

# Amended Campbell County Natural Resource Land Use Plan

Developed by Campbell County Commissioners

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## PREFACE

In 2007, the Campbell County Natural Resource and Land Use Plan was formally adopted. At that time, the Campbell County Commissioners created, by ordinance, the Natural Resource and Land Use Plan Committee, whose task was to timely review and update the Plan. This revised Campbell County Natural Resource Land Use Plan, adopted by the Campbell County Commission on \_\_\_\_\_, 2016, replaces and supercedes all provisions of the Plan adopted in 2007.

The members of the Natural Resource and Land Use Plan Committee that coordinated the revision of the Campbell County Natural Resource Land Use Plan include:

Marilyn Mackey – Agriculture  
Philip Murphree – Water  
Jeremy McJilton – Environmental  
Robert Grant – Oil & Gas  
Gerey Dillinger – Oil & Gas  
Acacia Elkins – Wildlife  
Calvin Taylor - Wildlife  
Bob Maul - Campbell County Conservation District  
Debra Hepp – Conservation District  
Timothy Morrison – Conservation District  
Rick Law – Mining  
Megan Degenfedler - Mining  
Nicholas DeLaat – Citizen At Large  
Madison Brown – Citizen At Large

# Campbell County Natural Resources and Land Use Plan

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## Purpose

The purpose of the Campbell County Natural Resource and Land Use Plan (CCNRLUP) is to document Campbell County's goals, objectives, and policies to guide federal and state natural resource-related plan and project analysis, decision-making, management and implementation in Campbell County. Various laws described in Chapter 1 of this plan require state and federal agencies to coordinate their management activities in a manner consistent with local government land use plans. The intent of this plan is to facilitate and inform this coordination.

## Principles

State and federal agencies are to manage lands in a way that protects and improves the health, safety, environment, and well-being of our citizens, and improves the performance of the economy without imposing unacceptable or unreasonable costs or impacts to local social structure. Federal land use plans are to be consistent with local land use plans, ordinances and policy to the extent practical. This land use plan represents Campbell County's distinct recommendations and policies for land management and use of federal lands within the county. The plan also outlines management considerations for state trust lands in Campbell County, which are meant to assist the State of Wyoming Board of Land Commissioners and Office of State Lands and Investments in achieving the constitutional, statutory and regulatory objectives specified for the lands they manage in a manner that considers and incorporates local and private landowner input to the extent allowed by law.

Campbell County recognizes that the private sector is the best engine for economic growth; that regulatory policies should respect the role of state and local governments; and state and federal land policies and regulations should be effective, consistent, sensible, and understandable. In adopting this land use plan, the Board of Campbell County Commissioners intends to:

- Protect the integrity of environmental systems and natural resources.
- Preserve and promote resource-based industries.
- Promote a robust, diverse and stable economy.
- Minimize conflicts between land uses.
- Protect public health, safety and welfare.
- Preserve culture, customs, heritage, and economic diversity.
- Recognize and protect private rights and interests in state and federal land resources including rights-of-way, public access, grazing leases and permits, water rights, special use leases and permits, mineral leases, contracts, and recreational use permits and licenses.

## Severability

Should a court declare any part of this plan void, unenforceable or invalid, the remaining provisions shall remain in full force and effect.

## Organization

This plan consists of four Chapters:

- Chapter 1 discusses general land use planning by state and federal agencies within Campbell County,
- Chapter 2 overviews the lands and realty within the county,
- Chapter 3 provides information relative to the natural resources within the county, and
- Chapter 4 discusses the current primary land uses within Campbell County.

Each chapter follows a similar format including a general discussion of the resource or industry within the county, the goal for that resource or industry, a list of objectives, followed by policy statements. Where applicable, we provide supporting documentation for the policy statements or groups of policy statements. Based on the information provided for a specific resource, a summary of Campbell County's adopted natural resource land use planning policy goals, objectives and directives is set forth at the end of the section for most of the resources. Appendix A contains all the stated goals, objectives, and policies contained within this CCNRLUP. Appendix B contains data related to resources that Campbell County will update as conditions change and situations warrant. Appendix C presents the regulatory framework for each resource or industry discussed in Chapters 3 and 4.

Campbell County is aware that unique issues regarding use and development of state and federal lands and associated mineral resources will occur from time to time. In these events, Campbell County will prepare supplemental information to support or further clarify their position and incorporate the supplemental into the CCNRLUP as an appendix document, assuming the unique issue does not change any of the stated goals, objectives or policies. Campbell County believes this approach is an efficient and effective way to keep this document relevant and useful for coordination with state and federal agencies.

## Definitions

**Credible Scientific Data.** Industry accepted, peer reviewed, scientifically valid chemical, physical and/or biological monitoring data. Data is collected using accepted referenced laboratory and field methods employed by a person who has received specialized training and has field experience in developing a monitoring plan, a quality assurance plan and employing the methods outlined in such plans or works under the supervision of a person who has these qualifications. Special training includes a thorough knowledge of written sampling protocols and field methods such that the data collection and interpretation are reproducible, scientifically defensible and free from preconceived bias.

**Cost Effective.** A smaller about of resources which can accomplish an objective, relative to other alternatives which could accomplish that same objective.

**Land Resources.** Land is an essential natural resource, both for the survival and prosperity of humanity, and for the sustainability of a healthy environment. Land resources are characterized in terms of soils and surface topography, but also by features such as underlying mineral deposits, climate and water resources, and the plant and animal communities which have developed as a result of these physical conditions.

**Mineral Resources.** All extractable geological natural resources that can be utilized for economic return including, but not limited to, leasable minerals including oil, gas and coalbed methane, coal, potassium, sodium phosphate; locatable minerals including bentonite, gypsum, uranium and salable minerals including sand, gravel, rip rap, building stone, common clay, decorative stone (including moss rock), clinker and scoria.

**Predator Animal.** Wyoming's designated predator animal list, where funds may be used for control means coyote, jackrabbit, porcupine, raccoon, red fox, skunk or stray cat; and gray wolf as allowed by law and an organism that hunts and kills other organisms for food.

**Predacious Bird.** Any predatory avian species that is permitted to be taken under either Wyoming or federal law.

**Stakeholder.** Persons, business, or groups who have a local, vested interest in a proposed action.

# Campbell County State and Federal Land Use Policy

## Chapter 1 GENERAL LAND USE PLANNING



## Chapter 1 – General Land Use Planning

In Campbell County, Wyoming, state and federal lands comprise approximately 18% of the surface acres and approximately 83% of the subsurface estate. The use and management of these surface and subsurface resources are inseparable from the economy of Campbell County. The intent of the Campbell County Natural Resource Land Use Plan (CCNRLUP) is to preserve the custom and culture of Campbell County, safeguard private property rights, facilitate a free market economy and ensure that management decisions allow future generations to enjoy and realize the intrinsic and economic value of the county's natural resources. Through cooperation with state and federal agencies, we can achieve the stated goals and objectives set forth in the CCNRLUP.

This CCNRLUP is designed to be a positive guide for development and implementation of land use planning and management decisions by state and federal land management and regulatory agencies. Campbell County supports the continued use and conservation of land in accordance with the existing custom and culture specifically described below. In compliance with current state and federal laws, Campbell County expects all state and federal agencies to coordinate with Campbell County local governments in order to effectively plan and manage activities associated with state and federal lands within the geographic boundaries of Campbell County. State and federal agencies proposing, analyzing or considering actions that will impact the resources, goals or objectives discussed and/or analyzed in the CCNRLUP are expected to prepare and submit in writing in a timely manner: report(s) on the purposes, objectives and estimated impacts of such actions including economic impacts to the local governments. State and federal representatives should provide these report(s) to the local governments for review and coordination prior to federal or state initiation of action.

Federal agencies shall negotiate, develop and maintain cooperating agency agreements with the Board of County Commissioners for purposes of land use planning efforts, project analyses and management decisions that affect, relate to or occur on federal lands or associated mineral interests in Campbell County.

Actions by the State of Wyoming affecting, relating to or occurring in Campbell County shall be coordinated with the affected local government(s) and formalized, where possible, with a formal Memorandum of Understanding.

Federal land management planners and decision-makers should develop, draft and review all future planning, project analysis and management decision documents in a manner that assures consistency with this CCNRLUP wherever possible; identify any inconsistencies or conflicts that may exist with the CCNRLUP; take practical and reasonable steps to resolve the conflicts to ensure consistency and compliance with this Plan; and describe these findings in the planning or other decision documents.

It is Campbell County's policy that federal land use planning and other decision-making should:

- Involve a high level of cooperation and coordination.



- Be multi-jurisdictional to the greatest extent practical.
- Incorporate the principles of performance-based and adaptive management, while respecting the legal interests and rights granted on federal lands.
- Identify, disclose and monitor socioeconomic effects.
- Include a large-scale cumulative analysis of effects, temporally and geographically.
- Be based on a holistic view of entire ecosystem, rather than a species-by-species or resource-by-resource approach.
- Use the best available data evaluated by rigorous scientific methodology and principles.

## Custom and Culture

Major land uses on state and federal lands in Campbell County include coal mining, uranium mining, oil and gas exploration, production and associated development, livestock grazing and recreation, which includes a broad spectrum from wilderness and primitive use to developed-area recreation, both motorized and non-motorized. It is these myriad uses that form the custom and cultural attributes of Campbell County. The traditions of its citizens are based in these land uses.

Other important components of state and federal lands include the land's inherent value as open space for use by the public, providing habitat for flora and fauna, and its role memorializing historical and cultural values associated with human uses of the land throughout history. Further, the County specifically recognizes that state trust lands provide significant revenues to support public education and other state institutions in Wyoming.

Campbell County supports the maintenance and enhancement of these custom and cultural values, and opposes any change in land use that does not evaluate, mitigate, and minimize impacts to its custom and culture and the economic stability of the County.

Federal land managers shall evaluate, analyze and, to the greatest extent possible, incorporate the custom and cultural values of the County when developing plans or projects and making recommendations that affect those values. Furthermore, considering the importance of these values to the County, state and federal agencies shall cite the consideration process used to assess impacts to county custom and culture in management plans and other management and decision documents and the steps taken to protect the county's custom and cultural values in each plan and/or project.

Because of the importance of its custom and culture, federal and state agencies can be assured that Campbell County will review state and federal land use and planning documents, decisions and/or issues impacting the County's custom and culture and comment on and make recommendations pertinent to the issue in question. Responsible use of federal lands is use that benefits the custom and cultural values of the County.

It is Campbell County's policy that state and federal land managers seek out and take into full consideration data and information available from local sources when developing plans and/or making decisions or recommendations. Local governmental agencies (including the county,



towns, school districts, public health care providers, and other local agencies) and industry have important and useful data and other information regarding custom and cultural values that may not be available from state or federal data sources.

Management of federal and state lands must recognize valid existing rights and interests in those lands. Livestock grazing permits and preference, mineral leases, mining claims, recreation permits and concessionaire contracts, special use leases and permits, and rights-of-way are integral in the administration, governance and economic security of the County's communities and its citizens.

## Overarching Planning Regulations

### Federal Management and Regulations

The United States Department of the Interior (DOI) Bureau of Land Management (BLM) and the United States Department of Agriculture (USDA) Forest Service (USFS) manage approximately 363,843 surface acres and 2,544,681 mineral acres within Campbell County. A system of laws and regulations relative to each agency govern the management of these lands. Three important acts operate as overarching regulations for federal lands that ensure public and local government involvement in the decision-making process related to actions carried out on federal lands and that federal agencies continue to manage the land for multiple uses. Provided below is a brief description of these three acts:

- National Environmental Policy Act (NEPA) of 1969. NEPA establishes a national policy and goals for the protection, maintenance, and enhancement of the environment. NEPA defines the procedural requirements for all federal government agencies to consider the environmental impacts of their actions and decisions. Two key requirements of NEPA are that agencies consider alternatives and that the public officials and citizens are involved in the decision-making process. The federal agency is to make available to the public all the environmental information utilized during the decision-making process before a decision is made and actions are taken. NEPA established a Council on Environmental Quality (CEQ; 42 USC § 4321), which issued regulations for implementing provisions of the law (40 CFR 1500-1508). In these regulations is the requirement that federal agencies to consider and use local planning documents during their decision making and planning efforts (40 CFR 1506.2 and 43 CFR 1610.3-2(a)).
- Federal Land Policy and Management Act (FLPMA) of 1976. This statute was designed to establish land policy for the management, protection, development and enhancement of public lands. The act requires federal agencies to manage public land for multiple uses and sustained yield of associated resource values. The act puts forth the intention of the federal government to retain public lands unless it is in the national interest to relinquish them (43 U.S.C. 1712). FLPMA provides a framework for managing public lands that requires a systematic, interdisciplinary approach that incorporates the consideration of the physical, biological, economic, and other sciences giving priority to areas of critical environmental concerns while considering present and potential uses of public lands. FLPMA requires coordination in land-use planning with other state and federal agencies involved in land-use planning. Under FLPMA (43 U.S.C. 1712), the BLM is required to keep apprised of local land use plans, assure consideration is given to local land use



plans, assist in resolving inconsistencies with state and local land use plans, and provide meaningful opportunities for local government officials to participate in the development of land use programs, regulations and decisions for public lands that may have a significant impact on non-federal lands.

- National Forest Management Act (NFMA) of 1976. This act obliged the USFS to use a systematic and interdisciplinary approach to resources management, much like the FLPMA. The act requires the USFS to assess forest lands, develop a management program based on multiple-use, sustained-yield principals, and implement a resource management plan for each national forest unit. The USFS is to conduct “suitability determinations” to identify the best use of the land. Resulting analyses require alternatives management options that assess the potential resource outputs (timber, range, mining, recreation) and the socio-economic effects on local communities.

In compliance with the identified acts, both the BLM and the USFS have prepared two management documents that address significant portions of Campbell County. Provided below are overviews of these management documents.

- BLM Resource Management Plan (RMP) and Record of Decision (ROD)– Buffalo Field Office 2015. The RMP and ROD include the administrative boundaries of the Buffalo Field Office including all of Campbell, Johnson and Sheridan Counties. The RMP and ROD set forth the resource allocations for the Buffalo Field Office and prescribe the framework to manage BLM lands within the Field Office boundaries. This management direction relates to energy development, wildlife habitat management including sage-grouse prescriptions, livestock grazing, air quality, lands with special management status, such as areas of critical environmental concern (ACEC), and travel management. The RMP and ROD establish “goals and objectives for resource management, identify lands that are open or available for certain uses, including any restrictions, and lands that are administratively unsalable to certain uses; and make broad-scale decisions guiding future site-specific implementation decisions.”
- USFS Thunder Basin National Grassland (TBNG) Land and Resource Management Plan (TBNG RMP) 2002, as amended through the Thunder Basin National Grassland Land and Resource Management Plan Amendment 2015. This plan “offers guidance for all resource management activities on the Thunder Basin National Grassland (Grassland). It suggests management standards and guidelines, describes resource management practices, levels of resource production, people-carrying capacities, and the availability and suitability of lands for resource management.” The TBNG RMP includes a number of Grassland-wide standards and guidelines for recreation and scenery management aimed at public use, safety and resource protection. The TBNG RMP describes the standards and guidelines specific to each Geographic Area, as well as those specific to various Management Areas. Management Areas are defined as “parts of the grassland that are managed for a particular emphasis or theme. Management Areas on the Grasslands that specifically address recreational use include Non-motorized Backcountry Recreation and High Use Dispersed Recreation, although others may indirectly affect recreation as well.



