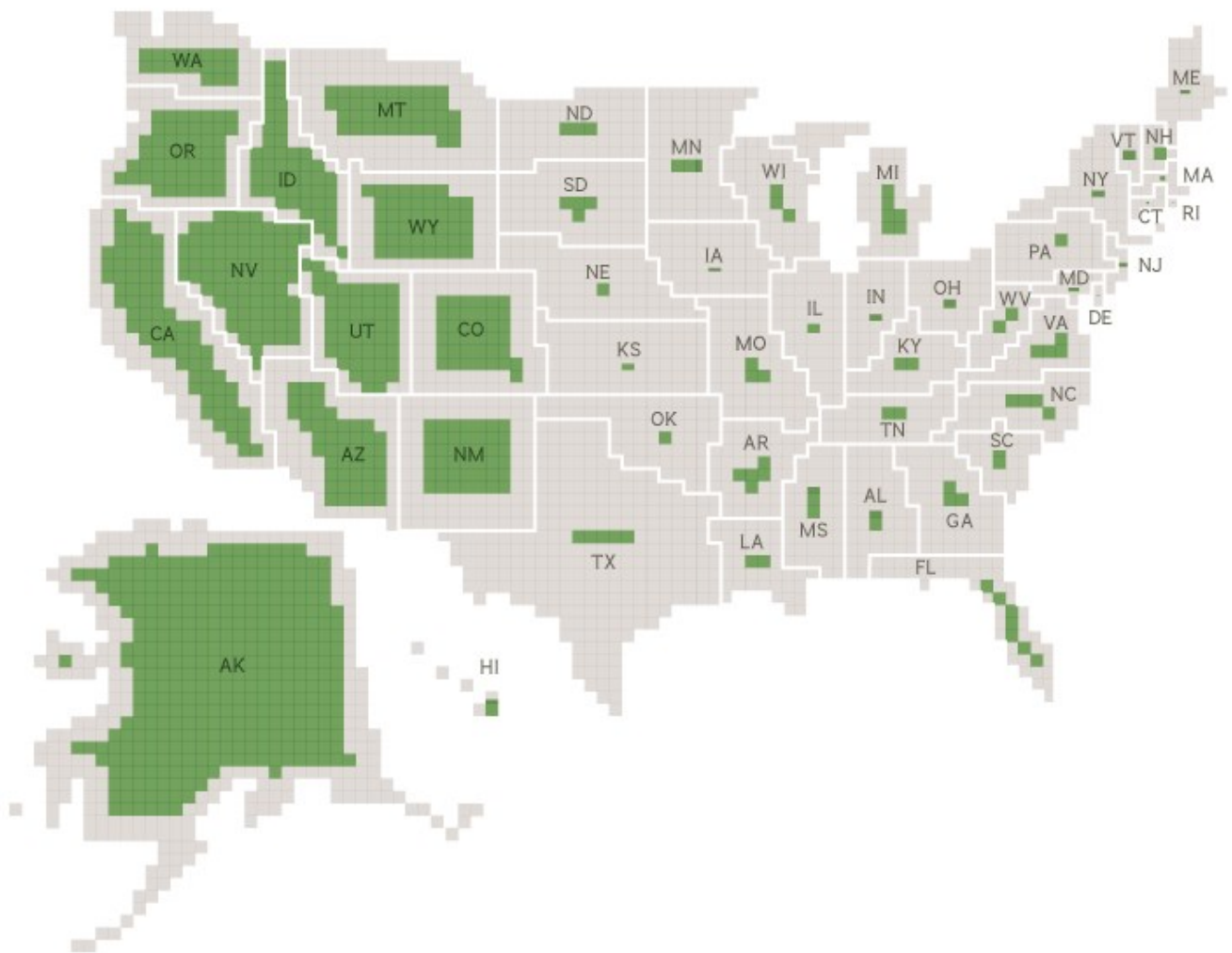




August 2016

A Feasibility Study of a Transfer of Federal Lands: Assessing the Triple Bottom Line



Department of
Civil & Environmental Engineering
THE UNIVERSITY OF UTAH

EXECUTIVE SUMMARY

This Study was prepared by University of Utah students enrolled in *CVEEN 3100: Technical Communications for Engineers* (Fall 2015). Students enrolled in this course identified various aspects of the proposed transfer of public federal lands to individual states by characterizing the most significant challenges that the transfer entails to civil and environmental engineers. Students worked in teams to compile individual reports, which comprise the chapters of this feasibility study. Teams coordinated with one another to ensure that research content, images, and technical data discussed in one chapter did not overlap with material in other chapters.

The primary artifact students used to research this topic was a nearly 800 page report that the Utah Legislature commissioned and titled *An Analysis of a Transfer of Federal Lands to the State of Utah* (2014). The principle task of this analysis examines the economic viability of a federal land transfer. Our feasibility study uses triple bottom line (TBL) assessment to determine, beyond economic factors, implications for private and public stakeholders including the necessary safeguards, which would need to be in place in order to ensure that the social and environmental dimensions of a land transfer are not overshadowed by economic pressures alone. Ultimately, the research question of this feasibility study asks: What significant benefits and consequences does a federal land management transfer pose to the State of Utah, and what safeguards are necessary to ensure that an equitable triple bottom line is achieved?

A note on the triple bottom line: the TBL concept is an increasingly important framework for evaluating and recommending policy decisions in Western land use decision making. As a research method, the TBL considers three aspects of land use policy planning: People, Planet and Profit. These criteria, also referred to as the 3Ps, attempt to strike a balance between the social (people), environmental (planet), and economic (profit) dimensions of land development and provide a clear criteria for basing recommendations that encourage sustainable development, ethical responsibility, and the long-term health and welfare of a given community or ecosystem. The TBL framework emerged initially out of the fields of accounting, economics, and sustainability studies and has been adopted by a variety of governmental, nongovernmental organizations, and for-profit agencies. Recently, TBL has become appropriated within the fields of civil and environmental engineering as a way to research, assess, draw conclusions, and base feasibility recommendations on an array of research topics spanning public urban infrastructure to water supply planning. In each case, TBL assessment criteria provide researchers with a methodological framework for approaching large-scale, multidimensional research questions in a comprehensive and systematic fashion.

Chapter Outline

Chapter 1 “Introduction: Public Opinion and the Federal Lands Transfer” introduces the land transfer issue by examining attitudes of the general Utah public and their views regarding a potential transfer. Chapter 2 “Are Forest Service Lands Mismanaged?” asks a similar question regarding the US Forest Service as a land manager. Specifically, Chapter 2 asks: “Is the US Forest Service mismanaging the national forest and would Utah be a better manager of these lands?” Chapter 2 then outlines 1) historic and contemporary public opinion regarding Forest Service

management uses and practices, 2) addresses how the Forest Service deals with complications in differing management philosophies, 3) characterizes the primary stakeholders most effected by a potential transfer, and, lastly, 4) accounts for potential conflicts regarding the enforcement of federal laws and regulations at the state level. Chapter 3 “On the BLM and SITLA” offers a point by point comparison on a federal (BLM) and state (SITLA) land management agency in an attempt to characterize how land management might change if federal lands ever were to be transferred to individual states. Chapter 4 “Public Accessibility on State vs. Federal Lands” makes a similar comparison as Chapter 3, but focuses less broadly on public land management, and more specifically on land access issues.

Chapter 5 “Utah’s Natural Resources: How Utah can Remain Environmentally Ethical while Economically Strong” tackles head on the issue of economic expediency of a transfer by researching the economic and environmental impacts to natural resource extraction industries such as timber, oil, and renewable energies. Organized as an ad hoc case study, Chapter 6 “Consequences of the Land Transfer on Water Quality: An Examination of Logging, Hydraulic Fracking, and Tar Sands Mining” considers effects that increased timber, gas, and oil harvesting activities will have on water quality. Specifically, this chapter: examines effects of 1) logging practices will have on surface runoff, and how this affects surface waters, 2) hydraulic fracking on quality and quantity of water, both above and below ground, and 3) tar sands mining on the quality subterranean springs and aquifers. In the concluding chapter of the Study, Chapter 7 “State versus Federal Land Management: Which Approach Benefits the Land and the People of Utah More?” offers a tentative summary of whether Utah or the federal government is better poised to manage federal lands held within the state. This chapter also analyzes state versus federal management as it pertains to wildfires, permitting, and grazing in an attempt to characterize the federal approach to land management and the likely approach that Utah would take if they gained control of these public lands.

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August 2016

SERIES EDITOR'S PREFACE

This feasibility study is part of an ongoing series that investigates large-scale, land and civil works issues germane to the Intermountain West. This is the third study in the series; all three studies are housed in the USpace Institutional Repository at the J. Willard Marriott Library on the University of Utah campus. All studies in the series were researched and written by students as part of their final course grade; I simply facilitated the research design and compiled the individual chapters once they were finalized. I firmly believe that student-led research is an important, and underutilized, aspect of civic engagement since it is not motivated by (overt) political or industry pressures. These students should be commended for their efforts at understanding and contributing to the ongoing dialogue that shapes our collective future.

As this Study is a compendium of student writing, I have made every effort to maintain the tenor and style of their work. At times, however, I have made minor revisions and omissions from their original drafts. Any changes I have made occurred within three general categories: redundancy, language use/grammar, and formatting.

Redundancy Occasionally, certain words or phrases would appear either out of context or in an inopportune place such as a title or subheading. The most common example of redundancy occurred with the use of acronyms for governmental agencies.

Language use/Grammar While compiling the Study, a grammatical error would appear on the page, and I accepted/rejected glaring typos that the spell check function highlighted. I must be clear: I did not *proofread* the document; rather, I would make a trivial typographical correction if I happened upon it.

Formatting The most significant edits I made involved formatting and organization. Occasionally a chapter was numbered incorrectly and I manually changed the numbering to ensure for overall consistency. Such changes no doubt have affected in-text referencing, etc. Other instances occurred when a sentence or passage needed to be shortened so that subheadings laid out correctly. In each case, I tried to maintain the integrity of the original, while editing only as much as required of final copy.

This Study represents a serious attempt by undergraduates to combine the technical writing skills we studied in the course of a semester with the expectation and level of expertise required of civil and environmental engineers. The students, for their part, were professional, serious, and intelligent, and I am immensely proud of the work they accomplished.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	ii
Joshua B. Lenart	
SERIES EDITOR’S PREFACE	iv
Joshua B. Lenart	
<u>CHAPTERS</u>	
Section I: Introduction	
1. Public Perception: Opinions on Key Aspects of the Federal Lands Transfer	1
Ryan Betz, Ariel Froerer, and Sierra Gentry	
Section II: On Administrative, Philosophical, and Practical Differences	
2. An Examination of Forest Service Philosophy and Stakeholders: Are National Forests Mismanaged?	25
Laura Alley, Ashlee Hilton, and Claire Kennington	
3. Comparison of State and Federal Land Management: SITLA as a Model for BLM Land Transferred to the State	49
Ian Boyd, Scott Barker, and Michael Smith	
4. Public Accessibility on State Lands versus Federal Lands: Implications of a Federal Land Transfer to the State of Utah on Public Access	72
Korey Walsh, Daniel White, and Brandon Quinton	
Section III: On Natural Resource Use, Development, and Consequences	
5. Utah’s Natural Resources: How Utah Can Remain Environmentally Ethical While Economically Strong.....	97
Chanse Sadler, Dustin Kimbrough, and Grant Shaffer	
6. Consequences of the Land Transfer on Water Quality: An Examination of Logging, Hydraulic Fracking, and Tar Sands Mining	120
Chad Jones, Dustin Paulsen, and Alex Lamb	
Section 4: Conclusion	
7. State versus Federal Land Management: Which Approach Benefits the Land and the People of Utah More?	142
Jenny Calderon, Alan Palmer, and Brian Naylor	
AFTERWORDS: A NOTE FROM THE EDITOR ON FINAL ASSESMENT SCORES	169
APPENDIX 1: TRIPLE BOTTOM LINE FINAL ASSESMENT SCORES	170

Cover Image: A cartogram representing public land ownership by state where each grey square= 1,000 square miles and each green square=Federal land

Image Credit: NG Staff, Congressional Research Service

Image Source: B.C. Howard, "Why Federal Lands Are So Wildly Controversial in the West," *National Geographic*, 4 January 2016. [Online]. Accessed: <http://news.nationalgeographic.com/2016/01/160104-oregon-protest-malheur-national-wildlife-refuge/>.

Chapter 1

Public Perception: Opinions on Key Aspects of the Federal Lands Transfer

Abstract

Utah H.B. 148, or the Transfer of Public Lands Act, seeks to transfer 31.2 million acres of federally owned public land to the state of Utah [1]. This Act rests on the idea that when Utah was inducted as a state, the federal government gained only temporary control of the land, thus validating Utah's claim. As of November 2015, none of the proposed 31.2 million acres have been transferred.

To assess a transfer, the Utah Public Lands Policy Coordination Office commissioned *an Analysis of a Transfer of Federal Lands to the State of Utah* in 2014. Prepared by a team of researchers from Utah State University, the University of Utah, and Weber State University, the report analyzed the impacts of a lands transfer with emphasis on economic viability. The report concluded that, "from a strictly financial perspective, it is likely the state of Utah could take ownership of the lands and cover the costs to manage them" [1], though it further acknowledges that a complete understanding of the impacts of the transfer is impossible. The following feasibility study attempts to address key issues affected by a possible transfer beyond an economic and financial perspective. Specifically, the impacts of a transfer will be assessed from an environmental and social perspective. This report does not aim to reach a specific conclusion on the public lands transfer; rather, the goal is to expand the conversation on the transfer to include Utah residents and the issues most relevant to them.

This chapter introduces the six main topics addressed in this report: public opinion, forest service land management, Bureau of Land Management and School and Institutional Trust Lands Administration management, public accessibility, natural resources, and water quality. For each topic, this chapter used sources including polls, surveys, and official documents to establish a basic understanding of the public's opinion in each area. Details of each topic are further explored in successive chapters.

Chapter one further addresses the likely public acceptance of a transfer based on polls and opinion specifically targeting a transfer. Public opinion shifts depending on the organization conducting the poll, the timeframe, and the questions and content. Though a decisive conclusion is not reached, the existing data helps gauge overall public sentiment and concerns regarding a transfer.

1.1 Chapter Introduction

This chapter analyzes the opinions on not only the land transfer itself, but the issues that will be affected in the event of transfer. A diverse variety of polls and surveys will be analyzed, and potential sources of bias will be interpreted and discussed. Any lack of clarity within poll findings will also be noted, showing that while a poll may appear to be unbiased, there may still be an underlying distortion altering the data. Though the future of the public land may reside in the hands of elected officials, ethics demand that public input be considered. This chapter defines “public” as all residents of Utah, except when specifically discussing residents of other states.

1.1.1 Envision Utah

One of the key surveys used for analysis was *Your Utah, Your Future* created by Envision Utah [2]. Over 52,000 people in the state of Utah were surveyed regarding eleven separate subjects including public lands, recreation, and water. The size of the survey adds credibility to the presented results. Envision Utah also published random samples to show that no major bias was present in the process of surveying. It sought to gather opinions regarding Utah’s future. These results are used throughout the report to understand and develop public opinions on the future of Utah’s public lands.

1.2 Federal Versus State Management: Opinions on the Overall Land Transfer

This section overviews both public and official opinion on the transfer as a whole. Polls and surveys may not accurately represent the views of all residents or may represent a specific segment of the population.

1.2.1 Official Opinions

Opinions of state and local officials have been critical of the federal government at varying levels. Government backers of a federal lands transfer commonly cite the perceived failures of certain federal agencies in managing the lands, and the lack of connection they have in the realities of life for local residents. Regarding state legislator

opinions, Congressman Chris Stewart, a proponent of the federal land transfer, said in a press release:

The federal government has been a lousy landlord for western states and we simply think the states can do it better. If we want healthier forests, better access to public lands, more consistent funding for public education and more reliable energy development, it makes sense to have local control. [3]

Leading a forum discussing public lands, Stewart also remarked:

...many of those who make decisions about western public lands will never actually visit those lands or understand the impact of their decisions in more than an academic sense. [4]

This idea of “local control” suggests that these senators understand what is required to maintain the land better than federal entities. There is complete validity in this argument considering local politics. The state elected representatives and officials are just that -- representatives. Therefore, at least theoretically, the opinions that the state officials hold reflect those of the majority of the state. Similarly, seeing the actions, or lack thereof, of the federal government regarding these public lands with a first hand account supports the argument for state control. If the federal government is a “lousy landlord” in the eyes of the state government--the same government who claims to understand and interact often with the land--the state officials imply that they can better maintain the land in question.

At the same forum, witness Pete Obermueller of the Wyoming State Commissioners Association claimed:

...often states and local governments are better managers of the resources we care so deeply about in the West. It is frustrating to be charged by your constituents to manage the health and economic welfare of your county, but be stymied by federal agencies that do not always share those values. [4]

Congressman Rob Bishop reasoned:

Utah is a public lands state and always has been a public lands state. To us, public lands means local people get to make decisions on how the public land is

used. Federal management means it is owned and controlled by someone here in Washington, and that is a big difference. [5]

These views express a desire to improve the way lands are handled for their constituents, on the belief that a more local approach will be tailored to local needs. A strong distrust of the federal government is evident due to perceived inability to relate and react to the realities of discrete regions, such as Utah. With a dissatisfaction on federal management, from forest fires to lack of resource development, H.B. 148 backers seek to responsibly develop the state's natural resources to fund poorly managed lands and generate revenue for education.

It is worth noting the redundancies in the above statements. While it may be true that local input and control better serves local communities, this support is not enough to convince the federal government that the state government could maintain and operate the land better. Obermueller claims that state and local government are "better managers," but the lack of proof makes this statement questionable. Likewise, the statement is vague, not considering all the aspects and requirements for management and maintenance.

Skepticism of the elected officials representing those who elected them is introduced with Bishop's statement that "public lands means local people get to make decisions on how the public land is used." However, many of those local people wish to keep the public land public [6]. To those surveyed, public land means "the public's land". They feel that, regardless of control, public land should be open and accessible to all. The local decisions treat land as a public entity, open and available to the general public, who will be happy with continued access to the lands.

Not all state leaders are in favor of a lands transfer. In a joint resolution between the Salt Lake City Council and Mayor, it was resolved that the Council and Mayor were in opposition "to the transfer of shared public open lands that belong to all Americans" [7].

The resolution cited the use of the lands by residents to escape from their daily routines, spending quality time with family and friends enjoying activities not available in urban areas, considering federal public lands “treasured open spaces”. The resolution criticized the waste of taxpayer dollars fighting for a transfer, and noted the high probability of a transfer being declared unconstitutional [7].

This resolution confirms that there is considerable room for disagreement in the state government on whether a lands transfer is in the best interest of the State. Rather than touting that “local control will solve everything”, the council and mayor of Salt Lake City show that they are willing to listen to their residents, conserve taxpayer funds, and do what is best for Utans, even if that means letting lands remain under federal control and reap the benefits of federal funds spent in Utah.

1.2.2 Public Opinions

Since the most recent revival of the land transfer movement in Utah, multiple groups have conducted polls and surveys on a possible land transfer in Utah and surrounding states. Many of these organizations have a direct interest in the outcome of the transfer, and the results vary depending on survey pool, style and question.

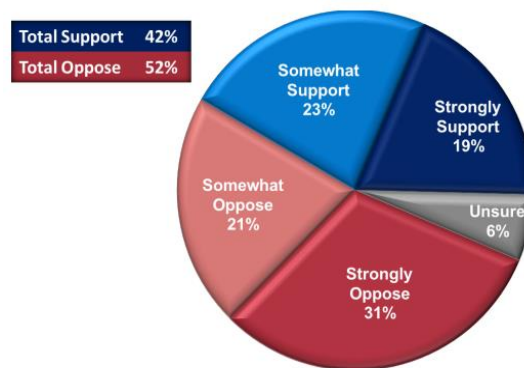


Figure 1.1: Views of State Government Assuming Control and Costs of Public Lands Managed by National Resource Agencies [8].

FM3 and Public Opinion Strategies conducted a poll in 2014 to assess public opinion on management of federal lands and potential land transfers. The results are shown above. Though the poll was taken in multiple states, it provides a snapshot of opinion in Utah. The poll contacted 200 registered voters in Utah. Fifty-two percent of Utahns polled stated that they would favor having state government and taxpayers "...assume full control of managing these public lands, including paying for all related costs..." [8]. Unlike some researched polls, this one did mention the cost of a transfer in the question, likely reducing the number of transfer supporters compared to other polls that do not mention the cost. This poll also asked whether voters characterized lands in the transfer--like national parks and wildlife refuges--as "American" or "state" places. Seventy-four percent of respondents from all states said that the lands are more "American" than "state" places. This may be one of the primary factors underlying public opinion of the transfer [8]. If public lands are perceived as belonging to the entire nation, there is limited justification for a transfer to state control.

A 2014 poll commissioned by UtahPolicy.com and conducted by Dan Jones and Associates found that when asked, "Do you support or oppose the state government filing a lawsuit against the federal government to take control of BLM lands?," 54% of Utahns responded with either "somewhat support" or "strongly support." The poll had a 4.86% margin of error. Unlike the previous poll, the cost of the transfer was not addressed [9]. Future polls and surveys could analyze public understanding of the transfer and its implications.

In *An Analysis of a Transfer of Federal Lands to the State of Utah*, the authors address public opinion based on several sources. Incorporated 2007 survey data observes the connections between public lands and economic and social resources. Report creators conducted a separate poll, which was discussed in section 1.2. The report also cites a 2013 survey addressing public lands in the Rocky Mountains. It does not cite polls regarding state versus federal control of the land. Newer surveys deal more directly with

the land transfer, but the results of the 2007 survey on public lands helps inform the newer polls and explain why certain questions or poll styles have different outcomes [1].

1.3 Attitudes towards public forests and U.S. Forest Service practices

The United States Forest Service (USFS) manages over 8 million acres of national forests within Utah. Of these acres, only those designated as wilderness areas—roughly 776,000 acres—would remain under the authority of the USFS if a transfer occurs [1]. Chapter 2 of this report discusses in further detail the current USFS management, conflicts between management policies, and stakeholders and regulations likely to be impacted by a land transfer. The following section briefly addresses public opinion on USFS management and attitudes to public forests in general.

1.3.1 Public Opinion on Forest Service Practices

In 2000, the USFS published the findings of a two year telephone survey process to assess U.S. public attitudes towards land management, conservation, use, and the role and success of the USFS. The survey was designed to inform the agency's 2000 Strategic Plan. Despite the time since its publishing, the survey provides a rough overview of the public's view of USFS practices [10].

One of the key strategic goals the USFS laid out in the survey addresses restoring and maintaining forests and grasslands in a "...healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species" [10]. All these are issues impacted by a possible land transfer. When asked about the role of the USFS in achieving the goal of preserving lands, the national average response was 4.53 (standard deviation 0.93) on a scale from one to five, one being "strongly disagree" and five being "strongly agree." When asked about the performance of the USFS in this area, the national average response was 3.90 (standard deviation 1.16) on a scale from one to five, one being "very unfavorable" and five being "very favorable." In questions addressing natural resources protection, preservation of wilderness, and making

decision at a local level, responses followed similar patterns. The survey respondents stated that the USFS should have a role in these areas or that these areas are important, and its past performance is more favorable than unfavorable [10]. If the majority of Utah residents consider the USFS as adequate, they might be more likely to support a transfer. Because forest maintenance and health are important to the public, Utah would likely need to prove that state management would equal or improve upon current USFS management to get public support.

Official legislative opinion on the USFS has recently focused on the failure of the forest in managing wildfire hazards. A September 2015 memo from the majority committee staff to the entire Committee on Natural Resources highlights several key opinions of legislative groups. The memo states that the USFS has insufficiently managed forests, and that “Federal agencies continue to neglect the necessary management that would reduce the threat of wildfires in the West” [11]. Rob Bishop, the head of the Committee, is a strong proponent of the land transfer. Despite these opinions at the official and policy level, Westerners may still generally approve of the USFS. In line with the previous USFS poll, a survey of residents in eight western states--including Utah--conducted by FM3 and Public Opinion Strategies in 2014 found that 73% of respondents approved of the forests service and the general job it is currently doing [12]. If support is strong for the forest service, the public may be less likely to support a transfer.

1.3.2 Attitudes Toward Public Forests

A brief 1995 Associate Press article in the *Seattle Times* presents the results of a national poll produced by the USFS and conducted by an outside firm. The poll concluded that 79% of respondents agreed that, “...the long term health of public forests should not be compromised by short-term need for natural resources” [13]. A large 2014 survey of Utah residents conducted by Envision Utah found that 54% of respondents agreed public lands should have, “...a balance of high and low-impact uses” [14]. *An Analysis of a Transfer of Federal Lands to the State of Utah* identified “Health Forest Management”

as priority number five in a list of six priorities based on a survey of 17 Utah counties [1]. The survey was distributed to county commissioners and other county leadership. The first four priorities are: “keeping public land open and available to the public,” “mixed-use land management,” “more local authority in public land management,” and “return of the timber industry” [1]. The sixth priority is “rural road and ATV trail expansion and maintenance” [1]. The Utah leaders represented by this survey generally support managing lands to maintain healthy lands and fill human needs. The question at the heart of the transfer is whether the state or the federal government can better meet those goals.

1.4 BLM and SITLA Land Management Practices

The Bureau of Land Management (BLM) is a federal agency that manages more public lands than any other federal agency [15]. Most of these lands are located in the Western states, and about 22.8 million acres of Utah are owned by the BLM. Utah would gain control of most of these lands in the transfer. The School and Institutional Trust Lands Administration (SITLA) is a state agency overseeing about 3.4 million acres of land in Utah. SITLA provides an example of current state land management practices and may even take control of public lands, including many BLM lands, if a transfer takes place [1]. Chapter Three of this report further compares the practices and roles of these two organizations. This section briefly examines public opinion of the two agencies and land management.

In the FM3 and Public Opinion Strategies survey discussed in Section 1.2.1, 48% of respondents approved of the way the Bureau of Land Management (BLM) is currently doing their job [12]. The major analysis report of the transfer commissioned by Utah notes that in surveys of 17 Utah counties, people generally felt that current management under the federal government had a number of problems.

Most counties feel the federal government is not sensitive to local concerns and priorities. No single county expressed explicit appreciation of current federal management, but some did note their satisfaction or indifference toward current federal management. In most cases each county wanted local representation and management of the land in their counties. Some even expressed concern that under

state control, there still wouldn't be enough local authority in the management of public lands. [1]

This statement highlights that one of the main concerns of county leaders is increasing local involvement in public land management decisions. This does not directly address the BLM, but given the proportion of federal land in Utah controlled by the agency, it is likely that general public opinion on the BLM follows a similar trend. The BLM is often criticized for ignoring public concerns and input, but the results of the survey suggest that some Utah residents do not agree a land transfer would improve local control.

Various groups have criticized SITLA in recent years, particularly for not getting sufficient public input on major decisions. *The Salt Lake Tribune* ran an article in 2013 about SITLA's decision to lease land in the Book Cliffs for oil exploration without gathering public opinion. Though the lease was delayed, several individuals, including the vice chairman of the Grand County Council and previous BLM employee, criticized the move because of its lack of public input. The public often views the BLM as a group operating with limited public oversight and input. SITLA may be increasingly viewed the same way [16]. If the state can demonstrate that management of the lands will involve more local voices after the transfer, public support could increase. Support may decrease if SITLA's management is not an improvement.

1.5 Public Opinion on Access and Recreation

Utah residents as a majority are concerned about continued access to and protection of their public lands. The state-commissioned *An Analysis of a Transfer of Federal Lands to the State of Utah* report contains survey results and conclusions presented in this section. Tables 1.1, 1.2, and 1.3 represent resident opinions on various topics.

Table 1.1: Importance of Hunting/Fishing/Motorized Recreation to Residents (Protected Land) [1].

Overall Importance Rating	County Protected Acres				
	Highest	High	Medium	Low	Lowest
Low	16.3%	22.3%	20.3%	29.0%	15.7%
Intermediate	24.1%	31.2%	31.2%	26.5%	26.5%
High	59.6%	46.5%	48.6%	44.6%	57.8%
No. of Responses	646	767	873	801	502

Table 1.1 presents ratings on the importance of hunting, fishing, and off-road motorized recreation opportunities on public lands, as contributors to community quality of life, by county-level protected land acreage. Similar tables were presented for USFS, NPS, BLM, and Wilderness Area land types. Percentage results did not fluctuate greatly, and the analysis report concluded that there was not a meaningful association between types of public land and resident ratings on the importance of hunting/fishing/off-road motorized recreation to quality of life [1]. Essentially, it was consistent across public land types that these types of recreation are largely valued by Utah residents.

Table 1.2: Importance of Habitat and Biodiversity Protection and Nonmotorized Public Land Use to Residents (Protected Land) [1].

Overall Importance Rating	County Protected Acres				
	Highest	High	Medium	Low	Lowest
Low	23.9%	20.7%	23.6%	14.8%	22.8%
Intermediate	43.0%	42.6%	39.1%	42.9%	45.9%
High	33.1%	36.8%	37.3%	42.4%	31.3%
No. of Responses	602	721	804	765	451

Table 1.2 reflects county-level residents' ratings on the importance of habitat and biodiversity protection, and nonmotorized uses of public lands as quality of life contributors, by county-level protected acreage. Again, these tables were also created for each of five contexts of public land, and the report concluded there was not a significant association between public land context and the importance of habitat and biodiversity protection and nonmotorized use. The majority of Utah residents found the issues important on at least an intermediate level [1].

Table 1.3: Residents’ Levels of Agreement that Natural Settings on Public Lands Provide the Best Opportunities to Recreate (Protected Land) [1].

Level of Agreement	County Protected Acres				
	Highest	High	Medium	Low	Lowest
Strongly Disagree	1.9%	1.6%	2.3%	1.6%	1.6%
Somewhat Disagree	4.5%	3.7%	3.5%	2.8%	3.7%
Unsure	10.7%	14.1%	16.3%	13.8%	13.1%
Somewhat Agree	29.4%	31.6%	34.2%	34.0%	34.4%
Strongly Agree	53.5%	49.0%	43.6%	47.7%	47.3%
No. of Responses	673	794	906	849	512

Table 1.3 reflects resident levels of agreement that “Natural settings on public lands provide the best opportunities to enjoy” their favorite activities, by county-level protected land acreage [1]. Results were gathered in similar tables for each of the five land contexts (protected land shown). The report concluded that public land context made no meaningful difference on Utahns agreement that public lands are important in providing opportunities to enjoy their favorite activities; a large majority of residents agreeing the lands are they best opportunities for such [1].

Chapter 11 of the Land Transfer Report summarizes that there appears a positive relationship between presence of “natural amenity” and public lands, and county-level population growth. Natural amenity and public lands presence also had positive relationships with employment growth, income growth, and in-migration [1]. Thus, it could be said the claim that areas abundant in natural beauty draw people to live in those areas is a statistically-supported claim.

1.6 Utah’s Natural Resources: Coal, Oil, and Timber

The public land currently held by the federal government in Utah is rich in natural resources. Coal, minerals, uranium, and oil are among the common non renewable sources, accompanied by the potential renewables such as timber and renewable energy sources. In conjunction with chapter 5, this section focuses on coal, oil and timber. The following section introduces public opinion regarding the use of these resources, while acknowledging that many views are either divided or biased depending on the source.

1.6.1 Coal: Energy Dominance

Coal is significant in Utah; over 75% of the energy produced in the state of Utah is generated from coal-fired power plants [17]. According to the *Envision Utah* survey, 43% of those surveyed wish to see a transition from coal reliance to natural gas, 36% support diversifying electricity generation with natural gas, nuclear, and renewable sources, and 23% wish to increase renewable sources as a whole [2]. The way the results are presented, every option shows a reduction in coal. In fact, there does not seem to be a survey option to keep coal as the dominant energy source. This lack of option assumes that every individual in Utah wishes to see a reduction in coal energy production. This may be true, but outright denying the option for energy production to remain as it is produces a bias that may invalidate some of the specific percentages reported. With coal dominating Utah's energy sector, support remains for coal use and production. Disregarding this choice skews the results towards a renewable bias, thus making the survey results for this particular section questionable at best.

Economically speaking, as of July 2015, coal is Utah's least expensive source of energy, so any reduction in coal power will likely cause an increase in energy prices within the state [17]. The *Envision Utah* survey shows that the more expensive the energy source, the fewer people who support the idea of switching to it. However, each option given shows a reduction in the coal energy production, resulting in the idea that "people want cleaner power generation, but they do not want to give up affordability to get it" [18]. This shows that while environmental concerns are addressed, the primary concerns are economical. Therefore, if cheaper energy could be produced within Utah that is also cleaner than coal, it is likely that most Utahns would support this. Assuming that a majority of the state is in support of reducing coal production, the option to mine large coal reserves within the land proposed for the federal land swap would either not contribute to the public opinion supporting the trade, or even reduce potential support.

1.6.2 Oil Extraction and Awareness on Public Land

There are split opinions regarding using the current public lands for oil extraction. Sixty-two percent of those surveyed believe that “environmentally sensitive places on public lands should be permanently protected from oil and gas drilling” [6]. However, it is not clear how those surveyed feel about the non vulnerable land, or the public land as a whole considering oil extraction. Fifty-nine percent of those who participated in this survey were in support of limiting oil extraction and drilling near water, wildlife, and recreation areas.

As of 2014, 13.2 million barrels of oil were extracted from Utah’s federal lands [19]. However, in a 2013 poll, approximately two thirds of those polled “were not aware that drilling [was] taking place on public lands” [20] [21]. The lack of awareness, thus the lack of public input, makes using such land for extraction questionable. If it is found that a majority of the state supports such a use for the land, then it would be politically ethical to continue. However, without public input, the public land may be questionably used.

While general public opinions on oil extraction are not prominent, the opinions held by Utah’s elected officials are clearly stated. Ken Ivory and Rob Bishop, both Utah State Representatives, strongly support transferring the public land into the hands of the state. One of the common reasons the representatives support such a transfer is the estimated economic benefits derived from oil extraction [1]. The validity of these statements will be further discussed in Chapter 5. The uncertainty held by the general public greatly contrasts with the definite stance of several of the officials who may ultimately vote on the issue. Especially with the oil industry, it is important that a consensus be reached, allowing the land to be used in a way that benefits not only a majority of residents now, but future generations. How to treat the land to ensure this is not yet clear.

