands;

State Land Use and Management Plan for Federal Lands

§ 63L-8-104. *State land use planning and management program.*

Department of Agriculture

§ 4-2-102. *Department created.*

(1) There is created within the state government the Department of Agriculture and Food.
(2) The department created in Subsection (1) is responsible for the administration and enforcement of all laws, services, functions, and consumer programs related to agriculture in this state as assigned to the department by the Legislature.

Uniform Agriculture Cooperative Association Act

§ 3-1-1. *Declaration of policy.*

"It is the declared policy of this state, as one means of improving the economic position of agriculture, to encourage the organization of producers of agricultural products into effective associations under the control of such producers, and to that end this act shall be liberally construed."

Livestock Dealers' Act

§ 4-7-102. *Purpose declaration.*

The Legislature finds that the public interest requires regulation of the sale of livestock between the producer and a person who purchases livestock for resale to protect the producer from unwarranted hazard and loss in the sale of livestock.

§ 4-7-104. *Unlawful to act as an agent or dealer without license—Exception.*

Except as exempted by Section 4-7-105, no person may act as an agent or dealer in this state without being licensed under this chapter.

Agriculture Fair Trade Act

§ 4-8-102. *Purpose declaration.*

(1) The Legislature finds and declares that in order to preserve the agricultural industry of this state it is necessary to protect and improve the economic status of persons engaged in the production of products of agriculture.
(2) To carry out the policy described in Subsection (1), the Legislature determines it necessary to regulate the production and marketing of such products and to prohibit unfair and injurious trade practices.
(3) This chapter shall be liberally construed.

Conservation Commission Act

§ 4-18-102. *Findings and Declarations – Duties.*

(1) In addition to the policy provided in Section 4-46-101, the Legislature finds and declares that:

(a) the soil and water resources of this state constitute one of the state's basic assets; and

(b) the preservation of soil and water resources requires planning and programs to ensure:

(i) the development and use of soil and water resources; and

(ii) soil and water resources' protection from the adverse effects of wind and water erosion, sediment, and sediment related pollutants.

(2) The Legislature finds that local production of food is essential for:

(a) the security of the state's food supply; and

(b) the self-sufficiency of the state's citizens.

(3) The Legislature finds that sustainable agriculture is critical to:

(a) the success of rural communities;

(b) the historical culture of the state;

(c) maintaining healthy farmland;

(d) maintaining high water quality;

(e) maintaining abundant wildlife;

(f) high-quality recreation for citizens of the state; and

(g) helping to stabilize the state economy.

(4) The Legislature finds that livestock grazing on public lands is important for the proper management, maintenance, and health of public lands in the state.

(5) The Legislature encourages each agricultural producer in the state to operate in a reasonable and responsible manner to maintain the integrity of soil, water, and air.

(6) The department shall administer the Utah Agriculture Certificate of Environmental Stewardship Program, created in Section 4-18-107, to encourage each agricultural producer in this state to operate in a reasonable and responsible manner to maintain the integrity of the state's resources.

(7) The Legislature finds that soil health is essential to protecting the state's soil and water resources, bolstering the state's food supply, and sustaining the state's agricultural industry.

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