In addition to standards and guidelines, the TBNG RMP calls for annual monitoring and evaluation in order to “identify the need to adjust desired conditions, goals, objectives, standards and guidelines as conditions change”. This adaptive management style approach provides the flexibility to address a number of potential changes (i.e., changes in environmental conditions or social attitudes). An annual monitoring and evaluation report is developed each year to “determine whether the Grassland Plan is sufficient to guide management of the TBNG for the subsequent year or whether modification of the plan or modifications of management actions are necessary.”

### **State and Local Regulations**

The State of Wyoming owns and manages about 188,662 acres scattered throughout Campbell County. The Wyoming Office of State Lands and Investments manages these lands, which are held in trust for the benefit of various trust land beneficiaries, pursuant to the Wyoming Constitution and state statute. The Wyoming Board of Land Commissioners, which is comprised of the five state-wide elected officials maintain broad authority to manage state trust lands. Current uses for these lands include oil and gas development, mining of minerals, grazing, timber, and real estate sales (State of Wyoming 2014). The primary revenue source for state trust lands has been oil and gas mineral royalties. Beyond revenue generation, Wyoming state trust lands that are legally accessible and not otherwise closed by the Wyoming Board of Land Commissioners are open to recreational and other uses by the public. Certain uses require a special use lease, temporary use permit or other authorization from the Board.

The Wyoming State Land Use Planning Act (W.S. § 9-8-301 through 9-8-302), mandates the preparation and adoption of local land use plans. A land use plan is defined as “any written statement of land use policies, goals and objectives adopted by local governments. Such plans shall relate to an explanation of the methods for implementation, however, these plans shall not require any provisions for zoning. Any local land use plan may contain maps, graphs, charts, illustrations or any other form of written or visual communication” (W.S. § 9-8-301 (d)(i)). Pursuant to this authority, Campbell County prepared the 2013 Comprehensive Plan that addresses future physical development for the next 20 years (Campbell County Division of Planning and Zoning [CCDPZ] 2013).

### **Cooperative Conservation**

Campbell County supports state and federal land management that is based on cooperative conservation; meaning actions that relate to use, enhancement, and enjoyment of natural resources, and protection of the environment, or both, and involves collaboration with federal, state, local, and tribal governments, private for-profit and non-profit institutions, other nongovernmental entities and individuals.

State and federal land management are strongly encouraged to facilitate cooperative conservation by fully involving local governmental entities, including the Board of Campbell County Commissioners and Campbell County Conservation District (CCCD); take appropriate account of and respect the interests of persons with ownership or other legally recognized interests in land and other natural resources; properly accommodate local participation in federal decision-making; and provide that any programs, projects, and activities are consistent with protecting



public health, safety and welfare. Campbell County will not support projects where a federal or state agency has excluded local government entities and, where appropriate, landowners, permittees and lessees from participating in the evaluation and development of such projects.

There are several laws, some of which are highlighted in the previous section (refer to Overarching Planning Regulations), that provide for local government involvement in state and federal land use planning efforts. Many of these laws provide for local government to participate as cooperating agencies. For purposes of land use planning efforts and management decisions on state and federal lands in Campbell County, state and federal agencies should assume that Campbell County desires cooperating agency status in all applicable cases and to otherwise be given full and fair opportunity to participate in federal and state decision-making processes to the extent required and allowed by law.

## Information Quality

State and federal agencies must assure the accuracy and relevance of the information they use in the decision-making process. Only current and accurate data should be utilized in project and planning analyses with “current” being defined by resource standards and regulations (i.e., wetland delineation data is only valid for five years with the Army Corps of Engineers). Further, federal agencies must strictly adhere to the rigors of Section 515 of the [Consolidated Appropriations Act, 2001 \(Pub.L. 106-554\)](#), commonly referred to as the Data Quality Act, and the Office of Management and Budget guidelines adopted pursuant to that Act.

Campbell County is aware that planning and management decisions, at times, must occur before scientific research can provide a conclusive understanding of proposed projects’ impacts and benefits to natural resources. In these cases, Campbell County recommends that state and federal land managers consider adaptive management programs or aspects to aide in the decision-making and management process. Campbell County supports the iterative process involving learning and decision-making associated with adaptive management. Campbell County recognizes there is a standard framework for adaptive management that includes the articulation of objectives, management options, a prediction of management consequences, and a monitoring program (Williams 2010). However, Campbell County is aware of the complexity and potentially extensive nature of fully addressing each of the steps in the framework and realizes variations of the process may be more appropriate in certain situations.

Irrespective of the framework in which they will evaluate and engage management decision, federal land managers must ensure that their decisions are supported by the best available, unbiased and credible scientific data. To achieve these ends, federal agencies should endeavor to fully demonstrate the scientific rigor of their planning efforts by:

- Documenting how the best available data evaluated by rigorous scientific methodology and principles was considered in the planning process within the context of the issues being analyzed;
- Evaluating and disclosing uncertainties in that science;
- Evaluating and disclosing risks associated with plan components based on that science;
- Documenting that the science was appropriately interpreted and applied;



- Basing decisions on up to date, relevant scientific research; and
- Stating if data is lacking, unavailable, or outdated due to the rapid changes occurring in various industries, such as energy development and indicating if and how the federal agency proposed to acquire the necessary data.

State land management agencies should also be guided by sound science in their decision-making. Further, state cooperating agencies should ensure that their comments and other participation in federal land management decisions are supported by the best available, unbiased and credible scientific data.

## **Waivers**

Waivers, modifications, and exceptions of existing standards or guidelines should be granted when it results in less impact, it substantially reduces the cost of the project, conditions have changed, or the restriction is unnecessary to achieve the stated objective(s).

## **Goal**

The management of state and federal lands for multiple use based in sound science and current, accurate data, where the land's various resource values are managed to best meet the present and future needs of the citizens of Campbell County.

## **Objectives**

- *Efficient use of land and resources to meet the needs of local citizens and industries.*
- *A combination of balanced and diverse resource uses that takes into account the needs of future generations for renewable and non-renewable resources, including, but not limited to: recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values.*
- *Harmonious and coordinated use and management of natural 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.*
- *The prioritizing of any one use should only occur after the impacts of potentially managing for that single use to other multiple uses are fully quantified and lessened. The public will be fully informed of any land use management proposal and/or decision which affects traditional multiple use status of federal lands in the county.*

## **Policies**

- *Support cooperation, consultation, and coordination between the state of Wyoming, federal agencies to achieve the goals, objectives and policies outlined in the CCNRLUP and other other laws, ordinances and policies applicable in Campbell County.*
- *Work to ensure that state and federal statutes and regulations are followed in the administration of state and federal land.*



- *Work to ensure that federal and state agencies comply with federal and state regulations to enhance productivity on federal and state land through use of credible scientific data and science-based decision making on land and natural resources.*
- *Support conservation practices recommended by the Campbell County Conservation District (CCCD) that improve natural resources and economic returns.*
- *Support the responsible recreational use of state trust and federal lands. Where such lands are damaged, encourage state and federal land managers to work with the County and other local partners to encourage thoughtful use of state and federal lands and mitigate/remediate damaged land. In the event that state and federal lands cannot be adequately protected from damage, access to such lands should be constrained.*
- *Protect, preserve and respect private property rights. Assure state agency compliance with the provisions of W.S. § 9-5-303, W.S. § 9-5-304 and W.S. § 16-3-103(a)(i)(H).*
- *Review NEPA documents to ensure consistency and compatibility with county attributes and objectives.*
- *Protect and promote Campbell County interests through participation in state and federal land and resource planning processes.*
- *Actively participate in the planning and regulation of state and federal land and associated resources.*
- *Require credible, science-based decisions regarding the management and use of state and federal land. Apply credible scientific data within the decision making process regarding the management and use of state and federal land.*
- *State and federal agencies shall coordinate with local government to:*
  - *Establish effective government-to-government relationships with Campbell County;*
  - *Identify a county relations liaison to serve as the first point of contact with the Campbell County Board of Commissioners;*
  - *Implement federal land management programs and activities consistent with and respecting the county's rights, including coordination;*
  - *Work to reduce or remove legal or administrative program impediments that inhibit the agency's and the county's capacity to work directly and effectively with each other;*
  - *Consult with the county on matters that may affect the public's rights and interests;*
  - *Promptly notify Campbell County at the earliest opportunity of proposed policy, plans, projects or actions that may affect the public's rights or interests in order to provide Campbell County an opportunity for meaningful dialogue concerning potential implications and effects;*
  - *Develop, in consultation and collaboration with Campbell County, agreements and statements of relationships with the county that help clarify the county's rights and interests and set forth procedures and protocols for consultation, with points of contact;*

- *Involve designated county representatives, including staff, consultants and technical representatives, including development of proposed policies, plans, projects, or actions, when appropriate;*
- *Involve the county early in planning process in the preparation of in-depth socioeconomic information;*
- *Fully consider recommendations by Campbell County to address county concerns on proposed decisions;*
- *Inform Campbell County and other local governmental entities how its information and recommendations were considered in federal land management decisions, including explanations particularly in the event that county input was not adopted or incorporated;*
- *Document the process and actions taken to consult with Campbell County, the results of those actions, and how decisions were communicated to the county. This consultation review and monitoring process shall involve Campbell County officials and representative;*
- *Participate in a “cooperator working group,” which would focus on implementation of planning decisions on public lands; and*
- *Conduct annual planning meetings for specific projects that include participation by livestock permittee, affected adjacent landowners, and other multiple use interests in affected area, as well as Campbell County representatives.*

# Campbell County State and Federal Land Use Policy

## Chapter 2 LANDS AND REALTY



## Chapter 2 – Lands and Realty

### Custom and Culture

Campbell County has a rich heritage and culture in agriculture; however, its character is historically and currently defined by the economic influences of the mineral extraction industry. Surface ownership within Campbell County consists of approximately 2,514,835 acres private, 188,662 acres state, and 363,843 acres federal (Figure 2-1). However, the subsurface estate (minerals) is primarily held in federal ownership (approximately 2,544,681 acres federal and 522,660 acres private). This condition is referred to as a split estate mineral ownership and heavily influences land development patterns in Campbell County. Therefore, development of state or federal holdings can have significant impacts on residents of the county and impact to private property owners. Multiple, sustained, economically viable uses of public lands is of great importance to Campbell County.

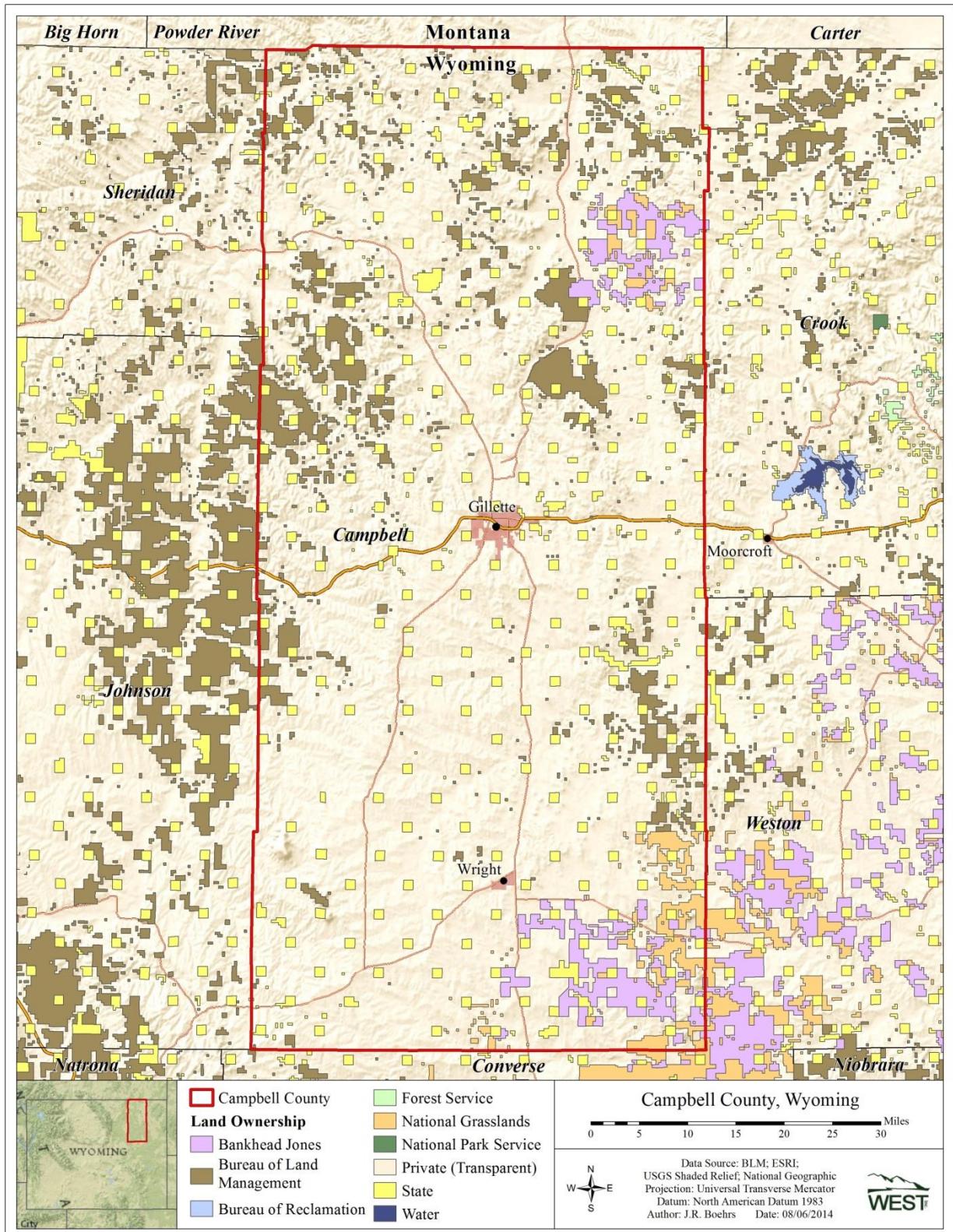


Figure 2-1. Surface land ownership of Campbell County.

## Goal

Sustain environmentally, socially and economically efficient multiple-use federal lands by preserving existing uses while protecting valid rights associated with those lands. Support state trust land management consistent with state constitutional, statutory and regulatory requirements.