1.6.3 Timber Use and Concerns

Forest fires tend to be frowned upon. And with neglected forests and human negligence, forest fires are becoming a frequent and costly issue [22]. Chapter 5 will discuss this further, but for a brief background, public officials have proposals for thinning out and better managing the public forests in Utah to prevent or mitigate forest fires and their effects [23].

A primary concern regarding forest fires is smoke, and how the resulting pollution may result in adverse health effects. A 2013 study conducted by the University of Idaho supports the notion that people feel they are directly and negatively impacted by forest fires [24]. Air quality issues result from forest fires, and the smoke often reaches far, non-local areas. The proposal to thin the dense and overgrown forests in an attempt to reduce fire impacts is not new, nor are the concerns held by individuals on air quality and fire danger [25].

Countless nonprofit organizations have vocalized their distaste for the thinning forests, but few acknowledge the idea that, at least according to the forest service, this is done primarily for an environmental benefit, not for supporting logging companies [26] [27]. The opinions vocalizing concerns for thinning contrast with those opinions that support reducing forest fires. This discrepancy results in a lack of clarity on the issue. Chapter 5 will further develop on the ideas of forest fires and their correspondence or lack thereof to the forest thinning, thus giving the public access to unbiased and researched data. This will help to clarify unknown or unclear factors.

1.6.4 Renewable Energy

As shown in Section 1.6.1, those surveyed by Envision Utah wish to see an increase in renewable energy. Utahns want cleaner energy, but at a lower cost. The issue here is that, as of 2015, coal is the cheapest energy source per megawatt-hour. Onshore wind, however, is a close second. This information shows that clean energy is more expensive than the coal that Utah predominantly relies on. Whether or not the desire for cleaner

energy is greater than that of cheaper energy is a question that does not have insight on yet. But if renewable energy is important to the state of Utah, as Envision Utah asserts, the most economically stable source would be one dominated by wind [1]. But as investments in renewable sources increase, and as the cost per megawatt-hour decreases, it is predicted that the cost for coal produced energy will exceed that of renewable sources, especially wind [28]. The cheap energy also encourages more business development within the state [1]. Further business and company expansions can support the economy, and provide more job opportunities for the increasing population.

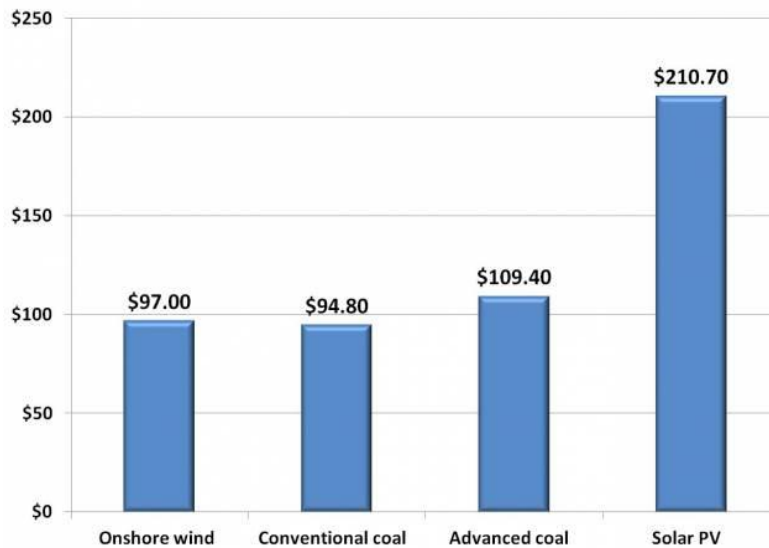


Figure 1.2 Costs of Energy Sources (\$/megawatt-hour) [29] [30].

However, this cost does not take into account the cost for creating new infrastructure, nor does it account for land usage. This is where the leveled energy costs, or LEC, can be considered [31]. The LEC analyzes the cost per kilowatt-hour of both the energy itself, along with the initial and return costs for the facilities that produce the energy. With information available from the department of energy, the LEC costs for the more popular coal, wind, solar, and even bio-fuels are all approximately equivalent. This, along with more support and research going into clean energy development, shows a promising economic stance for renewables [28]. Ultimately, as efficiencies increase for

the renewable sources, reliance will likewise increase, costs will reduce, and the people of Utah will be more satisfied in their energy sources.

Table 1.4: Leveled Energy Cost With Respect to Power Plant Type [31].

Power Plant Type	Cost \$/kW-hr
Coal	\$0.10-0.14
Natural Gas	\$0.07-0.13
Nuclear	\$0.10
Wind	\$0.08-0.20
Solar PV	\$0.13
Solar Thermal	\$0.24
Geothermal	\$0.05
Biomass	\$0.10
Hydro	\$0.08

One important aspect of any energy source that needs to be considered is the land usage. In order for Utahns to make knowledgeable choices regarding their energy future, they need to be fully aware of the cost, environmental impacts, and the expansion of land use. Eighty-seven percent of Utahns surveyed showed that they were willing to allocate some of the state owned land for the production of renewable sources. It is therefore likely that a majority of the state would be willing to use some of the current federal land for energy development in the event of a transfer. If some of the land in question were to be used to support clean, renewable energy, there may be more cause for support. However, with the officials backing coal and oil production, this may not be the case.

1.7 Water: Support and Concerns

Water rights issues in Utah are nothing new. However, as will be discussed further in chapter 6, new concerns are developing with respect to how the federal land transfer will affect Utah’s use and access to water.

1.7.1 Water Quality

Most Utah residents value water quality. The Envision Utah survey listed, “Maintain and improve water quality in watersheds and water supplies” as one of the six goals of respondents regarding water quality [1]. Currently, there are certain requirements that

drinking and wastewater must meet due to EPA regulations and state enforcement. Despite these regulations, there is a concern about water quality deterioration if development increases on public lands after a transfer. The rivers, streams, lakes and other sources of water on public lands may eventually flow into the drinking water system. If a transfer is likely to degrade water quality, public support for the transfer may decrease.

1.7.2 Water Quantity

According to a survey released by Colorado College, 82 percent of Utah residents are concerned about having an adequate water supply [1]. The poll also shows a strong preference for conserving the water, as opposed to diverting water from rivers [32]. While the exact reason for these views is unclear, Utah is the second driest state in the US and uses the second most water per capita [33]. Concern about water availability will increase as the state's population increases. There is also pressure, especially on state officials and legislators, regarding water rights from the Colorado River. With both of these issues, it makes sense that a majority of the state wishes to reduce water consumption to preserve resources [34]. As stated in Utah's full report on the transfer, to make it economically feasible, further resources would need to be developed. This will likely increase water usage on the public lands, even with careful management. If the increase is significant, the impacts of the transfer will be at odds with the views of Utah residents.

1.8 Discussion

A general consensus on the land transfer and the associated aspects has not been reached. While dominate opinions do exist, both the views and strength of those views are inconsistent at best. The inability to conclude upon the general viewpoints arises from several different factors. Political views, environmental support, economic needs, and personal values all influence not only the opinions but the potential for action, or lack thereof, for the issues specific to the land transfer. More education is required for both the public of Utah and their

representatives to reach a strong conclusion regarding whether or not the federal land transfer should occur.

The remainder of this document seeks to solve this issue -- to inform and to educate. With a further analysis taking the triple bottom line into account, perhaps a stronger sense of opinion can be reached by those who have been previously surveyed. Remaining ignorant about such an impacting issue is not ideal. It is the responsibility of the state representatives to truly understand the views of those they are allegedly voting and making decisions for. The statements these men make are often contradictory to the polling results obtained, which make their views and reasoning questionable. Likewise, it is responsible for the Utah public to educate themselves and understand to the best of their ability the implications of the federal land transfer. Negligent decisions and ignorant opinions have the potential to cause horrendous problems, especially with such a large and encompassing issue like the federal land transfer. Further education, research, and polling needs to partake before a consensus can properly and ethically be conceived.

Table 1.5: Decision Matrix Criteria: Triple Bottom Line Assessment Scores for Chapter 1.

<u>People</u> A	<u>Planet</u> B	<u>Profit</u> C
<u>Land Accessibility</u> 4	<u>Water Quality</u> 3	<u>Generate Revenue</u> 0
<u>Human Health (effects on)</u> 0	<u>Air Quality</u> 0	<u>Oil/Gas Royalties</u> 4
<u>Recreation</u> 4	<u>Wildlife Management</u> 0	<u>Livelihood/ Jobs</u> 4
<u>Jobs</u> 0	<u>Overall Environment Quality</u> 3	<u>Land Usage/ Development</u> 5
<u>Trust of Local Government</u> 5	<u>Mining (Effects of)</u> 2	<u>Land Sales</u> 0
<u>Final Score</u> 4.3	<u>Final Score</u> 2.7	<u>Final Score</u> 4.3

For the People category, land accessibility and recreation were given neutral ratings of 4, owing to the uncertainty of their future if a land transfer succeeds. It is predicted trust of local government will increase, due to their claimed desire to improve the lands. Because of Utah's general support for smaller localized government, the land transfer would ideally give the public more control over their land and the usage. The extent at which this would occur is questionable however, and relies on the notion that the elected representatives accurately represent their public.

Regarding the planet, the effects of the land transfer on water quality are not directly known. Ideally, the quality will improve with better land management; however with mining and oil expansion, the protective effects may be negated. Along with the oil and gas extraction, the general quality of the environment will decrease. While there may be a reduction of forest fires, the increased land use for natural resource extraction and use alone may counteract the benefits of the land transfer.

The major analysis report showed that the largest benefit that the State would obtain is from the economic prospects. This is mainly from coal and oil royalties, along with the potential to create more state jobs. Land use would also create a stronger flow of money with usage fees and permits to local communities. Increased permitting may also contribute to better overall land management.

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Chapter 2

An Examination of Forest Service Philosophy and Stakeholders:

Are National Forests Mismanaged?

Abstract

This chapter examines whether the United States Forest Service is mismanaging the forests by analyzing public opinion, current and potential complications and management practices, and the primary stakeholders who would be affected by a potential land transfer. The US Forest Service was established in 1905 by President Theodore Roosevelt with three basic goals of protecting wildlife, providing recreation, and preventing wildfires. Throughout the 20th century the Forest Service has become increasingly unpopular with Western state governments and some sectors of the public due to an increased number of conflicting objectives that often put the agency at a standstill. In order to compare the management style of the Forest Service to a state agency, a case study of plans to control the increase in mountain bikes is analyzed. The increase in mountain biking is a relevant issue to tackle as it is causing harm to the natural resources, compromises the safety of other users, and create conflicts and accidents.

Despite these conflicts, the recent growth of the US Forest Service allows citizens to enjoy recreational activities, provides clean water to growing populations, and develops solutions for increasing wildfires. Finally, the potential effects of a land transfer on stakeholders are analyzed. Stakeholders examined include county officials, the public, mining companies, wildfire managers, and livestock raisers. Specifically, the involvement of county officials in creating plans in the case of a land transfer are examined, as well as the economic consequences pertaining to a land transfer, and finally the accessibility of lands in the case of a transfer. Studies suggest increased difficulty in generating money if the state gained control of the lands, in addition to reduced public access of the lands.

2.1 Introduction

Currently, the United States Forest Service (USFS) manages 8.15 million acres (15%) of the land in Utah, all of which the state of Utah is trying to gain control of [1]. In order for Utah to obtain control of these lands, state entities are required to replace the current federal management. This portion of the engineering analysis of the potential transfer of public lands examines changes within the Forest Service land. Specifically, an analysis of current public opinion, current conflicts between the state and Forest Service management, and potential conflicts if the state were to overtake Forest Service land.

An analysis of the past and present Forest Service philosophies and management is analyzed in the first section. Simple goals of conservation, wildfire prevention, and recreation from the early twentieth century become highly complex in the twenty-first century where public and political opinions meet with a long list of sometimes conflicting management plans. A current case study of the increase in mountain biking on federal forest land is provided to compare the response strategies of the USFS and the State of California. This comparison provides some insight into how the State of Utah may differ in land management given a potential transfer.

The next section examines the opinions of government officials, the public, and those inside the agency regarding the USFS. The negative and sometimes aggressive opinions shown affect the strategies of the agency, and what is or is not accomplished. It is shown here that the apparent mismanagement of Federal Forests is a key point in the argument of those who advocate for the transfer of federal lands to Utah. Finally, the actions of dissatisfied Utah lawmakers in counties across the state will find that the planning for a transfer is well on its way. Although some counties propose selling Federal Forest land back to the federal government to be made into wildlife preservation areas or the like, evidence shows that the state will not have the resources to make these choices. Given a transfer, it is far more likely that the state will need to provide land access to gas and oil industries to make the profit required.



Figure 2.1: Official USFS Logo [1].

2.2 US Forest Service: Past and Present

The USFS was established in 1905 when 56 million acres of national forests were transferred from the US Department of the Interior to the Department of Agriculture under President Theodore Roosevelt [1]. The first Chief of the Forest Service, Giffort Pinchot, was known for his utilitarian and conservationist views, and led the agency with a philosophy of providing the “greatest good for the greatest number in the long run” [1]. Pinchot’s point of view revolved around the protection of forested lands, and this made him well known as “the ‘father’ of American forestry and conservation” [1]. The goals of the USFS from 1905 until 1945 involved controlling wildfires and overgrazing, providing recreation, and protecting various wildlife. Beginning in the 1950s, the USFS faced increasing demands for management of timber and expanding recreational areas. The following decades forced the agency to balance the needs of the timber industry with recreation, conservation, wildfire management, and water quality issues [1].

Table 2.1: Budget and Resources of the US Forest Service [1].

Budgetary and Financial Resources	
5.5	Total budget authority (\$ in billions)
42	Percent of the current budget spent for fighting fires
734	Total revenues and receipts (\$ in millions)
Personnel	
100	Scientists in 67 locations
737	Law enforcement personnel
10,050	Firefighters
34,250	Employees in 750 locations in all 50 States and Puerto Rico
Physical Resources	
44	States with National Forest System lands
59 million	Acres of Forest Service land classified as "Roadless Areas"
60	Percent of U.S. alpine skiing capacity occurring on national forests
70 million	Acres of urban forests in America where the Forest Service has a stewardship role
83	Experimental forests used for science
193 million	Acres of national forests and grasslands managed
14,077	Recreation sites
42,085	Buildings
55,258	Volunteers
143,346	Miles of trails
374,883	Miles of roads
192 million	Visitors per year
Select Resource Statistics	
8	Acres of trees to offset one person's annual carbon use. ¹
200 million	million tons of carbon sequestered each year by U.S. forests and wood products, equal to about 10 percent of annual emissions from fossil fuels. ²
1,700	Low-income, at-risk youth in 22 Job Corps Civilian Conservation Centers managed by the Forest Service. ³
9,130	Wildfires that were started on Forest Service lands
2,767,887	Green tons of small, low-value forest made available for bioenergy production
2,896,000	Acres of Forest Service lands burned
3,627,000	Acres treated on Forest Service lands to reduce hazardous fuels
123,750,000	People that depend on water from national forests
1.8 billion	Number of trees harvested per year in the United States ⁴

The current mission of the Forest Service is “to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations” [1]. The six focus areas are: (1) healthy forests, (2) recreation management, (3) water quality, (4) partnerships, (5) markets for ecosystem services, and (6) informed citizenry [1]. Although many of the goals Mr. Pinchot set forward remain in place, like protecting wildlife, the USFS of today must take into consideration the opinions of lawmakers and the public. Besides these additional challenges, the current goals of the USFS can often be in opposition to one another. For example, the rise in popularity of recreational activities in the National Forests requires the addition of new roads, trails, sanitary services, and other amenities to be built. Yet, the ongoing focus on conservation cannot also be achieved if the forests are being disturbed by construction.

Table 2.1 provides insight into current strategies by summarizing the current budget and resources of the agency. It is notable that a staggering 43% of the budget is allocated for fighting fires, and over 10,000 firefighters are dedicated to the task. The 193 million acres currently managed by the USFS provides many necessary services to the land, wildlife, and

people; yet there are many who claim that the Forest Service is not managing their land in the best ways. This argument is one of the centerpieces of the reasoning behind the need for a transfer of federal lands to the states. The following sections provide an in-depth analysis of a specific challenge to the USFS, and how the State of California has dealt with the same issue.

2.3 Forest Service Management Reaction to Mountain Bike Usage

Mountain bike riding is a growing activity on the United States Forest Service (USFS) lands. The increase in bikes have created new management challenges for the USFS managers regarding conflicts on multiple-use trails. In order to understand the current management styles of the Forest Service, the Pacific Southwest Research Station (The Research and Development team of the USFS) presented a national survey for all USFS resource managers to discuss land access, trail maintenance and conflicts that will potentially arise between bikers, hikers, and other interest groups. The Forest Service has provided detailed responses about their current management styles and philosophies to maintain natural resources, reduce social conflict with other users, and decrease safety issues [2]. These management tactics will then be compared with the state of California's reaction to an increase in bike use in Section 2.4 in order to compare and contrast changes that may occur if the federal land transfer occurs.

The main concern for all USFS managers includes the mountain bike effects on natural resources, including the degradation of trails. The social issues regard conflicts with other users and coordination groups for multiple trail use. If conflicts arose between bikers and hikers, the managers would need to help resolve such disputes. The increase of bikers also raises many safety issues and the need to educate the mountain bike riders and possibly include signage where appropriate. The sport is growing and the managers must account for the detrimental effects towards nature, users, and their safety [2].

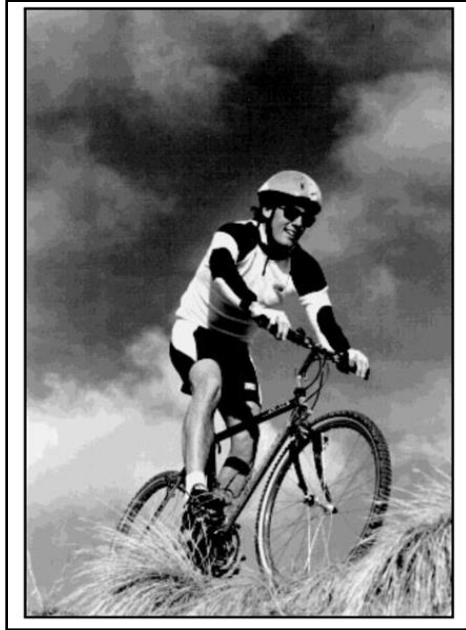


Figure 2.2: Biking in the USFS [2].

2.3.1 Safety Concerns

The Forest Service agrees that the increase in biking has increased user conflicts on multiple-use trails. Twenty-one percent of the other users complained about the speed of the mountain bikers, as well as their quietness [2]. In areas where the trail is narrow, and users have limited visibility, collisions are more likely to occur if the recreationists can't see or hear the other mountain bikers [2].

The USFS mainly only addresses general safety concerns. This includes clearing the trail surface from large obstructions, applying trail reconstructions where necessary, and making sure the trail is not too wide. Wide trails can promote side by side riding, which inevitably increases safety concerns. The USFS also focuses on educating the users in order to address safety concerns. All visitor centers located in the Forest Service include maps, brochures, and posters that include trail descriptions and promote bikers to tread lightly. They place more responsibility on the user to protect their safety, travel at safe speeds, and use trail etiquette on multiple-use trails [2].

2.3.2 Resource Damage

USFS managers have begun to notice how the increasing sport has already damaged the trails, soil, and water. The trails are becoming wider, more shortcuts are being used, and users are creating their own trails. The bikes are causing soil erosion and compaction due to tire skidding, which affects air and water infiltration into the soil. Water trail riding also causes siltation and damage to drainage structures [2].

The USFS is currently trying to prevent resource damage through information and education, resource hardening, cooperation, and visitor restrictions. They produce brochures, maps, local newspaper articles, and educational materials to educate all user groups the best places to partake in certain outdoor activities. Due to the fact that mountain bike use is increasing, the USFS is planning ahead to keep trails, streams, and bridges strong. In order to prevent resource damage, they have built small culverts, low bridges, boardwalks, footbridges, and implemented more trail monitoring. In order to limit damages towards resources, the Forest Service also urges visitors to volunteer, join a partnership, and adopt-a-trail to help keep nature healthy [2].

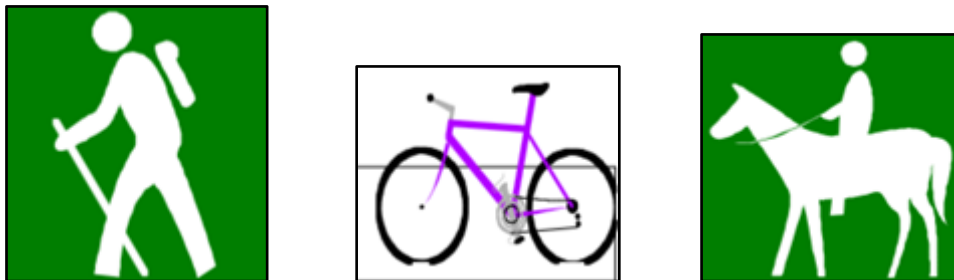


Figure 2.3: Multiple Use Trails [2].

2.3.3 Forest Service Bike Use Management Summary

The Forest Service attracts a range of 50 to 376,000 riders per year, in each region [2]. This number is continuing to increase due to the popular sport of biking. As a result, the natural resources are being affected, so the Forest Service has chosen to protect the land by building structures to harden the resources and prevent further damage. Due to the increase in user conflicts, the Forest Service is addressing safety concerns by keeping

up with trail management and promoting trail etiquette. It is the user's responsibility to protect themselves from the other recreationists, and will avoid altering the trail design if possible. Therefore, the Forest Service's main concern is to protect the natural resources, and wishes to address safety concerns through the use of education.

2.4 California's Management Reaction to Mountain Bike Usage

Similar to the Forest Service, California is also experiencing an increase in mountain bike usage. In order to compare the federal (Forest Service) land management tactics to state's management, the California Equestrian Trails & Land Coalition (CET&LC) will be studied to represent the state government. This will exemplify management changes that may occur if a federal land transfer occurs. CET&LC is a statewide organization consisting of multiple member organizations including Equestrian Trails, Inc (ETI), Back Country Horsemen Association (BCHA), and a few others. Safety is the main concern for members of the CET&LC, and have developed design and enforcement standards to keep all users on multiple-use trails safe [3].

2.4.1 California Management Concerns Similar to Forest Service

The two government agencies agree that bikes have increased safety issues among the users in their recreational locations, and want multiple-use trails to continue allowing access to all users. These include hikers, bikers, horses, vehicles, and any other user. The speed and lack of noise of the bikers is a large concern among all users, especially other bikers. Bikers traveling in the same direction may have trouble identifying where other bikers are and how close they are. Narrow trails make it difficult for bikes to pass each other or move off the trail to avoid collisions. These similarities exemplify a few management concerns that will remain the same if a federal land transfer is carried out.

2.4.2 California Safety Measures Affecting Resource Damage

In contrast to the Forest Service's general safety measures, the CET&LC's design considerations require a minimum six foot wide trail so users can pass and move off the trail, if necessary. California addresses speed issues by requiring a slope of less than 12 percent, as traveling downhill makes it harder for cyclist to stop, increasing the chance

of collisions [3]. Very few safety concerns apply to bikers traveling uphill. There must also be a minimum visual clearance of 50 feet on switchbacks, and if a separate trail is necessary for a particular user’s safety, California will consider making a new one [3]. Based on these required design specifications, California will consider altering the trail and environment, if it means the user will be safer.



Figure 2.4: California Hikers and Mountain Bikers [3].

2.4.3 California Education Differences to Forest Service

Similar to the Forest Service, CET&LC also focuses on education, but aims to improve the “startle factor” reaction in horses and their riders due to fast moving mountain bikes. CET&LC provides training clinics in order to increase the comfort level between the horses and other recreational users. This can be achieved by training the horses and their riders to encounter mountain bikes in many different situations, so as to teach the horses that the cyclists are not a threat [3]. Despite this new training awareness, all bikers should continue to ride with caution. Horse instincts may kick in regardless of the

training, and serious injuries may occur. Thus, the CET&LC education plan doesn't tackle any user education requirements, and only focuses on decreasing horse conflicts.

2.4.4 California and Forest Service Bike Use Management Summary

California's main concern regards the safety of their users on multiple-use trails, and have developed many design specifications that are required on those trails [3]. These include the slope of the trails, surface condition, trail width, and minimum visual clearance on switchbacks. These design considerations are maintained by altering the trails in order to increase user safety. Therefore, California prioritizes safety over preserving the natural resources, whereas the Forest Service's main concern regards maintaining the natural resources. This management difference may be due to the fact that California's trail population is a much larger concern. Even though both state and public lands have an increase in bike usage, California has over 400,000 recreational bike riders, whereas bikers in USFS regions can range from 50 to 376,000 riders annually [3,2]. Depending on location, safety may have a huge impact on the population. Therefore, California may be more pressured to provide these safer trail options. Each government agency tackles user education differently.

The Forest Service places a higher responsibility on the user to inform themselves, whereas California doesn't necessarily promote individual user education. Instead, they focus on creating a safer environment around horses. The differences in land management revolve around protecting the land versus protecting the safety of the people. It is difficult to differentiate which management is better, due to the differing situations that the land managers deal with. However, the following section provides evidence that in western states like Utah, a common opinion is that the state and local governments are better land managers as compared to the federal government.

2.5 Opinions Regarding the Forest Service

Public opinion of land management agencies by western peoples has a long and complicated history. A majority of land in the West is owned by Federal Government agencies: the Bureau of

Land Management (BLM), the National Parks Services (NPS), the Fish and Wildlife Services (FWS), and the USFS [4]. The extent of Forest Service-managed land is shown in Figure 2.5, and states including Utah, Nevada, and Colorado are showing interest in transferring the land to their states, but this process has yet to be done on such a large scale.

The comprehensive economic feasibility study *An Analysis of a Transfer of Federal Lands to the State of Utah* provides a brief history of how such a large portion of Utah land came to be federally owned [4]. The Homestead Acts of the mid-1800s, among other federal acts, provided a pathway for private buyers to purchase huge swaths of federal land in the west for cheap, for as little as \$1.25 per acre. Although some land was sold, much of it was mountainous, desert, and unusable. These areas were not sold and much of it remains in the hands of the Federal Government to this day [4]. In the aftermath of private disinterest in these lands, western state governments have taken issue with the regulations imposed on USFS lands, and public opinion of the agency’s management in Utah has often been poor. The following sections detail the opinions of some Western Government Officials, followed by the public’s opinion, and finally the internal opinions of the agency itself will be examined.

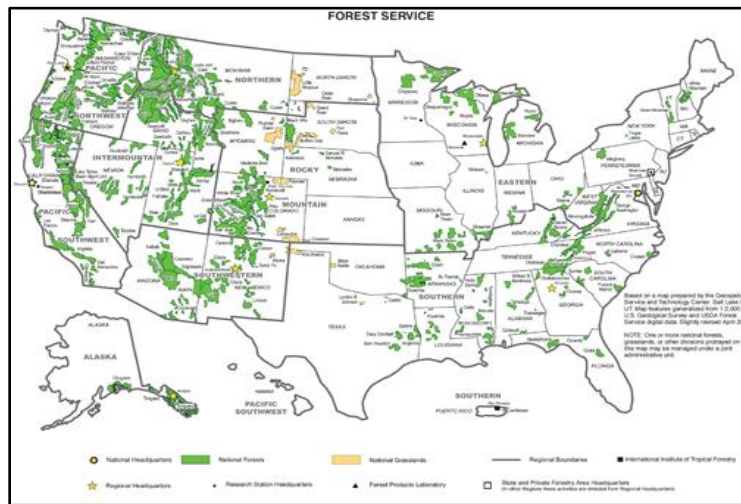


Figure 2.5: Map of Lands Managed by the US Forest Service [1].

2.5.1 Opinion of Western State Government Officials

In a hearing of the Committee on Natural Resources on September 28th, 2015, congressman Rob Bishop and the entirety of the committee lament that over just a few

months, the Department of the Interior has implemented over 200 new regulations on federal lands [5]. This hearing was put together in response to the rising oversight of federal government agencies into issues which the committee felt would be better handled by the states themselves. Many of these new regulations seek to provide greater environmental protection, which can cost the states potential income and jobs, like the delayed construction of the Keystone XL pipeline. The committee, which includes several western state governors, cite poor management in these agencies while handling issues of fracking, stream and wildlife protection, and contamination clean-up.

Committee members claim that with respect to the Forest Service, The Federal Forest Resiliency Act (H.R. 2647) was one of many failed attempts to promote “active management” of the forests. H.R. 2647 would have required that more timber be cleared in national forests to prevent fires, and that burned areas be reforested quickly afterwards. This bill was requested by President Barack Obama, passed the House of Representatives in September 2015, but currently remains at a standstill. The committee argues that instead of upholding the requirements of the bill, “long-term federal mismanagement of Western national forests has led to overgrowth, an alarming increase rise in invasive species, and proliferating annual catastrophic fires” [5]. The connection between overgrown forests and increased frequency of wildfires is discussed in the following section.

Although the Committee on Natural Resources takes issue with many federal land management practices, they fault the USFS in particular for the increase in wildfires in western states. As shown in Figure 2.6, the reduction in timber harvested is directly correlated with the increase of acres burned in wildfires [5]. Bishop et al. allege that the reduction in timber harvest is a clear mismanagement, and that the USFS must begin practicing “active land management” if this problem is to be resolved:

According to the Forest Service, **58 million acres** are at high risk to catastrophic wildfire; however, the agency is only thinning 250,000 acres per year. At this rate, the Forest Service will never overcome the true problem – overgrown,

unhealthy forests which are susceptible to severe wildfires, insects and disease infestation. [5]

The opinion of the committee is clear: instead of acting first to prevent wildfires that endanger lands, wildlife, and people, the USFS is a reactionary agency that spends over 2 billion dollars fighting excessive fires.

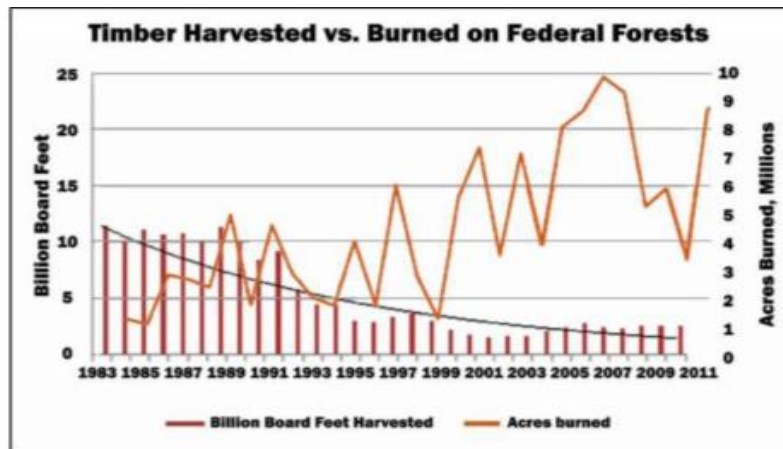


Figure 2.6: Timber Harvested and Burned on Forest Service Lands [5].

2.5.2 Public Opinion

Opinions provided by elected officials are often reflected in the actions of their constituents, and this is evident by the recent actions of western citizens who advocate for the land transfer. In 2010, two separate incidents occurred in the Uinta-Wasatch-Cache National Forest in which Forest Service employees were attacked. One report indicates an assault on a USFS employee and his vehicle on a road grading crew, and yet another provides evidence of threats by men carrying guns claiming that the land didn't "belong" to the USFS. According to the Salt Lake Tribune, Jeff Ruch, executive director of Public Employees for Environmental Responsibility, reveals that the USFS reports about 400 to 500 of these types of assaults, threats, and other misconduct against employees [6]. There is a long history of violence and altercations between the public and federal land employees, but agencies like the BLM and USFS rarely reported these occurrences in the past. From 2010 until 2014, the number of these events has increased drastically, as shown in the map in Figure 2.7 [6].

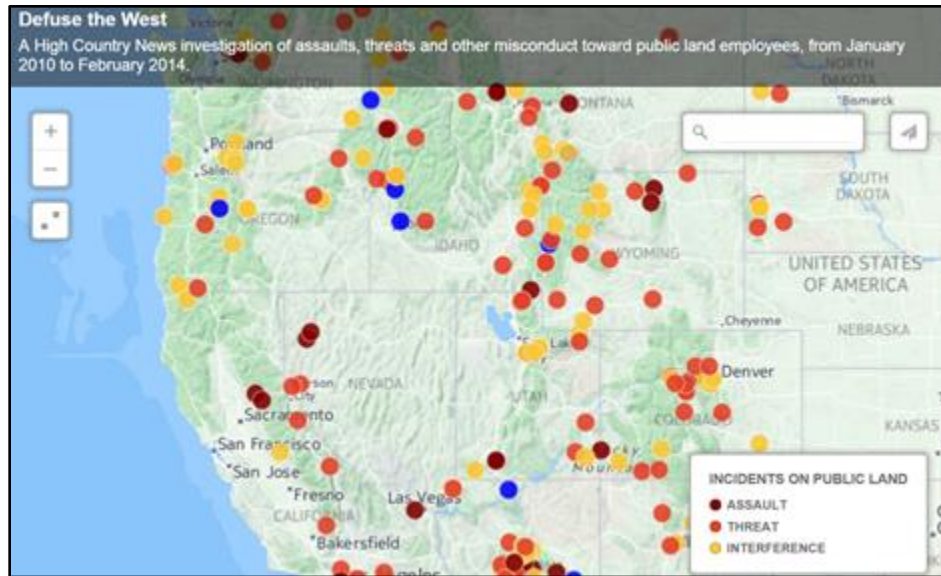


Figure 2.7: Assaults, Threats, and Misconduct Against Public Land Employees [6].

According to the *Salt Lake Tribune*, “In the 1960s and '70s, new laws and regulations — such as the Endangered Species Act and the Federal Land Policy and Management Act — focused on conservation. They fueled the Sagebrush Rebellion, a political movement to increase local control of federal lands” [6]. Opinions towards these agencies in today’s climate may be even worse than during the Sagebrush Rebellion, according to John Freemuth, a professor at Boise State University. He points to the fact that heavy regulation combined with a vast array of objectives often delays agencies like the USFS. These prolonged delays are often the reason behind the some of the public’s negative opinions of the USFS and other public land agencies.