## Objectives

- *Avoidance and minimization of impacts to land resources during resource development.*
- *Legal application and use of eminent domain laws with government and those that use eminent domain respecting and adequately compensating private property owners.*
- *Promote federal land management which encourages siting of linear and other infrastructure projects on federal lands, where technically and economically feasible.*
- *Proper and legal application of split estate laws and regulations, based in first encouraging cooperation and furthering the interests of the various owners in the split estate context.*
- *Environmentally responsible resource use.*
- *Identification and disposal of isolated, difficult to manage, federal and state lands, where warranted.*
- *Appropriate and cost effective reclamation to achieve .*
- *Protection of property and valid rights associated with land ownership and state and federal leases and permits.*
- *Continued multiple-use of federal lands.*
- *Administration of state trust lands in a manner consistent with state constitutional, statutory and regulatory provisions.*
- *Improved health of the land through sustainable, cost effective management practices.*

## Policies

- *Actively participate in the planning, regulation, and monitoring of state and federal land resources in relation to surface and subsurface land use.*
- *Encourage the use of coordinated resource management planning on the development and change of use on state and federal land, where applicable.*
- *Work with local, state and federal agencies to achieve the desired goal of sustained multiple-use of federal land and resources.*
- *Implement best management practices utilizing appropriate and accepted conservation measures, reclamation standards, and/or mitigation techniques to ensure sustained multiple use.*
- *Make available immediate, interim and final reclamation options to use as needed to address specific projects and offer flexibility in order to address individual land resource needs.*

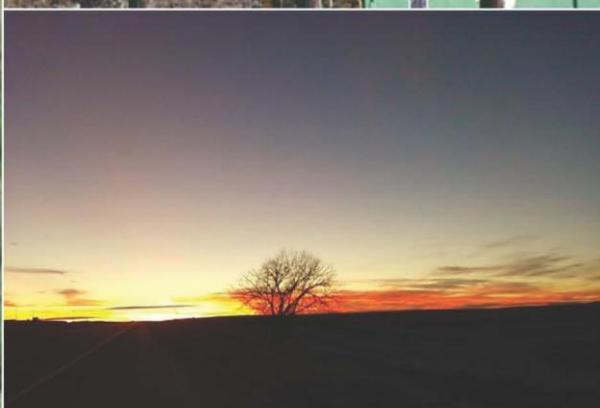
- *Seek to ensure that private property rights are protected in state and federal planning processes.*
- *Encourage coordination and cooperation between competing energy interests on same and adjacent lands to maximize development of available energy and mineral resources and minimize impacts on private landowners.*
- *Support state trust land exchanges that allow state grazing lessees to acquire isolated, inaccessible state trust land inholdings within their property holdings in exchange for larger, publicly accessible tracts that optimize returns to state trust land beneficiaries.*
- *Locate energy transmission infrastructure, such as oil and gas pipelines, data providers and high voltage electric transmission lines in existing utility corridors and on state and federal lands, where feasible.*
- *Obtain adequate bonding requirements to ensure complete removal and successful reclamation of state and federal agency permitted projects.*
- *Support bond release efforts by mining companies in order to more fully utilize use of private and public lands.*
- *Make available for disposal or exchange federally managed lands that are difficult to manage or exist in isolated tracts, as identified in agency land management plans.*
- *Ensure there is no net loss of private lands in Campbell County. Net loss shall be measured in acreage and fair market value.*
- *Utilize federal and state agency standards for reclamation practices.*
- *Initiate state or federal land exchanges or acquisitions only with willing private landowners without coercion or threat by state or federal agencies.*
- *Notify affected landowners and stakeholders of any proposed action affecting existing state or federal land uses.*
- *State and federal agencies shall:*
  - *consult, coordinate, and cooperate with Campbell County and affected stakeholders in any proposed state or federal land tenure adjustment;*
  - *consult, coordinate and cooperate with private and county stakeholders in actions affecting multiple-use of federal lands within Campbell County;*
  - *consult, coordinate, and cooperate with private property owners in any federal action affecting their private land resources;*
  - *coordinate with local government and affected stakeholders to ensure the removal of facilities and reclamation of affected sites when energy and mineral resource development projects are finished;*
  - *consult with local governments in Campbell County prior to any acquisition of private lands or interest in private lands in the county. Because state and federal acquisition of private lands could serve to negatively impact the tax base of Campbell County, any other state and/or federal acquisition of any ownership interests in private lands should be offset, to the maximum extent possible, with disposal of state and/or federal land and/or mineral holdings; and*

- *ensure that any state and/or federal land transaction involving lands within Campbell County is conducted in a manner that protects the private property rights of the landowner that is directly involved in the transaction and property rights of adjacent and/or affected landowners.*

# Campbell County State and Federal Land Use Policy

## Chapter 3

### NATURAL, BIOLOGICAL, & CULTURAL RESOURCES



## Chapter 3 – Natural, Biological and Cultural Resources

### Air Quality

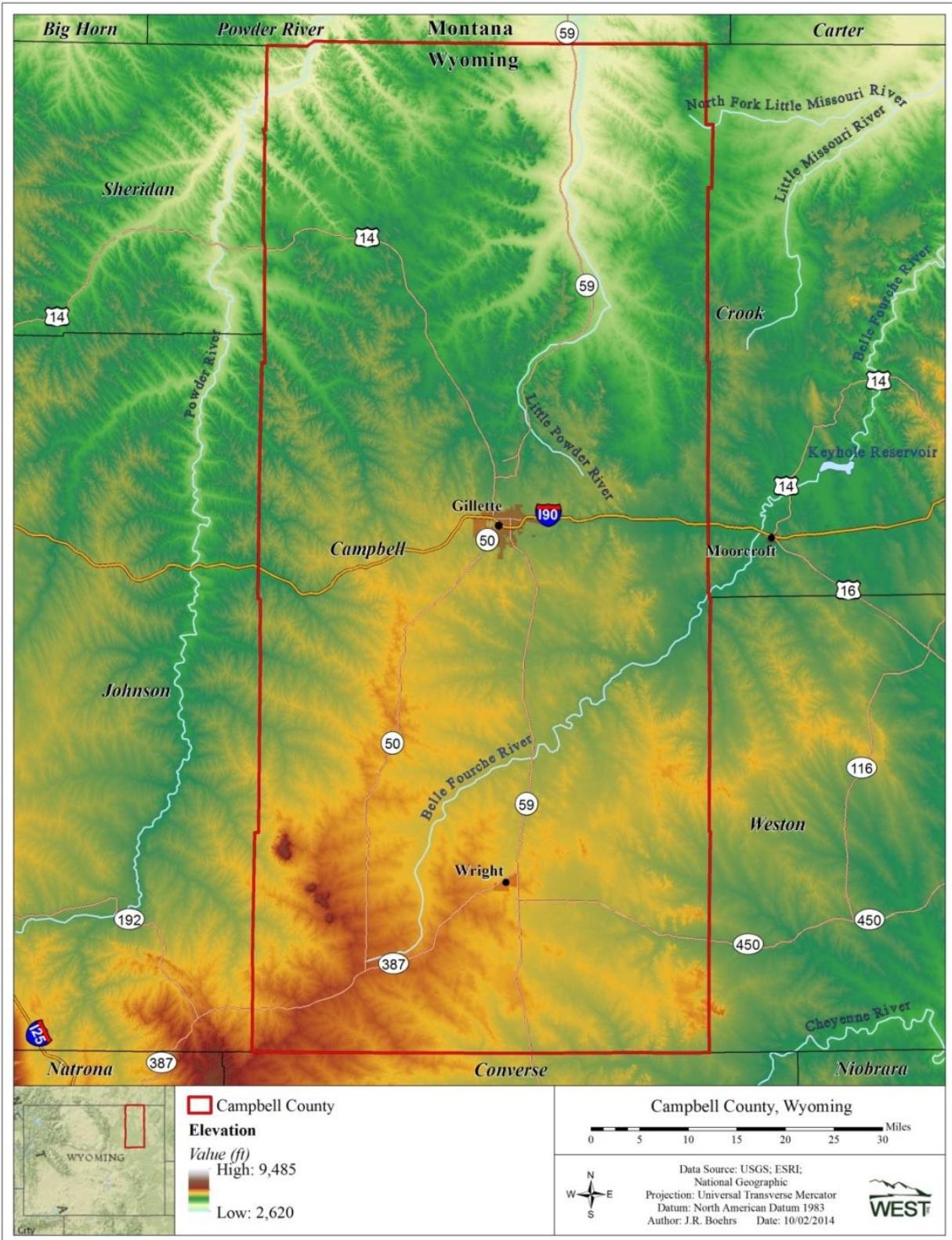
#### Custom and Culture

Air quality is affected by the amount and kinds of pollutants that are released into the air. However, other factors are involved that play a role in determining the degree of air pollution in a specific area; these factors are primarily topography and weather. The population in Campbell County that is affected by local and regional air quality conditions was 46,133 in 2010, of which almost two thirds resided in the city of Gillette (US Census Bureau [USCB] 2014). The population density in the county averaged 9.6 people per square mile in 2010; excluding Gillette, population density averaged 3.4 people per square mile.

#### *Campbell County Setting*

##### Topography

Campbell County is located in the Powder River and Belle Fourche River Basins in northeastern Wyoming. Elevation in the county generally increases from north to south ranging from 3,500 feet in the north to 6,000 feet in the Pumpkin Buttes (Figure 3-1). The Bighorn Mountain Range lies west of Campbell County, where peaks extend up to 13,000 feet.



## Meteorology

Wind data from the Gillette-Campbell County Airport between 1998 and 2012 show the wind direction is most frequent from the south in the summer, and the southwest, west, and northwest in the winter (Figures 3-2 and 3-3). Air pollutants are transported and dispersed by wind, so wind direction is important in determining impacts from air pollutants. For example, northeasterly and easterly winds are the least frequent winds in the county; therefore, emissions from sources northeast or east of Gillette are less likely to impact the majority of the Campbell County residents. Calm conditions, which are not assigned a direction, are most frequent in the summer months, which can lead to an accumulation of air pollutants.

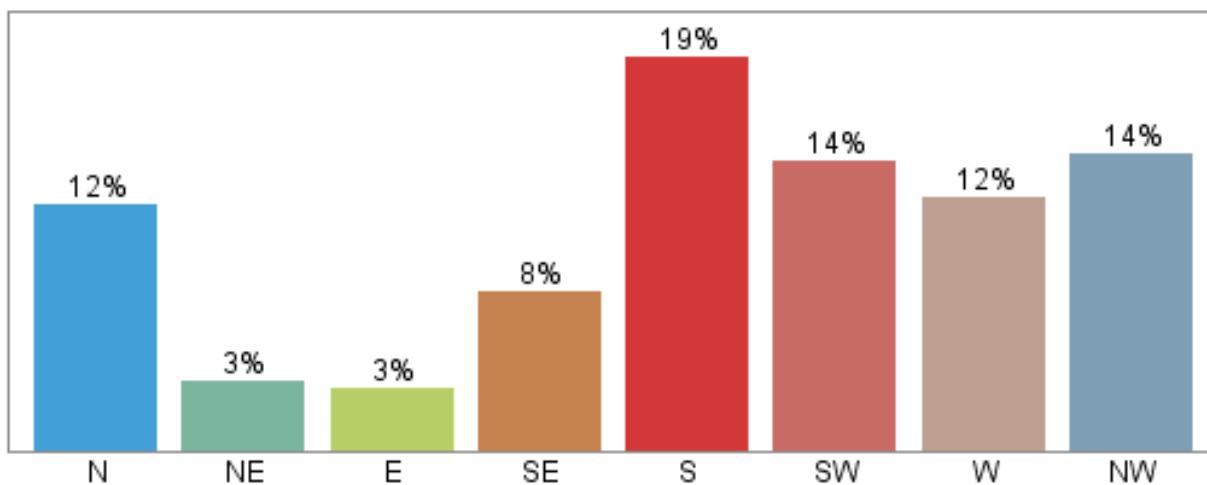


Figure from weatherspark.com

**Figure 3-2. Annual wind direction frequency at Gillette-Campbell County Airport (1998 -2012).**

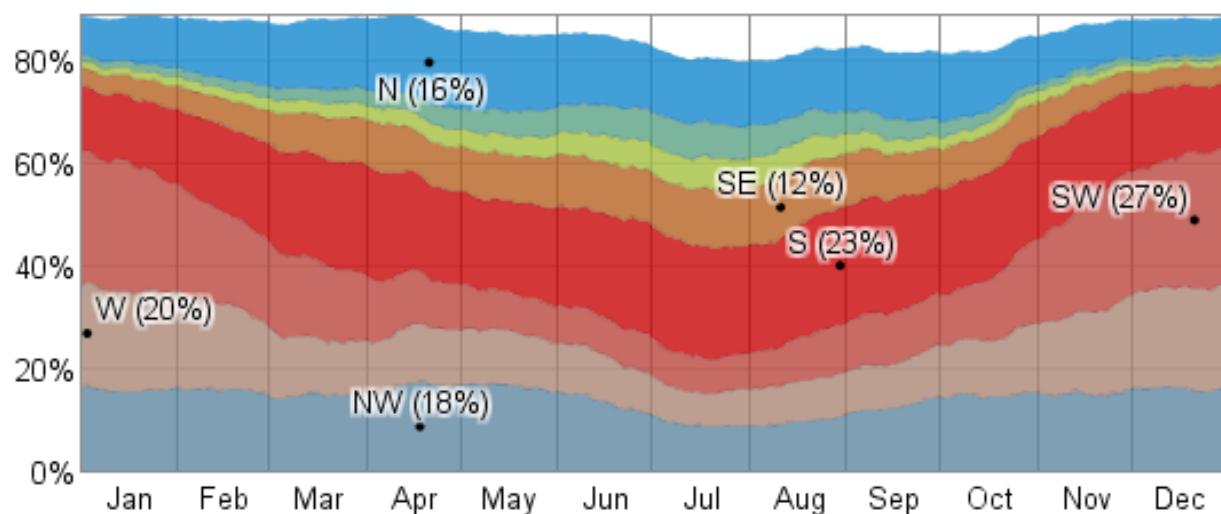
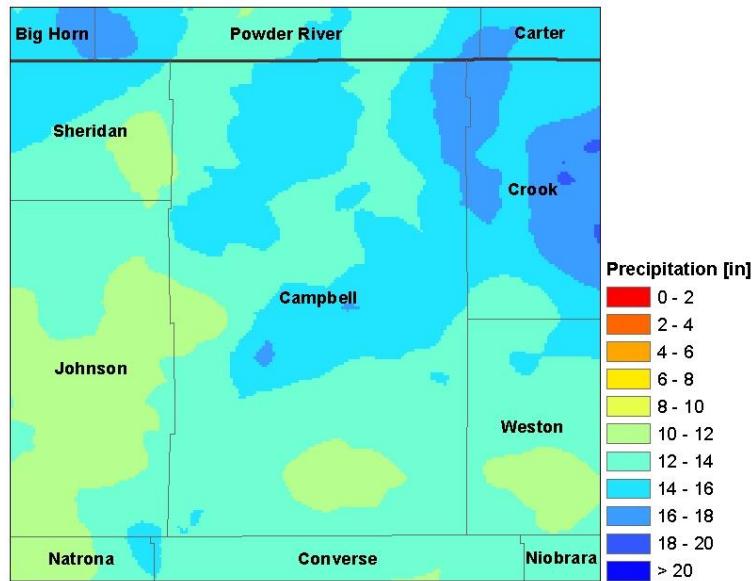


Figure from weatherspark.com

**Figure 3-3. Daily wind direction frequency at Gillette-Campbell County Airport (1998-2012).**

Precipitation averages 10 to 16 inches per year in most of the county, with higher amounts in the northeast and lesser totals in the south, based on 1981-2010 data (Figure 3-4). In Gillette, the spring months from 1998 to 2008 were the wettest with precipitation typically measured in one out of every three days between April and June (Table 3-1). High frequency of measurable precipitation helps remove pollutants from the atmosphere by wet deposition, as well as dampening soil that suppress dust emissions from vehicles on paved and unpaved roads. May is typically the wettest month, as listed in Table 3-1. Winters tended to be driest due to the limited moisture content associated with cold temperatures.



Source: PRISM 2014

**Figure 3-4. 1981-2010 annual average precipitation.**

**Table 3-1. 1998-2008 monthly average precipitation at Gillette – Campbell County Airport.**

Precipitation [inches]	Average number of days with measurable precipitation
January	5.2
February	6.7
March	8.0
April	10.7
May	11.4
June	9.7
July	7.6
August	5.9
September	7.7
October	9.0
November	5.4
December	5.2
<b>Annual</b>	<b>12.10</b>
	<b>92.6</b>

Source: Western Region Climate Center 2009

In Gillette, the average high temperature from 1998 to 2008 was 90°F and the average low was 57°F in July (Table 3-2) in the winter months, average highs were normally in the upper 30s with



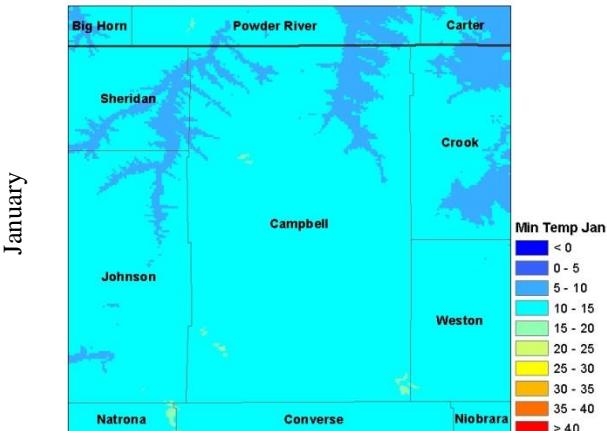
average lows in the mid-teens. Spatially, average high and low temperatures vary little county-wide (Figure 3-5).

**Table 3-2. 1998 – 2008 monthly average temperatures in Gillette – Campbell County Airport.**

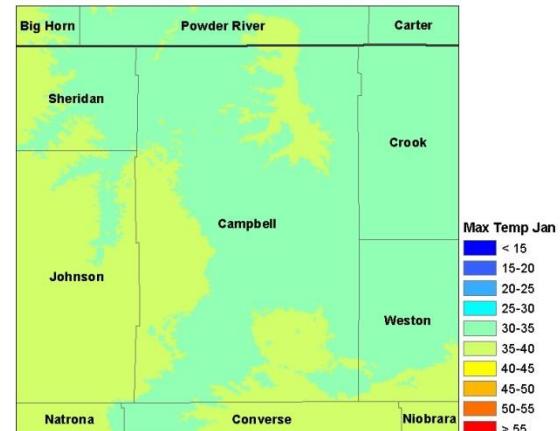
	Average High Temperature[F]	Average Low Temperature [F]
January	38	16
February	39	17
March	48	23
April	57	31
May	65	39
June	77	48
July	90	57
August	87	55
September	74	44
October	59	33
November	47	23
December	38	15
<b>Annual</b>	<b>60</b>	<b>33</b>

Source: Western Region Climate Center 2009

Minimum Temperature [F]

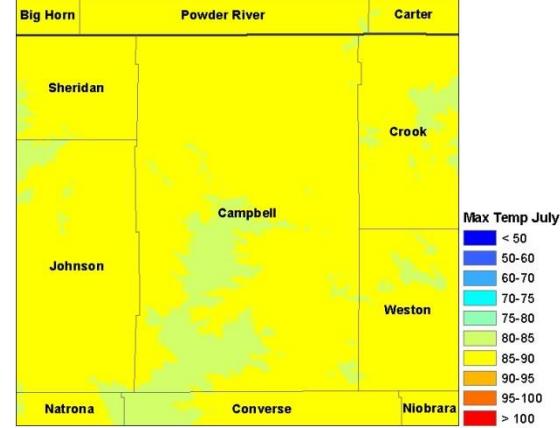
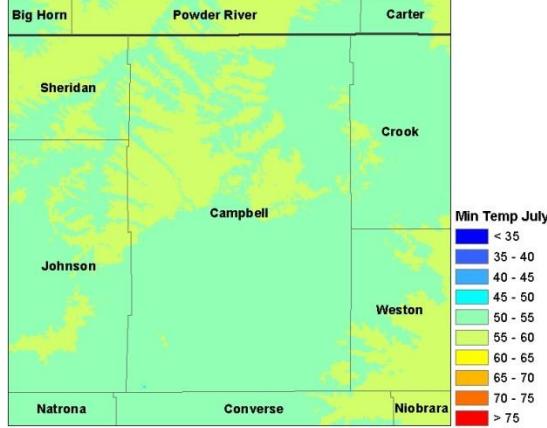


Maximum Temperature [F]



January

Minimum Temperature [F]



Source: PRISM 2014

**Figure 3-5. 1981 – 2010 monthly average low and high temperatures in January and July.**

## **Air Quality Standards**

State and federal air quality standards have been set for various air pollutants that are monitored for health concerns. Controls are usually required at the source to limit the release of these air toxins into the atmosphere. In general, states have assumed primary responsibility for enforcing most federal permit requirements, with the EPA exercising a formal review and oversight responsibility. A discussion of the state and federal regulatory framework for air quality is provided in Appendix B.

### Criteria and Hazardous Pollutants

State and federal air quality management programs have evolved using two distinct management approaches:

- The State Implementation Plan (SIP) process of setting ambient air quality standards for acceptable exposure to air pollutants, conducting monitoring programs to identify locations experiencing air quality problems, and then developing programs and regulations designed to reduce or eliminate those problems; and
- The Hazardous Air Pollutant (HAP) regulatory process of identifying specific chemical substances that are potentially hazardous to human health and then setting emission standards to regulate the amount of those substances that can be released by individual commercial or industrial facilities or by specific types of equipment.

Air quality programs based on ambient air quality standards (i.e., SIP) typically address air pollutants that are produced in large quantities by widespread types of emission sources and that are of public health concern because of their toxic properties. The EPA has established ambient air quality standards for six different pollutants, which often are referred to as criteria air pollutants or CAPs (ozone [ $O_3$ ], nitrogen dioxide [ $NO_2$ ], carbon monoxide [CO], sulfur dioxide [ $SO_2$ ], suspended particulate matter [ $PM_{2.5}$  and  $PM_{10}$ ], and lead [Pb]). Standards for suspended particulate matter have been set for two size fractions: inhalable particulate matter ( $PM_{10}$ ) and fine particulate matter ( $PM_{2.5}$ ). The 10 and 2.5 refer to the size of the particulate matter with  $PM_{10}$  representing particulate matter of a diameter of less than or equal to 10 microns ( $\mu$  or micrometers) and  $PM_{2.5}$  representing particulate matter with a diameter of less than or equal to 2.5 microns. Federal ambient air quality standards are adopted to address and/or alleviate acute and chronic health effects where evidence shows they are triggered by certain levels of air pollution and are set at threshold levels to prevent adverse health effects with a margin of safety. Federal ambient air quality standards (Appendix B) apply to outdoor locations to which the general public has access. The state of Wyoming has adopted the federal air quality standards with one exception; Wyoming continues to include an annual  $PM_{10}$  standard, which was revoked by the EPA in 2006 (Appendix B).

Air pollutants covered by state and federal ambient air quality standards can be categorized by the nature of their toxic effects as:

- Irritants (such as ozone, particulate matter, nitrogen dioxide, sulfur dioxide, sulfate particles, and hydrogen sulfide) that affect the respiratory system, eyes, mucous membranes, and the skin;
- Asphyxiates (such as carbon monoxide and nitric oxide) that displace oxygen or interfere with oxygen transfer in the circulatory system, affecting the cardiovascular and central nervous systems;
- Necrotic agents (such as ozone, nitrogen dioxide, and sulfur dioxide) that directly cause cell death; or
- Systemic poisons (such as lead particles) that affect a range of tissues, organs, and metabolic processes.

Air quality programs based on regulation of other hazardous substances (i.e., HAP) typically address chemicals used or produced by limited categories of industrial facilities. Programs regulating hazardous air pollutants focus on substances that alter or damage the genes and chromosomes in cells (mutagens); substances that affect cells in ways that can lead to uncontrolled cancerous cell growth (carcinogens); substances that can cause birth defects or other developmental abnormalities (teratogens); substances with serious acute toxicity effects; and substances that undergo radioactive decay processes, resulting in the release of ionizing radiation. Federal air quality management programs for hazardous air pollutants focus on setting emission limits for particular industrial processes rather than setting ambient exposure standards. Federal emission standards for hazardous air pollutants have been promulgated as National Emission Standards for Hazardous Air Pollutants (NESHAPS) and as Maximum Available Control Technology (MACT) standards (USEPA 2012d). The federal MACT standard for mercury emissions from coal-fired power plants represents an example of such hazardous air pollutant control programs. The NESHAPS and MACT standards are implemented through state and federal air quality permit programs.

The Clean Air Act (CAA) affords special air quality and air quality related values (AQRVs) protection to 156 areas in the US that are known as Class I areas. Class I areas consist of specific National Parks and Wilderness areas. AQRVs include visibility and nitrogen and sulfur deposition. There are currently no Prevention of Significant Deterioration (PSD) program Class I areas within Campbell County. The closest Class I areas to Campbell County are the North Absaroka and Washakie Wilderness areas to the west, the Northern Cheyenne Indian Reservation to the northwest, and the Wind Cave and Badlands National Parks to the east.

The CAA requires each state to identify areas that have ambient air quality in violation of federal standards. States are required to develop, adopt, and implement a SIP to achieve, maintain, and enforce federal ambient air quality standards in these nonattainment areas. Deadlines for achieving the federal air quality standards vary according to air pollutant and the severity of existing air quality problems. The SIP must be submitted to and approved by the EPA. SIP



elements are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are being violated.

The status of areas with respect to federal ambient air quality standards are classified as nonattainment (violating the air quality standard), attainment (better than federal standards), or unclassified (due to an absence of monitoring data). Areas that have been designated from nonattainment to attainment are considered maintenance areas, although this designation is seldom indicated in formal listings of attainment status designations. Unclassified areas are treated as attainment areas for most regulatory purposes. Campbell County is currently considered in attainment or unclassified for all federal ambient air quality standards.

### Air Quality Observations

Several air quality monitors are located in Campbell County (Figure 3-6a); most are associated with mines in the central and southeast part of the county. PM<sub>10</sub> monitors, in particular, are abundant in the county to monitor the particulate emissions near mines. Air quality data from the ten most recent years were downloaded from the EPA (USEPA 2014a) for monitors in Campbell County and surrounding counties (Figure 3-6b). The data were compared to the state and federal ambient air quality standards. The standards, data and detailed discussion are provided in Appendix B; a summary follows:

- Ozone - there were no violations of the NAAQS within Campbell County or in adjacent counties between 2004 and 2013. However, in December 2014 EPA proposed to lower the ozone threshold from 75 ppb to 65 to 70 ppb, which could result in violations of the ozone NAAQS in Campbell County because 30 to 50 percent of the fourth highest observed daily maximum 8-hour readings are in the 65 to 70 ppb range (Appendix B).
- Carbon Monoxide - no carbon monoxide monitors are available in Campbell County. Typically the largest source of carbon monoxide emissions is gasoline vehicles and because vehicle emissions are being reduced, even large urban areas rarely exceed the carbon monoxide standard. It is not expected that Campbell County will exceed the NAAQS carbon monoxide standard.
- Nitrogen Dioxide - there were no violations of the 1-hour or annual NAAQS within Campbell County or in adjacent counties between 2004 and 2013 when averaged over three years as required by the standard. There was, however, a single exceedance of the 1-hour nitrogen dioxide concentration 100 ppb threshold at the Bell Ayre Mine in 2005 of 116.9 ppb; that was the only exceedance during the ten year data set.
- Sulfur Dioxide – the only monitor in Campbell County is at the WYODAK Mine Site 4, which has consistently remained below the 1-hour and 3-hour NAAQS thresholds during the ten year data set. Two monitoring sites located in adjacent counties reported even lower concentrations.
- PM<sub>2.5</sub> – Campbell County has six monitors and the observed 24-hour PM<sub>2.5</sub> were all below the NAAQS thresholds during the ten year data set. Similarly, monitors in the adjacent counties all had values below the thresholds as well.

- $\text{PM}_{10}$  – at the 55 monitoring sites mostly associated with mines, several recorded  $\text{PM}_{10}$  levels that exceeded the 24-hour NAAQS standard during the ten year data set. However, a region is considered out of compliance when four or more exceedances occur over a 3-year period, which did not occur. At the North Antelope Rochelle Mine, three exceedances occurred during 2011 to 2012, one with a threshold of  $150 \text{ } \mu\text{g}/\text{m}^3$  in 2012 which was close to putting the region out of compliance. The sites recorded annual means for  $\text{PM}_{10}$  that were below the state limit of  $50 \text{ } \mu\text{g}/\text{m}^3$  for three consecutive years. Three sites in the southeast corner of the county associated with mines did have individual exceedances, but none were for three consecutive years.

Although nitrogen oxide and  $\text{PM}_{10}$  levels were exceeded on single event occurrences, neither had enough exceedances to be considered in violation with the standards.  $\text{PM}_{10}$  is the only pollutant that comes close to violating the federal or Wyoming state ambient air quality standards in Campbell County. But based on air quality observations over the last 10 years there are no violations of any federal or state standards.