2.5.3 Internal Opinions

Surprisingly, *An Analysis of a Transfer of Federal Lands to the State of Utah* provides evidence that even the USFS itself sees some of its practices as inefficient [4]. Acts such as the National Forest Management Act of 1976 (NFMA) and the Multiple Use–Sustained Yield Act of 1960 (MUSYA) have attempted to refine and clarify the goals of the USFS. Unfortunately, these new regulations are required to be implemented with extensive public input processes, which means that results can arrive slowly, if ever:

Time, effort, and resources poured into a project might ultimately yield nothing but paperwork—competent studies and documentation, but no results on the ground.... It is not just a matter of delivering more outputs: it is a matter of getting anything done at all. [4]

Future opinions on the Forest Service look even more grim; in January 2015 the USFS abandoned its plans to rebrand the agency and boost its image [7]. The 10 million dollar plan would brand the USFS as “a public agency that cares about people and nature” [7]. USFS officials claim that the decision to drop the public relations campaign was mainly in response to employees who felt that the money would be better spent improving the conditions of the forest itself. The Old Smokeys is a group of retired Forest Service employees in the Pacific Northwest, who often weigh in on the decisions of USFS management. The head of the Old Smokeys, Al Matecko, argues this decision is not only correct, but also favored by the public. According to the Salt Lake Tribune, “he received 50 emails from members who were strongly opposed. He passed on those objections to Forest Service leaders” [7]. Actions like this reinvestment into the issues the USFS faces may start to bring about a turn in political, public, and internal opinions.

Those in favor of the Land Transfer may speak out in the media or with threatening actions, as shown in the previous sections. Western State Government Officials, particularly those in Utah, are going beyond speaking out by procuring plans for a potential transfer. The following sections present more information on those affected most by a transfer, and how they are beginning the process.

2.6 Characterization of Stakeholders Affected

The land managed by the Forest Service includes the Ashley National Forest, the Dixie National Forest, the Fishlake National Forest, the Manti-La Sal National Forest, and the Uinta-Wasatch-Cache National forest. Additionally, small portions, totaling 78,938 acres, of the Caribou National Forest and the Sawtooth National Forest are part of the Forest Service land [4]. A breakdown of the Forest Service lands throughout the national forests is given in Table 2.2. As

shown in Table 2.2, Dixie National Forest accounts for the most Forest Service acreage in Utah, while Caribou National Forest accounts for the least amount of Forest Service land in Utah.

Table 2.2: National Forest Acreage [4].

National Forest	Forest Service Acreage
Ashley	1,286,123
Cache	437,712
Caribou	6,955
Dixie	1,889,106
Fishlake	1,461,226
Manti-La Sal	1,243,700
Sawtooth	71,983
Uinta	880,719
Wasatch	876,118

Besides the national forests that the Forest Service manages, the Forest Service also manages Flaming Gorge National Recreation Area within Ashley National Forest and the Desert Experimental Range in Millard County [4].

2.6.1 Land Transfer Effects on Counties

The Forest Service manages portions of land within every county in Utah. The counties with the largest portions of Forest Service land are Garfield, Sevier, and Duchesne. Forest Service land accounts for 25% or more of the land in 11 of Utah’s counties [4]. A breakdown of Forest Service land by county is presented in Table 2.3.

Table 2.3: Breakdown of Forest Service Land by County [4].

National Forest Acreage in Utah, by County							
County	Forest Acres	Share of Forest Total	Share of County Total	County	Forest Acres	Share of Forest Total	Share of County Total
Beaver	138,967	1.7%	8.4%	Piute	196,543	2.4%	40.1%
Box Elder	103,938	1.3%	2.4%	Rich	52,219	0.6%	7.5%
Cache	285,921	3.5%	38.1%	Salt Lake	97,556	1.2%	18.9%
Carbon	30,270	0.4%	3.2%	San Juan	449,924	5.5%	8.9%
Daggett	257,323	3.1%	55.9%	Sanpete	391,422	4.8%	38.2%
Davis	38,951	0.5%	9.6%	Sevier	732,423	9.0%	59.7%
Duchesne	722,748	8.8%	34.7%	Summit	528,858	6.5%	43.9%
Emery	211,965	2.6%	7.4%	Tooele	160,819	2.0%	3.4%
Garfield	1,046,311	12.8%	31.4%	Uintah	269,081	3.3%	9.3%
Grand	56,695	0.7%	2.4%	Utah	485,761	5.9%	35.4%
Iron	243,783	3.0%	11.5%	Wasatch	432,060	5.3%	55.8%
Juab	116,853	1.4%	5.4%	Washington	395,395	4.8%	25.4%
Kane	123,403	1.5%	4.7%	Wayne	160,140	2.0%	10.1%
Millard	358,371	4.5%	8.4%	Weber	60,993	0.7%	14.4%
Morgan	16,534	0.2%	4.2%	State	8,175,226	100.0%	15.0%

Note: State total shown here is higher than reported by the Forest Service source due to rounding.

A visualization of the locations of the national forests throughout the counties in Utah is shown in Figure 2.8. As shown in the figure, almost all of Utah’s national forests span over multiple counties.

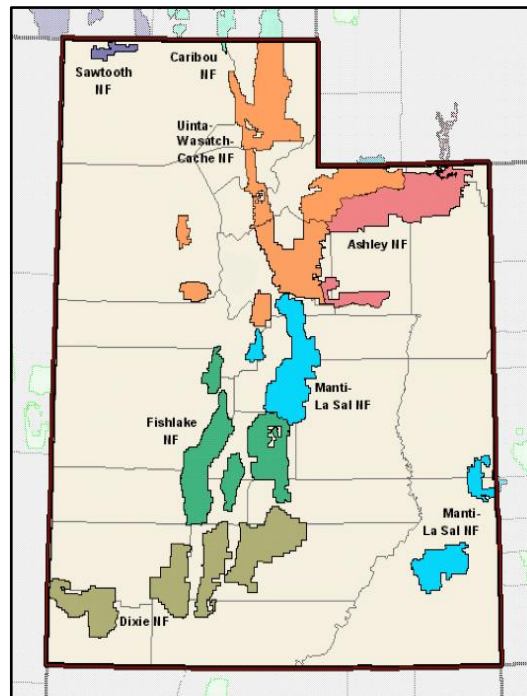


Figure 2.8: Location of National Forests in Utah [1].

According to *An Analysis of a Transfer of Federal Lands to the State of Utah*, the economic consequences in Utah counties could be significant [4]. Specifically, economic consequences, with respect to Forest Service land, may affect recreation, sale of mineral resources and forest products, land use for power generation, ski operations, and other business activities [4]. Not only will the state be affected economically, but the people and the land will be affected as well. Depending on how the state plans to manage the land in the case of a land transfer, the quality of the land could be affected by possible land development and oil leasing. People may be affected by a land transfer due to changes in access to the lands. Further examination and more detailed analyses on how these changes affect stakeholders will be given in the following paragraphs.

In an effort to create a concrete plan on the potential state management of public lands, Representative Rob Bishop asked all county officials in the state of Utah to submit proposals on how to best manage the public lands within their borders in 2013. Bishop's effort was an apparent attempt in creating locally crafted agreements. The idea, known as the *Public Lands Initiative*, was to find a balance between land development, wilderness, human-powered recreation and motorized recreation to help prevent lawsuits and political fights that would inevitably occur on such issues [8]. Also, Bishop hoped to prevent President Obama from using national monument designation to make large sections of Utah off-limits to state ownership through national monument designation [8]. After two years, Carbon County and Duchesne County are working on proposals, while Daggett County, Emery County, Grand County, San Juan County, Summit County, and Uintah County have either submitted proposals or are close to submitting proposals [8]. A significant step in the Public Lands Initiative happened on April 10, 2015, when Grand County submitted a proposal. Thus far, the economics of a land transfer have been researched extensively; however, the proposals created by the Utah counties (especially in controversial parts of the state, such as Grand County) exhibit a different outlook on how a land transfer will affect the land and the people of

Utah. The new perspective from the county proposals includes more insight into stakeholders' opinions within the counties.

Since Grand County Utah encompasses Arches National Park and Moab, it is an area known for recreation, such as mountain biking, climbing, backpacking, and motorized recreation. However, the county has almost no designated wilderness and approximately 800,000 acres of land available for oil and gas leasing [8]. The contrast between the idea of land use for public access, recreation, and preservation, to the more conservative idea of oil and gas leasing, makes Grand County a highly contested part of the state. Grand County's proposal for the Public Lands Initiative proves significant because a potential agreement on the use of public lands in such a controversial part of the state may indicate the possibility of agreements throughout the state. The recommendations proposed by Grand County include the creation of 514,000 acres of wilderness, near the Book Cliffs area, as well as the creation of 159,000 acres of National Conservation Area in the southeastern corner; Wild and Scenic River Suitability on the Dolores; Green and Colorado rivers; and a 2,900 acre expansion of Arches National Park [8]. The proposal did not indicate specific zoning for oil and gas development, although any land not protected by recreation or conservation may be available for drilling, as well as about 30,000 acres of tar sands development, as some recreation areas will also be available for energy development [8]. Specifically, the 2.4% of Forest Service land in Grand County would become part of the Wild and Scenic River Suitability, and would remain under federal management [8]. A visualization of the proposal made by Grand County is shown in Figure 2.9.

2.6.2 Land Transfer Effects on the Public

Although proposals have been given, or are currently in progress by Utah counties, whether or not the agreements will be viable is unclear. A study conducted by researchers at the University of Utah's Wallace Stegner Center suggests that Utah's most feasible option in generating revenue is to sell the acquired lands to private entities [9]. Supporters of the Utah Transfer of Public Lands Act claim that the state of

Utah does not have interest in selling the public lands because the state would only receive 5% of the proceeds from the sale [9]. According to the aforementioned study however:

The Transfer of Public Lands Act is not an agreement between the state and federal government, so Utah could unilaterally amend the Transfer of Public Lands Act and attempt to retain a greater share of sale proceeds. Such an amendment and subsequent sales could create a sizeable new source of revenue, and a strong incentive to sell transferred lands, especially when Utah faces a massive revenue shortfall. [9]

Some examples of how public access could change with a land transfer include mineral development displacing other uses, as well as increases in access fees [9].

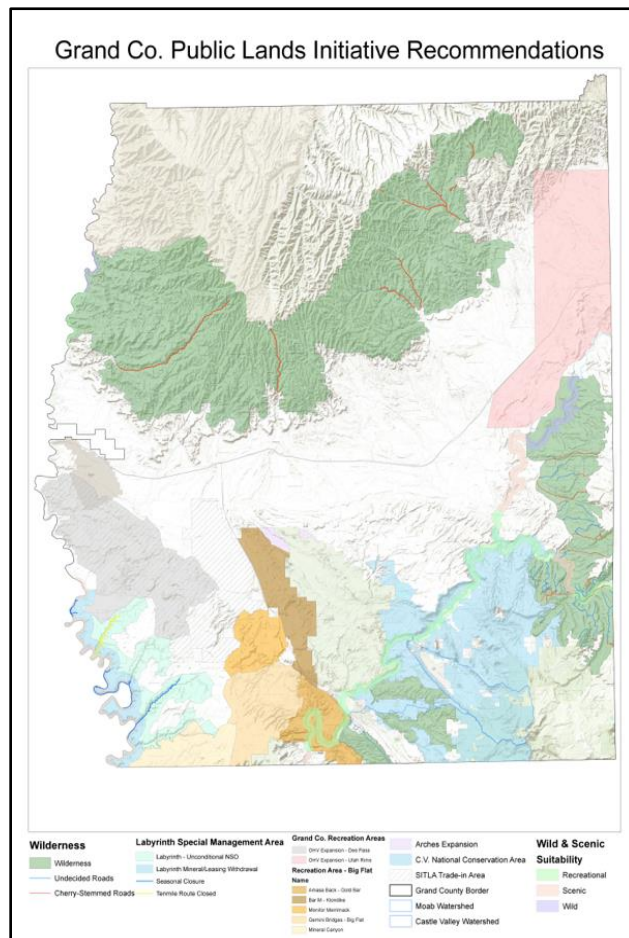


Figure 2.9: Grand County Public Lands Recommendation [8].

A decrease in public access to Forest Service lands, in the case of a transfer, may pose a significant risk to recreation in the state. Over 10 million people recreate in Utah's

national forests annually [4]. Table 2.4 exhibits the most popular recreational activities on Forest Service land. The Forest Service recreational activities include skiing, camping, hiking, snowmobiling, biking, backpacking, hiking, hunting and fishing, boating and swimming, and off-road vehicle riding. The most popular recreational activity is hiking or walking. Most of the previously mentioned activities are free to the public, while some require fees or special licenses [4]. In addition to predictions that a land transfer would entail the state selling land to private entities and displacing people, predictions also include land managers increasing public access fees in the newly acquired lands [8].

Table 2.4: Breakdown of National Forest Activities [4].

U.S. Forest Service Top Recreational Activities in Utah National Forests	
Primary Reason for Forest Visit	Response Percent
Hiking or Walking	20.7%
Skiing	16.5%
Fishing and/or Hunting	12.5%
Viewing natural features	9.6%
Camping (developed and primitive)	6.0%
Driving for pleasure	5.6%
Relaxing	5.1%
Motorized trail use	3.2%
Bicycling	3.1%
Picnicking	2.9%
Percent of users stating these preferences	85.2%

2.7 Conclusions

Many who advocate for the transfer of federal lands to the state of Utah do so by arguing that current federal land management is inadequate, misinformed, and exceedingly slow-paced. Western state politicians claim that the US Forest Service failing due to lack of active

management of timber and wildfires. Public opinion, as well as voices within the agency itself, regard the USFS as progressing so slowly that almost nothing is accomplished; but these fallacies do not prove that the state of Utah would necessarily do a better job of managing the forests. In fact, there are facets of forest management that may benefit from a “passive” management approach that truly *does* little to nothing, leaving the lands to exist as they should in nature. Further, transferring Forest Service land to the state of Utah would likely result in an economic deficit in the state, as well as reduced public access to the lands. In order to generate money, the state would likely need to develop the acquired land or sell the land at a premium.

Managing the National Forests is a multi-faceted task that involves issues of wildlife, recreation, land management, wildfire prevention, bureaucracy, and public input. These concerns are not always easily prioritized or accomplished in a timely manner by the USFS, but evidence is growing that the agency is allotting resources to the most pressing current and future problems. At this time, however, there is insufficient evidence that the State of Utah would provide better management of such a complicated group of lands such as the National Forests; in fact, the state may worsen the conditions of the forests given a transfer. Given these conclusions regarding the fate of the National Forests, the Triple Bottom Line Assessment resulted in slightly negative ratings for People (3) and Planet (3.1), and a generally positive rating for Profit (5.7). The complete results of the Triple Bottom Line Assessment for this section are shown in Table 2.5.

Table 2.5: Decision Matrix Criteria: Triple Bottom Line Assessment Scores for Chapter 2.

People - A		Planet – B		Profit - C	
Land Accessibility	3	Water Quality	3	Generate Revenue	0
Human Health (effects on)	2	Air Quality	2	Oil/Gas Royalties	0
Recreation	3	Wildlife Management	5	Livelihood/ Jobs	6
Jobs	0	Overall Environment Quality	2.5	Land Usage/ Development	6
Trust of Local Government	5	Mining (Effects of)	0	Land Sales	5
Final Score	3	Final Score	3.1	Final Score	5.7

2.8 References

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Chapter 3

Comparison of State and Federal Land Management: SITLA as a Model for BLM

Land Transferred to the State

Abstract

The current management of BLM lands and SITLA lands is evaluated in terms of selected criteria and then compared in order to predict what land management might look like after a land transfer. Management is analyzed not in economic terms, but instead, in terms of the people and planet, looking specifically at grazing, wildlife management, wildfires, and public access.

BLM is the primary land manager in the state of Utah, managing more than 22.8 million acres within the state. BLM as an organization is governed by many laws and regulations. Navigating the bureaucratic process can often prove to be difficult. Part of the state's argument for a land transfer is that they would better serve the people of Utah by streamlining the bureaucratic process. SITLA owns 6.3% of Utah's land and their claims are spread out across the state. They are often completely surrounded by BLM lands as a result of a grid layout originally used to organize the state's lands. It follows that BLM and SITLA land are similar in nature, located in the more remote, uninhabited parts of the state. BLM and SITLA lands could therefore be utilized by the state in similar ways should a land transfer take place. The purpose of this chapter is to answer the following question: How will the transfer of BLM land to the State of Utah improve the lives of the people of Utah as well as improving the environment of the state over the current arrangement of federal ownership and management?

3.1 Introduction

There are many possible ways to investigate the affects a land transfer would have on Utah. One way to evaluate the possible transfer of lands is to examine how each agency manages their currently owned land in Utah and if possible, determine who manages it more effectively in terms of people, planet, and profit. SITLA is the largest state land holder in Utah so their management and policies will be the base of the state land management evaluation. The BLM is the largest federal land holder in Utah so their policies and actions will be the basis for the federal land evaluations. To evaluate how each agency manages their land, we determined a few key areas important to the state of Utah which are most affected by the government land owners. These areas are grazing, wildfires, wildlife management, and public access. In this chapter, these areas will be thoroughly examined and evaluated based on group-determined criteria and a conclusion will be made regarding whether the transfer would be beneficial for the people and environment of Utah. First, a background of each agency needs to be established.

3.1.1 Bureau of Land Management

In 1946 the BLM was established with the merger of the General Land Office and the Grazing Service. The mission of the BLM is one of multiple use, as described in the Federal Land Policy and Management Act of 1976:

“The term ‘multiple use’ means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” [19]

In general, their statement aims to show that they care about all aspects related to their land, rather than simply being focused on making money or focused on a single aspect like wildlife management.

The BLM has an annual budget of over \$1 billion and employs roughly 10,000 people. They are one of the few federal agencies that actually generates money for the federal government, and in 2012, generated about \$5 billion. Onshore oil and gas development accounted for roughly \$4.3 billion of the \$5 billion, with nearly half of that amount going back to the states where the extraction occurred. [1]

3.1.2 State Lands

According to the Utah Bureau of Economics and Business Research, only 10% of Utah's land is owned by the state (see Table 3.1 below). Of this, there are four major agencies that manage the land. The biggest land owner is SITLA. Following them in size is the Utah Department of Transportation and then the Utah Department of Natural Resources. The department of Natural Resources encompasses a few smaller divisions within it including the Division of Forestry, Fire and State Lands, Division of Wildlife Resources, and the Division of State Parks and Recreation. The breakup of these various agencies allows a more focused and individual management of the lands and gives each agency various responsibilities to look after rather than having one centralized agency that must oversee many different responsibilities. This is a good way to manage land as it allows for more individualized attention that some areas need. It is difficult for the federal government to keep such a close eye on everything as they must oversee multiple states' operations. More details about the various land management agencies are shown in Table 3.1. This table gives exact percentages of every major landowner in Utah so it is clearer how exactly the land is broken up.

Table 3.1: Utah Land Ownership by Agency

Utah Land Ownership, by Agency		
Entity	Acres	Share
Federal	35,019,955	64.5%
Bureau of Land Management	22,803,707	42.0%
Forest Service	8,175,253	15.1%
National Park Service	2,096,702	3.9%
Department of Defense	1,812,561	3.3%
U.S. Fish and Wildlife Service	112,696	0.02%
All Other Federal	19,001	.003%
State	5,419,281	10.0%
School and Institutional Trust Lands	3,400,511	6.3%
Department of Natural Resources ¹	2,015,984	3.7%
Utah Department of Transportation	2,150	.004%
Other State	636	.001%
Private, County and Municipal	11,428,135	21.0%
Tribal	2,448,616	4.5%
Grand Total	54,315,952	100%

1. Includes acres managed by Forestry, Fire and State Lands, Division of Wildlife Resources, and Division of State Parks and Recreation.
Source: BEBR analysis of data from State of Utah, SGID.

Source: J.E. Stambro, et. al., "An Analysis of a Transfer of Federal Lands to the State of Utah"

Almost 7.5 million acres of trust lands were granted to Utah under the Enabling Act of 1894. Article 10 of the Act required that a permanent state school fund be established and that proceeds from trust land sales, other revenues generated on state lands, as well as the net proceeds from federal lands in Utah be placed into the fund, the interest of which was to be expended for support of public schools. By the mid-1930s more than half of the state’s original trust land grants had been sold.

On July 1, 1994, SITLA was established in order to manage the remaining school and institutional trust lands and assets. SITLA’s purpose is clear: *“to manage the lands prudently and profitably, balancing the immediate needs of the beneficiaries with long-term demands and optimize and maximize trust land uses for support of the beneficiaries over time”* [2]. SITLA administers the trust for *“the exclusive benefit of the trust beneficiaries, not for the benefit of other agencies or the general welfare of the state.”* Despite the clear purpose of generating revenue, not all of SITLA lands are utilized to generate maximum profits. There are still 345,471 acres in Wilderness Study Areas and 25,589 acres within designated wilderness areas, which are not open to mineral extraction or development. Table 3.2 shows how the land is distributed by

county in terms of surface acres and mineral acres. In total, SITLA has roughly three times more surface acreage than underground mineral acreage [2].

Table 3.2: Acres of Trust Land by County, 2013.

County	Surface Acres	Mineral Acres	Total Acres	County	Surface Acres	Mineral Acres	Total Acres
Beaver	157,455	25,246	182,701	Piute	57,037	11,222	68,259
Box Elder	177,312	117,413	294,725	Rich	46,115	32,709	78,824
Cache	16,997	20,340	37,337	Salt Lake	294	9,120	9,414
Carbon	102,859	65,125	167,984	San Juan	260,785	65,501	326,286
Daggett	26,791	12,394	39,185	Sanpete	28,096	39,397	67,493
Davis	19	592	611	Sevier	42,109	29,089	71,198
Duchesne	54,401	6,951	61,352	Summit	8,608	29,411	38,019
Emery	335,390	45,252	380,642	Tooele	256,432	88,418	344,850
Garfield	156,672	13,472	170,144	Uintah	235,936	63,846	299,782
Grand	343,657	38,217	381,874	Utah	45,676	55,717	101,393
Iron	129,843	62,515	192,358	Wasatch	16,321	2,027	18,348
Juab	167,735	76,286	244,021	Washington	76,791	35,677	112,468
Kane	99,605	43,922	143,527	Wayne	169,186	8,194	177,380
Millard	374,887	82,261	457,148	Weber	739	17,151	17,890
Morgan	0	20,255	20,255	Total	3,387,748	1,117,720	4,505,468

Note: Acreage total rounded by SITLA.

Source: State of Utah School and Institutional Trust Lands Administration, email communication, March 19, 2014.

SITLA manages state trust lands with a staff of 64 full-time employees, 9 part-time staff and 6 seasonal/temporary employees. Total expenses in 2012 were about \$12.2 million, while gross revenue from operations in 2012 was about \$92.1 million. Over the past five years, SITLA lands returned an average of \$6.15 for every dollar spent. These revenues are deposited in Utah's Permanent State School Fund, however, by law; SITLA is only allowed to distribute the interest and dividend earnings of the Fund to Utah's public schools. In 2014, with approximately \$80 million in revenue added to the fund, only about \$37 million was distributed to Utah schools [2].

SITLA makes most of its money from the activities that occur on the land rather than by selling land itself. For this reason, they have split themselves into organized groups to better manage individual operations. There are four main groups within the organization including the oil and gas group, surface group, planning group, and the development group. The oil and gas group oversees the natural resources of the land

such as oil, gas, coal, shale, and other minerals. This group generates 83% of all revenue for the organization [2].

3.2 Public Access

One of the key aspects of a possible land transfer is the level of public access to those lands. Public access to transferred lands depends on a few factors including physical accessibility, the level of access granted by the state, as well as whether or not the land is retained by the state or is sold off and privatized. The following sections will discuss these issues in relation to BLM and SITLA lands.

3.2.1 Public Access - BLM

The public lands that are in Utah are slowly diminishing under the BLM. Every year the BLM sells off land and every year the number of public roads on BLM land is reduced. Both of these actions can reduce the access that the public has to the land. There are also tracts of land throughout the Western United States where public land is completely surrounded by private land. This creates what is called landlocked public land. These are all things that reduce public access to the lands while their taxes pay to maintain it.

Every year the BLM sells land and retains new lands. It is a constantly changing environment. However, the trend is that they are losing land over time. In 2001, the BLM managed 22,867,574 acres [5], by 2014 that number had dropped to 22,839,423 acres [6]. That is a net difference of 28,151 acres, a loss of roughly 2165 acres per year. One way that the BLM loses this land is by selling it. In order to sell land the land parcel must meet one of three following criteria:

- 1) They are scattered, isolated tracts, difficult or uneconomic to manage.
- 2) They were acquired for a specific purpose and are no longer needed for that purpose.

3) Disposal of the land will serve important public objectives, such as community expansion and economic development [7].

If any one of these criteria is met the land can be sold. Meeting one of these criteria does not appear to be difficult and a lot of land falls into one of these categories.

Landlocked public land is an issue that restricts access to public lands. Landlocked land is a section of public land that is completely surrounded by private land and it is completely inaccessible to the public as the private landholders have cut off the access. As it is privately owned land there is no legal way to get to the public land; the private landowners have sole access to the public lands. This is a problem throughout the Western United States. As you can see in Table 3.3; in Utah there are 197,014 acres of public land that is inaccessible [8]. Similarly, in Montana there are an astonishing 1,955,145 acres of inaccessible public land.

Table 3.3: *Acres of Inaccessible land in select Western States [8].*

	Colorado	Idaho	Montana	New Mexico	Utah	Wyoming
Total Acres Inaccessible and Off-Limits	541,000 acres	163,000 acres	1,955,000 acres	542,000 acres	197,000 acres	758,000 acres
Inaccessible because the public cannot cross corners	87,000 acres	43,000 acres	724,000 acres	164,000 acres	161,000 acres	404,000 acres
Fully Land-Locked by private lands	454,000 acres	120,000 acres	1,231,000 acres	378,000 acres	36,000 acres	354,000 acres

Source: Center for Western Priorities, "Landlocked: Measuring Public Land Access in the West," Center for Western Priorities, Denver, 2013.

Throughout the Western United States there is a checkerboard pattern of private and public land that has resulted in a situation where public access is cut off as it is illegal to cross at the corners. This pattern is a result of the transcontinental railroads being built across the nation. In the 1800's the federal government gave every other parcel of land to the railroads. This was an incentive for them. It gave them land that they could sell off in order to finance the railroad [8]. This led to the current checkerboard pattern. It also creates a problem as it is currently illegal to cross at the corner of the boundaries. For example, in Figure 1, if there was a road that led to parcel B, the public would not have legal access to parcels A and C.

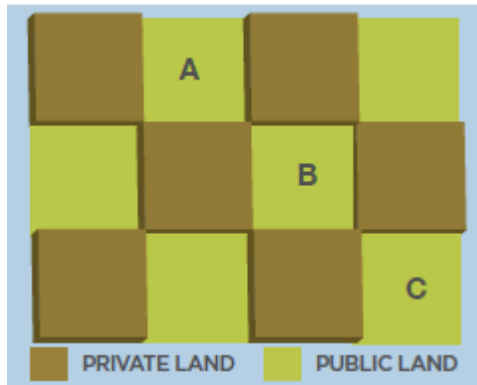


Figure 1: Checkerboard Pattern of Public and Private Lands.

Roadways are an important aspect of public access to public lands. In 2001 there were 9,710 miles of roads on BLM land [5]. This is in contrast to 2014 when there were only 7,669 miles [6]. The purpose of public lands is for the public to be able to access and use the land. If there are no more roads on the public land, it would be much more difficult to access it. However, this also helps the ecosystem as vehicles are not destroying the vegetation and habitat. There does need to be a compromise. Too many roads degrade environmental quality. Conversely, too few roads degrade access to the public lands. In contrast to the reduction in roads, the BLM has increased the number of trails on BLM lands. In 2001 there were 2,350 miles of trail [5] versus 2014 when there were 2,433 miles [6]. This is only an increase of 83 miles of trails, but more trails translates to more access to parts of the land that didn't use to be accessible. This is important to sportsmen and recreationists. Even if they can't drive there, they can still walk or bike to the locations that they want to get to.

Another trend with the BLM is the increase in recreation sites on BLM lands. A recreation area is defined as, "An area designated by Congress to ensure the conservation and protection of natural, scenic, historic, pastoral, and fish and wildlife values and to provide for the enhancement of recreational values" [6]. This means any area that has been officially established for camping, fishing, mountain biking, off road

vehicles, etc., has been designated and is maintained by the BLM as a recreation area. In 2001, the BLM had only 155 recreation sites in Utah [5]. By 2014 they had increased that number to 395 [6]. This is an increase of roughly 255 percent. This could be a direct result of the Recreation and Public Purposes Act. This act allows the Federal Government to “dispose of any public lands to a state, territory, county, municipality, or other state, territorial, or federal instrumentality or political subdivision for any public purposes, or to a nonprofit corporation or nonprofit association for any recreational or any public purpose” [9]. However, this act also seems to leave the door open to another way of selling off public land.

3.2.2 Public Access - SITLA

SITLA owns 6.3% of Utah’s land and their claims are spread out across the state. They are often surrounded completely by BLM lands as a result of a grid layout originally used to organize the state’s lands. Some of SITLA’s lands are actually a result of successful land transfers between the federal government and the state; however at a smaller scale than what is proposed currently. For example, the most recent exchange was part of the Recreation Land Exchange Act of 2009 in which Utah traded 58 parcels of land with high recreational value to BLM in exchange for 34 parcels of land with high mineral development value. SITLA’s land claims can clearly be seen in Figure 2.2. Note that in many areas, it appears that SITLA’s lands (blue) are spread out in a grid pattern surrounded by BLM lands (green). This is horribly inefficient for development but a necessary measure to ensure the divide between federal and state claims was fair. The reason the land is split up this way is because Utah is a huge territory with a large diversity of terrain. For example if Utah was theoretically split half and half with BLM and SITLA and one got all the Northern land and the other received all the Southern land, this would not be fair to either side because the land is so different between North and South and each agency would have advantages and disadvantages in certain areas. The way the land is split ensures each agency gets the same type of land.

SITLA has also been involved in numerous land transactions and exchanges which have resulted in the preservation/conservation of over 500,000 acres [10]. They have also shown that they are committed to conservation by partnering with private and non-profit organizations to protect their land for both its scenic value and for threatened species. For example, SITLA recently sold 800 acres of land reserved as prairie dog habitat to the Nature Conservancy which helped other agencies protect the habitat for the threatened species. SITLA also exchanged 17,000 acres of trust lands to the Division of Wildlife Resources who can better protect the habitat for endangered species [10].

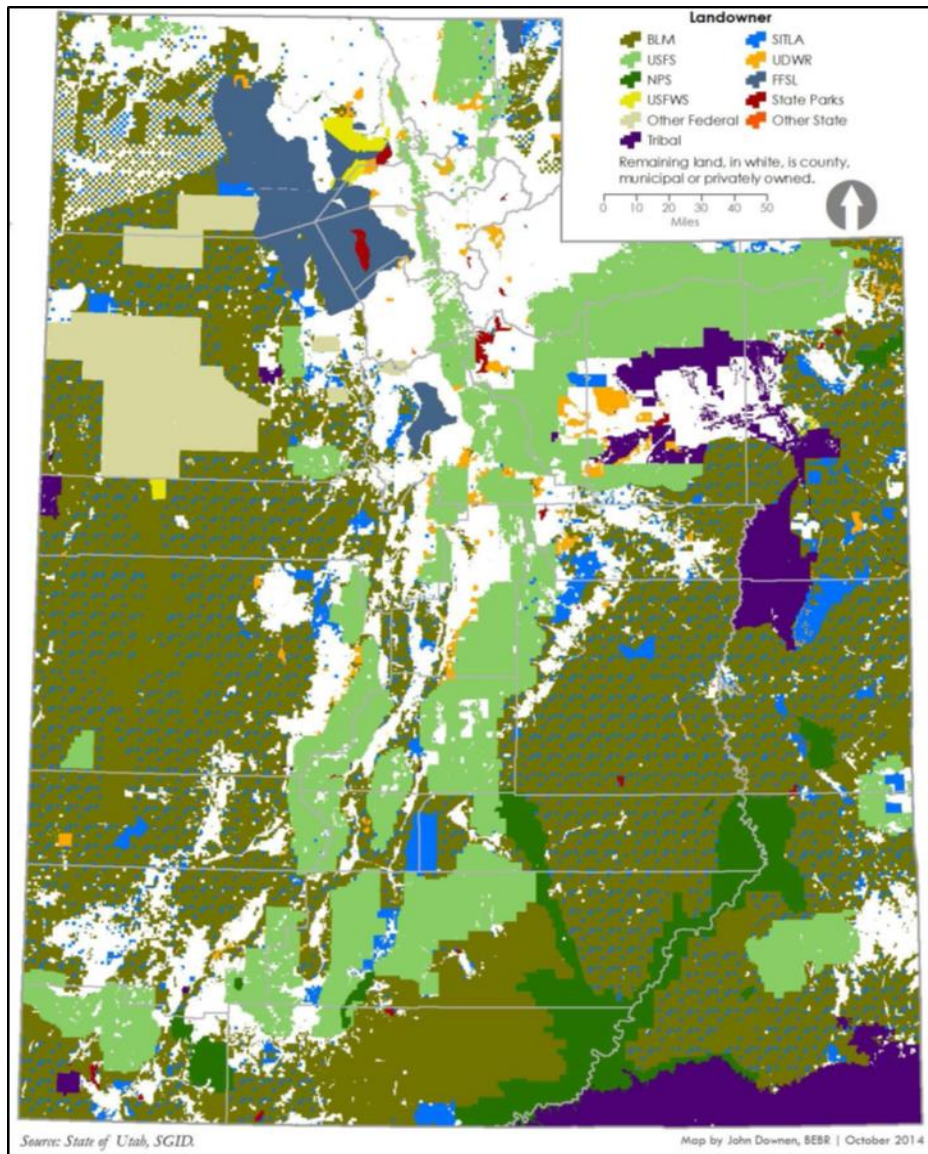


Figure 3.2: Utah Land Ownership [2].

Additionally, SITLA has worked with The Nature Conservancy, Utah Open Lands, the Conservation Fund, and other agencies to protect 3,191 acres of desert tortoise habitat throughout Utah [10].