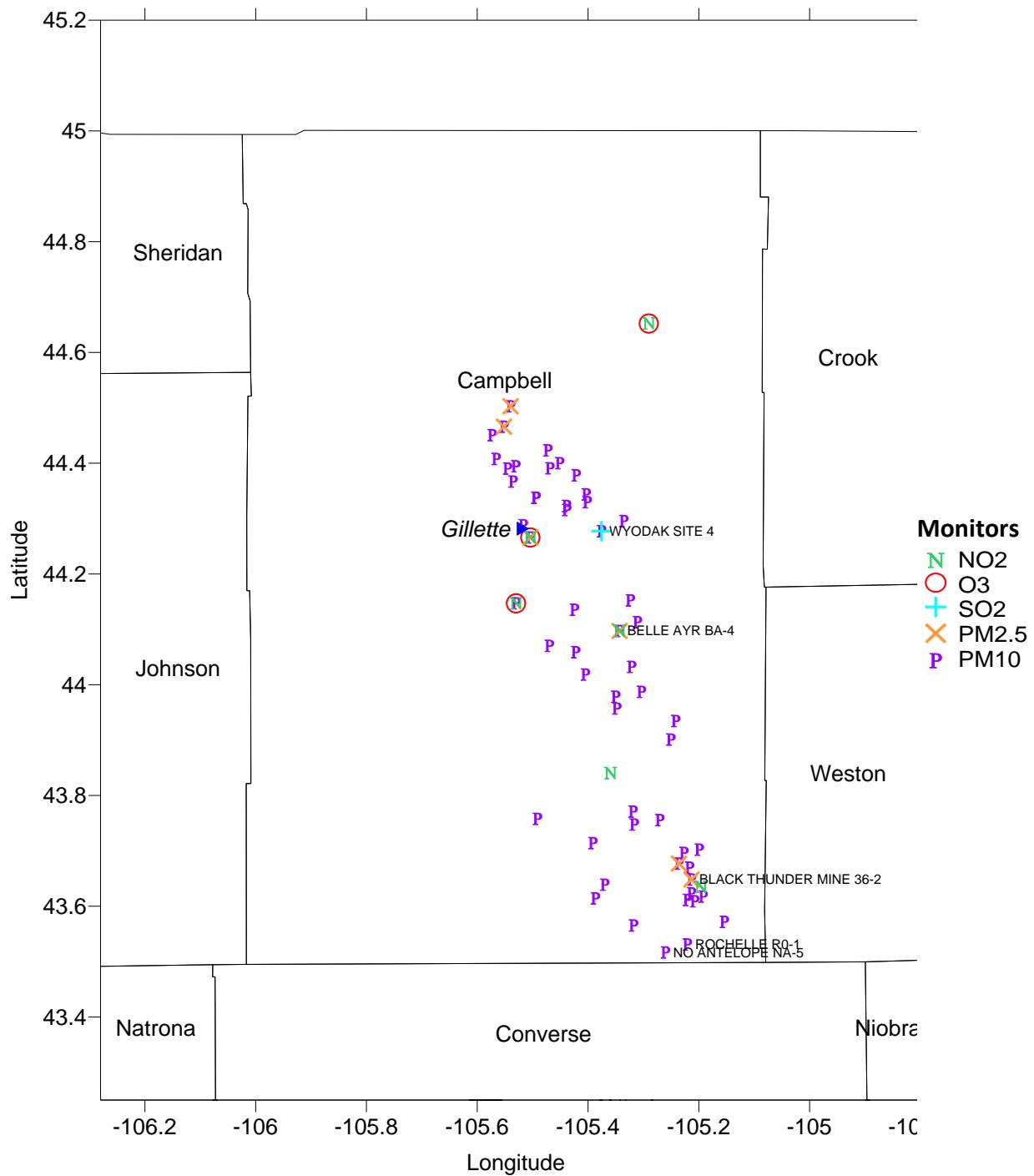
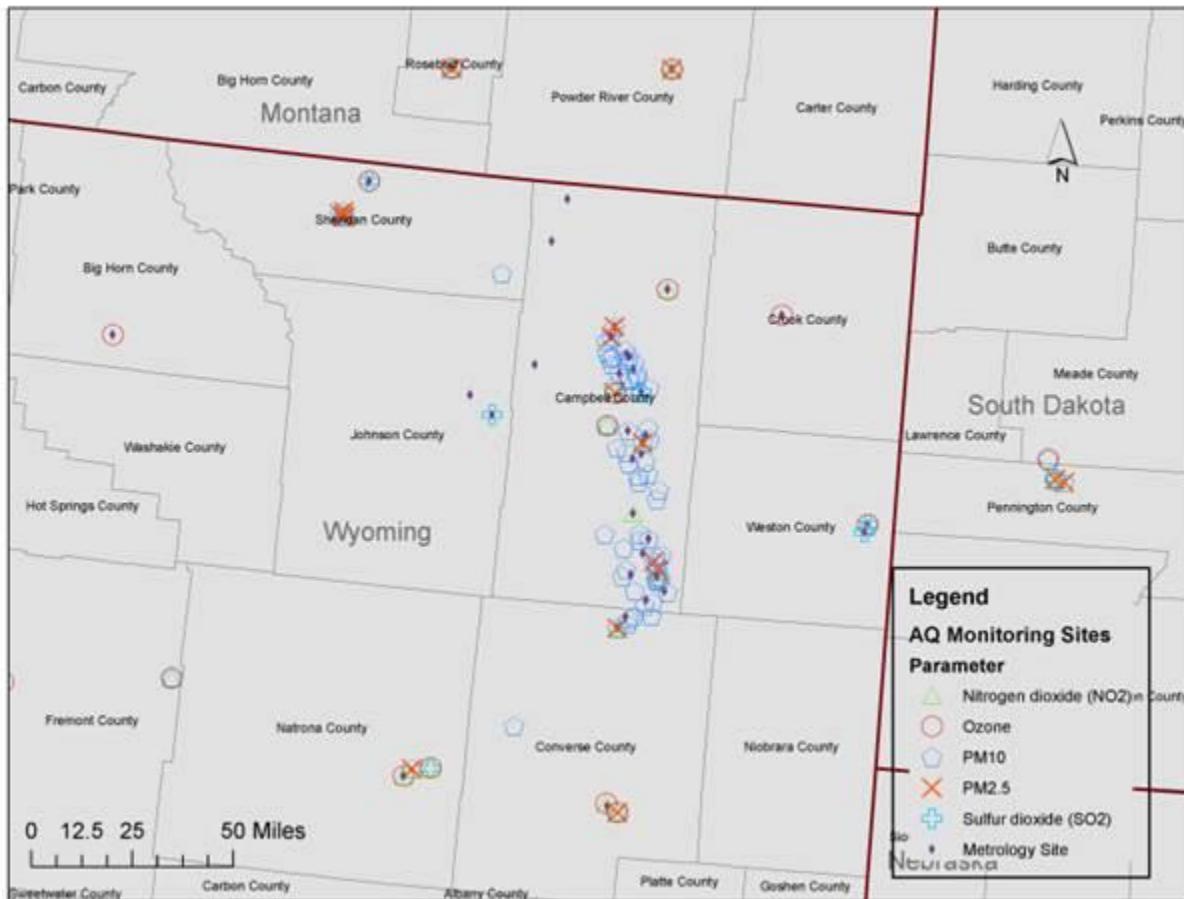


Figure 3-6a. Air quality monitors in Campbell County.



Data Source: USEPA 2014a

**Figure 3-6b. Air quality monitors in Campbell County and nearby counties.**

## *Future Emissions*

In order to understand the types of control strategies that may be effective in reducing emissions in Campbell County, the important sources of emissions must be identified. Below, criteria pollutant emission inventories are examined to identify the highest emitting sources for which emission reductions may have the largest impact on air quality.

## Criteria Pollutants

Emission inventories typically provide emission estimates for the criteria pollutants (nitrogen oxides [NO<sub>x</sub>], volatile organic compounds [VOC], CO, SO<sub>2</sub>, ammonia [NH<sub>3</sub>], PM<sub>2.5</sub>, and PM<sub>10</sub>). Criteria pollutant emission estimates from the EPA 2011 National Emission Inventory (NEI; USEPA 2013a) for Campbell County are based on four major anthropogenic emission contributions (on-road mobile, non-road mobile, area, and point sources; Figure 3-7). On-road mobile consists of motor vehicles and heavy duty trucks that operate on paved and unpaved roadways. Non-road sources include engines and vehicles that do not typically operate on roadways and include locomotives, airplanes, marine vessels, agricultural and construction equipment, lawn and garden equipment, off-highway vehicles (OHVs), generators, etc. Area

sources include residential and commercial fuel combustion, consumer products, livestock and agricultural emissions, oil and gas production fugitive sources and dust emissions. Point sources include emissions from mining, compressors, industries and electric generating units (EGUs). The four major anthropogenic emission contributors can further be broken down by sector (Table 3-3).

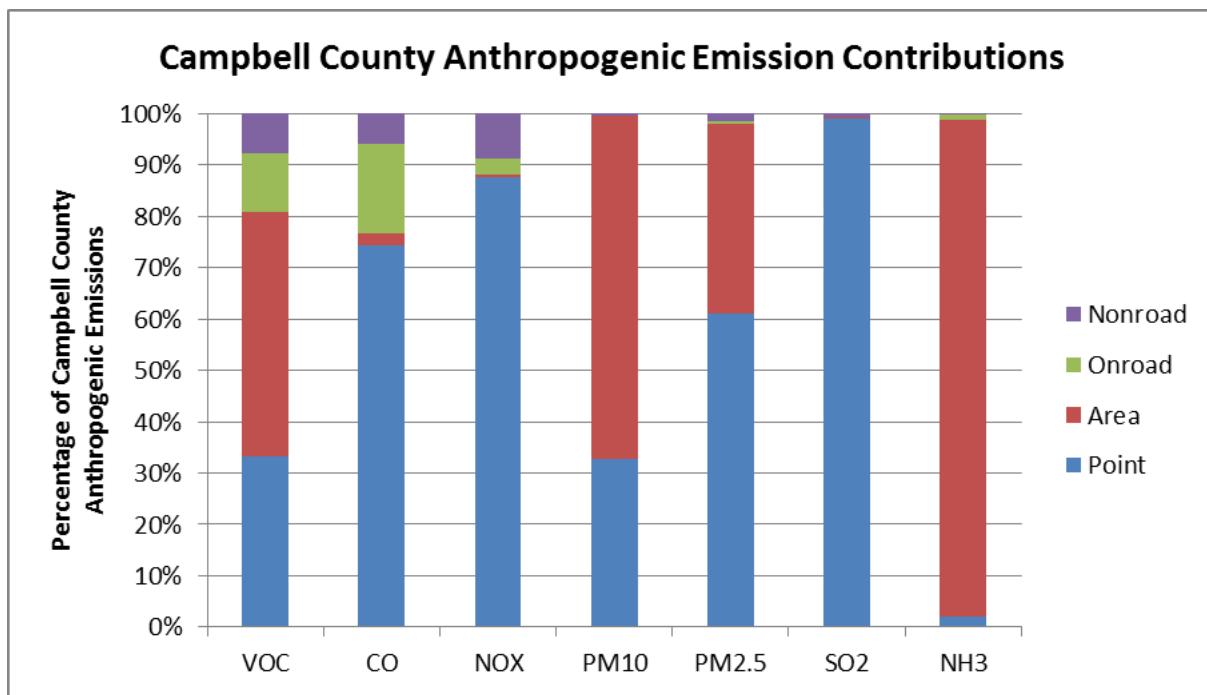


Figure 3-7. Campbell County criteria pollutant emissions by sector.

Table 3-3. 2011 anthropogenic emission in Campbell County, Wyoming by sector [tons/year].

Sector	VOC	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NH <sub>3</sub>
<b>Point</b>							
Mining	246	23,531	28,594	12,724	4,628	696	0
Oil and Gas	1,161	1,372	2,911	62	54	0	0
Other	29	129	395	398	377	795	16
EGU	90	1,716	4,256	1,494	240	4,243	23
<b>Point Subtotal</b>	<b>1,527</b>	<b>26,749</b>	<b>36,157</b>	<b>14,678</b>	<b>5,300</b>	<b>5,735</b>	<b>39</b>
<b>Area</b>							
Fugitive Dust	-	-	-	29,852	3,088	-	-
Agricultural NH <sub>3</sub>	-	-	-	-	-	-	1,920
Oil and Gas	605	28	40	1	1	<1	-
Other	1,576	733	163	110	102	9	10
<b>Area Subtotal</b>	<b>2,181</b>	<b>762</b>	<b>203</b>	<b>29,963</b>	<b>3,191</b>	<b>10</b>	<b>1,931</b>
<b>On-Road</b>							
<b>Vehicles</b>	<b>526</b>	<b>6,253</b>	<b>1,239</b>	<b>58</b>	<b>45</b>	<b>6</b>	<b>21</b>
<b>Non-Road</b>							
Locomotives	171	508	3,446	115	106	36	2
Other Equipment	178	1,638	165	16	15	<1	<1
<b>Non-Road Subtotal</b>	<b>349</b>	<b>2,147</b>	<b>3,611</b>	<b>131</b>	<b>121</b>	<b>36</b>	<b>2</b>
<b>Grand Total</b>	<b>35,369</b>	<b>42,463</b>	<b>41,736</b>	<b>44,830</b>	<b>8,657</b>	<b>5,786</b>	<b>1,992</b>

Source: EPA NEI (USEPA 2013a)

The key findings of the emissions analysis for Campbell County are as follows:

- The majority of anthropogenic emissions are emitted by area sources and point sources.
- Point source emissions are the highest contributors for CO, NO<sub>x</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub>. Mining is the largest source of point source for CO, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>, accounting for 88 %, 79 %, 87 %, and 87 % of anthropogenic emissions respectively; EGUs are the largest contributor of SO<sub>2</sub> and NH<sub>3</sub>, while the oil and gas sector is the largest contributor of VOC emissions (Figure 3-8).
- Area sources are the largest contributor to PM<sub>10</sub> (67 %) and NH<sub>3</sub> (97 %), and the second largest contributor to PM<sub>2.5</sub> emissions (37%). Fugitive dust accounts for almost all PM<sub>10</sub> and PM<sub>2.5</sub> area source emissions and are comprised of emissions from unpaved road dust (92% of PM<sub>10</sub> and 89% of PM<sub>2.5</sub>), construction dust (5% of PM<sub>10</sub> and 5% of PM<sub>2.5</sub>), paved road dust (2% of PM<sub>10</sub> and 4% of PM<sub>2.5</sub>), and agricultural dust (1% of PM<sub>10</sub> and 2% of PM<sub>2.5</sub>). Fugitive dust and mining are the main sources of PM<sub>10</sub> emissions (Figure 3-9).