The main purpose for SITLA is to make money for their beneficiaries. SITLA states that “Land sale auctions are usually held once or twice each year. In order for a parcel of land to be sold, it must first be determined that selling the property is in the best interest of beneficiaries of the Trust” [11]. This clearly states that the main priority is to the beneficiaries. Furthermore, in 2015 alone, the BLM sold off 3,124.5 acres [11]. The BLM has roughly 19.4 million more acres than SITLA in the State of Utah, and they sell off 1,000 acres less than SITLA.

SITLA has also done many projects to develop the land for recreation, residential and commercial purposes. For example, they recently designated a 135 mile trail system for off-highway vehicles [10]. This trail system spans 28,000 acres and was put into place due to undisciplined off-highway vehicle use. Additionally, more than 50 miles of unauthorized roads and trails were closed and reclaimed because they were threatening resources on two of SITLA's premier land blocks.

Another example of SITLA managing the public lands is the construction project on The Great Hunt Panel. The panel is a famous rock art site in Wellington, UT that was in danger of deterioration because of its close proximity to a popular road. SITLA teamed up with a few other organizations to realign the road and installed fencing, a walkway, and other protective measures to ensure the safety of the paintings [10]. Protecting historical sites is an important part of managing the public land. They must be protected in order to preserve them for future generations.

SITLA also sells much of their land for development of residential and commercial development. One example of this is the Sienna Hills community in Washington County.

The project took over ten years to plan and complete and cost more than \$10 million [12]. This development was built from the ground up for residential and commercial uses and has plenty of open space for trails, recreation, shopping, and entertainment.

3.3 Wildfires

Wildfires are another important aspect that needs to be looked into. Because wildfires are usually considered an emergency, many organizations work together to stop them so the transfer of lands is a little complicated in this area. Currently, both the federal government and the state spend a lot of money on preventing and extinguishing wildfires. This section will look further into the various aspects associated with wildfire management.

3.3.1 Wildfires - BLM

It is important not only to fight wildfires, but to also prevent wildfires and to rehabilitate burned areas. The BLM currently does this as part of their land management. A substantial amount of BLM's fire prevention goes towards removing fuels from areas close to urban areas. They do things such as controlled burns and restoration of natural ecosystems in order to reduce the amount of volatile vegetation [13]. These programs are in place in order to remove fuels from areas that may be susceptible to wildfires, or that are high danger areas. It is important to remove those fuels as a way to prevent fires, and in the case of a fire, to slow its spread. They are trying to prevent the catastrophic wild fires that have been happening all over the West.

The BLM also uses education as a way to prevent wildfires. They use advertisements, signs, brochures, and by teaching wildfire safety programs as a way to help educate and reduce wildfires [14]. These programs are in place to help educate people of all ages in ways to prevent and to prepare for wildfires. Without this proper education, there would inevitably be more fires; and more damage and loss of life when fires occur.

3.3.2 Wildfires - SITLA

Currently, Utah’s wildfires are controlled mostly by the U.S. Forest Service and BLM. The state is only responsible for about 3% of the total wildfire spending. BLM is responsible for 58% and the Forest Service takes 39% of the cost according to data ranging from 2008-2012 [9]. Most of the state’s wildfire management is controlled by Utah’s Division of Forestry, Fire, and State Lands (FFSL). Table 3.4 shows this information along with total land area managed and cost per acre. Additionally, SITLA spent \$450,000 last year to reseed and rehabilitate lands scorched by wildfire. The cost per acre acts as a good comparison between the agencies. Utah spends the least per acre by a large margin. They spend about one-quarter as much as any other agency. This could be explained by few different reasons. FFSL relies heavily on federal land managers for aviation support. They don’t operate their own fleet of aircraft. This is most likely the main reason their costs are so low. Operating a fleet of aircraft to fight wildfires is extremely expensive but it is one of the most effective strategies to contain wildfires. Currently, when Utah needs aviation support, they contact the federal agencies or other companies in the mid-West to help them.

Table 3.4: Utah Wildfire Spending

Utah Wildfire Spending, FY2008–FY2012
(Average Annual Expenditures in Constant 2013 Dollars)¹

Agency	Expenditures		Total	Share of Total	
	Suppression	Other ²		Suppression	Other ²
BLM	\$9,558,790	\$30,538,049	\$40,096,839	23.8%	76.2%
Forest Service	\$16,348,072	\$20,262,806	\$36,610,878	44.7%	55.3%
Utah FFSL	\$5,234,519	\$1,406,100	\$6,640,618	78.8%	21.2%
All Three	\$31,141,381	\$52,206,955	\$83,348,335	37.4%	62.6%

1. BLM and Forest Service amounts are for federal fiscal years ending September 30. Utah FFSL amounts are for state fiscal years ending June 30.

2. Other wildfire spending includes preparedness, fuels treatments, burned area rehabilitation, and other non-suppression expenses related to wildfire.

Source: Bureau of Land Management, U.S. Forest Service, Utah Legislative Fiscal Analyst

Source: “Wildfire in Utah,” Center for Society, Economy, and the Environment

3.4 Grazing

Grazing practices are very important in Utah. From rancher’s making a living to the ecosystem, grazing impacts every aspect of the triple bottom line. Additionally, both the federal

government and the state make considerable profit off grazing allotments. This section analyzes how each agency manages their grazing allotments.

3.4.1 Grazing - BLM

Grazing rights for livestock owners is an extremely important use of public lands within the State of Utah. In 2005 there were 19.4 million acres of grazing land within Utah that the BLM managed. As of 2012 there were 1,468 separate grazing permits in place on BLM lands [2]. In 2013 the BLM charged \$1.69 per AUM [2]. These grazing rights, and the amount they pay, are extremely important to ranchers and livestock owners. Livestock owners rely on these grazing rights for their livelihood.

In managing these grazing permits, the BLM utilizes a variety of procedures; all of which are mandated by Federal Law. One of the things that the BLM does is to make sure that grazing is done in such a manner that the land remains in a healthy condition. The BLM works in conjunction with local citizens in order to set criteria that must be met in order to give out grazing permits. Those criteria can include such things as vegetation on stream banks and adequate ground cover [15]. Land grazing also has other important side effects. Controlled grazing can control invasive vegetation and reduce fuels that lead to catastrophic wildfires. Proper control over grazing can also support strong watersheds and wildlife habitats [15]. Proper grazing is important in many ways and is vital for the livestock owner's livelihoods as well as for the health of the land and ecosystem.

3.4.2 Grazing - SITLA

Approximately 91% of SITLA's land is considered suitable rangeland for grazing. Currently, land grazing permits have 15-year terms. To obtain a permit, individuals or corporations must apply with a small fee and then they are given permission to use the lands for grazing. Current fees for grazing are \$4.78 per AUM which is higher than the BLM charges. SITLA also charges \$8.32 per AUM on 12 specific larger blocks of land.

There is currently a policy in place for when federal lands are transferred to SITLA. This policy involves permittees to have their grazing fees phased over from the federal rate to the SITLA rate over a 3-5 year period. The purpose of this policy is to ensure fairness to people who bought grazing rights under the federal rate who would have to pay the higher SITLA rate when lands are transferred. The policy was developed with the input and support of the Utah Farm Bureau and the Utah Cattleman's Association. In the event that all federal lands were transferred to the state, this policy would most likely stay in place.

3.5 Wildlife Management

The last aspect of land management that needs to be evaluated is wildlife management. Wildlife management considers how animals on the land are treated, hunting policies, land limitations, as well as the protection of threatened species and any other factors that impact animals on the lands. It is important to look at wildlife management because poor management will result in animals going extinct, animals overtaking land, negative effects on the ecosystem, and poor land health. This section analyzes the policies and regulations each agency has concerning wildlife on their lands.

3.5.1 Wildlife Management - BLM

Within the State of Utah there are several ongoing programs to manage wildlife. These programs are a vital part of managing public lands. It ensures that hunters are able to continue to hunt game, and it also helps to protect the ecosystem in its natural state. The BLM partners with private, county, state, and federal entities in order to maintain and study wildlife throughout BLM land.

The BLM has a Wildlife Program that aims to protect land and aquatic wildlife and their habitats. They assess every potential project on BLM by doing environmental impact statements in order to determine the potential impact that project might have on the ecosystem and it's wildlife. In Utah the BLM has also worked with Utah Division of

Wildlife Resources, Utah State University, and Brigham Young University to conduct studies and to perform restoration projects throughout Utah [16]. These projects are important aspects of Land Management. It is important to see that the BLM is working hand in hand with local entities in order to accomplish wildlife management.

The BLM also has a current program running throughout the Western United States to restore the Greater Sage Grouse. In 2010, the U.S. Fish and Wildlife Service declared that the state of the Greater Sage Grouse was “Warranted but Precluded” [17]. This means that the species was under a major threat of being endangered. They have established a plan to minimize disturbance to Sage Grouse Habitat, to improve upon their habitat, and to reduce the threat of rangeland fires by eliminating cheat grass and restoring the natural ecosystem [17]. The actual plans for accomplishing these goals are to be worked out with other federal and state agencies. This is a crucial way that the BLM can restore these animals.

In 1971, the United States Congress passed the Wild Free-Roaming Horses and Burros Act of 1971. This act directs federal agencies in the management of wild horses and burros. According to this Act, the U.S Forest Service and BLM are required to manage herds in areas in which they were found in 1971 [18]. These management programs are all examples of some of the things that the BLM does in order to maintain the wildlife and ecosystems within Utah.

3.5.2 Wildlife Management - SITLA

Aside from financial management of the lands, SITLA also manages wildlife. For example, over the last 70 years, the Sage-Grouse populations in the West have been steadily decreasing. In 2010, it was listed as a species in great danger of dying out and with a possibility of being placed on the Endangered Species list. Due to this, SITLA worked with the state on a plan to preserve the species and before it reaches that list. If the animal was listed as an Endangered Species, regulations would be put in place to

preserve the species and they would have a significant impact on the oil, gas, mining, and other surface activities on SITLA's land. This would significantly decrease profits for SITLA and therefore decrease education funding. SITLA takes great initiative in making changes before this occurs. Utah also has a problem with wild horses and burros. When too many of these animals roam the rangelands, it causes damage to the ecosystem. This is the BLM's legal responsibility to manage but the BLM lacks funding to take care of the problem. If the problem were to continue, it would render the rangelands unsuitable for domesticated animals and livestock. This would reduce grazing on the lands and therefore limit SITLA's profits.

3.6 Summary

This chapter outlined some of the differences and similarities in the way that SITLA and BLM manage their lands in order to draw some conclusions on what changes, if any, would result from a transfer of federal lands to the State of Utah. The agencies were compared in four general areas; public access, wildfires, grazing, and wildlife management. This section will make a few conclusions in these areas and use the analysis to give a grade to specific categories within the people, planet, and profit framework.

3.6.1 Wildfires

In looking for differences in wildfire strategies between BLM and SITLA it became clear that there isn't currently much separation between the two. Utah benefits from wildfire suppression on BLM land as well as on SITLA land. However, if a transfer takes place and wildfire conditions are anything less than optimal, Utah will be looking at spending an additional \$76.7 million on wildfires under current practices [2]. Alternatively, Utah could scale back on wildfire suppression and prevention activities, which could have serious consequences.

3.6.2 Grazing

Grazing on BLM and SITLA lands is managed in order to make a profit as well as maintain the quality of the land for future generations. The current management of grazing on

BLM and SITLA lands does not appear to be significantly different except for grazing fees, where SITLA charges much more. So a land transfer would not have much effect on the land, but there would be a large negative effect on the people buying grazing rights because they would have to pay about 4 times as much.

3.6.3 Wildlife Management

Wildlife management on BLM and SITLA lands is similar and the two organizations often work together. The only major difference is SITLA tends to focus more on profit, as demonstrated by the example of the sage grouse, where SITLA is working hard to keep it off the endangered species list in order to maintain current levels of profit-making activities, like mining and oil exploration. This is in contrast to BLM who seems concerned about the animal's well-being rather than the profit effect it would have.

3.6.4 Public Access

Public access is a complicated issue with many facets. Public access is quite good on both BLM and SITLA lands. However, the current trend in land sales shows SITLA selling much more land per year (as a percent of total acreage) than BLM. If a transfer were to take place, and BLM land was sold at the rate that SITLA land was sold in 2015 it would have a negative impact on public access. Additionally, the problem of landlocked land is between the agencies and private owners so transferring the land would not have much effect on this problem. Roads and trails is another important factor when considering public access. While roads on BLM land decreased by approximately 2000 miles, roads on SITLA land were reduced by 50 miles. While both BLM and SITLA are currently decreasing roads, they are also both increasing trails. So, a land transfer would not cause much effect on public access.

3.6.5 Grading

Taking all relevant aspects of this chapter into consideration, the following is a justification for the grades given to applicable categories as shown in Table 3.5.

3.6.5a Land Accessibility

(3) Due to the apparent trend of SITLA selling off more land than BLM. With more land becoming privatized, less of it will be open to the public.

3.6.5b Recreation

(4) No change. Similar policies will stay in place.

3.6.5c Jobs

(3) With the increase in grazing fees, some ranchers/farmers will not be able to keep up with the increased price and lose their jobs

3.6.5d Wildlife Management

(3) It seems SITLA is more focused on making profits than on aiding the animals

3.6.5e Overall Environmental Quality

(2) Primarily due to the risk of increased wildfires under current practices without an increase in funding.

3.6.5f Mining

(4) The effects of mining would remain unchanged.

3.6.5g Livelihood/jobs

(3) Farmers/ranchers would be profiting less due to the increased grazing fees

3.6.5h Land Usage/Development

(6) SITLA develops a lot more on their lands

3.6.5i Land Sales

(6) If current trend holds, land sales will increase substantially. SITLA sells off their land twice per year.

Table 3.5: Decision Matrix Criteria: Triple Bottom Line Assessment Scores for Chapter 3.

People	A	Planet	B	Profit	C
Land Accessibility	3	Water Quality		Generate Revenue	
Human Health (effects on)		Air Quality		Oil/Gas Royalties	
Recreation	4	Wildlife Management	3	Livelihood/ Jobs	3
Jobs	3	Overall Environment Quality	2	Land Usage/ Development	6
Trust of Local Government		Mining (Effects of)	4	Land Sales	6
Final Score	3.33	Final Score	3	Final Score	4.33

3.7 References

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Chapter 4

Public Accessibility on State Lands versus Federal Lands: Implications of a Federal Land Transfer to the State of Utah on Public Access

Abstract

Within the Federal Government there are a number of agencies that oversee, in some way, public access to Federal lands. These agencies include the Bureau of Land Management, Forest Service, National Park Service, and the U.S. Fish and Wildlife Service. The State of Utah has its own agencies that help manage Public Access to state lands. These agencies include the School & Institutional Trust Lands Administration, and the Department of Natural Resources.

Although there is some overlapping in oversight between the Federal and State agencies generally they remain separate. There are a number of differences between Federal and State oversight of public access to government owned land. In order to understand what infrastructure the Federal and State government currently have in place this chapter discusses the various agencies which manage public access to government owned lands as well as a number of differences, pros, and cons for each government.

4.1 Introduction

In “An Analysis of a Transfer of Federal Lands to the State of Utah” the value of recreation on public lands is observed using the benefit transfer method and is given a net worth of \$16.9 billion with hiking and mountain biking as the greatest contributors [1]. Utah’s unique landscape is comprised of ecosystems ranging from forested mountain ranges, to sandstone bluffs/arches, and vast desert regions, which draw outdoor enthusiasts from around the world. Hunting, fishing, camping, hiking, off highway vehicle (OHV) use, climbing, mountain biking, sightseeing and many other activities take place here improving the quality of life for Utah residents. These benefits hold a value much greater than monetary worth. Federal government agencies such as the Bureau of Land Management (BLM) and United States Forest Service own 64 percent of the total land area in Utah all of which is accessible to the general public [1]. It is their goal to manage the land by protecting and preserving it for future generations [2]. State land management divisions including the School and Institutional Trust Lands Administration, and the Utah Division of Natural Resources own and manage 10 percent of the land within state boundaries [1]. Both federal and state organizations share goals to improve recreational opportunities and environmental wellbeing though the state places a greater emphasis on financial gain available through exploitation of natural resources and possible development or sale of land. Both government and state agency management policies, historical and current, will be outlined with pros and cons expressed in order to respond to the following research question. In the event of a land transfer how will access of public lands be affected: namely, 1) what ways do the federal government and Utah state governments currently protect and manage lands that are used for recreational activities including: hunting, fishing, hiking, camping, and Off-Highway Vehicle use and 2) in what areas have the land management organizations succeeded and/or failed?

4.2 Access to Public Lands under the Federal Government

The Western United States has vast amounts of federal land where the public can hunt, fish, hike, camp and recreate without worrying about trespassing on private property [3]. Over time, many of these Western States have considered to regain this land via transfer through

legislation in which they would gain a state land trust. If the land were to be transferred to the states, the general public could lose access to these lands and important fish and wildlife habitat could disappear as the lands are sold and developed in accordance with their mandates [3]. It is important to understand how these federal agencies currently regulate the land in order to understand the reasoning of a potential land transfer.

4.2.1 Federal Agencies – Land Overview

The mission of the BLM is “to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations” [2]. Therefore, such agencies like the BLM has enforced specific regulations in order to protect their land for all generations. Most of the BLM public lands are located in the Western United States. The United States Forest Service manages approximately 25% of federal lands [4]. Much like the BLM, their motto follows the same target of future generations, “To sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations” [4].

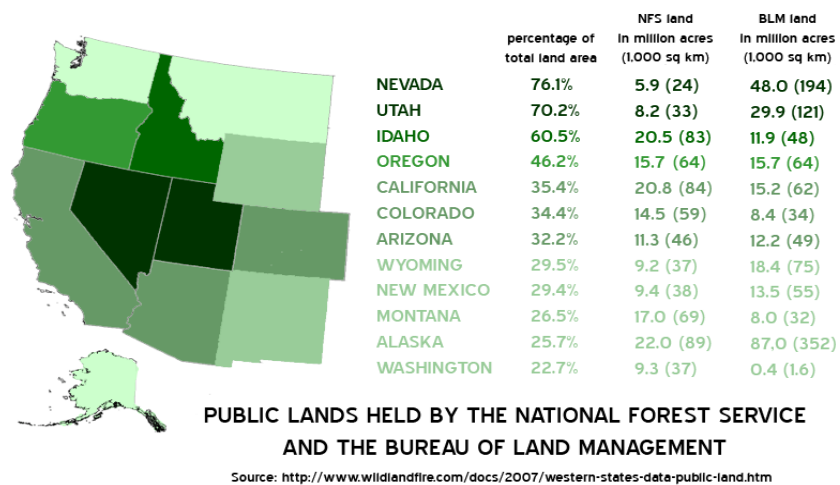


Figure 4.1: Federal Agency Land Management [1].

4.2.1.a Federal Agencies – Recreation

Millions of people recreate on BLM lands each year and use of these lands is increasing. Over the past decade, there has been a 20 percent increase of

recreation-related activities on BLM lands in Utah. In the year 2003, an estimated 5.9 million visits were made on the BLM lands. With the 20 percent increase of visitation, the number of visitors has increased since 2012 to 7 million [5]. A variety of recreation occurs on BLM lands, including activities that involve visits to recreation sites and as well as activities that occur on undeveloped lands. In Utah, recreation on BLM lands is almost evenly split between visits to recreation sites and dispersed recreation (visits to areas with no amenities) [5].

4.2.1.b Federal Agencies – Special Recreation Permits

The BLM requires a Special Recreation Permit (SRP) for commercial operations, competitive events and races, and organized group activities on public lands [6]. Because these events bring large numbers of people into concentrated areas for a period of time it's important that these events be regulated so that the effects of human traffic on fragile parcels be contained and minimized. Permitting also allows for the collection of land use fees which can help fund maintenance and management of the land. The minimum annual fee for any commercial SRP is currently \$100 [6].

4.2.1.c Federal Agencies – Hunting and Fishing

Many refuge areas have been set aside in Utah to protect feeding and breeding grounds for the wildlife. Currently there are over 560 refuges in the National Wildlife Refuge System [7]. The refuge we are focusing on in this section is the Bear River Refuge which is located north of the Great Salt Lake. The grounds are to be maintained in such a way that the public will not leave their own footprint to disturb the natural habitat. Therefore, off-road vehicles are not allowed in this area without a permit. Each refuge also has its own guidelines on which animals may be hunted at any given time. Some refuge areas may be heavily populated with water fowl, or some areas may be prime for fishing. The Bear River Refuge is an area that allows hunters to hunt ducks, geese, coots, tundra (whistling)

swans, and pheasant [7]. Hunting any other wildlife species is prohibited. Specific species of animals may also require a hunting permit before any public hunting may take place. Gun regulations also apply to each refuge area. In the case for Bear River, archery hunting is prohibited. This really depends on the conditions of the land as well as the safety for other hunters and the animals that these rules are maintained. Entering hunt units prior to the opening day of hunting season is forbidden.

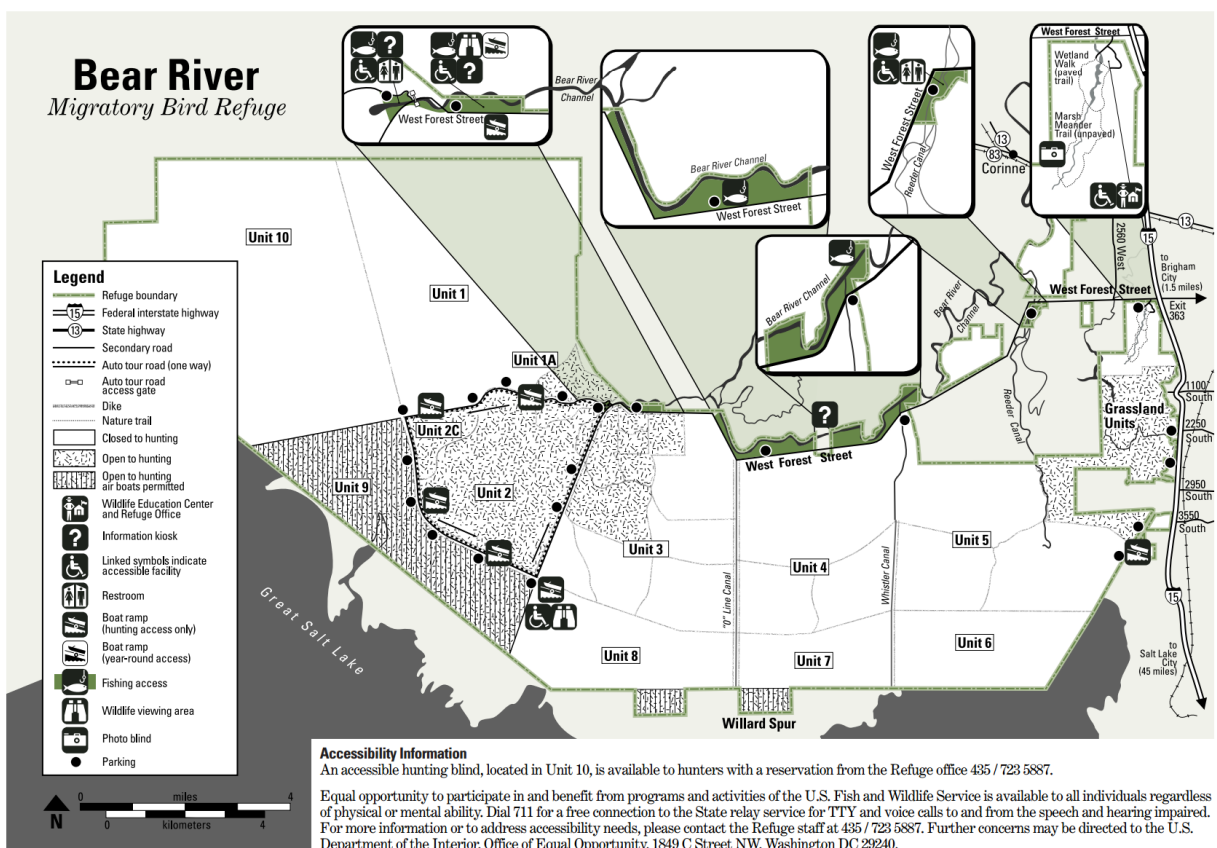


Figure 4.2: Bear River Refuge Hunting and Fishing Regulated Map [7].

This map shows the general layout of the Bear River hunting and fishing regulated areas [7]. Hunters may not enter closed areas to retrieve birds. They must allow enough room between the closed area boundary and where they are hunting to retrieve their birds. Safety and order is not only a priority focused on

the wildlife, but as well as the hunter and fisherman in the region. At times, small motor boats are permitted in all hunt units during waterfowl hunting season. Utah State laws requiring registration and safety equipment apply [7]. Fishing is allowed on the Bear River Refuge at the following three locations: Refuge lands along the main Bear River channel upstream from the River Delta Interpretive Area; Refuge lands accessible from West Forest Street along the Reeder Canal; and Refuge lands north of West Forest Street along the Whistler canal. Fishing is allowed by foot access only and is not permitted to be carried out on bridges or any water control structures. Each refuge has its general regulations of how the area is supposed to be maintained, however, within federal guidelines the rules are pretty similar across the country [7].

4.2.1.d Federal Agencies – Camping

The United State Forest Service has distinguished their camping regulations by allowing avid campers to pursue in what is called dispersed camping. Dispersed camping is the term used for camping anywhere in the National Forest outside of a designated campground. However, dispersed camping also means there are little amenities provided like tables, trash removal, and fire pits. Some popular dispersed camping areas may have toilet facilities to access. The United State Forest Service extends a fair warning to all campers wishing to camp off of a set campground in order to make sure everyone is safe, and to keep the natural resources scenic and unspoiled for other campers. Groups of over 75 people who wish to use the forest need to obtain a special use permit with no fee from the nearest District Office. This is maintained for safety regulations and also notifies the Forest Service of any safety measures it needs to take in order for everyone to stay safe in such a large group. You may camp in a dispersed area for up to 16 days. After 16 days, you must move at least 5 road miles for camping in another dispersed area. Campers may not return to the same campsite within the calendar year. Guidelines such as ‘Leave No Trace’, encouraging campers to

leave the environmental surroundings as they found it with no trash and in good condition, as well as to be alert for Bears or any other dangerous wildlife in the area. Campers must also keep 100 feet from any stream or other water source to preserve it for wildlife inhabitants [8].

4.2.1.e Federal Agencies- Off-Highway Vehicles

The Omnibus Public Land Management Act of 2009 directed BLM's St. George Field Office to complete a Comprehensive Travel and Transportation Management Plan for public lands in Washington County by 2012. The plan was illustrated to give a comprehensive analysis of the access needs of all public land users. Access needs were evaluated in conjunction with the BLM's legal mandate to protect natural and cultural resources on public lands. Individual route evaluations and designations that were included in the Comprehensive Travel and Transportation Management Plan were analyzed in an Environmental Assessment. Based on the evaluation, the routes were then designated with a specific classification:

- Open: Route is open for use by the public.
- Limited: Travel on this route is limited to the public in some form (seasonal restriction, administrative access, vehicle width restriction, non-motorized use).
- Closed: Route is closed to one or more uses.

In evaluation of these routes, the plan focused on the needs of a wide array of public land users. These people included recreational users, commercial users, competitive and organized group events, and administrative users. Recreational users make up the largest public lands user group. It is subdivided into both motorized and non-motorized users. Motorized users include full-size 4WD enthusiasts, ATV/UTV riders, and off-road motorcyclists. Non-motorized users include equestrians, mountain bikers, hikers, hunters, and rock climbers [9]. Commercial user group depends on the land for their income and employment.

It includes oil and gas companies, mining companies, and outfitters who offer a wide variety of guiding services for all forms of motorized and non-motorized recreation [9]. In terms of competitive and organized group events, the BLM issues permits for events such as: off-road motorcycle races, 4WD group events, ATV group events, mountain bike races, running races, adventure races, weddings, and family reunions [9].

4.3 Access to Public lands Under the Utah State Government

In the state of Utah there are approximately 27 departments/ agencies involved with managing or overseeing Utah's outdoor environment or natural resources, only four of which oversee various aspects of public access to state lands [10]. These four organizations include the School & Institutional Trust Lands Administration (SITLA), Utah State Parks and Recreation, Utah Division of Forestry, and the Utah Division of State Lands. However, the last three mentioned above operate under the Utah Division of Natural Resources (DNR). In the event of a land transfer to the state of Utah from the Federal Government these agencies will help to oversee and manage how the public accesses and uses public lands inside the state. It's crucial to understand how these agencies currently operate in order to more fully understand what public access might look like if Utah gains control over the public lands it seeks. Therefore, to understand how Utah might manage public lands , if lands are transferred, we will look at how Utah is managing its own lands currently with respect to the School & Institutional Trust Lands Administration, and the Department of Natural Resources and how these organizations affect public access to state lands.

4.3.1 School & Institutional Trust Lands Administration

Before understanding how SITLA currently manages public access to state lands it is important recognize what SITLA was organized to accomplish. Trust Lands are lands that were given to the state during the time of statehood which the Trust Lands Administration has full access to in order to provide funding for state institutions like schools and hospitals. During the time of allotment of lands the the entire state was broken up into townships of 36 square miles. Those townships were then subdivided

into 36 one square mile parcels; of which Utah was given parcel numbers 2, 16, 32, and 36 of each township as illustrated in Figure 3. Trust Lands comprise approximately 6% of the state's acreage.



Figure 4.3: Illustration of a single township parcel in the state of Utah along with the four subdivided units given to the state.

Currently SITLA is comprised of a number of departments, which oversee 4 main genres of *access*: Oil & Gas, Mining, Property Planning & Development, and the Surface Group. The first three focuses of SITLA mentioned above are discussed in other chapters of this report; therefore, the Surface Group will be the only subdivision of SITLA discussed in this chapter. The Surface Group oversees a number of activities, including the forestry program, the state grazing program, land sale auctions, rites of entry, special lease uses, and recreational use of Trust Lands [11]. Although the Surface Group's involvements are relatively broad for the sake of this chapter, we will be focusing on on the Surface Group's oversight of recreational use of State Lands. Although Trust Lands belong to the state of Utah they are operated in a fashion that more resembles that of private land. This is primarily due the fact that there are natural resources being extracted on these lands. Due to hazards, and liabilities that exist on extraction sites, it is important to restrict the public from these areas. Disregarding restricted public access to developed sites on state lands, the lands that are open to the public allow access for hunting, camping, off-highway vehicle use, commercial outfitters/tour operator, and competitive/group events [11].

4.3.1.a SITLA- Hunting

Because Trust Lands are vastly intermixed with Bureau of Land Management (BLM) lands they contain many varieties of huntable game, which include large game like elk, moose, and deer, along with smaller game and fowl like duck, turkey, bobcat, fox and many others. Like BLM land Trust Lands are also open to various hunts scheduled throughout each year. There are approximately nine different hunts that occur throughout the year, which allow public harvesting of hundreds of species of animals. This will be discussed more in depth in the following section. Trust lands are state lands, therefore, in effort to preserve and keep them from being degraded through disrespectful use SITLA requests that anyone accessing the land for hunting respect the land and help to preserve it for Trust beneficiaries. This can be done by following various common-sense practices and no-trace efforts; for example, respecting privately owned animals or wildlife, not leaving behind waste of any sort, helping to prevent erosion and protect fragile ecosystems by staying on established trails when possible. Currently SITLA does not broadly restrict public access to undeveloped state lands; however, in the future if the public begins to have an enormously negative effect on the trust lands SITLA does have the authority to restrict public access to those lands if it was their intention. Although SITLA allows for hunting on Trust Lands, hunting in Utah is not regulated by that administration [11].

4.3.1.b SITLA- Camping

Trust Lands are also available for camping, and the various SITLA guidelines that govern public access for camping are similar to other state and federal guidelines. The public is able to camp on any Trust Lands open to the public. However, those who wish to camp are required to camp only in spots that have already been established as campsites. In other words SITLA wants to preserve Trust Lands by restricting the public from creating new campsites. The public is also restricted from expanding the area of existing campsites. Abusing or

disregarding these guidelines could result in restricted public access. Any person is free to camp on Trust Lands for up to 14 consecutive days without any documentation. If one desires to camp for longer than 14 days on Trust Lands then that person is required to obtain a Rite of Entry Permit. Other guidelines and restrictions for public access to camping on Trust Lands include selecting campsites with durable surfaces not inhabited by vegetation and are at least 200 feet from any water source, not camping in any wet areas or fragile meadows. SITLA also asks that if fires are to be built that they be built in established fire-rings, that all garbage is packed out, and that campers use provided toilets if available. If toilets are not available, SITLA requests that human waste be buried 6 to 8 inches deep. Firewood can be removed from Trust Lands with a permit only; however, campfire wood can be taken without a permit only if the wood is from dead and downed wood [11].

Although there may be examples of SITLA restricting camping access to the public, research on this topic yielded no examples of such action. Therefore, it can be deduced that SITLA will continue to advocate for respectful use of Trust Lands (and possibly transferred lands in the future), and unless the public greatly harms these lands by disregarding SITLA's stated guidelines it is probable that this administration will continue welcoming camping access to the public.

4.3.1.c SITLA- Off-Highway Vehicle Use

Due to large amounts of uninhabited land in Utah off-highway vehicles (OHV's) are a popular way for some to access the open land. The main uses for OHV's on public lands are for those hunting, or who are simply riding for enjoyment. OHV's are openly welcomed on most Trust Lands as long as the public follows a few guidelines set out by SITLA. In order to preserve the natural environment the public is asked to remain on open routes designated for OHV's and to respect date and time restrictions for those routes. It is against SITLA guidelines for the public to use OHV's for cross-country travel mainly because operating OHV's off

pre-established trails and roads damages plant life and other fragile ecosystems which can lead to unnecessary erosion and scarring of the land. Although cross-country travel is restricted for OHV's it is allowed for over snow-vehicles provided there is sufficient snow on the ground to protect the underlying plants and soil. One main goal SITLA wants OHV operators to practice is to preserve land to the best of their ability; they're asked to leave gates as found, not to harass wildlife or livestock, to avoid wet conditions and wheel-spin, which helps prevent erosion of soils [11].

A primary environmental concern with allowing OHV's into the wilderness is the acceleration of erosion, as mentioned above. If necessary, SITLA has the power to close roads/ trails that have been degraded by OHV use. In areas heavily used for recreational OHV use or roads and trails winding through heavily hunted Trust Lands this may be necessary to help stem erosion rates. However, the majority of Utah's Trust Lands lie in arid regions of Utah that get little to no use throughout the year. Therefore, it is probable that SITLA will not restrict public access to these remote lands, or other Trust Lands designated for OHV use unless soil conditions on roads and trails degrade, and or OHV operators damage the land through disregard of stated guidelines.