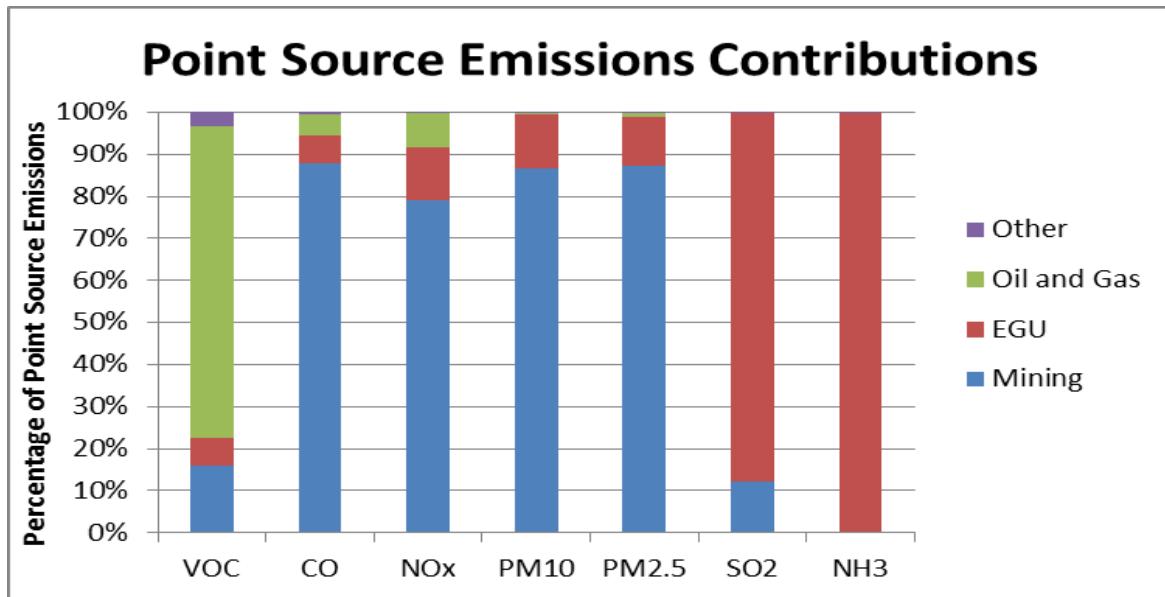
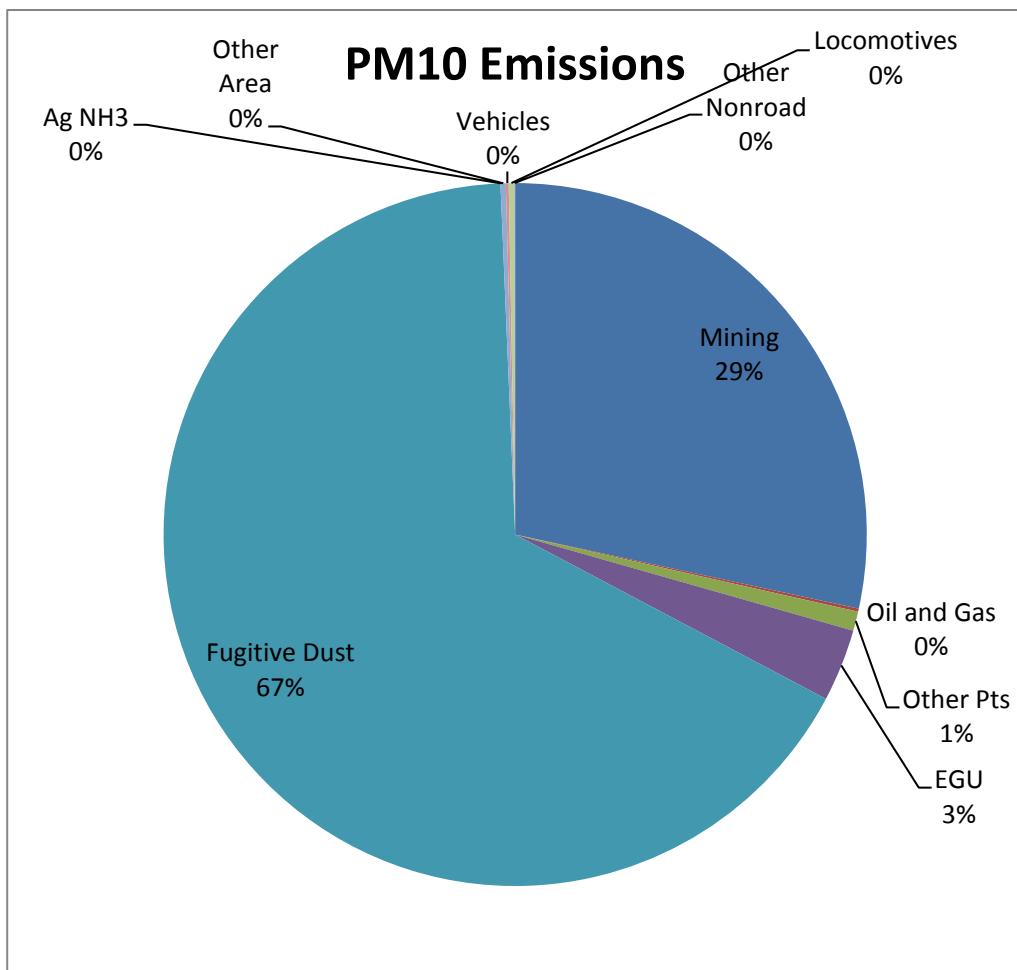


Figure 3-8. Campbell County point source criteria pollutant emissions by industry.



**Figure 3-9. PM<sub>10</sub> emissions by source category.**

Campbell County has some of the largest coal mining operations in the US. All of the mines are open pits, extracting coal at or near the surface. In addition, there are a number of coal-fired power plants located within Gillette that generate electricity from the local coal mining production. Table 3-4 lists the 2011 emissions from the major coal mines and EGU facilities. Emission control equipment for regulating NO<sub>x</sub>, SO<sub>2</sub> and PM emissions has been installed at several of the major EGUs in Campbell County (Table 3-5).

**Table 3-4. 2011 emissions from EGUs and coal mines in Campbell County, Wyoming [tons/year].**

Facility Name	VOC	CO	NOx	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NH <sub>3</sub>
<b>EGUs</b>							
Wyodak Plant	44	1,062	2,330	1,147	119	2,393	0
Neil Simpson One	7	19	282	351	347	791	16
WYGEN Station I	9	43	601	95	31	559	8
Neil Simpson Two	19	165	600	92	85	542	8
Dry Fork Station	0	153	238	78	7	279	1
WYGEN III	18	91	212	68	7	256	
WYGEN II	4	204	278	52	14	215	5

**Table 3-4. 2011 emissions from EGUs and coal mines in Campbell County, Wyoming [tons/year].**

Facility Name	VOC	CO	NOx	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NH <sub>3</sub>
<b>Coal Mines</b>							
Black Thunder Mine	0	19,781	11,726	4,272	1,791	163	-
North Antelope Rochelle Mine	113	708	3,325	2,898	932	197	-
Cordero Rojo Complex	29	1,290	784	1,441	421	81	-
Buckskin Mine	5	14	312	1,047	563	33	-
Belle Ayr Mine	0	60	730	939	402	17	-
Eagle Butte Mine	0	37	648	841	198	10	-
Coal Creek Mine	0	909	9,100	334	122	12	-
Rawhide Mine	22	125	450	305	21	34	-
Wyodak Mine	6	58	237	229	85	4	-
Dry Fork Coal Mine	12	210	299	205	18	16	-
Caballo Mine	50	296	791	48	48	79	-

Source: EPA NEI (USEPA 2013a)

**Table 3-5. Emission controls and generating capacity of EGUs in Campbell County, Wyoming.**

Facility Name	Generating capacity (MW)	Year Installed	Control Equipment
Wyodak Plant	335 – 362	1978	NOx: low- NOx burner (LNB) SO <sub>2</sub> : scrubber PM: cloth fiber 'baghouse'
Neil Simpson One	21.8	1969	NOx: LNB SO <sub>2</sub> : unknown PM: Electrostatic precipitator
WYGEN Station I	80	2003	NOx: Selective catalytic reduction system (SRC) + ultra-LNB SO <sub>2</sub> : unknown PM: fabric filter 'baghouse'
Neil Simpson Two	80 – 90	1995	NOx: unknown SO <sub>2</sub> : Circulating Dry Scrubber PM: Electrostatic precipitator + 'baghouse' and bin vent filter
Dry Fork Station	385	2007	NOx: LNB + SCR SO <sub>2</sub> : Circulating dry scrubber PM: Fabric filter – baghouse
WYGEN III	101.7	2010	NOx: SCR/LNB + over-fire air (OFA) SO <sub>2</sub> : Dry scrubber - flue gas desulfurization (FGD) PM: fabric filter - baghouse (PM);
WYGEN II	100	2008	NOx: SCR SO <sub>2</sub> : atomizer spray dryer PM: baghouse, bin-vent dust controllers and scrubbers + water and chemical dust suppressants (fugitive)

Source: USEPA 2014h and WYDEQ 2014d

## Data Summary

Based on a review of the air monitoring data from 2004 to 2013 and the emission inventories, several conclusions can be made. Generally, the air quality in Campbell County is not in violation with any federal or state standards or regulations. However, the levels associated with PM<sub>10</sub> are close to violating both state and federal ambient air quality standards. Furthermore, the



EPA December 2014 proposed rule change for the NAAQS ozone threshold may result in areas within the county being classified as out of attainment.

## Goal

Maintain air quality consistent with approved standards in Campbell County for the protection of the health of residents and in furtherance of responsible development.

## Objectives

- *Air quality standards and regulations which do not prohibit reasonable economic activity within Campbell County.*
- *Air quality monitoring according to approved protocols and standards.*
- *Utilization of economically feasible and best available technologies in air quality management and monitoring.*

## Policies

- *Do not apply air quality controls to naturally occurring events, such as drought or wind events, which are beyond the scope of human ability to control.*
- *Make open and available to the public raw collected air quality monitoring data at all stages of collection, publication and processing.*
- *Utilize best available and economically viable technologies in development and implementation of air quality standards and regulations.*
- *Make open and available for public inspection methodology and result criteria for the evaluation of air quality monitoring data prior to collection of the data.*
- *State and federal agencies shall:*
  - *collaborate with relevant county agencies and stakeholders in the development of provisions or stipulations for proposed projects that may significantly impact air quality;*
  - *collaborate with relevant county agencies and stakeholders in developing mitigation plans to reduce potential impacts to air quality from proposed projects;*
  - *consult, coordinate, and collaborate with county agencies and stakeholders in dust suppression projects;*
  - *collaborate with Campbell County on air quality modeling and quantitative data analysis for air quality and visibility standards affecting Campbell County industries and stakeholders;*
  - *cooperate, coordinate, and consult with local governments and affected stakeholders to minimize emissions and reduce economic impacts related to air quality management where possible; and*
  - *utilize credible scientific data, and economic cost benefits analysis when proposing and developing air quality standards and regulations.*

## ***Emission Control Strategies***

Control strategies that could benefit Campbell County are described below. It is noted that the selection of the most appropriate, efficient, and effective control strategy for any emission sources requires a process to assess project and/or area specific emissions, air quality, and other considerations.

### **Coal Mining**

Coal mining dust emissions are subject to control as described in the document “Natural Events Action Plan for The Coal Mines of the Powder River Basin of Campbell & Converse Counties, Wyoming” (WYDEQ 2006a). Three levels of required control are specified:

- **Best Available Control Technology:** Measures that mines already employ as part of their requirements under their individual WYDEQ Air Quality Division permits including control of dust from stockpiles, roads, coal conveyor transfer points, crushers and processing plants, coal dump hoppers through the usage of moisture or chemical dust suppressants, enclosure of operating areas, baghouses, cyclones, scrubbers, fog systems, and controlled flow transfer chutes.
- **Best Available Control Measure:** Measures that mines must employ continuously that are not part of the requirement under each mine’s individual WYDEQ Air Quality Division permit including controls such as ripping of graded areas, recently reclaimed areas, and topsoil stripped areas to limit suspension of dust.
- **Reactionary Control Measures:** Measures that mines must employ during a high wind event including visual inspections, moderation of dumping activities, potential shutdown of scoria crushing operations, potential shutdown of road maintenance activities, increased usage of watering, reduced hauling activities, and reduction or shutdown of earth moving activities.

Control is not required for strategies that were identified in WYDEQ (2006a) as unreasonable and/or economically infeasible, such as suspension of blasting activities during a high wind event, use of windbreaks, dust control sprinkler systems, irrigation of reclamation areas, and paving of mine haul roads.

A detailed listing of the identified control measures is included in WYDEQ (2006a).

### **Road Dust**

Unpaved road dust is the largest single source of PM<sub>10</sub> emissions in Campbell County according to the 2011 EPA NEI (USEPA 2013a). A large fraction of unpaved road dust is likely due to vehicle activity associated with oil and gas development and, to a lesser extent, mining. Such control strategy projects may include, but are not limited to application of water or chemical dust suppressants, and paving of unpaved roads.

Campbell County currently utilizes dust suppression agents to help control dust from unpaved roads. Focus by Campbell County Road and Bridge is concentrated in the southern end of Campbell County where a majority of the mineral development occurs, however dust mitigation



measures are used over all of Campbell County, and work by the Road and Bridge Department increases as activity moves further north and west.

Congestion Mitigation Air Quality funds are used in conjunction with county funding for dust suppression projects. Campbell County also partners with mineral developers on road maintenance and dust suppression agreements and projects.

It is expected that state and federal agencies shall consult, coordinate and collaborate with county agencies and stakeholders on projects to control road dust emissions.

### Oil and Gas

Oil and gas exploration (e.g. drilling), production (e.g. well sites), and midstream (e.g. compressor stations) emissions from oil, natural gas, and coal bed methane activities might be significant contributors to VOC, NO<sub>x</sub>, and methane emissions.

The wide variety of emission sources in the oil and gas sector allow for a similarly wide variety of potential strategies to reduce emissions from these sources. Both WYDEQ and EPA have regulatory programs that limit emissions from the oil and gas sector, including but not limited to the WYDEQ Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance (WYDEQ 1997), EPA New Source Performance Standards (NSPS; e.g. Subpart OOOO, Subpart JJJJ, Subpart KKKK; USEPA 2012e; 40 CFR 6) and EPA off-road diesel engine standards (USEPA 2014g). State specific oil and gas requirements are listed in Table 3-6.

**Table 3-6. State specific oil and gas regulations by source category for Campbell County, Wyoming.**

Source Category	WYDEQ Regulation for Campbell County
Drill Rigs, Workover Rigs	Wyoming has no separate state restrictions for temporary Compression Ignition (CI) or Spark Ignition-Internal Combustion Engine (SI-ICE). EPA Non-road Mobile Tier Standards take precedence
Well Completions	<b>C6 S2 O&amp;G Permitting Guidance</b> Wyoming has 4 area categories; 1) Concentrated Development Areas (CDA), 2) Upper Green River Basin (UGRB) 3) Jonah and Pinedale Anticline Development Area and 4) Normally Pressured Lance (JPAD/NPL) & 4) Statewide refers to all facilities not located in CDA, UGRB or JPAD/NPL  Green completions are required in the JPAD/NPL area and CDA's in Wyoming as of July, 2014.
Pneumatic Controllers	<b>C6 S2 O&amp;G Permitting Guidance</b> Install low or no-bleed at all new facilities. Upon modification of facilities, new pneumatic controllers must be low/no-bleed and within 60 days of modification, existing controllers must be replaced with no/low-bleed. (well site facilities only - not gas plants)
Condensate & Crude Oil Tanks	<b>C6 S2 O&amp;G Permitting Guidance</b> 98% control of all new/modified tank emissions $\geq 10$ tpy VOC within 60 days of startup/modification
Gas Processing Plants	Wyoming has adopted NSPS Subpart KKK on LDAR
Glycol Dehydrators	<b>C6 S2 O&amp;G Permitting Guidance</b> PAD Facilities - 98% control upon startup/modification. SINGLE Well Facilities - 98% control within 60 days of startup/modification for VOC emissions $\geq 6$ OR 98% control within 30 days of startup/modification for VOC emissions $\geq 8$ tpy

**Table 3-6. State specific oil and gas regulations by source category for Campbell County, Wyoming.**

Source Category	WYDEQ Regulation for Campbell County
Minor Source Permitting	Emissions from minor sources must be approved through permitting applied through the Wyoming Air Quality Standards and Regulations (WAQSR) <b>Chapter 6 Section 2(a)(i) O&amp;G Permitting Guidance</b> . For VOC emissions $\geq 8$ tpy from sources other than tanks, dehydrators, pneumatic controllers and pumps, water tanks, BACT is considered on case-by-case basis.
Point Source Permitting Threshold	Wyoming has no de minimus permitting threshold outside of their <b>C6 S2(k)</b> exemptions, thus all sources not waived by the Administrator are permitted and undergo BACT analysis
Pneumatic Pump	<b>C6 S2 O&amp;G Permitting Guidance</b> PAD Facilities - pneumatic pumps shall be controlled by at least 98% or the pump discharge streams shall be routed into a closed loop system at startup/modification. SINGLE Well Facilities - 98% control within 60 days of startup/modification for sites with combustion units installed OR solar, electric or air-driven pumps for sites without combustion units installed

### Coal-Fired Power Plants

Seven coal-fired EGUs are located in Campbell County with a total output of slightly over 1,000 megawatts (MW) whose emissions and attributes were provided previously in Tables 3-4 and 3-5. These EGUs are subjected to federal rules such as the Title IV acid rain control program. The largest two coal-fired EGUs in Campbell County are the WYODAK (335 – 362 MW) and Dry Fork Station (385 MW) power plants located near Gillette. Although these two plants have comparable electricity output, the WYODAK has much higher NO<sub>x</sub> and SO<sub>2</sub> emissions (Table 3-4); this is because it was built about 35 years ago (1978) so it was not required to have current BACT controls as implemented for the Dry Fork Station, which is less than 10 years old (2007). The Neil Simpson One 21.8 MW EGU built in 1969 was closed in March 19, 2014 because it was too expensive to retrofit the facility to meet approved air quality standards.