4.3.1.d SITLA: Public Access Through Commercial Outfitters, Tours and Group Events

Generally, accessing Trust lands is done by single persons or small groups. However, Trust Lands are also available for public access in the form of organized tours, groups, and events. These events can include guided hunting, mountain bike races, cross-country trail races, ultra-marathons, triathlons, and wilderness therapy, among other things. These various activities, together, create noticeable income and benefit for the state on the hole. For example, hunting alone created approximately 7,600 Utah jobs in 2001 [12]. These jobs bring many people onto public and state lands each year. Organized tours, groups, etc. are

allowed to organize events on state lands as long as the event coordinators obtain a right-of-entry permit. These permits generate revenue for the state along with helping to manage human impact on state lands. As with other types of access allowed to the public, in order to help protect and preserve the land SITLA asks that land use be restricted to established trails, roads, and recreational areas [11].

4.3.2 Utah Division of Wildlife Resources

The Utah Division of Wildlife Resources (DWR) is similar to SITLA in that it helps oversee how the land is accessed by the public although it has a much different function than SITLA. One main characteristic that sets the DWR apart from SITLA is that the DWR does not own land. SITLA owns land for the purpose of benefiting various state institutions while the DWR acts as an intermediary regulatory division which manages the relationship between wildlife populations and recreational activities like hunting and fishing.

4.3.2.a DWR- Hunting

The DWR continuously publishes information on big game, bear, cougar, furbearers, upland game/turkey, and waterfowl populations to inform the public about those respective hunts. By allowing the public access to state lands for hunting the DWR can manage game populations vicariously through hunters. This is done in part by overseeing the permitting process. The population size and level of nuisance aids in determining how many permits the DWR issues each for a particular species. For more popularly hunted species the DWR issues permits by lottery as a means of distribution due to the number of applications received each year. Many hunts are also restricted by time of year to limit the number of animals hunted throughout the year. In contrast to limited hunts, other species of can be hunted all year long, which allows the interested public to access state lands for hunting throughout the year. Although hunting can be limited to state lands, federal agencies, like the BLM, also allow hunting;

however, access to BLM lands for hunting is only accessible for those with permits issued through the Utah DWR [13].

4.3.2.b DWR- Fishing

Unlike issuing limited hunting permits for game, the DWR issues fishing licenses for a flat fee. In order to legally access public waters for fishing anyone over 12 years of age must purchase a fishing license. Also, rather than issuing hunting permits in effort to artificially reduce animal populations, fish populations are artificially maintained through DWR stocking efforts. Maintaining fish populations in the state's rivers, lakes, and reservoirs continually provides opportunity for the public to recreate. The DWR has laid out a set of rules and regulations that vary based on the demands of a specific body of water and the aquatic life present there. Native fish including the Razorback Sucker, Humpback Chub, Colorado Pikeminnow, June Sucker, and Bonneville Trout currently are or previously were listed as endangered species. Great efforts have been taken by the DWR to protect these endemic fish. If a fish designated as threatened, restrictions are in place restricting their harvest. Though fishing regulations may differ at distinct locales, a list of general rules can be found in the 2015 Utah Fishing Guidebook. Regulations regarding fishing from a boat, netting, use of bait, and spear-fishing are all contained in the handbook. Private bodies of water including reservoirs or lakes surrounded by private property and manmade rivers and streams are not accessible to the public unless written permission is granted by the landowner [14].

Over the past 15 years access to fishable rivers throughout Utah has gone back and forth between private landowners and recreationists. In 2000, a man was cited for wading through a river bed on private property. Consequently, Mr. Conaster requested an action from the court declaring his right to wade through the Weber River even though it passed through private property. In 2008, the Utah Supreme Court ruled in "Conaster vs Johnson [15]" that those who

specifically use rivers to recreate such as hunters and fishers are legally protected to wade in any section of public water. Between 2008 and 2010 a bill to decrease recreational access to rivers was under consideration and was fought for by private landowners and state officials while groups like the Utah Stream Access Coalition fought against it. Eventually House Bill 80 was passed which restricted access to rivers flowing through private property to those floating on the water and not wading. On November 4, 2015 in “USAC vs VR Acquisitions and the State of Utah [15]” Judge Pullan from the fourth district court ruled in favor of the Utah Stream Access Coalition which renewed wading access to rivers running through public waters on private land. This bill opened 2700 miles of fishable water to wading fishers. “Public waters are natural lakes and natural-flowing rivers, streams, and creeks located on private land. For the easement to apply, a watercourse must have sufficient water to support lawful recreational activities. There is no right of access in waters diverted away from natural waters, including diversion works, canals, ditches, man-made streams, flumes, off-stream reservoirs and so forth” [13]. Only recreational activities that require the use of public waters for enjoyment grant access. It is likely that the State will try to overturn this latest ruling as it has always showed its support of the private landowner over the public recreationist on this issue.

4.3.2.c DWR- State Parks

The state of Utah, through the DWR, manages approximately 43 State Parks, Museums, and Recreation Areas. These Parks range from forests, to lakes/reservoirs, to sand dunes. Although these parks sometimes require entry fees, permit fees, or camping fees these generally are the not state’s main incentive managing state parks. As stated in the state’s vision for recreation, recreational tourism has brought many positive benefits to the state, and because there are no small amount of recreational areas in Utah the state government wants to build this sector of the economy as much as possible.

Activities on these lands includes, boating, hiking, fishing, golf, mountain biking, OHV riding, museums, and water sports. Between travel, food, and other gear needed for vacation in these parks these activities bring sizable amounts of money into the state. For example, in 2011, spending by tourists in Utah reached approximately \$6.9 billion, generating \$890 million in direct tourism-related tax revenue for the state. Furthermore, tourism employs about 124,000 people in Utah. These parks are designed and set apart specifically for public access [16]. Although Utah would not be taking control of any of the National Parks within the state's boundaries, a land transfer would give the state the opportunity to create more state parks. However, even if new state parks weren't created it is probable that the public would still have access to all the same public lands for the same purposes.

4.3.2.d- DWR- Forests/Sovereign Lands

According to the Utah Division of Forestry, Fire, & State Lands the large majority of Utah's forests are privately owned, or owned by the U.S. Forest Service. Therefore, this sector of the DWR does not oversee public access to these areas. However it does oversee Utah's Sovereign Lands, or submerged lands. These lands include Utah Lake, Great Salt Lake, Bear Lake (Utah Portion), Jordan River, Green River (portions), Colorado River (Portions), and Bear River (portions). The DWR helps to maintain access points to these bodies of water which allow the public the use these bodies for swimming, boating, etc. [17].

4.4 Pros and Cons

"31.2 million acres of land is currently managed by the federal government. This accounts for more than 60 percent of the state's land area, or five times the amount of land the state currently owns and manages [18]" Each has a different method of doing so and has seen successes and drawbacks. In general the state manages the public lands with a mindset focused more on the economic benefits that can be gained. The state managed SITLA public lands have the purpose of generating revenue to contribute to education throughout the state. Although

the Federal government also generates revenue through extraction of natural resources on public land, Federal agencies tend to manage lands based on policies put in place such as the Wilderness Act of 1964 to protect natural areas and endangered species that reside in public areas such as BLM and Forest Service land. Because of the pressure by the state to transfer the lands, an increased effort to win the support of the community has also been made. They funded the 785 page financial feasibility report which proved the state financially capable of managing the lands in question. Utah's Public Lands Policy Coordinating Office (PLPCO) has made it their goal to demonstrate that the state would do a better job managing public lands than the federal government. Because of this push to obtain support, more information regarding the successes that the state has had is readily available. The federal government, on the other hand, has not published such information or lobbied for the public's support because they already own the land and currently have no intention of forfeiting land ownership to the state of Utah. Because so much effort has been exerted by Utah arguing its financial capability there is an absence of information relating to topics other than monetary gain; for example, its intention to allow public access. However, due to the state's strong support of bringing in out-of-state dollars through recreation it can be assumed that Utah will develop its lands for this purpose than what has currently been done. The state has taken an approach to the land transfer that resembles a business plan in that they must make a profit to support and pay off the land. The federal government maintains a budget that will supply what is necessary to fund the management of the lands and ensure that the land is available for public use.

4.4.1 State Management Pros

Issues that arise on lands in Utah can readily be addressed by the state itself in an intimate way that the federal government may not be able to. State officials and divisions have a keen understanding on the wants and needs of those that live near and use public lands and can manage the accessibility in a way that caters to locals specifically. State officials are aware of the economic benefits of proper oversight of said lands.

Governor Gary Herbert requested that the Governor's Council on Balanced Resources prepare a vision outlining the goals the state has for providing the public an excellent opportunity and experience as they take part in recreational activities. Utah houses many renowned natural sites and landscapes that add to the economic and nonfinancial value. There exists a great divide between those that see the land as a business opportunity and those who wish to maintain public lands as a nature preserve, state officials have gained a close to home understanding of sensitive issues that need to be addressed in a bipartisan and respectful manner. Many of these issues and questions of concern are outlined in Governor Herbert's vision for recreation in Utah. The vision developed by the council intends to address topics such as tension between recreationists, the environmental harm that could be done by allowing too much access to the land, the financial burden of managing the lands and how it can be supported, balancing use of land for profit and non-financial gain, and ensuring affordability for locals to enjoy natural areas. [19]

Since developing the outdoor recreation vision of Utah, Governor Herbert created the Office of Outdoor Recreation. This branch was founded on the goal to maintain a national standard in the recreation industry, and "ensure the State's natural assets can sustain economic growth for years to come [20]."

Utah has defined plans and goals to preserve public land access and it's upkeep in the Governor's vision in various specific goals. "Through public processes, identify the most valued recreational areas in Utah and explore how to optimize the recreational experience in those areas" [19]. It is critical that the state recognizes all parties with special interests as this goal is completed. The state could take a close to home "Resolve RS2477 claims in Utah's counties as expeditiously as possible and with consideration for access to popular recreational areas" [2]. An infrastructure of roads built by the public to access the federally owned lands has raised many disputes. Environmentalists see these roads as slashes through wilderness areas and questions have surfaced of who owns and should maintain RS2477 roads built in the past that are

now widely used. In the event of a public land transfer these roads would fall under the jurisdiction of the state and processes to resolve disputes would be more expeditious.

4.4.2 State Management Cons:

Utah has a good track record managing its money. Its economy is consistently growing creating jobs as more and more people move into the state. This financial priority has translated into their management of public lands as well. Upon statehood Utah was given 7.5 million acres of trust land and have since sold off 4 million acres of that land to private owners. [22] The land that was sold is no longer publicly accessible. If the land transfer were to take place, it is likely that the state will sell off portions of the 30.9 million acres it has acquired. It is apparent that Utah will be able to afford the maintenance of the additional 30.9 million acres of land if oil prices remain high. However, if prices dip, as they have in 2015 due to various current events, their ability to fund the land's maintenance will be severely disturbed. For example, in May of 2015 oil was sold for nearly 70 USD per barrel and approximately five months later, in November oil prices dropped as low as 44.4 USD [23]. If Utah does gain control of public lands and the price of oil continues to drop, revenue will need to be generated in other ways. Therefore, if management strategies similar to those currently in effect are implemented, it is likely that the state would sell off portions of public land to make up any losses. Furthermore, if land is sold to private entities, as experienced in the rulings on stream access, it is likely that the state will back private landowners rather than recreationists on issues that will arise in the future.

State managed SITLA lands are more lenient with respect to the use of OHV vehicles in areas that do not have developed roads. BLM management restricts the use of OHV vehicles to established roads designated specifically for the use of ORV and OHV riders. OHV use in wilderness areas erode the soil and destroy vegetation. Should the state obtain possession of the lands increased OHV use may cause damage to some of the wilderness areas currently protected by the BLM.

4.4.3 Federal Management Pros

The federal public land management agencies do not have to generate revenue to maintain the lands. Federal agencies are allotted a budget each year that has been predetermined which helps to ensure that public lands are preserved environmentally while also providing recreationists access to the vast Federal government's vast amount of land. This ensures the stability of the public lands. Over the past 50 years the United States government has shown an interest in preserving the wild places in the country and reserving the right for citizens to enjoy the beauty found in those places. In 1964 the Wilderness Act was passed with the purpose of establishing “a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes [24].” Although financial benefits gained through recreational activity on wilderness lands may be a side effect of the act, its main goal is to protect wild places. Since Utah was settled by pioneers in the mid 1800’s many wild animals and places have been run out by industrial practice and population growth. Greater importance was placed on economic growth over environmental awareness. Many people desire to live in Utah because of the natural beauty that fills the state and the recreational opportunities available here. The BLM states that their goal is to instill a recognition that “In an increasingly urbanized West, these recreational opportunities and the settings where these activities take place are vital to the quality of life enjoyed by residents of western states, as well as national and international visitors [25].”

4.4.4 Federal Management Cons

Although BLM, and other federal agencies have offices within the state of Utah, they report directly to the national level. Over time, management of these offices move on and new employees come in. A disconnect arises between the federal officials and their knowledge on the history of public lands in the state. This lack of understanding results in inefficient management. Final decisions are ultimately made by those that may not actually work in the state of Utah and may not know what’s in the best interest of the citizens that reside here and access the public land. Federal and state agencies do

however, work to coordinate efforts to improve the experience for those who recreate on the land, for example the national forest service works closely with the department of wildlife management to revive wildlife populations for the benefit of anglers and hunters. Federal agencies are forced to take a back seat on projects of which the state organizations understand more deeply.

RS2477 Revised Statute 2477 is a federal law that was passed in 1886 with the purpose of granting “The right of way for the construction of highways over public lands...” [26]. This allowed the development of public rights-of-way for uses such as hunting, fishing, camping, mining, and other general purposes. In 1976 this law was repealed and the Federal Land Policy and Management Act (FLPMA) was passed. This new act placed restrictions on the development of roads but preserved the R.S. 2477 roads in use. The thousands of roads remaining, many of them not documented by the federal government have been the cause for much confusion at the state and county level. The federal government did not develop a process to distinguish state or county owned roads. This inefficient management has led to uncertainty lawsuits and other disputes. The bureaucratic nature of federal agencies has produced restrictions and decisions overlooking the concerns of some who may be interested in the issues surrounding public lands.

4.5 Triple Bottom Line Conclusion

Table 4.1: Decision Matrix Criteria: Triple Bottom Line Assessment		
Scores for Chapter 4.		
A	B	C
People-A	Planet-B	Profit-C
Land Accessibility- 3	Water Quality-3	Generate Revenue-6
Human Health-0 (effects on)	Air Quality-0	Oil/Gas Royalties-0
Recreation-4	Wildlife Management-5	Livelihood/ Jobs-6
Jobs-0	Overall Environment-2 Quality	Land Usage/ Development-0
Trust of Local Government-2	Mining (Effects of)-0	Land Sales-6
Final Score- 3	Final Score- 3.3	Final Score- 6

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Chapter 5

How Utah Can Remain Environmentally Ethical While Economically Strong

Abstract

In 2012, House Bill 148 was passed by the Utah State Government requesting that all federally owned lands be transferred to the state for management. This transfer will affect the exploitation of Utah's natural resources. The purpose of this chapter is to determine how Utah can manage these resources in such a way that Utah's economy will remain strong while avoiding negative environmental impacts. In recent years, Utah has relied heavily on oil royalties which is responsible for about 77% of Utah's revenue generation. In addition to crude oil, Utah plans to exploit its vast deposits of oil shale and oil sands. An analysis of these exploitations shows an overall detriment to Utah's environment in both water and air quality.

Utah's dependence on oil and natural gas also carries a large economic risk due to market volatility. In order to avoid these adverse conditions, Utah must diversify their energy portfolio. Utah's timber industry has been on the decline over the past several decades, resulting in unhealthy forests and loss of jobs and revenue. In order to help the state's forests regain their health, it is important that logging and controlled burnings take place. Currently, the BLM and Forest Service are both underfunded and do not have the resources to take care of the forest as they should, this is why the forests have outgrown their natural tendencies and are at serious danger of a major wildfire. The timber industry should be brought back because the state could kill two birds with one stone by not only could it creating hundreds of jobs throughout the state and generating millions in revenue, but also increasing the health of the ecosystem and making the land more resilient to wildfires.

5.1 Introduction

This chapter examines how the land transfer from the federal government to the Utah state government can affect the use of natural resources within the state both economically and environmentally and how the land can be used best. The timber industry has long been on the decline not only in Utah, but in the entire rocky mountain west and should be brought back in order to keep the forest and ecosystem as healthy as possible.

Oil shale and tar sands are also prominent in the region and hold huge economic potential. These economic potentials however are rested upon a guarantee of percentages from royalties that the state needs to meet in order for this transfer to be economically viable. Offered here are potential revenue streams that may offset any economic impact not planned for by a decrease in these royalties.

5.2 Oil Shale and Oil Sand Resources

5.2.1 The Role of Oil in Utah

Of Utah's natural resources, oil is expected to play the largest role in making a transfer of public lands economically feasible. The purpose of this section is to determine what role oil should play if a transfer takes place by analyzing potential benefits and implications within the industry. Recommendations will be made based off of these benefits and implications to determine the best course for Utah to follow. This section will also discuss the possibilities of developing a more balanced energy portfolio, so as to reduce Utah's dependence on oil and gas and its associated risks.

5.2.2 Availability of Oil in Utah

A driving factor in the public lands debate is the amount of resources that Utah has and how it might be able to exploit them. Utah has considerable deposits of various types of oil. Of these various types, oil shale and oil sands are the most abundant. Estimates of worldwide oil shale availability are placed at about five trillion barrels or 795 trillion liters [1]. Of the world's known deposits, the largest is found in the Green River Formation, which is located in Utah, Colorado and Wyoming. Recoverable oil shale in

this region is estimated to be between 500 billion and 1.1 trillion barrels [2]. In comparison, the two largest proven reserves of crude oil in Venezuela and Saudi Arabia contain 297 billion barrels and 268 billion barrels respectively. A significant portion of the Green River formation lies within Utah in the Uinta Basin. In addition to oil shale, the basin also contains the state's largest deposits of oil sands with an estimated 12-19 billion barrels [3]. With a land transfer, Utah can tap into these abundant resources, which have the potential to bring billions of dollars into Utah's economy.

Oil Shale & Tar Sand Deposits in Utah

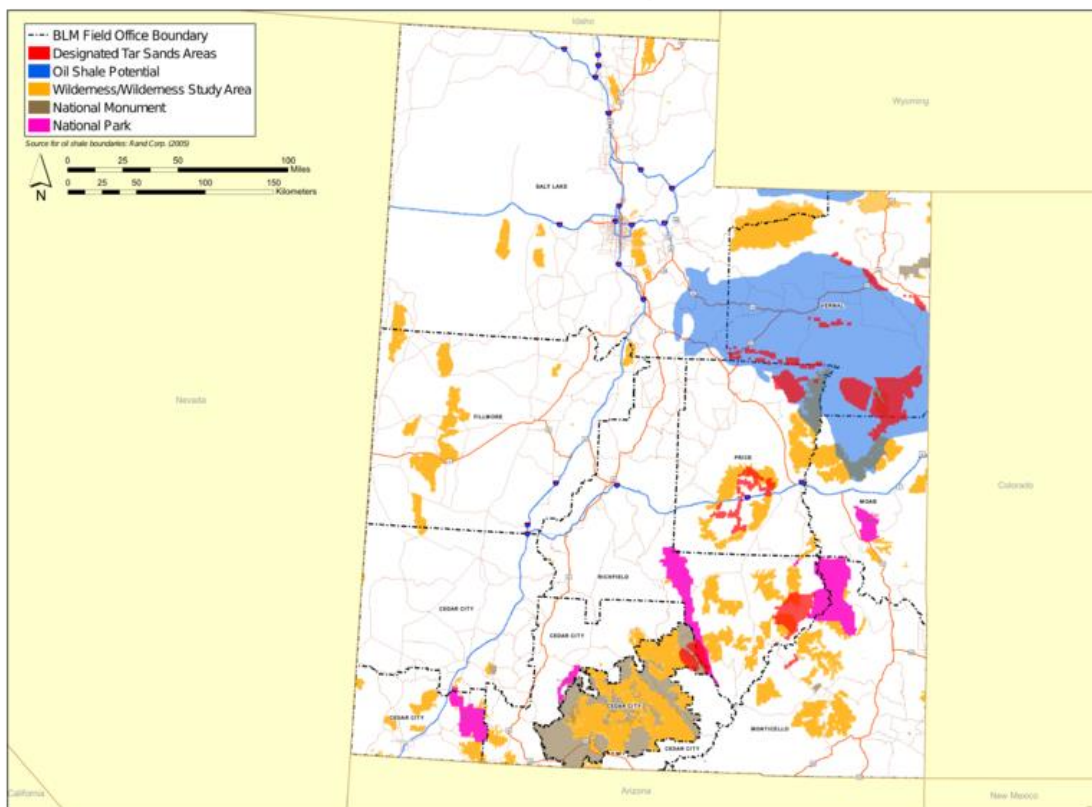


Figure 5.1 A map showing significant oil shale and oil sand deposits within Utah.

5.2.3 Current Status of Utah's Oil Industry

Given the potential for economic growth with oil shale, Utah may decide to invest heavily in it in the event of a land transfer. But is this a wise decision? Current and previous production efforts provide a glimpse into what the future may hold with these

resources and highlights the risks involved. There has been interest in harvesting oil shale and oil sands for a number of decades. In the 1980's, Exxon Mobil made an attempt to commercialize oil shale but adverse market conditions forced them to abandon the project. Similarly, revitalized attempts at commercialization have moved forward cautiously. While some companies like Ambre Energy have sold their land leases, others like Red Leaf Resources are slowing infrastructure development. [4] These slowdowns can be attributed to the low price of crude oil, which stands at \$48 a barrel as of late October 2015. Low oil prices, in conjunction with costly extraction processes have significantly decreased the profitability of oil shale. Even with breakthrough extraction technologies, economic assessments show that the mines would need to produce more than 50,000 barrels daily to be competitive even when crude oil prices are above \$100 a barrel [5].

Current economic impact of oil production has been limited to royalties collected by the government from oil companies that have received land leases. These royalties have decreased over recent decades to remain competitive with federal land leases. In 1988, state royalties decreased from 16 2/3% to 12½% of gross proceeds [6]. Royalties between state and federal governments that were once split 50-50 are now split 51-49 in benefit to the federal government due to a budget deal implemented in 2014. The new split caused Utah to lose \$2.8 million in oil and gas royalties for that year with much of the royalties coming from natural gas production [7]. With the onset of oil production, this figure is expected to increase. Due to the volatility of the crude oil market, many potential oil companies in Utah have been forced to reassess plans. This in turn affects land leasing agreements and state royalties.

5.2.4 Necessities for Initial Transfer – Infrastructure Development and Revenue Losses

Given a transfer of public lands to the state of Utah, oil will be the most important resource in making the transfer a profitable venture. In 2013, oil and gas royalties accounted for 77% of all revenue produced on federal lands within the state, generating

almost \$257 million. By 2017 – the assumed year for a full transfer to take place – it is estimated that Utah will need to generate \$280 million to cover all land management costs. In order to meet these costs, the state will need to depend on the volatile oil market. Current crude oil prices and royalty collection will not cover the estimated costs. Statistics show that current oil prices will need to increase from \$48 per barrel to \$92 per barrel in addition to raising royalties from 49% to 100% in order to meet cost projections for the year 2017. Failing to meet these standards will result in no net revenue for the initial five years following a transfer [8]. The inevitable need to increase royalties can be advantageous to the environment because it will potentially reduce private corporation leases. This is necessary because the government will need to be responsible for production to receive 100% royalties. As a result, the state government can gain more revenue with less exploitation.

Crude oil prices will also play an important role in the development of unconventional oils such as oil shale and oil sands. If oil prices remain low, production of unconventional oil will not be a profitable enterprise. Given the requirement that the state receive 100% of oil royalties, it will be necessary to invest large amounts in infrastructure development. Infrastructure costs for a processing complex capable of producing 100,000 barrels per day are expected to be \$3-10 billion [9]. Initial costs to produce one barrel of oil have been projected to be \$70-95\$ which will decrease as production increases. Upon complete infrastructure development and the implementation of new technology, costs are projected to decrease to \$30 a barrel after 20-30 years of production [10].

5.2.5 Potential Impact – Economical and Environmental

Due to the volatility of the global oil market, it is very difficult to accurately forecast the impact oil production will have on Utah's economy. There are several factors that the state must consider such as population growth, demand, innovation, competition and corporate leasing. Depending on the course Utah decides to take and the state of the

market, the transfer has the potential to be highly profitable or to be ineffective. Early projections show that the ultimate factor is the cost of oil. If oil prices are high, the state is likely to double current revenues. If prices stay low as they are currently, revenues can be expected to decrease by as much as 40% over a period of 10 years [11].

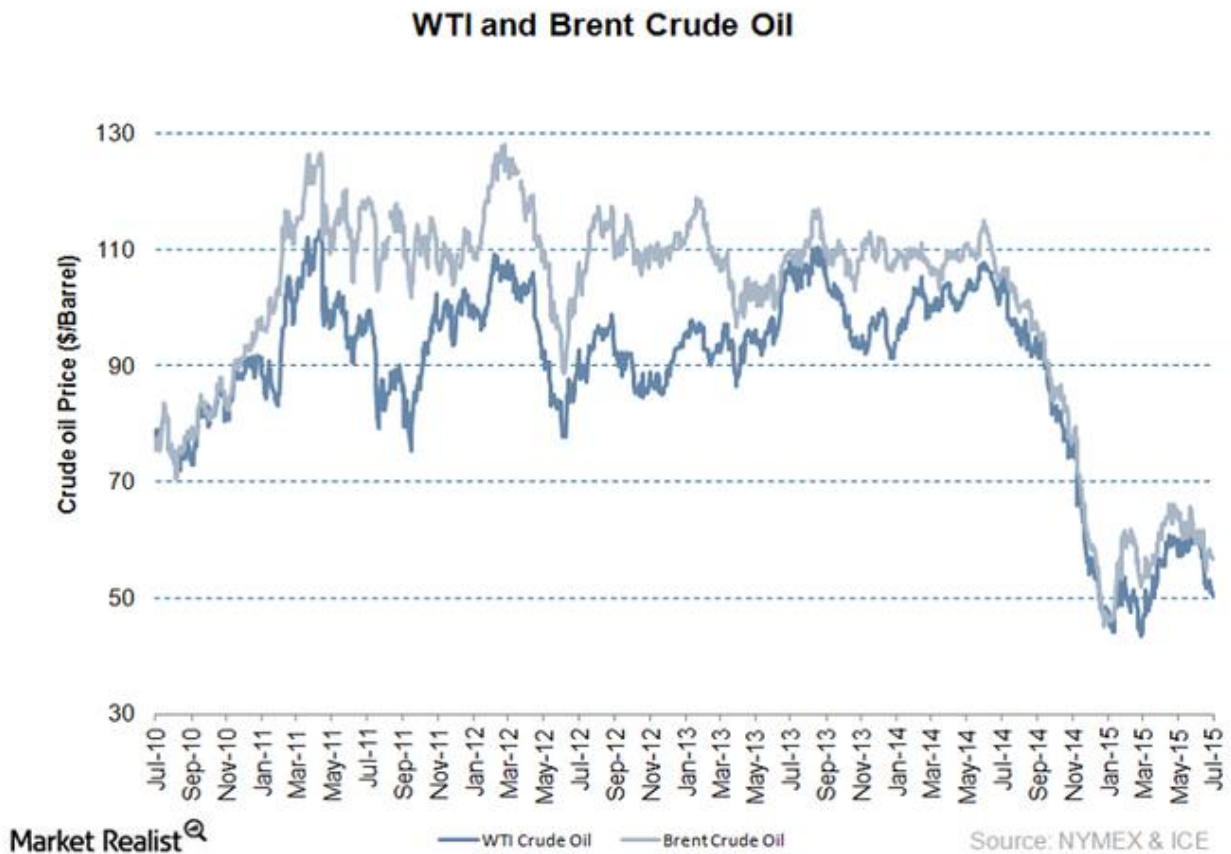


Figure 5.2: Crude oil prices from July 2010 to July 2015.

Much like economic impact, the environmental impact on the state is highly dependent on the actions Utah decides to take given a transfer, but less so. To remain economically feasible, the state may be required to exploit natural resources on a higher level.

Perhaps the single most important environmental component is the usage of water.

Utah is an arid state with a history of water scarcity. Water is an important part of oil production, especially in drilling. Current oil well samples have been shown to use as much as 5 million gallons of water for drilling and fracturing. Ground and surficial waters

may also be exposed to chemical additives caused by fracturing and by mine tailings [12]. Oil companies claim that new and developing technologies are helping to mitigate these water challenges. Studies have shown that water usage has decreased from 2-4 barrels of water per barrel of oil produced to 1.5 [13]. Another adverse effect of drilling will be increased air pollution due to the thermal input needed to extract organic materials from the rock. The current leading pollutant in shale production is carbon monoxide emitting up to 9 ppm in an 8-hour period. Other pollutants include Lead, Nitrogen Dioxide, Particulate Matter, Ozone, and Sulfur Dioxide [14]. It is important to note that oil producers must adhere to federally mandated air quality standards regardless of a land transfer. Other important aspects of environment impact include deforestation, habitat destruction and fragmentation, and endangerment of a variety of plant and animal species.

5.2.6 Sustainability – Future Demand vs. Future Availability

Perhaps the most crucial aspect of the oil industry in Utah is how sustainable oil will be. Given oil's importance in a potential land transfer, it is important that the oil is economically feasible over a long period of time. Utah must consider world population growth and the demand that comes with it. Will oil reserves be sufficient to meet demand over the next few decades? Alternatively, the state must consider alternative, renewable resources and the trend away from non-renewable resources. Will new innovations and better technology push the world away from non-renewable resources and decrease demand? These are the questions that will ultimately determine how feasible a transfer is and if the potential benefits outweigh the apparent risks and implications.

While there are trillions of barrels worth of oil in the Green River Formation, studies show that 800 billion barrels are technically recoverable with 77 billion barrels being economically recoverable in the Uinta Basin. This will satisfy national demand for 11 years at current rates of consumption [15]. If demand increases with population growth,

this number will continue to decrease. Current estimates may change over time as new technology develops, making the extraction and production processes more cost effective. Companies that invest heavily in oil shale and oil sands will have to make technological developments a necessity in order to stay profitable over time.

Long-term forecasts are difficult to make in regards to demand for oil, given the number of factors involved. The International Energy Agency has made projections of oil production through 2035 in their annual World Energy Outlook. In it, they determine that both crude oil and natural gas production will continue to decrease with the historical trend. In contrast, oil shale and oil sand production is anticipated to increase significantly and be a major competitor with crude oil in the next five years. If projections follow that of the International Energy Agency's, Utah will play a major role in oil production for the next 20 years before production begins to trend downward [16]. If these projections are accurate, it will be very important that Utah consider alternative methods to bring in revenue and meet energy needs.

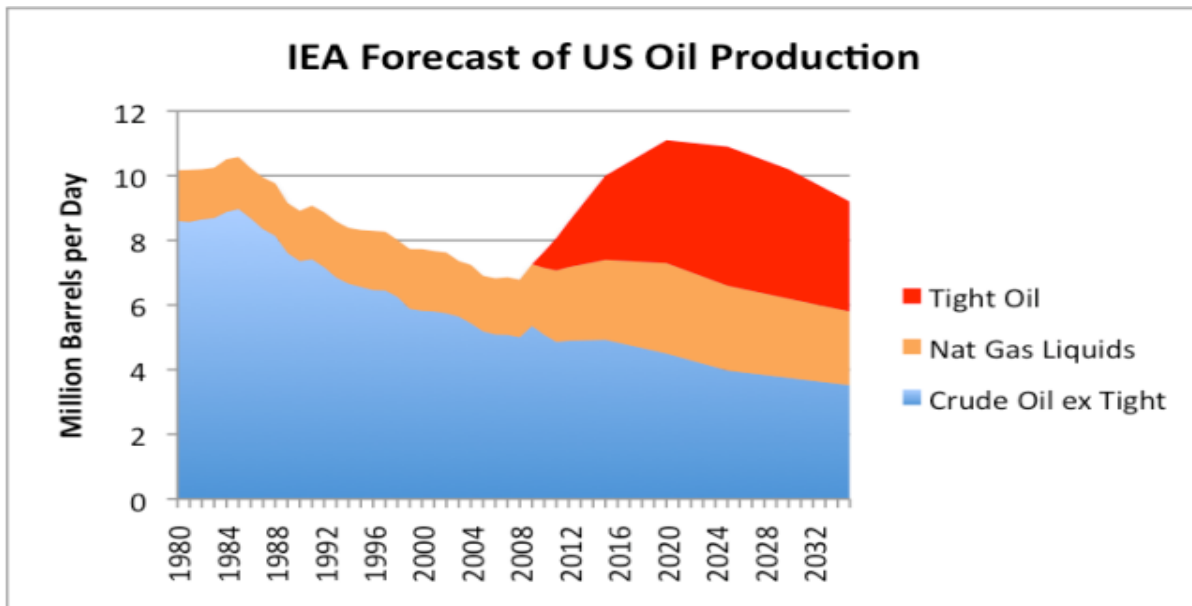


Figure 5.3: International Energy Agency trends and forecast of oil production for the United States from 1980 to 2035.

5.2.7 Necessities of Alternative Resources

Within the oil industry, Utah can take a number of steps to reduce negative impacts to the environment while staying economically strong. Such steps include increasing royalty rates and reducing corporate leases for crude oil. This will give the state more control over crude oil production and reduce corporate exploitation of land.

Additionally, raising royalty rates on private enterprises and limiting leases related to the production of unconventional oil will allow Utah to see potential revenue while reducing the associated risk. Regardless of the steps Utah takes, there will always be risk within the oil market. Given the industry's prominence in revenue generation, alternative energy will need more development to mitigate this risk. Alternative developments are also necessary to mitigate negative environmental impacts that come with exploitation of Utah's oil deposits. By diversifying its energy portfolio, Utah can reduce its dependence on oil and thereby increase economic stability while protecting the environment.

5.3 Logging and the Timber Industry

5.3.1 History of the Region's Forest

The timber industry in the United States resides mostly in a few locations, primarily the North West, South, and Maine; however, much of the Midwest to West is covered in forests, and logging can even be beneficial to the wilderness as well as the logger's pocketbooks. Throughout the Rocky Mountains, the Mountain Pine Beetle has been spreading uncontrollably and producing hundreds of thousands of square miles of damage and dead forest. While the past of the pine beetle trends is still somewhat unknown, it is clear that between the warmer climate and overgrown forests there is no longer cold winters to kill the beetles off and now enough trees to help the beetles spread faster, just as a wildfire would [18].

When Lewis and Clark traveled through the Midwest exploring, much of the forests they traveled through averaged about 25 full-grown trees per acre [23]. This number was so

small because lightning would periodically start fires and clear out the undergrowth and smaller trees. This process helped maintain a healthy forest that would ensure that only the strong and healthy trees could survive, and then the weaker vegetation would be killed off. That was also the same time period in which the forests were relatively untouched by humans and in the most natural state, and ever since then, especially over the past half century, the tree count has risen to about 400 trees per acre in some area due to a decline in logging and increased activity of fighting wildfires [23]. This problem is not exclusive to Utah, as it exists throughout the Western United States.

Right now, the national agencies throughout the Midwest taking care of the land are underfunded. The Bureau of Land Management and the Forest Service both don't have enough manpower or funding to properly both clear away dead trees that have been attacked by pine beetles and for logging healthy forests in order to prevent beetle caused death. Utah is not in the worst state in the Rocky Mountain region, and nowhere near as bad as states such as South Dakota and Colorado, where pine beetles have killed up to 25 percent of the Black Hills' forest. In Utah, almost 700 square miles are affected, but if nothing is done to help then this number is sure to rise [19].

It is essential to bring the timber industry back to Utah in order to help protect the region. Because of the warmer climate and less harsh winters, the pine beetle populations have grown. In addition to the dryer underbrush, the areas affected by the beetle produce acres of dead trees, perfect for helping maintain wildfires. As wildfires continue to grow in power and frequency across the country, it is clear that Utah needs to be taking action in order to help protect its own well-being as the national agencies will not.

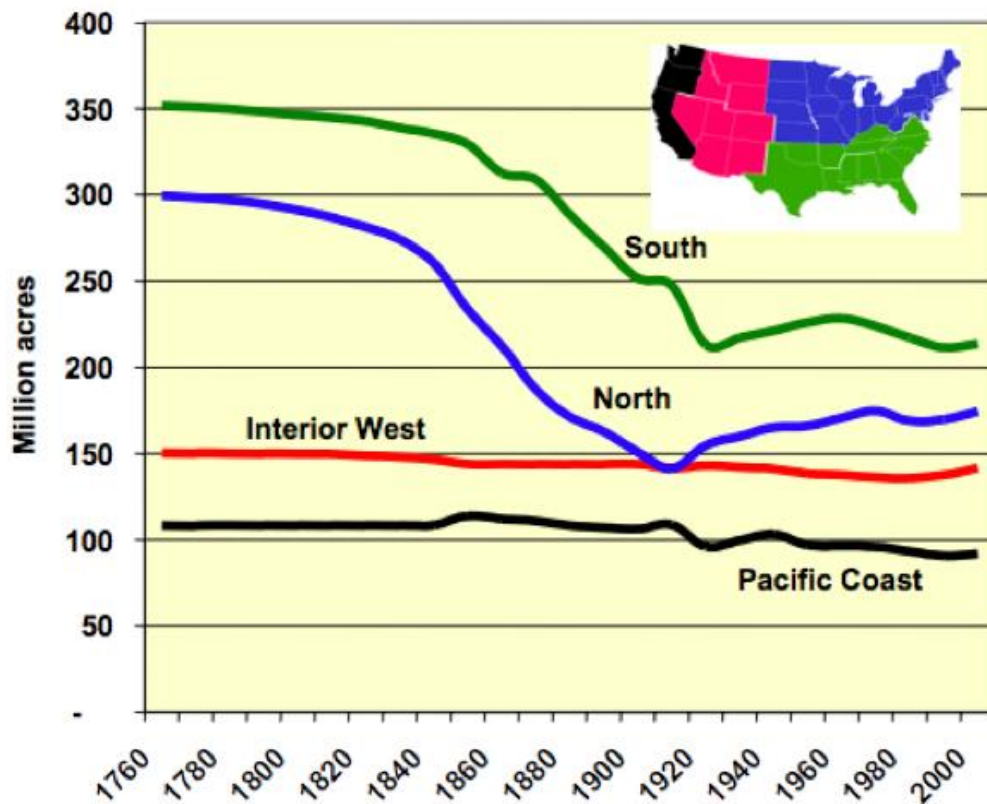


Figure 5.4: Acreage of Forests: Graph showing the total area of forest per region [19].

Timber will have a large payout with leasing land and royalties that could last in the foreseeable future. While this is nowhere near the economic level of oil, it is still important that not only Utah, but the entire Rocky Mountain region to take advantage of the land in a responsible way. The figure above helps show how the forests in the entire Western side of the United States have remained at a fairly constant acreage over the past two centuries, while in the Eastern side the forests have almost halved in acreage. This is problematic for the Western regions because even though the land covered in trees has remained constant, the amount of trees has gone up drastically. It is also important to note that much of the Rocky Mountain Interior West region is covered in desert such as Nevada, Arizona, and New Mexico. So the Forested region is highly concentrated in the more northern states of the region. Also, if logging becomes

more popular, it could also become more popular among private landowners, which is needed to help keep the forests in as healthy of a state as possible. Figure one helps show how the western United States as a whole has not seen much of a decrease in forest size. This is due to the federal government owning much of the forest land and pushing the timber industry out in order to try and keep the forests as full as possible, but also due to regions such as the northwest where logging thrives the replanting of the logged areas.

Table 5.1: Land Logged: Chart showing total land logged by method in the 1990s [20].

Owner	Region	Total	Clearcut	Partial Cut
		<i>thousand acres</i>		
Public	North	368	140	229
	South	348	133	215
	Rocky Mountain	256	53	203
	Pacific Coast	402	167	234
	Total	1,374	492	882
Private	North	1,824	319	1,505
	South	5,617	2,549	3,068
	Rocky Mountain	124	91	33
	Pacific Coast	916	322	594
	Total	8,481	3,282	5,199
All owners	North	2,192	459	1,733
	South	5,965	2,682	3,283
	Rocky Mountain	380	144	236
	Pacific Coast	1,318	490	828
	Total	9,855	3,774	6,081

The chart above helps show not only the total acreage of land logged by each region, but also which method is preferred. This helps show the regions culture and acceptance towards logging in comparison to the others, which clearly shows that the rocky mountain region is the least active.

5.3.2 Logging Methods

The two possible methods of cutting the forest would be clearcutting and partial cutting in order to create an economic profit. There are several methods of partial cutting such as seedtree, shelterwood, group selection, and single tree selection. Each method varies in the age of the trees and number taken out. Seedtree is when small groups of trees are left remaining after the majority of mature trees are removed. Shelterwood is when the forest is cut throughout, leaving gaps to encourage undergrowth of both new trees and underbrush. Group selection logging is when small groups of trees are selected and removed, leaving sparse mature trees. The single tree method is when only a few of trees are removed, this process is highly selective and allows for the removal of either dying trees or a few mature trees, which leads to the least amount of profit [20].

When Utah does allow clear cutting of its forests, however, there is so much resistance that it rarely happens. Utah avoids clear cutting for the most part for the protection of the forests and native species. Clear cutting does happen however, and does produce the largest profit. However, this produces the greatest problems for the ecosystems. Not only does the existing habitat get wiped out, but after the forest is replanted, there will be much less biodiversity which limits what other animals can live there in turn.

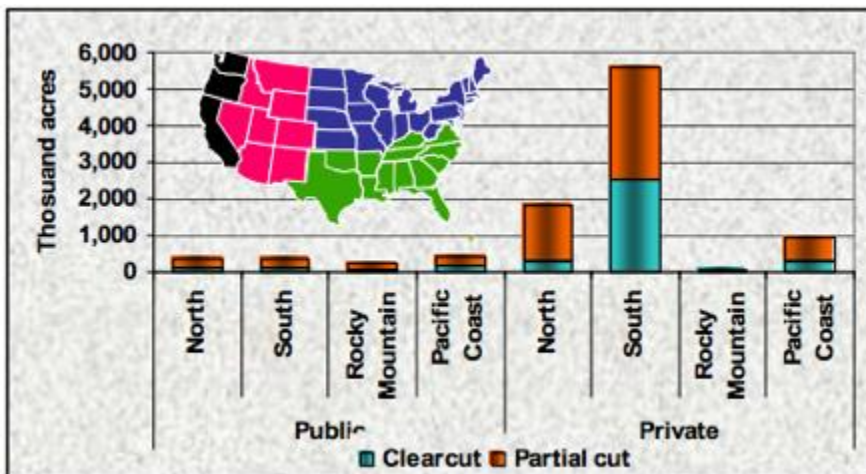


Figure 5.5: Chart showing logging in the 1990s [19].

In Utah, the logging industry has been on the decline and between 2008 and 2012 as the total employment has decreased from 269 to 136 people. Of this number over half are typically working in saw mills, which means there is little business in the actual logging industry and there much room for expansion. Over the past two decades as well the number of companies has dwindled from 28 to 6.

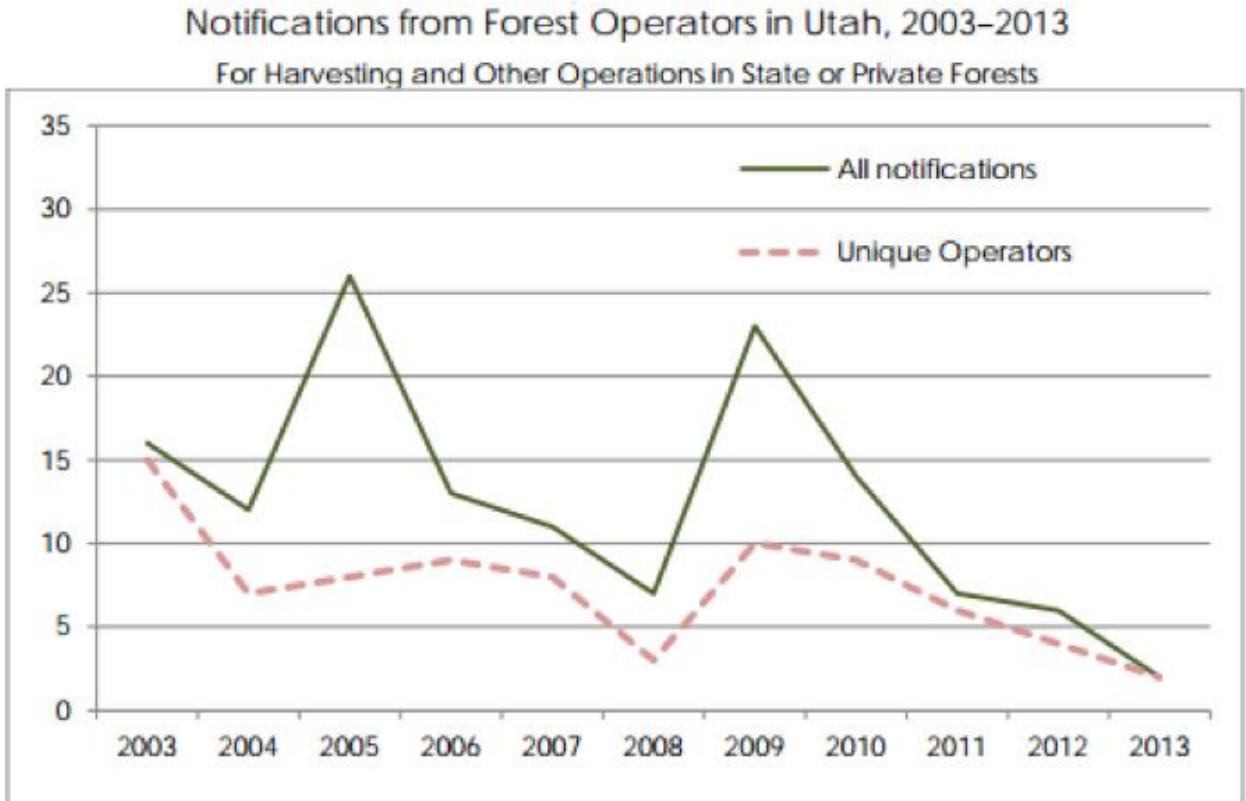


Figure 5.6: Chart showing decline of logging operations within Utah over a decade [19].

This should be evident for lawmakers that between the decrease in amount of jobs and activity in the logging industry, there is much room for expansion, especially as most of the forests continue to only grow thicker and stronger. Millions of dollars are being lost for the private sector as the logging industry continues to decline[25].

In summary, the timber industry is similar to the oil industry in Utah in that it can offer a large payout initially, but as time goes on smaller revenues to both private landowners

and the state. Also bringing back a larger Forest and timber industry has huge benefits not only economically but also with safety for people and the forest when protecting against pine beetles and wildfires. Logging should not be treated solely as a renewable energy, but it is a continuous source of labor and profits that are necessary to keeping the state in the best condition possible.

5.4 Renewable Energy Revenue Streams

5.4.1 Importance of Royalties

Utah's Public Lands Policy Coordinating Office and the office of the governor of Utah specify the current costs for the State to manage transferred lands will be \$248 million by the year 2017 [26]. The only operation which currently makes this sort of revenue is in oil and gas production which constitutes 77.5% of the states total revenue [26]. A commissioned report by the state of Utah has stated the importance of the State to receive 100% of total royalties on all oil production in order for the federal land transfer H.B. 148 to be economically feasible [26]. This report states that "oil and gas revenues alone will offset \$280 million in total costs associated with the transfer after 3 years" [26]. This section will outline some other possible revenue sources that can be generated off of the transferred land that will allow Utah to remain economically viable given 100% of total royalties are not met, namely renewable energy sources as a viable form of revenue generation.

This portion of the report will outline:

- Potential revenue streams in the form of renewable energy.
- Determine energy capacity per square acre of renewable energy farms and approximate total cost to the state to construct said farms based off of financial demands not appropriated by the land transfer. This design must follow all ethical engineering codes, to include migratory pattern research, endangered species protection, and all other aspects in order to ensure a minimum human footprint.
- Provide cost benefit analysis whether or not 100% total royalties are met.

This report will account for the economic impact of this strategic issue as it relates directly to the people of Utah, the land, and future generations.

5.4.2 Wind Farm Revenue Potential

According to a report done by Purdue University [27], a wind farm consisting of 100 turbines would cost the state approximately \$86 million dollars and would yield a 15% annual return from this initial investment, totaling \$12.9 million each year. This annual return will allow the state to pay off its initial investment within 7 years after completion. Assuming 5% of these revenues go to maintenance, Utah will be looking at a \$12.25 million dollar revenue stream each year. These monies could go toward helping recoup the loss of federal monies from wildfire suppression by 25%. Wildfire suppression allotment for fiscal year 2012 was reported to be at \$58 million [28].

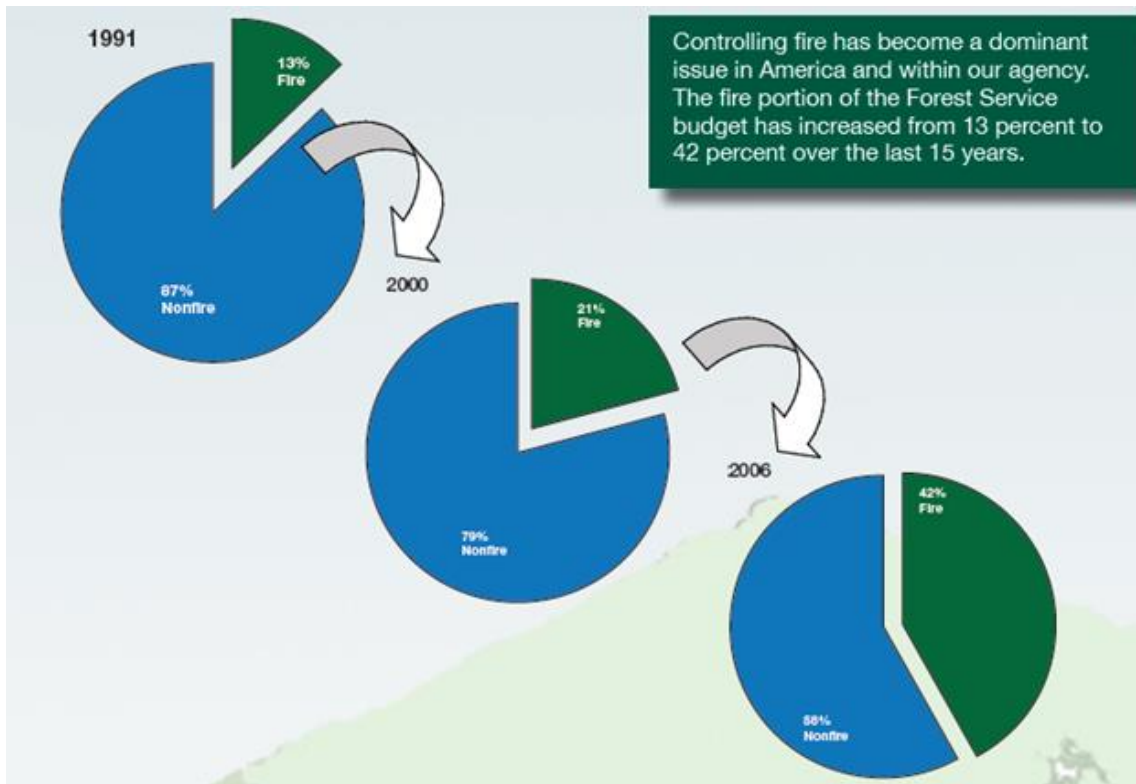


Figure 5.7: Percentage of Allocated Monies to Fire Suppression 1991-2006 [29].

Figure 5.7 shows how fire suppression costs are increasing exponentially across the west. This increase in costs need to be maintained after the Federal Land Transfer is

completed. This speaks to the importance of external revenue sources given 100% of gas and oil revenues are not achieved.

5.4.3 Solar Farm Revenue Potential

Utilizing some of Utah's desert landscape for a solar farm would not only allow the state to prepare for a future energy crises but also is a great opportunity to utilize previously held federal lands to the financial advantage of Utah's economic growth. An average of 5-6 acres of land will produce approximately 1 Megawatt (MW) of energy for the surrounding area and have an initial cost of \$2.5 million dollars. The return on solar farms are a little less than wind farms, averaging at around 9.6% per year. For a 1,000 acre solar farm, generating 20 MW of energy, an initial cost of \$50 million dollars would be paid off within 14 years, and accrue an average of \$3.5 million per year on top of that. This does not sound like much, but when considering the size of a 1,000 acre lot in relation to the expanse that is the west desert, imagining a multiplier of this amount is not difficult.

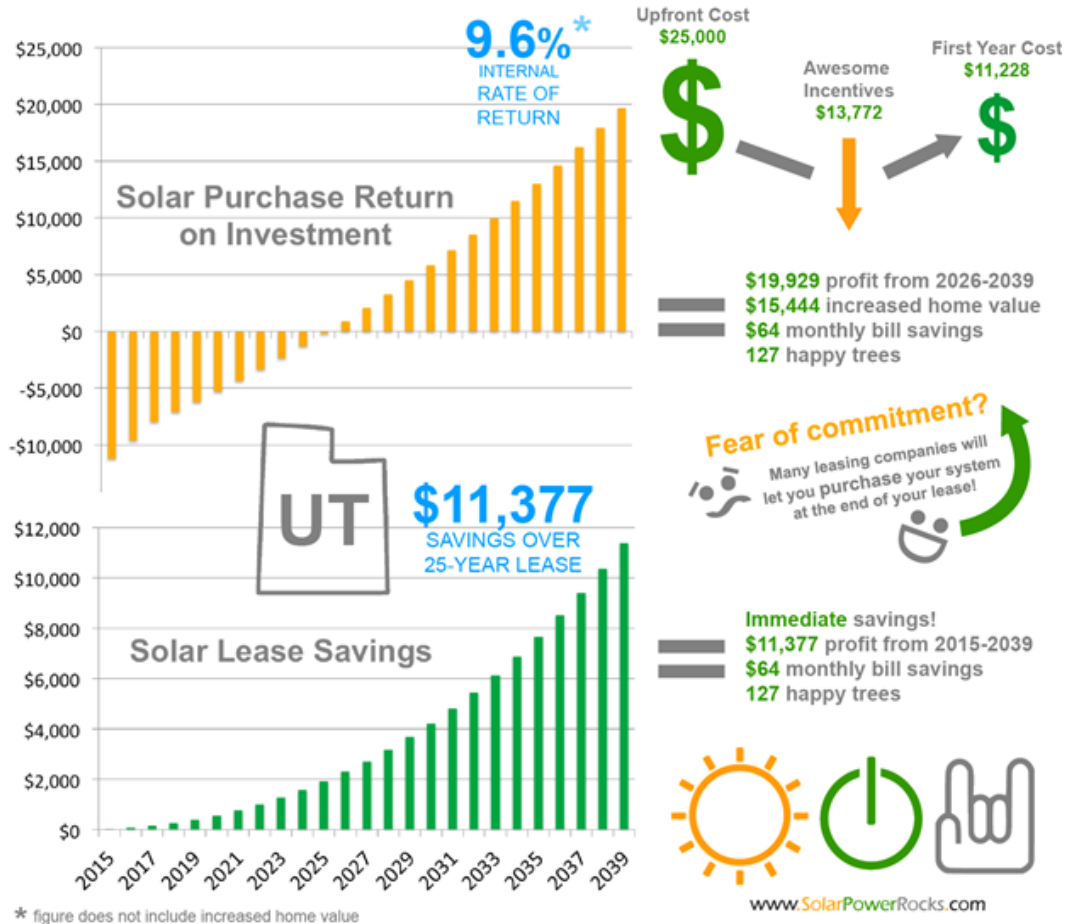


Figure 5.8: Example of Small Scale Solar Opportunities and Effects on Community [30].

Figure 5.8 shows a small scale sampling of returns on investments for solar power over the course of years. These added revenues could once again offset current monies allocated by the federal government if proposed land transfer does not guarantee the state 100% oil and natural gas royalties.

5.4.4 Proposed Locations for Energy Farms

5.4.4.a Proposed Wind and Solar Farm Locations

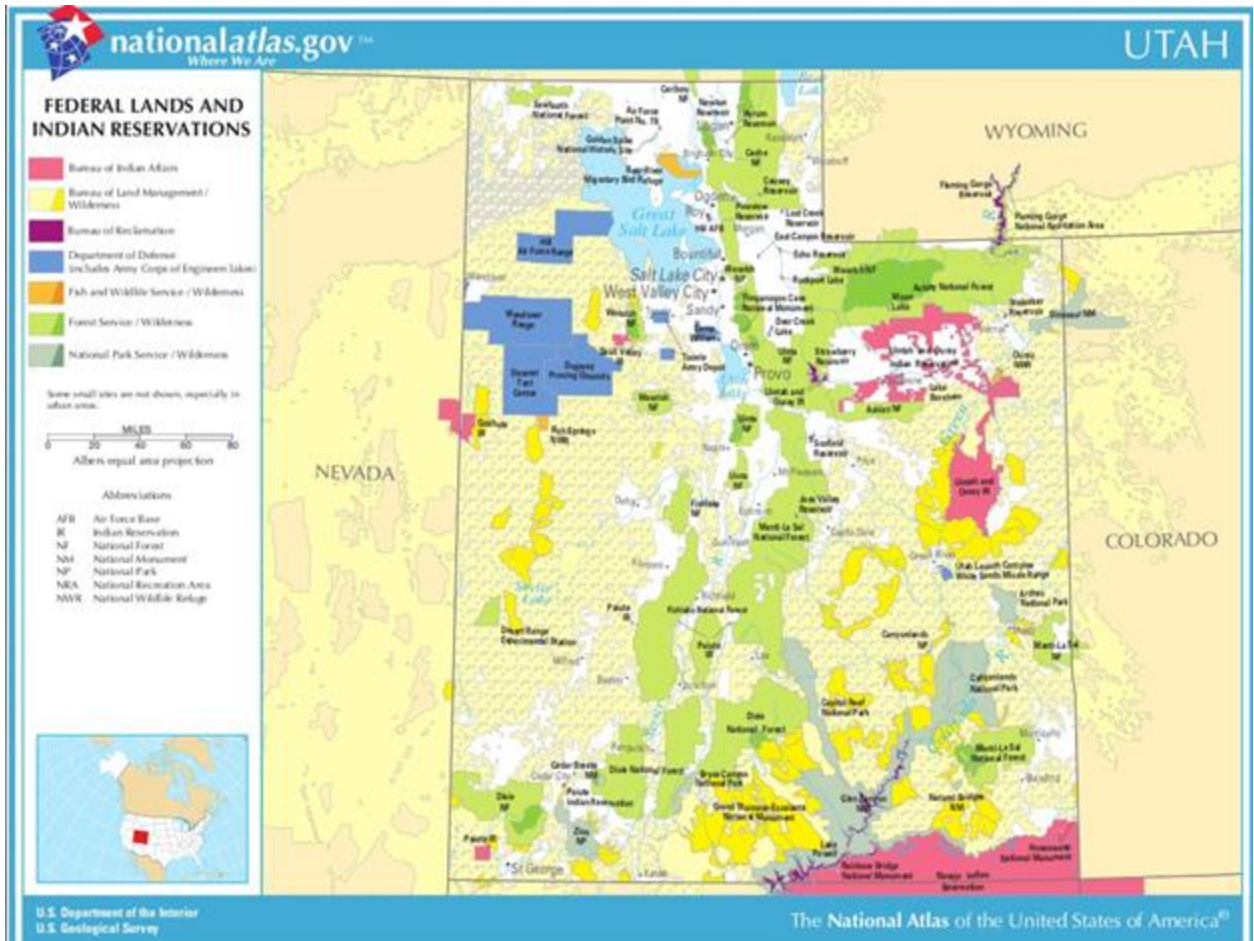


Figure 5.9: Map of Areas Affected by Land Transfer [31].

Figure 5.9 shows a map of the areas affected by the proposed land transfer and which federal agency is in control of that region. As one can see, Utah is a state with vast areas of open land fully capable of housing thousands of acres of renewable energy farms. Ideal locations for wind farms are located on slowly sloping open hills as found in the west of the state near Delta Utah between the DOD proving grounds. This location can also serve as a solar panel farm as it is not surrounded by sun blocking vegetation.

5.5 Summary and Conclusion

In summary, the importance of diversifying energy sources has never been more relevant than it is in this questionable time of Federal land transfer. Allocations of Federal monies to agencies that support wildlife suppression, land policing, and energy allocation will be

removed from the state once this land transfer goes through, the States need for preparation of this case is mandatory and should be looked at in all angles of potential revenue streams. The triple bottom line, People, Planet, and Profit, have been researched thoroughly in this chapter and it is believed by the authors that a balance of these three factors can be achievable through ethical engineering and environmental consciousness.

PEOPLE C	PLANET B	PROFIT A
Accessibility – 0	Water Quality - 5.25	Generate Revenue - 5.50
Human Health - 5.50	Air Quality - 5.00	Oil/Gas Royalties - 5.75
Recreation - 0	Wildlife Management - 0	Livelihood/Jobs - 0
Jobs - 3.75	Overall Enviro Quality - 5.00	Land Usage/Develop - 4.50
Trust of Local Gov't - 4.25	Mining – 0	Land Sales - 0
Final Score - 4.5	Final Score - 5.08	Final Score - 5.25

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Chapter 6

Consequences of the Land Transfer on Utah's Water Quality: An Examination of

Logging, Oil and Gas Development, and Tar Sands Mining

Abstract

Timber, gas, and oil harvesting activities provide economic benefits to the state of Utah, but they can also negatively impact the quality of surface and ground water.

The transfer of federal lands to Utah affords the state many new opportunities in terms of resource collection. Timber, oil, and gas reserves that currently lie on federal lands will be available to the state for production, and with this comes added revenue to the state. However, the production of these resources can have a negative impact on the quality of water local to the areas of production. This chapter focuses on the effects of timber collection, hydraulic fracking, and tar sands mining on water quality.

As resource harvesting increases, water quality is affected in different ways depending on the type of resource and the method of harvesting. Timber collection directly affects the quality of surface waters. As forests are cleared, they become less able to mitigate storm runoff or control erosion of soils. These soils travel downstream from hillsides to streams to reservoirs, thus soiling clean drinking water sources. Hydraulic fracking involves drilling horizontally into hillsides and mountains, and filling these bore holes with high pressure fluid to fracture the rock and allow natural gas to escape and be collected. This process creates large amounts of waste water mixed with natural gas that can seep down through the newly formed cracks to foul well water. Tar sands are sands mixed with clay and oil shale that are mined and processed to extract and refine the oil. This mining process can cause a bitumen by-product to percolate through the ground into subterranean aquifers and springs, which are difficult to remove from the water source. All these resource development processes can cause harm to local fresh water sources if they are not developed responsibly. The state will need to have best management practices in place if it is to ethically and environmentally develop areas from the land transfer.

6.1 Introduction

With the transfer of public lands to the state of Utah comes the potential for natural resource harvesting to expand. Large areas of current BLM land and Forest Service land contain areas ripe for collection of timber, for drilling to extract natural gas, and for mining operations to extract oil from tar sands. As operations expand to utilize natural resources, their impacts on the environment will also expand. Water quality is important to the public, and should be protected from operations utilized for the purpose of economic gain. These operations, if not performed properly, are usually conducted at the cost of environmental health.

One of the most important sources of water in Utah is the national forests. Large wooded areas affect how water flows across a surface before reaching a stream or river. These rivers flow into lakes and reservoirs that become a major source of fresh drinking water for residents in the state. Regulations like the Roadless Rule and the Utah Forest Practices Act partially protect these regions, and thereby protect the quality of surface waters. Another major source of fresh drinking water in the state is subterranean wells, springs, and aquifers. These sources are fed by percolation of surface water through the ground. As mining and drilling industries expand, so does the potential for these underground sources of water to become contaminated. All of these industries can have a potential impact on the environmental health of the region, and therefore must be regulated to avoid deterioration of the water quality. What effect will timber, gas, and oil harvesting activities have on water quality? Specifically, this chapter: 1) examines the effects that logging practices will have on surface runoff, and how this affects surface waters, 2) examines the effects of oil and gas development on quality and quantity of water, both above and below ground, and 3) the effects of tar sands mining on the quality subterranean springs and aquifers.

6.2 Affected National Forest Regions

Utah national forests provide 33% of the drinking water in the West, which is the purest natural water available to Utah [1]. The Forest Service currently is running minimal timber harvest in Utah's national forests, resulting in minimal impacts on the watershed regions. The state would

gain most of the Forest Service's lands from the transfer, and have indicated that they have a high interest in expanding the timber industry in Utah. Timber industry could impact the water quality of the watersheds, polluting water sources that provide the region with clean drinking water. Potentially impacted watersheds include the national forests of: Ashley, Dixie, Fishlake, Manti-LaSal, and Uinta-Wasatch-Cache National Forest [2].

Not all of the 8.125 million acres are being transferred, due to the sensitive nature of the lands, and their need to be protected. Wilderness regions and national parks totaling approximately 775.6 thousand acres will remain under control of the federal government. Also, approximately 3.23 million acres of roadless areas are part of the transferred acres, and cannot be utilized for the timber industry. The roadless areas are explained in greater detail in section 6.3. The transfer would then include 4.1 million acres of available timber harvest, or over half of Utah's national forests [3]. Utah cannot afford to have such large regions that provide its one source of natural water be polluted by the timber industry. It should be noted that the 1999 Forest Service inventory included higher acreage for all areas compared to the 2012 Forest Service inventory, and therefore the 4.013 million acres of roadless areas are most likely higher than the actual value. Figure 6.1 includes a detailed map of the national forest system lands, with the light blue regions available to timber harvest. This figure was included to give a better understanding of the affected watersheds. The timber industry could expand to over half of our national forests, and should be regulated to avoid damage to the environment, and to the social value it holds.

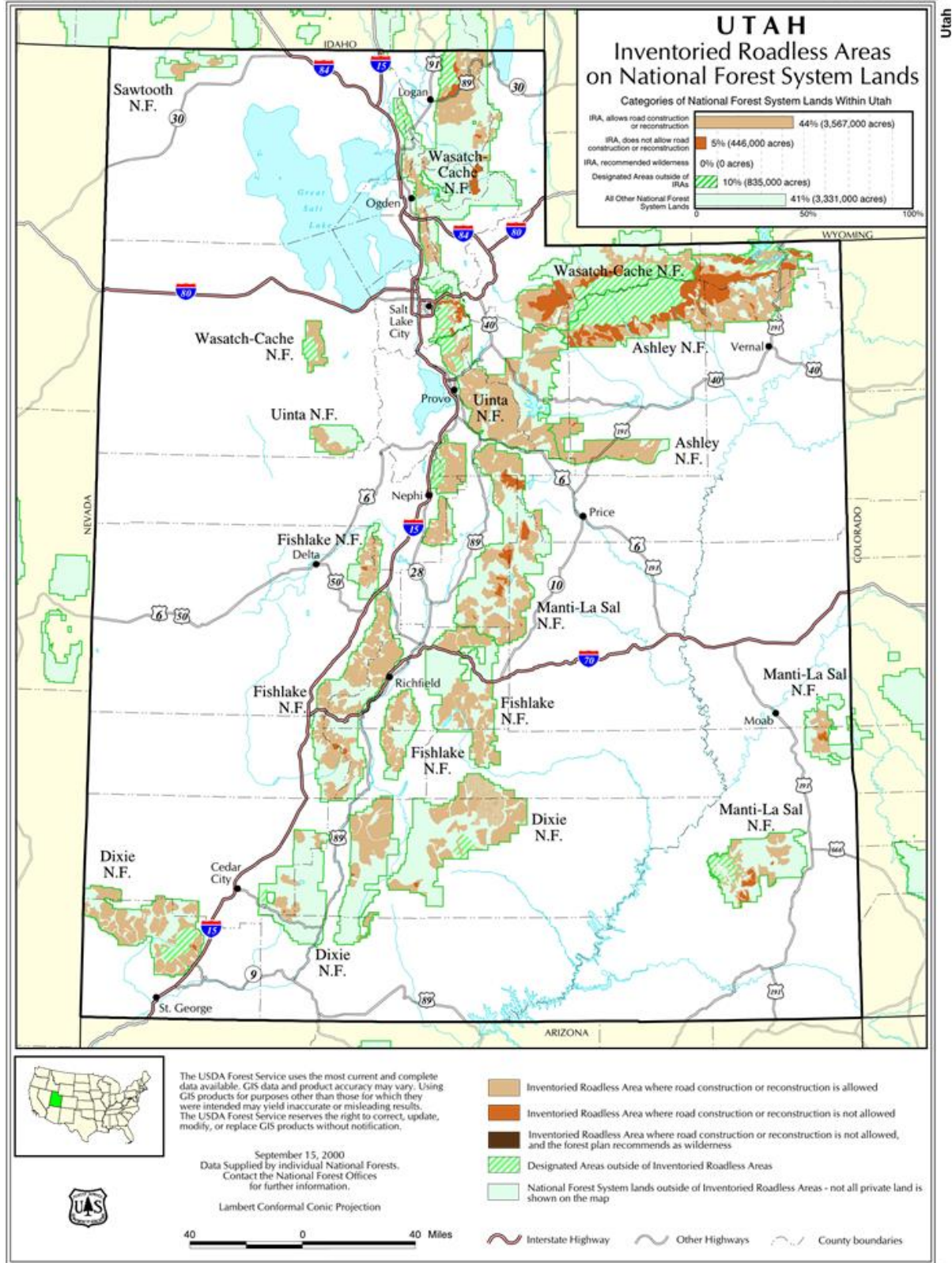


Figure 6.1: National Forest Land Distribution [4].