### Other Sources

In addition to the sources listed above, other anthropogenic emission sources such as on-road vehicles (heavy and light duty), off-road equipment (recreational, construction, agricultural, industrial, etc.), locomotives, other point sources, and other dispersed area sources may be controlled above and beyond existing levels in efforts to conform to regulatory requirements or improve air quality. Although on-road mobile is controlled by federal tailpipe and fuel standards, local officials can reduce emissions from vehicles by reducing activity. It is expected that state and federal agencies shall consult, coordinate and collaborate with county agencies and stakeholders in all projects to control emissions from any source.

### **Campbell County Position Summary**

Based on the data compiled above, and the importance of resource extraction to the economy of Campbell County, it is the overall position of Campbell County to continue to encourage and support the current and future mineral development activities within the county.

It is Campbell County's position that, upon review of the information provided, the mineral industry does not pose a risk to air quality in the region, based on current uses. If appropriate best management practices are applied future concerns in regards to air quality within Campbell County will be mitigated.

Campbell County has concerns regarding potential future changes to threshold levels and the corresponding impacts to the operation of current and future resource extractions within the county. It is Campbell County's intent to work with stakeholders and state and federal agencies in continuing to mitigate the impacts of future regulation changes on the mineral extraction industry.

Campbell County has some of the largest coal mining operations in the U.S. All of the mines are the open pit type, which means that coal is extracted at or near the surface. In addition, there are a number of coal-fired power plants in the region which generate electricity from the local coal mining production. Table 3-4 lists the 2011 EGU emissions by major facility and coal mining emissions by mine. Table 3-5 shows operating capacity of major EGUs in Campbell County and installed emission control equipment for regulating NO<sub>x</sub>, SO<sub>2</sub> and PM emissions.

## Cultural/Historic/Paleontology Resources

### Custom and Culture

Campbell County supports the protection, study, and/or excavation of unique archeological, historical, and paleontological resources that occur in the county, while including the responsible stewardship of these resources through balancing resource protection with natural resource recovery and visitor values.

Prehistoric archaeological resources in Campbell County date from over 11,000 years ago to less than 200 years ago. Campbell County contains sites representing all five known prehistoric cultural periods within Wyoming (Kornfeld et al. 2010):

- Paleoindian Period (11,500-8,000 before present [BP])
- Early Plains Archaic Period (8,000-5,000 BP)
- Middle Plains Archaic Period (5,000-3,000 BP)
- Late Plains Archaic Period (3,000-1,500 BP)
- Late Prehistoric and Protohistoric Periods (1,500-200 BP)

The prehistory of Campbell County is the story of innovative and highly skilled groups of hunter-gatherers wresting a living from the land. These people used stone, wood, and bone tools, hunted large and small game, fished, and gathered diverse plant foods. The Paleoindian residents of the area may have hunted extinct mammals such as mammoth, mastodon, and extinct species of bison, whereas later groups relied primarily on modern bison and pronghorn antelope. Important prehistoric site types that occur within Campbell County include artifact scatters, stone circle sites, big game (usually bison) kill and processing sites, vegetable processing sites, rock alignments and cairns, and stone material procurement areas. Other significant, although less common site types include human remains and cultural landscapes. The oldest sites are typically the rarest because they have had more time to be destroyed by natural processes. Inversely, more recent sites are more common. Although there is a tremendous amount of variation, substantial prehistoric sites are often found near reliable sources of water along major drainages and in close proximity to other valuable resources such as edible plants or sources of tool stone. Specific sites



types (usually stone alignments and cairns) may be of special religious significance to Native American groups. These sites may qualify for Traditional Cultural Property (TCP) status. TCPs require some special consideration but their management is governed by the same laws and regulations as other cultural resources.

The historic period of Campbell County begins approximately 200 years ago with the sporadic incursions and habitations of the earliest Euro-American fur trappers and explorers. The French fur trader Larocque followed the Powder River South from the Yellowstone in 1805 (Larson 1978) and represents the first well documented Euro-American to traverse a small portion of what would later become Campbell County. Historic settlement of the region was driven by the fur trade until approximately 1840, at which point changing fashions and declining beaver populations sent the industry into a tailspin. The 1840s, 1850s, and 1860s, saw the establishment of emigrant trails within and near Campbell County and increasing hostility between the United States and Native Americans in the region. Hostilities faded in the 1870s and homesteading in Campbell County began at this time. The 1890s and the early decades of the Twentieth century were the heyday of the small homesteader in eastern Wyoming and Campbell County, although many of these homesteads failed during the drought and depression of the 1920s and 1930s. Coal mining in Campbell County began to be an important industry as early as the 1890s when the Burlington Railroad entered the area, providing a more efficient way of shipping coal out of Wyoming to the Midwest and east coast. The energy industry came more and more to dominate the economy of Campbell County throughout the twentieth century, although cattle ranching remained important as well. Important historic site types in the area include rural ranches, homesteads, and settlements, urban buildings and associated infrastructure, mining sites, roads and trails, military sites, and sites associated with the fur trade and early exploration. Campbell County has invested in the Rockpile Museum to document and archive historic site information.

The following are significant historic buildings and sites in Campbell County that are open to the public, as well as museums displaying information and artifacts pertaining to the historical, archaeological, and paleontological heritage of the area:

- The 1811 Astorian Expedition Route and Campsite (Interpretive sign at Mile Marker 70.22 on U.S. Highway 14/16 near Spotted Horse, Wyoming)
- The Bozeman Trail (Interpretive sign at Mile Marker 24.8 on State Highway 387 near Midwest, Wyoming)
- Burlington Lake and Burlington Ditch (McManamen Park, Gillette, Wyoming)
- The Gillette Post Office (301 South Gillette Avenue, Gillette, Wyoming 82716)
- The Rockpile Museum (900 West 2<sup>nd</sup> Street, Gillette, Wyoming 82716)
- The Wright Centennial Museum (104 Ranch Court, Wright, Wyoming 82732)

The paleontology of Campbell County has been understudied relative to nearby locations in the Bighorn and Wind River Basin. This is not necessarily due to a lack of scientifically significant fossils in the area but likely because of less exposure in Campbell County of paleontologically significant geology than these other locations due to higher vegetation densities and more soil

development. The Wasatch Formation is the most significant fossil-bearing geologic unit in Campbell County and it covers most of the southern and western portions of the county. Its Eocene deposits contain small mammal fossils, including fragmentary bones, isolated teeth, and more complete dentary/maxillary fragments in rarer cases. Older deposits in the Wasatch Formation contain more articulated material including reptile fossils. The Fort Union Formation which is widespread in eastern Campbell County also contains locally abundant fossil vertebrates, invertebrates, and plants, albeit less consistently than the Wasatch Formation.

The preservation of archeological, historical, and paleontological resources shall be done in conjunction with the recovery of natural resources and minerals in the county. This can be accomplished by carefully assessing the sensitivity and importance of the resources relative to the economic and cultural impacts associated with land management decisions. Campbell County realizes there can be a balance of existing uses and the need to protect these resources. Nevertheless, private property rights or existing land uses, such as oil and gas extraction, mining, logging and harvesting of forest products, road maintenance, and grazing, should not be precluded due to efforts to protect archeological, historical, and paleontological sites. Impacts to such resources should be appropriately mitigated, pursuant to federal and state laws and regulations.

Campbell County recommends that priority be given to retention and display of locally recovered archaeological, historical, and paleontological resources from state or federal lands in Campbell County. Campbell County may cooperate with state and federal agencies to gain public access to these sites when a willing landowner has indicated interest in granting such access.

## **Goal**

Make collaborative decision regarding identification, protection, and/or excavation of archaeological, historical, and paleontological resources.

## **Objectives**

- *Uncompromised economic viability of projects for the protection of archaeological, historical, and paleontological resources.*
- *The County supports the protection of private property rights in state and federal planning actions involving archaeological, historic, and paleontological sites.*
- *The confidentiality of identified archaeological, historical, and paleontological sites on private lands, unless landowner gives written permission for public dissemination.*

## Policies

- *Realize cultural and archaeological artifacts located on private lands are property of the land owner and uphold that property ownership in any state or federal planning action or decision.*
- *State and federal agencies shall recognize Campbell County as a consulting party as described in Section 106 of the National Historic Preservation Act and subsequent amendments. As a consulting party, Campbell County will request periodic review and comment on classification and management of significant cultural resources on federal lands in the county, and the impact of proposed land use actions on those sites.*

## Soils

The soils of Campbell County provide the support for all natural resources. The protection of soils from wind and water erosion is considered a critical management goal for local, state and federally managed lands. Soil conservation is crucial to sustaining a viable agricultural economy, wildlife populations, and high quality water and air resources.

The Natural Resources Conservation Service (NCRS) has mapped and conducted research to support detailed soil surveys for both northern and southern Campbell County, which is available online at the Web Soil Survey website (<http://websoilsurvey.sc.egov.usda.gov/>). Soil surveys are the base information source used for evaluating land use development and disturbance activities. Two hundred and thirteen unique map units have been mapped in Campbell County and each are described in the soil survey, along with information on their use, management, properties, and limitations. The soil survey mapping is a component of ecological site descriptions (ESDs) that land management agencies utilize in their decision and policy making processes (refer to Vegetation Section). The Soil Survey of Campbell County, WY (northern and southern parts) is hereby incorporated by reference to the Campbell County State and Federal Land Use Policy – 2014.

The soil survey identifies soil properties that are used in making various land use or treatment decisions and identifies soil limitations on various land uses. Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding, others are shallow to bedrock, and some soils are too unstable to be used as a foundation for buildings or roads. A high water table, for example, makes a soil poorly suited to basements or underground installations. Some soils of Campbell County are known to have physical limitations due to inclusions of clay in the soil profile. Those limitations include but are not limited to high shrink-swell rates, impermeability, difficult reclamation, and incompatibility with septic systems.

Although state and federal laws and regulations exist that address the management and protection of water, air, wildlife and fish, there are no laws that pertain solely to soils.

## Goal

Maintenance and protection of soil quality and quantity for maximum vegetative production and clean air and water.



## Objectives

- *Conservation of soil resources on local, state, and federal lands in order to provide for the vegetative needs of the county.*
- *Improvement of quality of soil resources through the efficient management, development, and use of ecological site principles.*
- *Continued use of the soil resource on local, state, and federal lands as part of the county's custom and culture, and economic viability.*
- *Coordination, consultation, and cooperation with local, state and federal agencies in the modification or disturbance of the soil resource and efforts to mitigate or reclaim impacts to soils.*

## Policies

- *Coordinate with USDA NRCS and CCCD on land use development and disturbance activities.*
- *Use Ecological Site Descriptions developed by the USDA NRCS as a foundation for the inventory, evaluation, monitoring, and management of rangelands and forestlands.*
- *Use Campbell County Soil Survey for the orderly planning and development of the state and federal lands in Campbell County.*
- *Monitor soil use and resources on state and federal lands in cooperation with local agencies.*
- *Protect private rights and interests in the use of soil resources on state and federal land.*
- *Support the CCCD in their efforts to:*
  - *ensure that the watersheds in Campbell County are managed to reduce soil erosion and associated hazards;*
  - *cooperate, consult, and coordinate in studies, planning, and implementation activities related to soil resources by local, state, and federal agencies; and*
  - *enhance natural resource education by providing information to urban and rural communities and legitimate media sources.*
- *Support approved soil remediation efforts by local, state, and federal agencies.*
- *Support efforts of soil conservation by industry and agriculture interests.*
- *Apply credible scientific data in decisions regarding soil resource restrictions and development.*
- *Require oil, gas, and other industry developments affecting the soil resource on federal lands to coordinate, cooperate, and consult with CCCD and USDA NRCS.*
- *Review and comment on new and revised state and federal policies and decisions for applicability to soil resource issues in Campbell County.*
- *State and federal agencies shall consult, coordinate, and collaborate with affected stakeholders in projects potentially affecting soil resources of Campbell County.*