6.3 Regulations

The Roadless Rule was enacted to protect large portions of national forests from roads and timber harvest [5]. The Roadless Rule was issued by President Clinton, in January of 2001, but not legally adopted until 2002[6]. President Bush proposed a new rule that would replace the original 2001 rule, and adopted it in 2005, allowing governors to choose management requirements for the roadless regions, bypassing protection requirements to expand timber harvest [6]. Most of the regions were once again protected under the original rule in 2009, due to environmental concerns voiced by many political entities and the community, with help from President Obama. Reinstatement of the rules is still ongoing, with the most recent being protection of the Tongass National Forest in Alaska [6]. Protection for national forests has been mired since the Bush Administration's proposal.

The adoption of the Roadless Rule almost entirely ended timber harvest within the U.S. Areas designated as roadless cannot permit motorized vehicles, but may be used for recreation including hiking, horseback riding, fishing hunting, and other non-destructive activities. The rule was originally proposed to protect valuable forest lands from fragmentation and alteration due to roads and timber harvest, consisting of about one third of all national forest acres. Alteration and fragmentation would result in the loss of the values and characteristics of these forest regions [1]. This was proposed due to the expanding nature of our society, and the need to protect the natural regions from our ever expanding infrastructure. The forest system was unable to manage the roads it already had in national forests, and therefore wanted to restrict the creation of new roads [1]. This rule protects the social and environmental benefits of these watershed regions, including high quality and undisturbed water, soil, air, safe havens for threatened species, biological diversity, and research opportunities [1]. A study done by the Forest Service and Bureau of Land Management determined that road construction and timber harvest in the West has been shown to significantly increase landslides, with timber harvest being responsible for 31% of all landslides, and roads being responsible for 52% [1 4]. These sources of clean water save communities downstream millions in treatment cost, and pollution from landslides would negate these savings, negatively impacting the economy of the region.

These undisturbed lands are a reference point to evaluate current engineering efforts, in order to determine if an impact is man-made, or if it is a natural process. The Roadless Rule also facilitated the transfer of some of the decision making to the Forest Service, which as a federal agency must consider the nation's needs over individual states. This larger picture offers insights that local government lack.

The state of Utah passed the Utah Forest Practices Act, which protects national forest land that is state or privately owned. The purpose of this act is to preserve water quality within watershed regions, soil stability, and protect the regenerative and productive capacity of forest lands [7]. This was enacted in response to increased timber harvesting on state and privately owned land in recent years, which account for approximately one fourth of Utah's national forest lands [7]. This act requires operators to register, and notify the Utah Division of Forestry, Fire, and State Lands (DFFSL) of any operations involving timber harvest including road building [7]. The operation must be authorized, allowing the DFFSL to better regulate operators, limiting impacts on forested regions. The DFFSL only has control if the laws are enforced. This act does not affect noncommercial timber harvest, operations smaller than five contiguous acres, and wildland-urban interface zones [8].

6.4 Harvesting methods and their effects

The Forest Service's primary goal is to ensure the health of our national forests, and therefore uses the single tree selection method, which evaluates each tree, and designates individual trees as harvestable [9]. "Products removed from national forests in central and southern Utah are mostly salvage wood from trees that are dead or dying due to disease, drought, insects and fire"[2]. This method doesn't allow for much harvest, but ensures that dead and diseased trees are removed, allowing for new growth. The state claims that this method isn't thinning the forests enough, creating hotter, more devastating fires. Fires would have a negative effect on the water quality. The ash would pollute the water, and the removal of growth would allow for erosion. This would cause suspended solids, nitrogen, and phosphorus to enter the brooks, and

rivers. The forest service has characteristics for Inventoried Roadless Areas (IRA's). They report that 2,252 acres are under fire condition Class 1 [10], which is considered at natural forest.

Class 1 regions are not in danger of severe wildfires, and are therefore ideal [11]. 1,240 acres are under condition class 2[10], which is considered a moderate departure from the natural environment. These regions are at an increased risk for severe wildfires because of the thicker growth, but are still low. 258 acres are under condition class 3[10] which is largely altered from natural characteristics, and has thick undergrowth [11]. This creates a high danger for wildfires, and increases the intensity of the fire. Utah must be ready to deal with the fires that would most likely occur on class 2 and 3 regions. No data has been found on national forest lands outside of IRA's. To avoid Class 2 and 3 regions from occurring, more aggressive harvesting methods than single tree selection must be used.

Another Harvest options is clearcutting, where all trees in a designated location are removed, optimizing economic gain at the cost of environmental health. [9] This method is usually not supported by the Forest Service, and is often more harmful than other methods. The Forest Service does note that clearcutting can be used to enhance the forest's health, but only when a swath of trees is sick, or are suppressing other natural growth. *Long-term effects of forestry managements on water quality and loading in brooks* investigated the effect of clearcutting on brooks, reporting unchanged suspended solids, nitrogen concentration, and phosphorus concentration until the ground was disturbed [12]. Marketta Ahtiainen and Pertti Huttunen noted a noticeable spike in suspended solids, nitrogen, and phosphorus after the region experienced ploughing, ditching, and mounting [12]. These concentration increases are avoided by leaving a strip of forest next to the brook, creating a buffer that traps the loose material [12]. Clearcutting methods should be restricted to avoid soil movement, and the potential water quality impacts it has on these watershed regions.

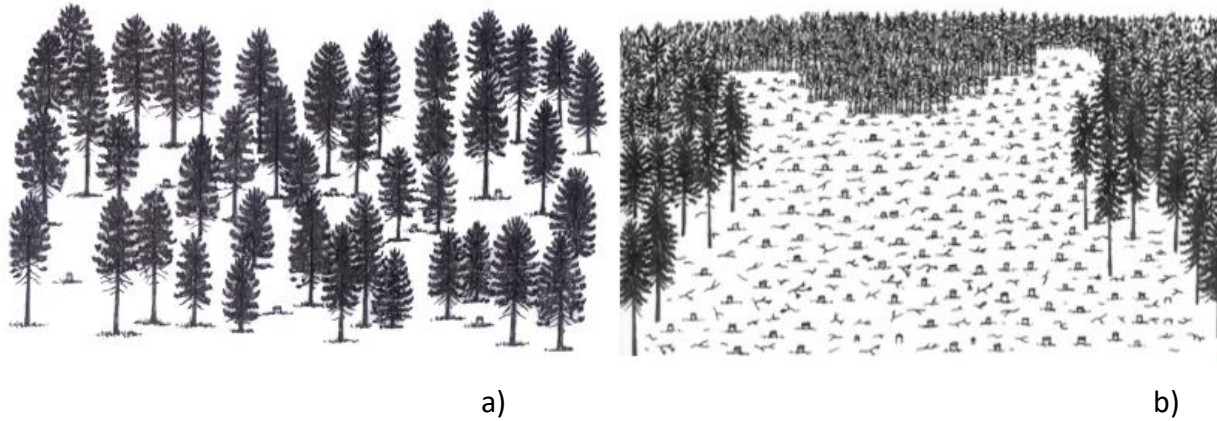


Figure 6.2: Common Timber Harvest Methods; a) Single Tree Selection, b) Clearcutting [13].

Other harvest options available to the state that are not utilized by the federal government include seedtree, shelterwood, and group selection. The seedtree system removes most mature trees, but leaves pockets to allow for the forest to reseed, ensuring regrowth [9]. Shelterwood removes certain trees, allowing for protected regrowth under the remaining mature trees [9]. The group selection system designates mature trees as harvestable, and some middle-aged trees, on intervals across the forest, creating a more natural forest condition [9]. These methods are advised because it allows for increased timber harvest while also avoiding the water quality effects of clearcutting because replanting is done by the forest. This avoids disruption of the soil, and its impacts on water quality. It also creates Class 1 fire conditions, lowering the risk of severe fires and the impacts to the water quality that ash and erosion bring.



Figure 6.3: Three Alternative Methods of Timber Harvest; a) Seedtree, b) Shelterwood, c) Group Selection [13].

6.5 Oil and Gas Extraction in Utah

Utah's extensive development of its oil and gas reserves make the extraction of hydrocarbons a significant enterprise. According to the Utah Department of Oil, Gas, and Mining, the value of the state's production of crude oil, natural gas, and natural gas liquids in 2014 exceeded \$5 billion [14]. As can be seen in Figure 6.4, the Department of Oil, Gas, and Mining show's Utah's hydrocarbon reserves, and therefore oil/gas field development, are concentrated in five counties: Duchesne, Uintah, Carbon, Emery, and Grand. These counties roughly cover the Uintah Basin, and large-scale extraction also occurs in San Juan County. These counties are a central part of the watershed of which the Green River and Colorado River flow. The Colorado River is a source of water for nearly all of the states of the Southwest. Problems relating to water quality in the Green and Colorado Rivers quickly spread over a large geographic area, which does not end at the state line. Due to the extent of the state's reserves, Utah's Department of Oil, Gas, and Mining also reports that more than 12,000 oil and gas wells are active in Utah, the majority between 6,000 and 10,000 feet deep. Several thousands more have been capped and abandoned. By far the largest production comes from Federal land; "...when adjusted for acreage, federal land [is] about a third as productive as state land, equally productive as private land, and only one and a half times as productive as tribal land. [15]" If federal lands in Utah are transferred to the control of the state, the productivity in current federal lands could increase to match that of state lands. This makes the effects of such activity an issue of importance, particularly to those that live in counties with intense oil and gas development.

Oil and gas extraction, as any industrial process, involves much complex machinery, intense labor, and potentially hazardous chemicals and fluids. When not conducted properly, these operations can be hazardous to the workers, the natural environment, and the residents near the field operations, pipelines, and refineries. Contamination of the natural waters surrounding oil and gas operations need not be a point source; runoff from rain collects all spilled and leaked chemicals, fuels, and other fluids, and transports them to the nearest waterway. Construction projects are required to abide by established best practices to prevent

contaminated runoff from projects sites from making its way untreated to natural waterways. Oil and gas field operations, however, are not required to follow these practices.

6.6 Hydraulic Fracturing

Of all the phases of hydrocarbon extraction operations, few are as controversial as hydraulic fracturing (“fracking”). The controversial literature surrounding fracking is voluminous, and the debates over its effects have been conducted in congressional hearings, books, news media, documentaries, and other forums. In the frenzy over the effects of fracking, it is often forgotten that many of the problems associated with the process also are present with other hydrocarbon extraction processes. As the American Water Works Association states, ““The issue of spills and accidents is not limited to wells utilizing hydraulic fracturing, but rather applies to all oil and gas development as well as many other industrial activities” [16]. All activities of this type involve storage tanks, pipelines, surface ponds, and pumps.

The main feature of the fracking process is the injection of a complex water-based fluid into horizontally-drilled wells that typically are over 6,000 feet deep. The extremely high pressure of this fluid fractures the rock formation, usually shale, and allows the natural gas to escape up the well. During the life a well anywhere between 500,000 and 6 million gallons of fracking fluid are typically used, although occasionally more are needed. In Utah, the amount needed is in the lower range: the required fluid for most wells is approximately 500,000 gallons. The fluid used consists of ninety percent water, nine and a half percent sand, and half a percent chemical additives. The fluid will be discussed in further detail below.

The technology that enables this process has allowed drillers to access gas reserves that have previously been unreachable, and has thereby spurred economic revival in many rural communities located above gas reserves. The natural gas boom in the United States has created thousands of jobs and generated billions of dollars. These are the desired effects of expanding oil and gas production following a transfer of federal lands to the state, and it cannot be overlooked that such an increase in hydrocarbon extraction will entail a commensurate

increase in jobs and economic activity across the state. Although this economic side of the issue will not be addressed in this report, it should be noted that these economic gains will benefit not only the counties in which extraction occurs, but also other counties where oil and gas field workers live (many do not live near the fields where they work).

As regards the risks that fracking presents to human health and the environment, several aspects of the operation are recognized as hazardous if done carelessly, and others cannot be fully evaluated. Again, quoting the AWWA: “Given current knowledge, it is possible to qualitatively describe with a high degree of confidence the potential risks to drinking water supplies from oil and gas development activities, but it is not currently possible to quantify those risks with confidence” [17].

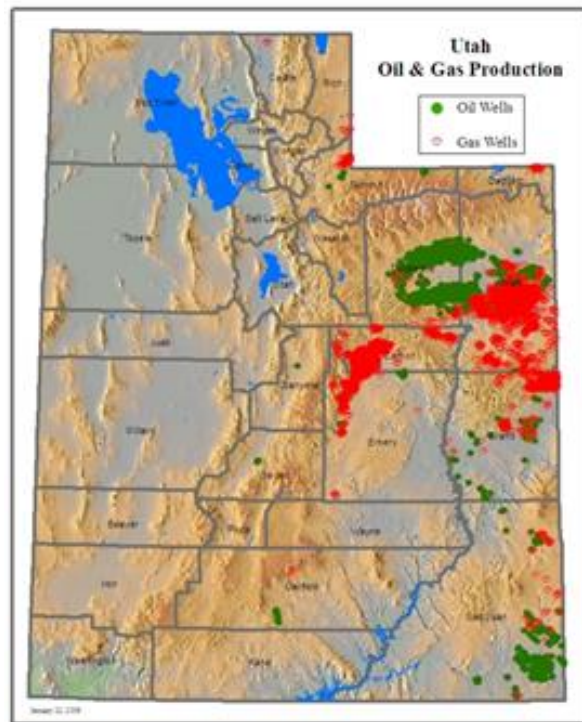


Figure 6.4: General location of Utah’s oil and gas reserves.

First, those that are not fully understood or provable. Fracking occurs deep beneath the earth's surface in the shale deposits, and the migration of fracking fluids and liberated methane through thousands of feet of rock is impossible to track. Many people with homes near fracked natural gas wells report fouled well water after the drilling, yet it has so far been impossible to prove that the pollutants were a result of the fracking. This lack of proof is highlighted during court proceedings, and prevents court-mandated clean-up operations in contaminated areas. In Pavillion, Wyoming, residential well water tests showed that aquifers contained elevated levels of petroleum compounds shortly after fracking operations began in the area. The EPA published its data, declared that they stood behind it, and turned over the task of its verification to the state [18]. This case shows that explicit evidence of groundwater contamination can be difficult to produce, but that circumstantial evidence (which recurs in cases from many states throughout the nation) strongly implicates the fracking operations.

Second, the areas that clearly pose hazards. Natural gas wells pass through shallow aquifers, and despite several layers of steel and concrete well casings, fugitive vapors do escape and contaminate the groundwater [19]. Thankfully, states are beginning to increase regulations regarding well casing materials, methods, and testing. Unfortunately, tens of thousands of wells have reached the end of their service life and have been abandoned, and the casings of these wells were not installed per current regulations. Concrete cracks and deteriorates, allowing leakage, and seismic activity also can rupture the well casings. Figure 6.5 shows the many layers of a typical well casing.

Fluids recovered from wells following fracking is dealt with in two ways: first, it is stored at the surface until treated sufficiently to be disposed of in waterways. In states where fracking is less regulated, contaminated water has often been discharged into rivers and streams directly, without treatment. Often the storage ponds for this 'produced water' are not constructed properly, and even though they are lined, leaks occur. The other method of disposing of well flowback fluid is to inject it into disposal wells. This fluid is not biodegradable and remains in the injection wells indefinitely. This practice is not all that different from disposal of solid waste

in landfills. However, it is re-using the fluid eases the demand on local water sources; this is discussed further below.

Fracking fluid contains hundreds of chemicals, several of which are known carcinogens [21], albeit in very diluted quantities. The constituent chemicals of fracking fluid have been a contentious issue. Gas developers prefer not to divulge the names of all the chemicals used in their wells. The state reason for this is competition; publicly releasing the formula makes it available for competitors to copy. Environmentalists and other concerned citizens see this as deliberate avoidance of responsibility for using chemicals known to be toxic. The image of the oil and gas companies has not been helped by the fact that they are exempt, on the federal level, from regulations from the Clean Air Act and Clean Water Act. This situation is slowly changing, however, as states are beginning to impose their own restrictions. This is true of Utah. According Utah's Department of Oil, Gas, and Mining: "Rule R649-3-39 requires all operators to report the amount and type of chemicals used in hydraulic fracturing operations to the national registry website, "**FracFocus**", within **60 days** of the work being performed. [22]"

Lastly, fracking poses a risk to water quantity as well as quality. Very large amounts of fracking fluid are required to fracture each well [23], anywhere between 500,000 gallons and 8 million gallons per well. Utah's shale deposits are closer to the surface and therefore the wells require less fluid, but the amount is still substantial. As gas fields expand and multiply, the demand for water to manufacture fracking fluid will grow along with them. As discussed earlier, water used in fracking fluid eventually ends up discharged into waterways or injected into deep wells. Injection wells are not needed in gas operations that re-use the fracking fluid. Until recently, this has not been required and certain companies do so only by choice. As long as this remains voluntary, more water will be consumed by natural gas extraction than is necessary. This will put strains on local water supplies, both on the surface and beneath it.

6.7 Effects of Tar Sands Mining

Tar sands are a combination of clay, sand, and bitumen that form underground, and can be extracted and refined into oil. Because the bitumen is mixed in with other elements in the ground, it cannot be pumped out of wells like crude oil can; instead, it must be mined, usually through open pit mining techniques [24]. Open pit mining--otherwise known as strip mining--is a process that involves removing all earth material in a designated mining area, then sorting through the material for desired mineral deposits. Figure 6.6 shows an oil sands mine in Canada.



Figure 6.6: Jackpine Oil Sands Mine in Northern Alberta [25].

6.7.1 Tar Sand Mining in Utah

An Analysis of a Transfer of Federal Lands to the State of Utah states that in 2013, roughly 36% of all oil produced in Utah came from wells and pits located on federal land [26]. The land transfer entails that this percentage of oil production becomes part of Utah's revenue, thus giving the state an incentive to continue to develop oil production across the state. One source of oil that so far has largely gone untapped is the state's reserves of tar sands. The Bureau of Land Management claims that if this domestic resource "can be economically produced in an environmentally acceptable way, [it]

could be a key to the Nation's energy security and economic strength" [27]. The BLM also estimates that there are more than 50 tar sands deposits in eastern Utah. Figure 5.1 shows areas of oil shale and tar sands in Utah that are candidates for development.

6.8 Effects of Mining on Subterranean Water Quality

A major source of fresh drinking water for Utah is its system of subterranean springs and aquifers. Surface waters, such as storm runoff, streams, and reservoirs, filter down through the earth to underground deposits where they may lie for long periods of time before they are tapped for drinking purposes. Mining operations necessarily dig deep into the earth to extract resources, and this can cause sediment or other types of chemicals used in mining to enter into the underground springs.

According to an article in *Science of the Total Environment*, tar sand mining produces a low soluble bitumen compound waste product that is similar to what is found in asphalt [28]. This waste product and others like it are typically kept in pond tailings above ground until they can be treated and removed. However, not all of the bitumen by-product can be contained, and some will inevitably find its way to the underground water sources and make them undrinkable. The by-product enters the subterranean springs either through direct percolation into the ground below the mine, or by runoff into canyons away from the mine and then by percolation into a spring farther away. In this way, the effects of tar sands mining on water quality are far reaching, as the bitumen by-product is carried to aquifers in canyons adjacent to the mining operations.

In order to extract tar sands while minimally impacting the local fresh water supply, best management practices must be implemented at the site. According to InfoMine, an online resource for mining information, "Best Management Practices (BMP) are structural and nonstructural stormwater management control measures taken to mitigate changes to both quantity and quality of runoff caused through changes to land use. Generally BMPs focus on increased impervious surfaces from development. BMPs are designed to reduce volume, peak

flows, and/ or non-point source pollution through evapotranspiration, infiltration, detention, and filtration or biological and chemical actions” [29]. Bitumen runoff from tar sands mines must be stopped at the source in order to control the amount of waste water that filters into underground fresh water sources.

The *Science of the Total Environment* study was involved with the tar sand mining operations on the Tavaputs Plateau in Utah. With the land transfer more land could potentially be used for similar mining operations, which would put greater areas at risk for contamination. If there are more tar sands mining sites in Utah with similar geography to the Tavaputs Plateau, these areas will be subjected to the same issues and bitumen effects as those listed in the study. Tar sand mining provides the state with an economic opportunity too large to be ignored, and if federal lands are transferred to the state, it is more likely that these tar sand deposits will be developed. This will expand the water quality problems associated with the Tavaputs Plateau to other areas in the state.

6.9 Effects of Bitumen Byproduct on Health

A 2012 Canadian federally funded study on tar sands confirms that pollution can spread far from a mining site, and that this pollution has adverse effects on health [30]. The study outlines what happened when there wasn't proper environmental monitoring at the Athabasca oil sands mining site. Without proper monitoring, pollution spread to lakes ranging from 35 to 90 kilometers away. Environment Canada researchers analyzed the sediment in these lakes and found many different toxic contaminants from tar sands mining, including polycyclic aromatic hydrocarbons (PAHs). PAHs are known carcinogens in humans and suspected carcinogens in animals. PAHs are also known to impede fetal growth during the first trimester. Any person or animal drinking water from a well that has been contaminated by PAHs is at risk of these health effects, and with how far the pollution can spread it is difficult to determine which sources of water will be contaminated.



Figure 6.7: Scientist David Schindler holds a fish affected by tar sands pollution [31].

6.10 Conclusion

The economic return for timber harvest has been minimal while under forest service management. Their excessive use of single tree selection can create a forest with too much growth and increased fire risk. The clearcutting method can be used, with minimal effect to water quality if a buffer strip is left, but is not advised because of its alterations to the environment. The remaining methods could be used to increase the economic value of timber harvest in Utah, with minimal effects on water quality. These methods may even prevent large forest fires, and the water quality impacts they cause. Timber harvest is economically viable, and can be environmentally beneficial, but only if regulations restrict the use of single tree selection and clearcutting method, which is currently not restricted unless the DFFSL determines that it will negatively affect the region's water quality, soil, or harvest capabilities.

The untapped oil and natural gas that still lie thousands of feet underground represent a potential major boost to Utah's economy and state government budget. These funds might be sufficient to enable Utah to take possession of federal lands and maintain the current level of management activity. However, the operations that extract the oil and gas may have side effects that damage local water supplies. Some of the effects of fracking are recognized, while

other, potentially more severe consequences, cannot yet be proven conclusively but are nonetheless possible.

The tar sands and oil shale areas in eastern Utah represent a huge potential for increased revenue in both oil production and gas royalties. However, as with hydraulic fracking, the mining of tar sands also has a large potential of polluting local water sources. If not properly contained, bitumen by-products can travel over 50 miles before settling in surface and subsurface waters, making it difficult track and prevent harm to human and animal life. The transfer of public lands provides Utah with the chance to develop and exploit resources on previously untouched areas. For the triple bottom line (specifically with timber harvesting, oil and gas production, and tar sands mining in mind), the transfer of public lands is great for the State's profit. These resources will bring in new revenue, increase the amounts of royalties from oil and gas, and create new jobs. The people stand to benefit only minimally from the transfer in this respect, as the collection of these resources neutrally affects most aspects of our grading criteria for people listed in Table 6.1. The largest impact that these resources have on the triple bottom line is on planet, with all the criteria listed receiving negative scores. The way that hydraulic fracking and tar sands mining have typically been done is generally detrimental to the environment. In order to have a balanced triple bottom line with respect to timber collection, hydraulic fracking, and tar sands mining, those who would harvest these resources must take more precautions to avoid polluting local waterways than have been taken in the past. Otherwise, it is clear that the transfer of public lands to the state of Utah will have a negative impact on the environment, local ecosystems, and human and animal health.

Table 6.1: Decision Matrix Criteria: Triple Bottom Line Assessment Scores for Chapter 6.

People B		Planet A		Profit C	
Land Accessibility	4	Water Quality	3	Generate Revenue	5
Human Health (effects on)	3	Air Quality	3	Oil/Gas Royalties	6
Recreation	4	Wildlife Management	2	Livelihood/ Jobs	6
Jobs	6	Overall Environment Quality	3	Land Usage/ Development	5
Trust of Local Government	0	Mining (Effects of)	2	Land Sales	0
Final Score	4.25	Final Score	2.6	Final Score	5.5

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Chapter 7

A Look at Wildfire, Permitting, and Grazing Rights and How These Concerns

Could Impact or be Impacted by a Federal Land Transfer

Abstract

Examining the management of federal lands as pertains wildfires, permitting and grazing, this chapter is an attempt to determine if Utah's management of BLM and Forest Service land within its border is feasible and whether it would have a net positive or negative effect on Utah with respect to economic concerns, social concerns, and environmental concerns. Early research indicates that the transfer of lands to state management is economically feasible. With the proper regulatory framework in place, could Utah ensure that the social and environmental impacts of the transfer were net neutral or positive.

The use of a regulatory framework is necessary to ensure that Utah could handle wildfire without appealing for federal aid and could protect land from over-grazing which has disastrous environmental impacts. In terms of wildfire the state would have to take an aggressive preventative approach. In terms of permitting and grazing, a regulatory framework for the sustainable management of grazing lands would likely see little noticeable change from the management practices currently in place in the federal government. On balance, this chapter concludes that a federal land transfer would be feasible, and net neutral to positive for the state and the land.

7.1 Introduction

Is Utah or the federal government better poised to manage the lands outlined in the federal land transfer? Does Utah have the funding or programs and institutions to manage federal lands? How do Utah residents feel about the land transfer and about federal management of state land? To address these issues, three areas of concern to Utah residents and to federal agencies have been identified; they are: 1) the cost and management of wildfires and resources, 2) the permitting process for the use of federal lands by ranchers, farmers, logging, mining and oil companies, and 3) the use and management of, and revenue from, grazing lands.

All three interests involve a high degree of cooperation, communication, and policy interactions between federal, state, and local agencies, government officials, and residents. Triangulating the information and policies relating to these three areas, this chapter identifies and characterizes the history of federal land control. By understanding the history of this conflict and the conflicting ideologies, conclusion can be drawn to who is most capable of managing the federal lands in question and why. This chapter will identify local culture and how federal control has developed over time, and how public sentiment has changed over time. In terms of local sentiment, this chapter will explore how the land transfer would represent different managerial practices, but also an era with a better attitude toward those managerial practices, by allowing Utahans to answer the question of what is right for the land that surrounds them.

7.2 How did we get where we are?

The tensions between federal agencies and the state of Utah over control of land inside the state have been ongoing since Utah's petitions for statehood. This conflict has over the years been a roller coaster with periods of calm and periods of political and legal foray. Most notable of these forays is the Sagebrush Rebellion, and Utah's Governor Gary Herbert signing into law the "Transfer of Public Lands Act and Related Study," (TPLA) commonly referred to House Bill 148 (H.B. 148).

Several key pieces of key legislation have been passed throughout the last century that have modified public land use, each serving to further weaken Utahans' trust for federal land management, and each in its own way leading Utahans to eventually begin their quest to gain

control of Utah's federal lands through HB148. These laws include The Taylor Grazing Act of 1934 and the Federal Land Policy and Management Act of 1976 (FLPMA), both of which will be discussed further in section 7.4 on grazing.

Other legislation that has affected tensions between local and state governments are:

1. The *Multiple-Use Sustained-Yield Act* (MUSYA) of 1960, which was enacted to ensure that all possible uses and benefits of the national forests and grasslands would be treated equally, including outdoor recreation, range, timber, watershed, and wildlife and fish in such combinations that they would best meet and serve human needs [1].
2. The *Wilderness Act* of 1976, which provoked the Sagebrush Rebellion, a movement of ranchers, miners, loggers, and oilmen who understood the implications of the Wilderness Act as mandate for their activities to be heavily regulated, subject to environmental analysis and public hearings and the strictures of what the federal management act called "sustainable use" [2].
3. Transfer of Public Lands Act and Related Study (H.B. 148), on which this study was based and which demands that the federal government transfer the title of 31.2 million acres of public land controlled mainly by U.S. Forest Service and the Bureau of Land Management to the state of Utah. H.B. 148's argument is grounded in Utah's 1894 Enabling Act which is the law that established Utah's statehood. The Enabling Act states, territorial land was ceded to the national government "...without the consent of the United States and the people of said state...until the title (to these public lands) shall have been extinguished by the United States". The state's argument is that the federal government was to dispose of the land and Utah would receive 5% of the proceeds to fund public education. With the passage of FLPMA the federal government formally reneged on the promises made in the Enabling Act [3].

7.3 Current Issue

Utah's legislature has sought recompense for the land that was lost on many occasions, and have received concessions, including the Payment in Lieu of Taxes (PILT) and Secure Rural School programs (SRS). PILT are Federal payments to local governments that help offset losses

in property taxes due to non-taxable Federal lands within their boundaries. SRS are regular federal payment to county governments that help to offset revenue loss from a poor producing, or regulation effected timber industry in counties with national forest within their boundaries. These programs are forms of subsidies from the federal government designed to substitute the revenue that was promised in the Enabling Act.

The question of who is better suited to control federal lands is now renewed with the passage of H.B. 148. The issues of wildfires, permitting, and grazing are topics of interest because these are issues that federal agencies deal with either alone or cooperatively with state agencies. In the event of a federal land transfer state agencies could be solely responsible for funding and managing operations of all three.

7.4 Wildfire

The passage of MUSYA was the beginning of a change in the philosophy of United States forest management: “members of Congress and interest groups felt that the Forest Service was giving too much attention to timber harvesting on the national forests” and felt that this was a mismanagement of federal lands by not allowing for other uses such as recreation that had exploded in the Post WWII recovery” [1]. In 1963, the Forest Service became involved with the Accelerated Public Works (APW) program, designed to put the unemployed to work to develop or improve national forest resources. APW projects included working on camp and picnic areas; planting trees; thinning timber stands; improving fish and wildlife habitat; and constructing or improving roads, trails, fire lookouts, and other facilities. This focus change began the move to a more hands off approach in forest management due to rising pressure over the heavy timber harvesting.

The Division of Forestry, Fire and State Lands (FFSL) is responsible for wildfire control on approximately 15 million acres of state and private lands, whereas the Forest Service and Bureau of Land Management (BLM) are responsible for 35 million acres [4]. Utah H.B. 148 seeks the transfer of title to 31.2 million acres of land currently managed by the federal government to the state of Utah. If the state were to take control of these lands The FFSL and other state

agencies would be responsible for wildfire suppression and prevention of 46.2 million acres, more than three times what they now control. Because federal agencies have shifted to a more hands off approach in the management of the forests, and because they have taken a wider focus making the forests more accessible and available for recreation, many areas have been neglected and are becoming overgrown. Without a timber industry or other means to manage overgrowth, many areas are primed for high risks of severe wildfires. These dangerous conditions lead to higher costs when a wildfire does occur because overgrowth facilitates rapid spreading of wildfire, making it harder to contain and allowing the fire to become larger and hotter. These large fires are called super fires. Super fires are very costly to extinguish because of the amount of man and mechanical power required for longer periods of time.

Because the federal agencies do not have as many budgetary restraints as state agencies, it becomes more feasible for federal agencies to manage wildfire suppression. In the event of a federal land transfer, fire prevention techniques could be used by the FFSL to lower the costs of wildfires suppression. These are techniques such as: building and maintenance of fire breaks, logging to thin the forests of dead trees, controlled burns to remove under growth and local wildfire awareness education. In order for the state to manage the tasks and costs of wildfire they will need significant amount of funding not now available and may still have to rely on federal agencies to be most effective.

7.4.1 Wildfire Costs

During the years of 2008–2012, FFSL supported as much as 16.8 percent of the cost of wildland fire suppression in Utah. FFSL paid for just 8.0 percent of all wildfire-related expenses during those

years. In the event of a land transfer the state of Utah could expect to need an estimated \$76.7 million in additional state

Table 7.1: Agency Shares of Wildfire Spending in Utah [5].

Agency ¹	Suppression	Other ²	Total
BLM	30.7%	58.5%	48.1%
Forest Service	52.5%	38.8%	43.9%
Utah FFSL	16.8%	2.7%	8.0%
Total	100.0%	100.0%	100.0%

funding to address wildfires under current management practices [4]. This is a cost that the state would have to account for in its budget. Budgeting for wildfires can be very difficult because they are so unpredictable and can become very costly in a short time. Some of the costs to fight wildfires are: manpower, training, aerial support and equipment and equipment on the ground. Depending on the size of the fire, the conditions of the fuel being burned, weather, and proximity to local population, costs increase exponentially.

7.4.1a Wildland Fire Suppression Fund

During the ten-year period 2003–2012, federal wildfire suppression costs in Utah averaged \$27.6 million per year in 2013 dollars, while state costs were \$5.8 million annually.

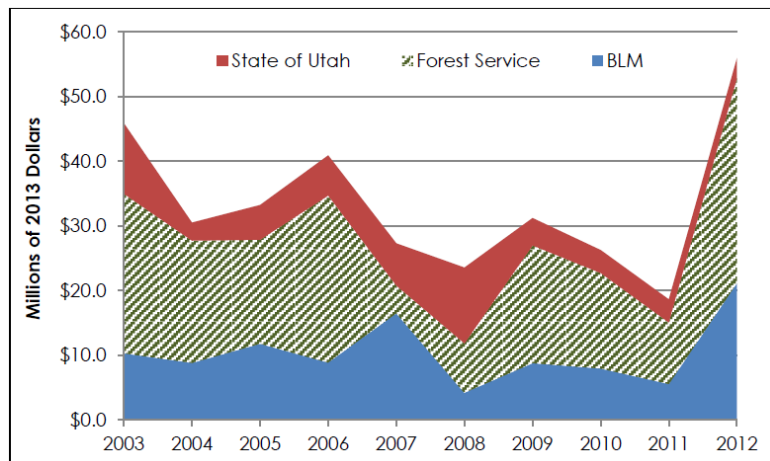


Figure 7.1: Wildfire Suppression Spending in Utah [5].

This means that Utah could expect a cost increase up to four times its current cost. The majority of the current \$5.8 million FFSL uses is funded at a county level [4]. Counties share the cost of fire suppression for private lands at risk for wildfire and not covered by city or county fire departments. Counties pay annual assessments into the Wildland Fire Suppression Fund (WFSF), which operates as fire insurance for counties that opt into the program. Average public spending for fire suppression by BLM, the Forest Service and FFSL amounted to \$33.4 million, not counting substantial ongoing fire prevention and management efforts that are not included in fire suppression expenditures [4]. Currently the state only requires participating counties to maintain a minimum budget of

\$5000 [6]. The state could expand this program to increase available funding, by requiring every county to contribute and by increasing the minimum budget.

7.4.2 Fire Prevention Costs

Government agencies in Utah sustain wildfire-related expenditures far in excess of fire suppression costs. Nearly all wildfire spending in Utah for mitigation, preparedness and rehabilitation came from federal land managers, 97.3 percent of \$52.2 million per year during 2008 to 2012. The state’s contribution through FFSL was \$1.4 million annually [4]. FFSL would presumably be in charge of wildfire management on acquired federal lands, and would have to increase their annual spending by a factor of fifty. Although fire prevention costs will rise, effective use of prevention techniques could significantly reduce wildfire suppression costs. According to FFSL the risk of wildfire is high throughout most of the state.

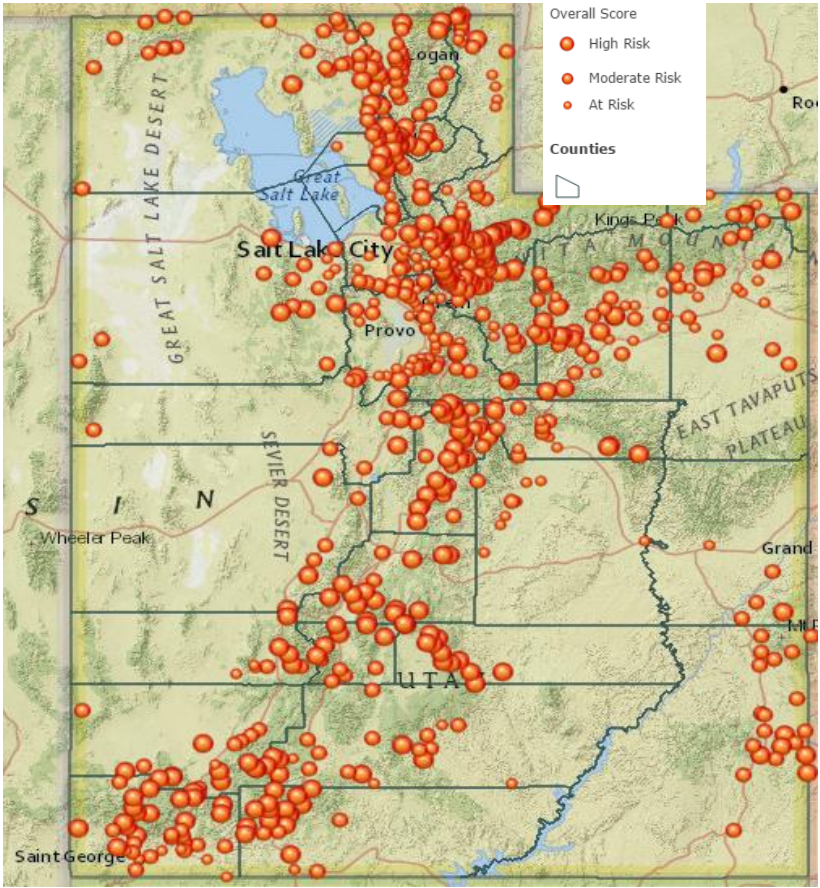


Figure 7.2: Communities at Risk to Wildland Fire [5].

One of the reasons for these high scores is the decades of fire suppression and the loss of most of Utah's timber harvest industry. With Utah communities expanding into wooded areas, no industry to thin the surrounding forest or remove excessive undergrowth, and many successive drought years severe wildfire conditions surround many of Utah's communities. The FFSL and other state agencies will have to manage these worsening condition.

7.4.2a Woody Biomass

The FFSL uses a program started in the Intermountain West by the Forest Service in 2001 called *Fuels for Schools and Beyond*. It is an innovative program to help public schools and other public facilities reduce their heating costs while increasing forest health. This goal is achieved by promoting use of biomass heating systems that can burn waste wood from fuels reduction projects in nearby forests [5]. The program works by thinning dense and unhealthy forests to reduce fire danger. Then, unsellable woody biomass (small diameter trees, slash, mill waste, urban tree trimmings, etc.) is chipped and hauled to buildings with biomass systems using local contractors. Wood chips are then used as fuel in efficient burning systems that lower heating costs and produce a fraction of the emissions of an open burn. Then, the fuel savings can be redirected back into more productive uses, such as teachers and supplies for schools [5].

Motivating factors for facilities to convert to a biomass heating system include:

- Lower, less volatile future fuel costs.
- Local fuel purchase, and the support of local forest products industry.
- Create market for non-merchantable timber.
- Reduce fire hazard and ecosystem risks.
- Renewable, sustainable fuel source.
- Science and technology teaching tool for schools [5].

7.4.3 Income

It is difficult to budget for wildfire suppression, and much easier to budget for wildfire prevention. Knowing what areas are at risk and what measures can be taken to mitigate it could allow the state to prevent catastrophic wildfires and maintain a healthier forest. When it comes to wildfires there is a lot of spending and not much income but in wildfire prevention that's not the case. One element of wildfire prevention is the process of thinning the forest and removal of undergrowth through logging, FFLS's *Fuels for Schools and Beyond* initiative, and through other programs. Not only does this provide a means of income for the agency responsible for permitting and regulation logging it also provides a stimulation to the local economy. Utah's timber harvest statewide rose from 32.5 million board feet (MMBF) in 1974 to 64.7 MMBF in 1992, falling to 41.3 MMBF in 2002 and 30.3 MMBF in 2007. The timber industry has been in decline. Would the state's management revitalize the industry for the good of its land and people, and not simply for profit? The total economic impacts of the timber industry in Utah in 2012 consisted of \$14.7 million in earnings, 537 jobs, and \$21.0 million in value added or gross state product. Estimated state and county fiscal impacts, in the form of income and sales tax revenues, amounted to almost \$1.1 million: \$989,138 for the state and \$84,972 for the counties [4].

7.4.4 Where do we go from here?

The lack of budget restraints on federal agencies verses state agencies indicate that financially federal agencies may be better equipped to manage wildfire suppression, but the state may be better suited for wildfire prevention. The cost of wildfire suppression could be lowered through continues and effective prevention regulations and activities. Creating a revenue steam for the state and offsetting the costs of fire suppression. Would the State of Utah be able to better manage the federal lands, or will there have to be a more corporative solution? The complexity of the issues involved will require further individual research into each one and forthcoming information to Utah's purposed plans for managing the federal lands. The state is wholly inadequate to take

over the lands as they are currently equipped. The state will need plans and programs in place long before they begin taking over these lands and the best solution may be a more open and equal federal partnership.

7.5 Permitting

In a round table discussion conducted at the University of Utah, Rocky Mountain Elk Foundation regional director Bill Christensen made the following remark in reference to obtaining permits from the BLM versus (potentially) the state of Utah: “I would prefer to deal with the devil I know rather than with the devil I don’t” [7]. This comment gave rise to the question of why Christensen described the BLM as a devil in the first place. What makes obtaining a permit difficult? Why has it been an issue of controversy in Utah? And how can Utah hope to improve this in the event of a public lands transfer?

7.5.1 What activities require a special recreation permit from the BLM?

The BLM asks several questions when an activity will involve the use of public lands, such as:

- Are you charging a fee?
- Will there be competition?
- Will you advertise?
- Will you mark a course?
- Are you expecting vehicles at the event?
- Will anyone be paid to organize, lead or participate in the activity?
- Will your activity involve public land?

If the answer to any of these questions is yes, a BLM permit is required, issued by the local BLM office nearest to the proposed. The different regions for each BLM office in Utah are shown in Figure 7.3 on the following page. The BLM mandate is, “Applications must be submitted at least 180 days prior to your proposed activity” [8]. If one month is considered to be 30 days, this is exactly a six-month window for the BLM to review an application for a permit and decide whether or not to grant a permit. If the state of Utah

could find a way to reduce this six-month period, it is possible that there would be more local support for Utah managing these public lands. However, the state would have to ensure that the process was sufficiently long to be well-regulated, or improper permitting could lead to destruction of public lands. Without specific regulations, the state of Utah could not simultaneously accomplish the goal of shortening the waiting time for a special use permit and protecting the land.



Figure 7.3: BLM Offices by Region [9].

7.5.2 What are the criteria used by the BLM when evaluating permit applications?

In an effort to understand the principles governing BLM it is important to understand the mission of the BLM: “To sustain the health, diversity, and productivity of America’s public lands for the use and enjoyment of present and future generations” [10].

To accomplish their mission statement, the BLM uses certain criteria to assess the details of an applicant’s activity. Does the activity serve the public interest, as well as interests of local communities and businesses? Does the activity protect the natural and

cultural resources of the public lands? Will it provide for the health and safety of the participants and other public land visitors? Will this activity enhance the quality of recreation experiences on public lands and waterways; and be consistent with the goals and objectives established in the local land use plan [8]. The BLM clearly emphasizes the preservation of public land as a top priority. So, the question then becomes: Would the state of Utah place an equal emphasis on these principles? This is the question that is still awaiting an answer and can only be officially answered by Utah’s public officials.

7.5.3 What special requirements are needed for a permit?

Besides the six month notice, an insurance policy is required for a permit. The Utah BLM special permit handbook provides a fairly concise table to notify applicants the type and amount of insurance needed:

Table 7.2: Insurance Policies Required by BLM [11].

Liability Insurance Minimum Requirements by Level of Risk		
SRP Event or Activity	Per Occurrence	Per Annual Aggregate
Low Risk: general non-competitive and non-commercial activities such as group camping, group activities, mounted orienteering, backpacking, or dog trials.	\$300,000	\$600,000
Moderate Risk: whitewater boating, horse endurance rides, OHV events, mountain bike races, rock climbing (with ropes), ultra-light outings, rodeos	\$500,000	\$1,000,000
High Risk: bungee jumping, speed record events, unaided rock climbing	\$1,000,000	\$2,000,000 - \$10,000,000

In addition, there are certain fees applicable to a special use permit. “Fees are charged on a \$4 per user day basis for participants; as 3% of gross receipts; or the minimum \$90 fee, whichever is greatest. All SRP fees are due in advance” [11].

An applicant is required to fill out a “SPECIAL RECREATION PERMIT GUIDING & OUTFITTING OPERATING PLAN.” This is a six-page document with fairly detailed questions. The applicant is asked to demonstrate the need for the service or activity to be offered. How will the activity enhance the opportunity for visitors to enjoy the public

lands and their recreational experience? How will this activity help meet BLM's management objectives? How is the proposed area "suitable for and not in excess of the size needed to accomplish the purpose" of the activity? [11] These questions require the applicant to have knowledge beyond a cursory level of the impact of their activity. The applicant must consider how the activity will contribute to BLM goals (delineating the idea that the public land is not just for the recreationist, but the recreationist for the public land). While this encourages wilderness preservation, an applicant could easily become frustrated by the level of detail they are required to provide. Would state management be able to expedite this bureaucratic process, while maintaining conservation and preservation as its goals, possibly using fewer questions? If the level of detail required cannot be realistically reduced, the wording can be different: "How will this activity help meet the state of Utah (and its citizens') goals to continue the preservation of public land?" This ideally engenders a realization in the applicant into that Utah takes pride in its natural beauty and public lands. The applicant then is not fighting a distant bureaucrat from Washington. They are being asked to politely respect that long after their activity is finished, Utah and its local citizens will be left with whatever imprint was left behind.

There is also a post season report required. In contrast to the (BLM required) guiding and outfitting operation plan, this form is rather brief. It is a one page document that includes all receipts for the permitted activity. This is a sample image of a post season report form from the BLM:

Post Season Use Report

OUTFITTER BUSINESS NAME: XYZ Outfitters, Inc.

Trip Start Date mm/dd/yr	Trip End Date mm/dd/yr	# of Guests	# of Guides	Area or routes used	Gross Receipts \$	Pre/post trip lodging deductions \$	Pre/post trip transportation deductions \$
3/1/06	3/1/05	12	2	Hell's Revenge 4WD route	\$540.60	N/A	N/A
5/6/06	5/6/06	18	4	Porcupine Rim mountain bike route	\$2475.00	\$240.00 (see attached receipt)	
7/9/06	7/9/06	14	3	Fisher Towers hiking trail	\$1179.50		\$310.00 (see attached receipt)

1. Gross receipts includes all payments made by the customer to the permittee, including reservation and trip fees, special rentals, trip add ons, photographic services, trophy fees etc. The only exceptions are state and local sales tax and sales of durable, retail items that would have utility and use after the trip.

2. Pre/post trip lodging deductions must be supported by copies of receipts.

I certify the above report is true, correct and complete accounting of all commercial activities conducted in conjunction with my Special Recreation Use Permit.

Joe Anyone
Signature, company representative

7/15/08
Date

Figure 7.4: Report for Post Season [11].

7.5.4 What are the consequences of operating without a special recreation permit?

While the waiting period for obtaining a special purpose permit is considerable, the consequences for operating without a permit are staggering: “Operating without a required SRP (special recreation permit) or participating in a non-permitted event or activity that requires a SRP is a Federal Class A criminal misdemeanor punishable by a fine of up to \$100,000 and 12 months incarceration” [11].

7.5.5 Where has some of the local frustration originated?

While much of the frustration comes from the lengthy time required to obtain a permit, local Utah counties have expressed concern about the law enforcement aspect of the BLM. In an article from the *Deseret News*, Garfield County Sheriff Danny Perkins made the following statement: “We have absolutely no relationship with the BLM. We have tried; they seem to want to do their own thing. They do not respect the authority of the sheriff at all. It is hard for them to accept that this sheriff is the chief law enforcement officer in this county” [12]. In a survey conducted by Utah State University, responses

pertaining to federal land management were categorized by tri-county regions. Garfield, Kane, and Wayne county were reported to have the highest attendance (at 54.6 %) of all county regions for “Respondents Reporting Attendance of Meetings Held By Public Land Management Agencies” [13]. Garfield, Kane, and Wayne County also had the highest percentage (at 60.3%) of all counties for “Respondents who agree that BLM Managers have too much control over decisions about resource use” [13]. This evidence is contrary to the theory that there is not local frustration with the BLM’s management practices. This provides evidence that negative perception of BLM policy is not touted by Utah politicians alone.

How does this apply to permitting? If there is no enforcement by local officials, the outcome could be a decrease in BLM permit applications. If local law enforcement does not coordinate with the BLM in enforcement efforts, a potentially dangerous social tension could evolve (not just for local Utah citizen’s, but for the public land as well). BLM’s special agent in charge, Dan Love, has been accused by county commissioners as being responsible for “spreading a culture of dismissiveness and arrogance among his coworkers” [12]. Dan Love responded with the following statement: “Working together is the only way to navigate current issues and meet future law enforcement challenges, and I look forward to having the serious, productive discussions necessary to make that a reality” [12]. However, local congress representative Chris Stewart feels that the BLM has become too militarized:

I understand that federal agents must be capable of protecting themselves. But what we have goes far beyond providing the necessary protection...Not only is it overkill, but having these highly armed units within dozens of agencies is duplicative, costly, heavy-handed, dangerous and destroys any sense of trust between citizens and the federal government [12].

Regardless of the outcome for the transfer of public lands, attitudes between the party responsible for managing enforcement and county officials must be reshaped to

preserve the public lands in Utah. If the state can still enforce conservation laws through local law enforcement, there is a possibility that this frustration will be alleviated. This possibility will only be effective if ideals of conservation and ecology are adhered to. Otherwise, the land is exposed to the threat of unrestrained development and mass ignorance to wilderness preservation develops. Utah could then lose a portion of its natural landscape. If Utah legislators can find a way to simultaneously conserve the land and serve the citizen, the feasibility of public land transfer becomes all the more plausible from a law enforcement perspective:

7.6 Grazing

The Bureau of Land Management (BLM) and the U.S. Forest Service together “manage nearly 31 million acres of land in Utah, and allow livestock grazing on roughly 26.2 million acres,” [4]. Figure 7.5 on the following page provides an idea of how much of the state that represents. The areas marked in green represent active grazing land allotments. Through a discussion of the history of grazing practices in the region, Utah’s managerial competence, economic stability, and local attitudes and sentiments toward federal control of the land, this section attempts to examine whether the federal government remains the best steward of these lands, or whether Utah could better manage them better in terms of grazing.

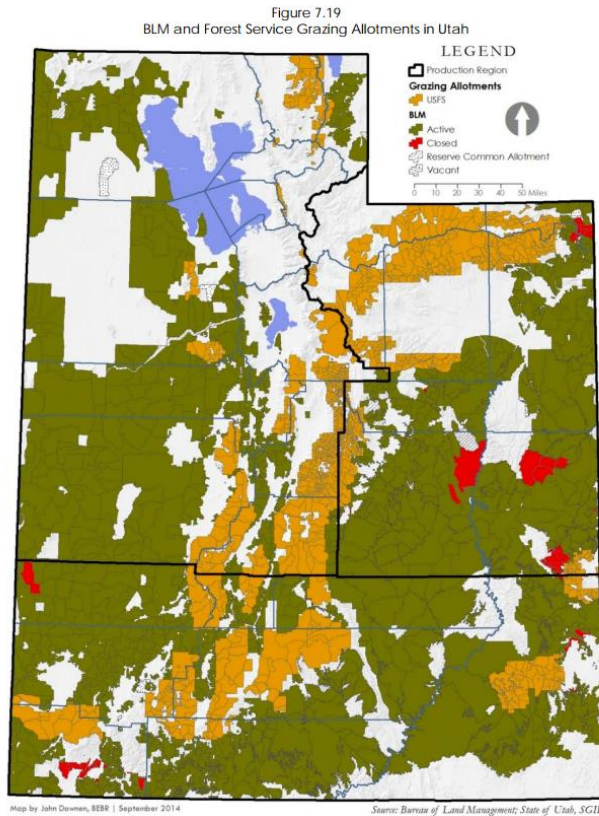


Figure 7.5: Grazing Allotments by the BLM and U.S. Forest Service [4].

7.6.1 History

Grazing on federal lands is controlled by the federal government under the Taylor Grazing Act of 1934. “The western range livestock industry came into prominence in the decades after the Civil War because capitalization costs were minimal,” [14]. As the industry grew, shrewd investors saw a tremendous opportunity to make money by investing in the industry causing the lands to become “severely overcrowded and the range depleted by the late 1800s,” [14]. The Taylor Grazing Act was the federal government’s solution to the depletion of the lands through over-crowding. It limited ranchers from having their animals graze on the land unless they had a federal permit. These restrictions were further refined when the Federal Land Policy and Management Act (FLPMA) of 1976 was passed. The bill reflected “Changing social values with respect to environmental protection and conservation of natural resources...

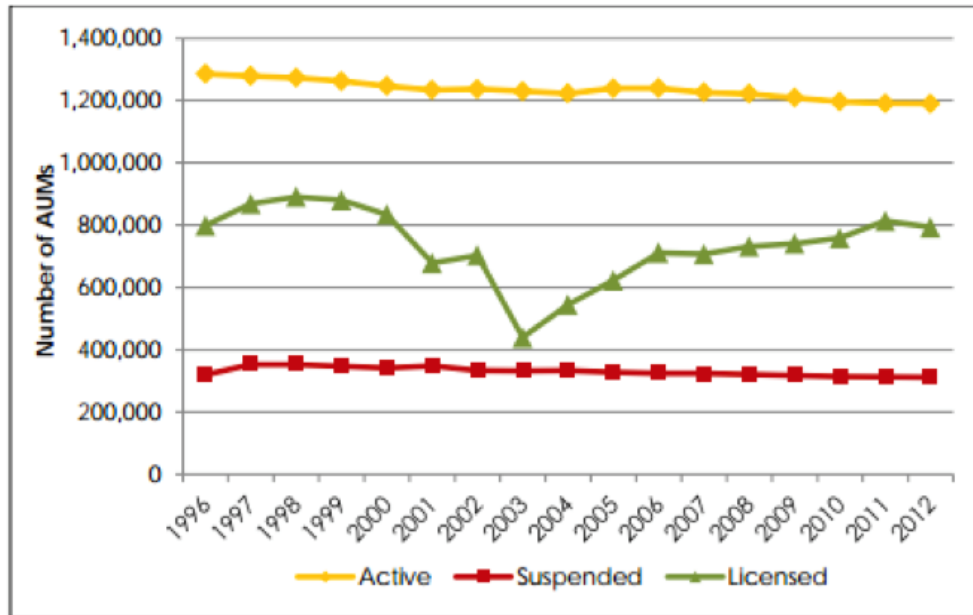
[which] have brought more scrutiny to livestock grazing practices and the level of livestock grazing on public lands,” [14].

Utah, like much of the American West has a characteristic “traditional reliance on natural resource-based activities,” [15]. In the time since the Taylor Grazing Act of 1934, “disagreements over federal management of these public lands...have been the source of contentiousness and political turmoil....contribut[ing] to widespread distrust of nonlocal authorities,” [15]. In short, the people of the west resent the restriction of federal land, and thus refuse to recognize that it was a lack of regulation, coupled with over-crowding, that led the Taylor Grazing Act and subsequent regulations. Furthermore, “antifederal sentiments regarding public land management are not restricted to ...areas that are most dependent on farming and ranching or other traditional land-based economic activities,” [15]. These notions are in fact part of the local culture. If Utah, therefore, were to outline a legal framework to protect the land from depletion, water resource contamination, and other ills caused by over-grazing, transfer of BLM and forest service land to Utah could prove a positive change. It could simultaneously offer the preservation of the land that the federal government has sought and the local control that Utahans trust and desire.

7.6.2 Economics

In “An Analysis of a Transfer of Federal Lands to the State of Utah”, an economic evaluation of public grazing lands is developed. This analysis details the costs of public grazing to the state, and the economic benefits realized through the employment of its citizens, sales tax revenue, income tax revenue, etc. Grazing on public lands is something that has clear economic benefit. However, it is not clear that those economic benefits have to do with the ultimate manager of the lands. The report indicates that “livestock grazing on lands managed by the BLM declined significantly following the passage of the Taylor Grazing Act of 1934,” [4], but referring to the report and

illustrated by the figures below, the active number of animals permitted to graze on BLM land has changed very little over the past several years.



Source: Source data: U.S. Department of the Interior, Bureau of Land Management, "Public Land Statistics," various years. Available at www.blm.gov/public_land_statistics/.

Figure 7.6: Data on Permitting Changes for Grazing on Federal Land [4].

The report further states that in recent years, fluctuations in the amount of grazing permitted resulted from environmental factors. For instance, "drought is a major factor in determining the number of AUMs allowed each year, as it directly affects both rangeland conditions and forage availability," [4]. The report further indicates that "holders of both BLM and Forest Service permits commonly graze fewer animals than authorized or reduce the period of use on the range so actual use is less than what is permitted. Non-use is generally the result of drought conditions... [or] the presence of other wildlife or animals on the range," [4]. In other words, public lands are often permitted but not used or used less than permitted at the discretion of the permittee.

Considering the economic findings, there is little compel the lands to remain under federal control. In the combined interests of conservation, respect for local culture, and economic concerns, there remains a strong argument only to respect the local culture in

managing local lands with the provision that a legal framework and managerial structure are set in place to ensure that the lands are not devastated.

7.6.3 Big Money in Grazing

The debates over grazing on public lands are perennial, ranging over much of the past century. Many years of unchecked grazing on the land led to the federal government restricting use of said land. This restriction led to a suspicion that the federal government did not respect local tradition. Further federal restriction resulting from a deeper scrutiny on the passing of the FLPMA of 1976 led to fears that the federal restrictions would one day take away all grazing privileges.

The fact is that “livestock producers with permits to graze public lands have larger operations than livestock producers without permits,” [14] and further that “Livestock operators with grazing permits generally have been owned by the same family for more than one generation, and they intend to keep this a family operation in the future,” [14]. Smaller operations may find it difficult to obtain permits for grazing because wealthier interests already own the permits they seek. The fact that obtaining permits for grazing may be more difficult for smaller ranchers could be indicative of a problem in the permitting process on a federal level.

This is another problem Utah could begin to mitigate in the event a public land transfer, further sealing its potential to be the trusted source of regulation in the American West that the federal government fails to. The state government could propose a framework for the issuance of grazing permits that distributed them more fairly among ranchers, and allowed for smaller operations to flourish. In this way, the state could put forth a democratic notion of what land management could look like.

7.6.4 Local Concerns & National Concerns

Ranchers in Utah are also concerned that interests wholly unconnected to the state, its culture, and its land will influence the federal government's policies on grazing. These interests come in many forms: recreation enthusiasts, environmentalists and conservationists, and concerned taxpayers. The Center for Biological Diversity, for instance writes, "A new analysis finds U.S. taxpayers have lost more than \$1 billion over the past decade on a program that allows cows and sheep to graze on public land.... Livestock owners pay less to graze their animals on publically owned land in 2014 than they did in 1981," [16]. This is not a strong federal argument because although taxpayers subsidizing federal grazing permits at \$1 billion over the last decade is significant, it barely registers on the list of government expenditures by percentage. The question of subsidizing does affect Utah, however. By taking ownership of federal land, the state would have to determine if it would raise permitting fees, or continue subsidizing at the state level where a billion dollars over ten years is more significant. This does not stand up to the argument of the federal government being swayed by concerns that are not Utah concerns.

The Center for Biological Diversity further state that "livestock grazing wreaks ecological havoc on riparian areas, rivers, deserts, grasslands and forests alike — causing significant harm to species and the ecosystems on which they depend," [17]. The threat of ecological devastation is real, and has happened before. It was the reason for the passage of the Taylor Grazing Act. The federal government, however, rather than being cowed by the ecological threats of grazing, has worked to develop sustainable grazing practices. In their document entitled "Sustainable Grazing Lands Providing a Healthy Environment," the U.S. Department of Agriculture not only presents a case for creating grazing practices that do not pose a threat to natural systems, but also argues that "healthy grazing lands provide an economic base for many regions of our country," and also that the lands "are watersheds which contribute to good water quality and sustained stream flows. Tributaries, and the rivers that they feed, are the source of

water for agricultural, domestic and municipal uses; power production; and fish and wildlife. Grazing lands are used for outdoor recreation, camping, hiking, hunting, and fishing. Encompassing nearly half of the nation's landscape, they provide essential habitat for many wildlife populations," [18].

The USDA lays out a strategic plan for working with local governments and private landholders to develop and implement sustainable practices, including monitoring the land for over-grazing, educating ranchers, supporting research, and developing and adopting technology. The USDA is an agency with the goal of supporting grazing and ranching activities. This mirrors Utah's own position. However, this is an age in which preservation and conservation become increasingly important because our populations become increasingly large. Grazing, ranching, and raising livestock cannot be wholeheartedly supported without evolution. Those with the goal of protecting practices that are widely vilified as "causing significant harm," [17] must make the move toward causing less harm. The approach of the USDA could be implemented into a regulatory framework proposed by Utah State in the event of a federal land transfer. Working in connection with Utah Ranchers, local government would have a plan in place for adopting sustainable grazing practices. In this way the transfer could take place in such a way as to make use of the implementation of our best knowledge about wise grazing practices.

7.7 Conclusion

After examining wildfires, permitting and grazing, and how management by Utah might impact public lands, this chapter concludes a net neutral to slightly positive impact. The most positive impact a federal land transfer would have is on the attitudes of Utah residents. This chapter brings to light the mistrust for the federal government commonly found in Utah residents. This mistrust was forged in the fire of well-intentioned federal law regarding land management, particularly with respect to grazing lands. As seen in this chapter's examination of wildfire, the federal government has nurtured this mistrust by taking a hands off approach to management

that frustrates and alienates local authorities. The permitting process for use of federal lands is no more conducive to creating an environment of communication and trust between local authorities and residents and the federal government. It is lengthy and complicated and frustrating. In these people related respects, a transfer of public lands to state control could alleviate some of the tension and mistrust between national and state interests.

Where planet is concerned, it is unclear that grazing practices would actually be altered. The long history of the management of grazing laws was initiated because lands had been devastated by over-grazing. Utah would have to propose a regulatory framework to make sure sustainable grazing practices were maintained or improved upon in order to make a federal land transfer desirable. Because many of the restrictions placed on grazing by the federal government are the result of drought and other environmental factors, there is no reason to expect that more grazing would be allowed. The way Utah could make a land transfer positive for grazing would be to make permitting more equitable, allowing small as well as large interests to partake.

Wildfire practices could prove an area where Utah could strike a net positive impact. Where the federal government has relied on suppression as the primary method of managing wildfire risk, Utah could take a more active, preventative approach to it. Because Utah does not have the financial reserves of the federal government, this would in fact be necessary to mitigate the overwhelming costs of wildfire suppression. This could prove to have a net positive, or at least net neutral effect on the environment.

Similar to grazing, the effect of a public land transfer to Utah is unclear as pertains to permitting in general. The federal government has a permitting policy that is expressly directed toward preservation and conservation. Assuming that Utah had a regulatory framework in place, in the event of taking ownership of federal lands, directed toward easing permitting frustration while maintaining a conservational approach, the state could have a net neutral to positive effect on permitting as well.

In terms of triple bottom line assessment, profit seems the most unstable factor in terms of the foci of this chapter. Wildfire is a huge and unpredictable cost for the state to address.

Aggressive preventative measures could serve to mitigate these costs, and could mark the rise of a small timber industry, and other programs for energy use and forest management. These could have a positive impact on the economy and job production. However, it is difficult to say how large an effect these measures would have on wildfire suppression costs. At the same time, it is not clear that permitting or grazing practices would have substantial effect on profit.

The conclusion of this chapter therefore, in terms of wildfire, permitting and grazing, is that a public land transfer would have a neutral impact on Utah. People's attitude toward the managerial body might be improved by placing said management in the hands of local government rather than a national government that Utah mistrusts. But even still, it is unclear that a marked change would occur in permitting and grazing practices and profits. Wildfire practices would shift from a suppression to a prevention practice. However, it appears certain that Utah would be taking on a significant cost to manage forests and take a hands on approach, while not eliminating the cost of suppression. Preventing fire would require an active approach creating jobs, and stimulating economic growth in the form of a timber industry. It is not clear, however, that this would be sufficient to offset the costs of fire suppression. On balance, the conclusion of this chapter is slightly in favor of a land transfer, in light of a positive impact on the local culture and trust of the federal government.

Table 7.3: Decision Matrix Criteria: Triple Bottom Line Assessment Scores for Chapter 7.

A. People	B. Planet	C. Profit
Land Accessibility 6	Water Quality: 4	Generate Revenue: 2
Jobs: 5	Overall Environment Quality 5	Land Usage/ Development: 6
Trust of Local Government: 7	Wildlife Management: 3	Livelihood/ Jobs: 4
Final Score 6	Final Score 4	Final Score 4

7.8 References

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AFTERWORDS: A NOTE FROM THE EDITOR ON FEASIBILITY REPORT FINAL ASSESMENT SCORES

Perhaps not surprisingly, the feasibility report average assessment score (see Appendix 1) for the **Profit** category is 5.01 (Somewhat Beneficial). It is generally accepted that a transfer of federal public land to Utah state governance would be a financial boon to the state economy. Students accurately corroborate this viewpoint; however, it is significant that students did not rank this category higher, given local sponsorship of the movement within the state and federal legislature. In only ranking Profit a 5.01, students remain skeptical of the financial implications a transfer might incur.

Concerning the **Planet** dimension of a public land transfer, a final assessment score of 3.4 (Somewhat Detrimental) is significant given that engineering students tend to be boosters of many infrastructure development proposals as well as natural resource extraction efforts. Because the TBL forces students to evaluate the multidimensionality of an issue, this number would assuredly be higher had students used a different approach that neglects all three aspects of this method.

Also significant among the findings is the fact that students ranked the **People** category 4.06 (Undecided). Furthermore, had Chapter 7 not ranked this category a 6, over 2 assessment points greater than average of the other six chapters, then the report average for the **People** category would have been 3.73 (Somewhat Detrimental). The significance of this outlier marks the distinction between the conclusion that two of the three categories rank a proposed land transfer in a negative or Somewhat Detrimental outlook. As such, the final assessment scores are inconclusive overall as to a final feasibility recommendation given the fact that one category ranks as Somewhat Beneficial, one category ranks as Somewhat Detrimental, and one category remains Undecided. Nevertheless, when viewed through the lens of this nascent study, this report provides a wealth of rich data to be analyzed further in an expanded study or research article.

Appendix 1: Triple Bottom Line Final Assessment Scores for all Chapters. Based on a 7-Point Likert Scale, which evaluates a land transfer based on a common set of criteria, where: 1=Extremely Detrimental, 2=Detrimental, 3=Somewhat Detrimental, 4=Undecided, 5=Somewhat Beneficial, 6=Beneficial, 7=Extremely Beneficial.

<i>Final Decision Matrix Assessment Scores for Land Transfer Feasibility Study</i>			
Chapters	<u>People</u>	<u>Planet</u>	<u>Profit</u>
1	4.3	2.7	4.3
2	3	3.1	5.7
3	3.3	3	4.3
4	3	3.3	6
5	4.5	5.1	5.3
6	4.3	2.6	5.5
7	6	4	4
Final Score	4.06	3.40	5.01