## Vegetation

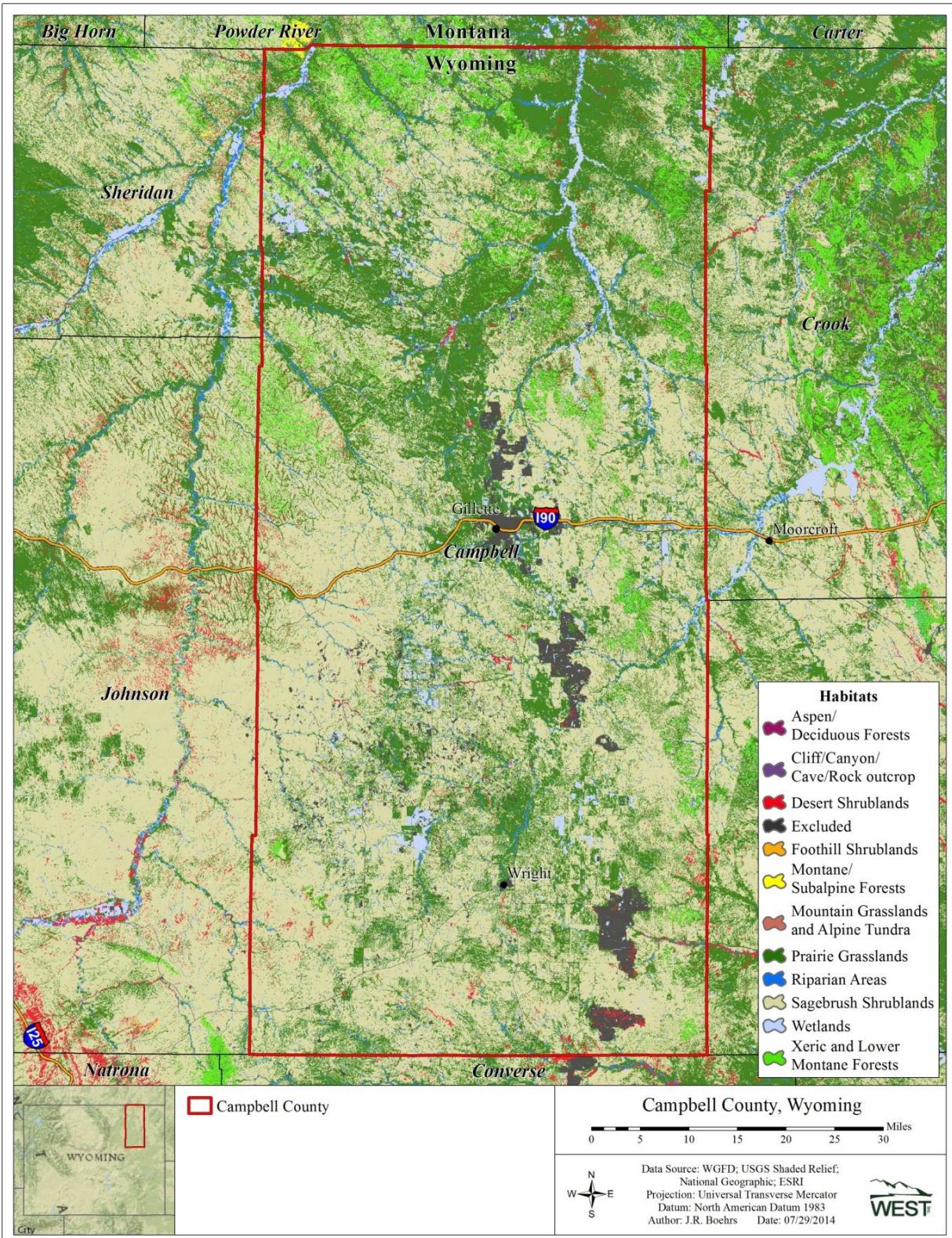
### Custom and Culture

Campbell County is characterized by sagebrush habitats in colder, intermountain areas (typically occurring at 4,000 to 9,500 feet above sea level), and prairie grasslands in warmer, low elevation areas (below 7,000 feet above sea level; Strategic Wildlife Action Plan [SWAP]; WGDF 2010). These two habitat types compose 55 percent and 32 percent of the total area in Campbell County, respectively (Table 3-7). Sagebrush shrubland is characterized by a semi-desert climate, long winters (when much of the precipitation occurs as snow), hot and dry summers, and persistent winds (WGDF 2010). Prairie grasslands in eastern Wyoming, the majority of which are characterized as either short or mixed-grass prairie, are characterized by fertile soils, high summer precipitations, and a longer growing season compared to any other habitat type in Wyoming (WGDF 2010), which results in high biomass productivity. All other habitat types, separately, represent less than 10 percent of the county area (Table 3-7, Figure 3-10). Overviews of the SWAP habitat types that are prominent in Campbell County are discussed in Appendix B.

Surface ownership in Campbell County is primarily private, followed by state and federal ownership. Thus, it follows that the various habitat types in Campbell County are primarily located on private land (Table 3-8) and management decisions on private land strongly influence the condition and trend of these habitat types within the county. Campbell County desires to maintain viable plant communities that are productive for livestock operations, while maintaining habitat for wildlife populations.

**Table 3-7. Composition of habitat types within Campbell County, Wyoming**

<b>Habitat</b>	<b>Acres</b>	<b>% Comp</b>
sagebrush shrublands	1,698,318.00	55.4
prairie grasslands	968,756.80	31.6
xeric and lower montane forests	105,942.40	3.5
excluded	105,439.60	3.4
riparian areas	82,512.27	2.7
wetlands	77,226.50	2.5
desert shrublands	28,251.23	0.9
aspen/deciduous forests	518.57	<0.1
montane/subalpine forests	335.81	<0.1
foothill shrublands	39.11	<0.1
mountain grasslands and alpine tundra	0.67	<0.1
cliff/canyon/cave/rock outcrop	0.46	<0.1
<b>Total</b>	<b>3,067,341.41</b>	<b>100</b>



**Figure 3-10. Habitat types in Campbell County, Wyoming.**

**Table 3-8. Percent ownership of habitat types within Campbell County, Wyoming\***

Habitat	Private Ownership	Federal Ownership	State Ownership
sagebrush shrublands	81%	13%	6%
prairie grasslands	83%	11%	6%
xeric and lower montane forests	68%	25%	7%
excluded	89%	7%	4%
riparian areas	89%	3%	8%
wetlands	92%	3%	5%
desert shrublands	78%	18%	4%
aspen/deciduous forests	96%	<1%	4%
montane/subalpine forests	6%	94%	0%
foothill shrublands	70%	21%	9%
mountain grasslands and alpine tundra	100%	0%	0%
cliff/canyon/cave/rock outcrop	0%	100%	0%
<b>Total</b>	<b>82%</b>	<b>12%</b>	<b>6%</b>

\*Percent calculations are based on data presented in Figure 2-1 and Figure 3-10.

History shows plant communities can be changed by disturbances such as wildfire, drought, grazing management, recreational use, and other activities (BLM 2008). The plant communities within Campbell County evolved with some level of disturbance. Disturbance levels or type of disturbance can alter various processes within the ecosystem that result in changes to the plant community (Pimm 1986). Plant community conversion results in changes to vegetative structure and composition, which can lead to landscape fragmentation, increased susceptibility to invasive species, negative impacts to shrubland- and grassland- adapted wildlife species, reduced productivity and forage value, and in turn threaten ecosystem functions and structure (Smith and Enloe 2006, Knight 1994, Connelly et al. 2003, Bradley et al. 2010). No specific data are available on the effects of disturbances (i.e., wildfire suppression, drought, grazing management etc.) on the ecosystem processes in Campbell County, but it can be assumed that there has been some alteration to the native landscape during the last century.

The vegetation of Campbell County includes various grasses, shrubs, and trees that represent both indigenous and introduced (from other countries or parts of the United States) species. The maintenance of a perennial grass cover provides protection from wind and water erosion, as well as feed and cover for grazing animals and wildlife. Shrubs are an important component of the rangelands in Campbell County; however, the county respects the management style of fewer shrubs on private rangelands. Vegetation management must include a multiple use base in the county, which reflects our local custom and culture. Coniferous and deciduous trees are tied to specific geographic and ecological sites within Campbell County. Cottonwood trees once predominated in riparian areas of the county only to see a decline in the last 20 years due to insects and drought. Restoration efforts could include re-establishment of shrub communities on rangelands and cottonwood trees in riparian areas, but with local support. Successful reclamation of vegetative rangeland communities is supported by Campbell County.

Any recovery planning efforts for sensitive, threatened, and endangered plant species shall evaluate, mitigate, and support the county's custom, culture and economic viability.

## Goal

Sustain vegetation communities for food and cover for livestock, wildlife, and bird populations and protect the soil from erosion.

Reclamation plans for federal and state agencies shall consult with local, specialized agencies including, but not limited to, the Campbell County Weed and Pest Board, the Pedator Management Board, the Campbell County Conservation District and other city and county agencies with specialized expertise.

## Objectives

- *Conservation and cooperative management of vegetative communities on state and federal lands.*
- *Cooperation with local, state, and federal agencies regarding vegetation monitoring and assessment.*
- *Support of rehabilitation and restoration efforts for historic vegetative communities.*
- *Cooperative management of rangeland, forest land, and crop land vegetation treatments.*
- *Cooperation with local agencies conducting plant surveys to validate existing data and add new data.*
- *Support of locally driven efforts to identify, modify, and manage the vegetative resource for desired plant communities.*

## Policies

- *Provide adequate notice to Campbell County residents regarding any proposed state or federal action relating to the vegetative resource of Campbell County.*
- *Utilize multiple use management concepts in managing the vegetative resource on state and federal lands in Campbell County.*
- *State and federal agencies shall cooperatively manage vegetative resources on the state and federal lands with consideration of adjoining private lands.*

Federal agencies are appropriated funds by the US Congress to support multiple use on lands within Campbell County as guided primarily by the FLPMA. Vegetative resources on federal lands within Campbell County provide forage for livestock and habitat for wildlife. Some other uses include mineral (coal, oil, natural gas, coal bed natural gas) extraction, research, and recreation. To balance and evaluate the various uses of federal lands, the BLM prepares a Resource Management Plan (RMP) and the USFS prepares Land and Resource Management Plans (LRMP) that contain specific decisions designed to manage the variety of uses in a way that is complementary to one another, and attempts to resolve conflicts where it occurs. These planning documents are updated routinely or as needed.

The BLM recognizes the importance of vegetation management and the complexities involved with multiple use management. Therefore, the BLM prepared the Integrated Vegetation



Management Handbook (BLM 2008) with an approach that fosters interdisciplinary and collaborative process to implement actions that will improve the biological diversity and ecosystem function to promote and maintain native plant communities that are resilient to disturbance and invasive species. This handbook presents several goals including:

“Decisions concerning the desired mix of plant communities and uses will be made at the local level, through the land-use planning and implementation process, with involvement of local communities, stakeholders, other landowners, tribes and other agencies. This approach will help avoid duplication of efforts, ensure consistency and improve public acceptance of vegetation management activities.”

The USFS Forest Service manual (FSM) 2000 identified the management of range vegetation to meet an assortment of USFS objectives (USFS 2005), including:

“To manage range vegetation to protect basic soil and water resources, provide for ecological diversity, improve or maintain environmental quality, and meet public needs for interrelated resource uses.”,

“To integrate management of range vegetation with other resource programs to achieve multiple use objectives contained in Forest land and resource management plans.”, and

“To provide for livestock forage, wildlife food and habitat, outdoor recreation, and other resource values dependent on range vegetation.”

Specific to national grasslands, FSM 2000 identified the following objectives:

“To promote the development of grassland agriculture and sustained yield management of the soil, water, forage, fish and wildlife, recreation, and timber resources.” and

“To demonstrate sound and practical principles of land use to favorably influence nearby areas and economies.”

- ***Use unbiased and scientifically accepted ecological site descriptions including state and transition models for vegetative management.***

Ecological sites descriptions (ESDs) define a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation, and in its ability to respond to management actions and natural disturbances. ESDs are used to assist in management, research, and evaluation as the system divides the landscape into basic units for study. These sites are defined using resources and concepts such as climate, soils, and state-and-transition models to characterize the area.

Uses of ESDs include:

- Assess the risk of persistent degradation (undesirable change) and take proactive measures to avoid it.
- Specify constraints to desired ecosystem change, estimate their probability of occurrence and devise contingencies.
- Design and interpret monitoring based on expected responses to management or climate changes.

Reseeding, brush management, and range renovation are dependent on the soil and climate of a given site. Soil survey information is an important as ESD data. Soils should always be included in management decisions.

The BLM, USFS, and NRCS agreed in 2010 to utilize ecological sites for the common framework in their land management practices and policies (BLM et al. 2010). The common objective is to utilize science-based technical processes to sustain and enhance natural resources and the environment. In the past, each agency utilized different methods to stratify landscapes but this approach results in a standardized method to define, delineate, and describe terrestrial ecological sites. Since the adoption of using ecological sites, the *Interagency Ecological Site Handbook for Rangelands* has been released (January 2013; BLM et al. 2013).

## Visual

### Custom and Culture

Campbell County enjoys a variety of visual resources, ranging from prairie landscapes and scenic juniper- and cedar-dotted hillsides to views of the Big Horn Mountains, Powder River Basin and the Pumpkin Buttes. With the advent of the homesteaders introducing livestock and farming to the viewshed, to the development of its rich mineral resources of oil, gas, uranium, and coal, the county's visual resource has continually changed to accommodate the infrastructure needed to support the industries associated with the economy of the county.

Campbell County has historically embraced new industries and infrastructures in order to enhance the county's economy and improve the lives of its citizens. These technologies, such as wind turbines, cell phone towers, and radio antennas bring new aesthetic challenges along with the infrastructure needed to support them, such as transmission lines.

Campbell County recognizes that federal agencies are required to consider scenic values when it comes to allowing development and other actions on federal lands within the county.

Federal land management agencies conduct assessments of visual impacts in determining how an area should be managed, with the goal of protecting the visual resource while not burdening authorized land uses and maintaining economic stability.

Campbell County supports the evaluation and appropriate protection of visual resources, particularly those with tourism/recreational value, to extent that such management



accommodates and recognizes custom and culture, or economic development of the county. Recovery of mineral and natural resources and other properly managed multiple-uses should be a central objective, in areas with a designated scenic value.

## Goal

The utilization of additional visual resource protection only upon determination that the visual resource has not already been compromised.

## Objectives

- *Continuation of existing land uses.*
- *Economic projects and activities not unduly restricted by visual resource protections.*
- *Communication sites recognized as important to the health, safety, and welfare of Campbell County citizens.*

## Policies

- *Evaluate economic viability of projects before implementation of visual resource protection requirements.*
- *Visual resource protection requirements should not unnecessarily or inappropriately intrude on existing land uses.*
- *Visual resource designations should not adversely affect private property rights or private land uses.*

## Water

### Custom and Culture

The Powder/Tongue River and Northeast Wyoming River basins make up the drainage basins in Campbell County (Figure 3-11). These basins are divided into seven watersheds including the Upper Powder, Middle Powder, Little Powder, and Upper Little Missouri in the Powder/Tongue River basin and the Antelope, Upper Cheyenne, and Upper Belle Fourche in the Northeast Wyoming River basins (Figure 3-12). The county is headwaters for the Belle Fourche River and Little Powder River. Many other named and unnamed creeks and streams flow within the county (Figure 3-13). No major reservoirs exist within the county; however, a number of smaller water storage facilities occur.

Water has historical importance in the West and Campbell County for agricultural, domestic, and industrial needs. Native American tribes used natural water courses as landmarks and often as routes of travel. Early settlements and homesteads were located in close proximity to water sources. Current large water users in Campbell County include the municipalities of Gillette and Wright, mining, oil and gas, agriculture, and rural subdivisions.

Agriculture and railroads, the predominant early industries in Campbell County, depended on water for their existence. Farming successfully utilized irrigation early in Wyoming's history.



Ranchers utilized irrigated cropland and dryland farming to provide winter feed and summer grazing to sustain ranching enterprises. Fields are irrigated for livestock forage production including alfalfa, grass hay, and pasture grass (Wyoming Water Development Commission [WWDC] 2002). Wyoming Agricultural Statistics provide historical crop data. Water waste associated with irrigation practices is a concern due to water loss from ditches, infrastructure leakage, and field waste; however, much of the water is returned to the downstream system. Agriculture is the largest source of consumptive water use in the Powder/Tongue River basin (surface 184,000 acre-feet/year; ground 200 acre-feet/year) and Northeast Wyoming River basin (surface 69,000 acre-feet/year; ground 17,000 acre-feet per year; WWDC 2002).

Municipal and domestic water uses include public water supply systems and individual well and small water systems. Current high users of Campbell County's water resources include the municipalities of Gillette and Wright (WWDC 2002). Municipal water use is fairly low in the Powder/Tongue River basin (surface 2,000 acre-feet/year; ground 500 acre-feet/year) and Northeast Wyoming River basin (ground 9,100 acre-feet/year); domestic use is slightly higher in the Powder/Tongue River basin (4,400 acre-feet/year) compared to the Northeast River basin (3,600 acre-feet/year).

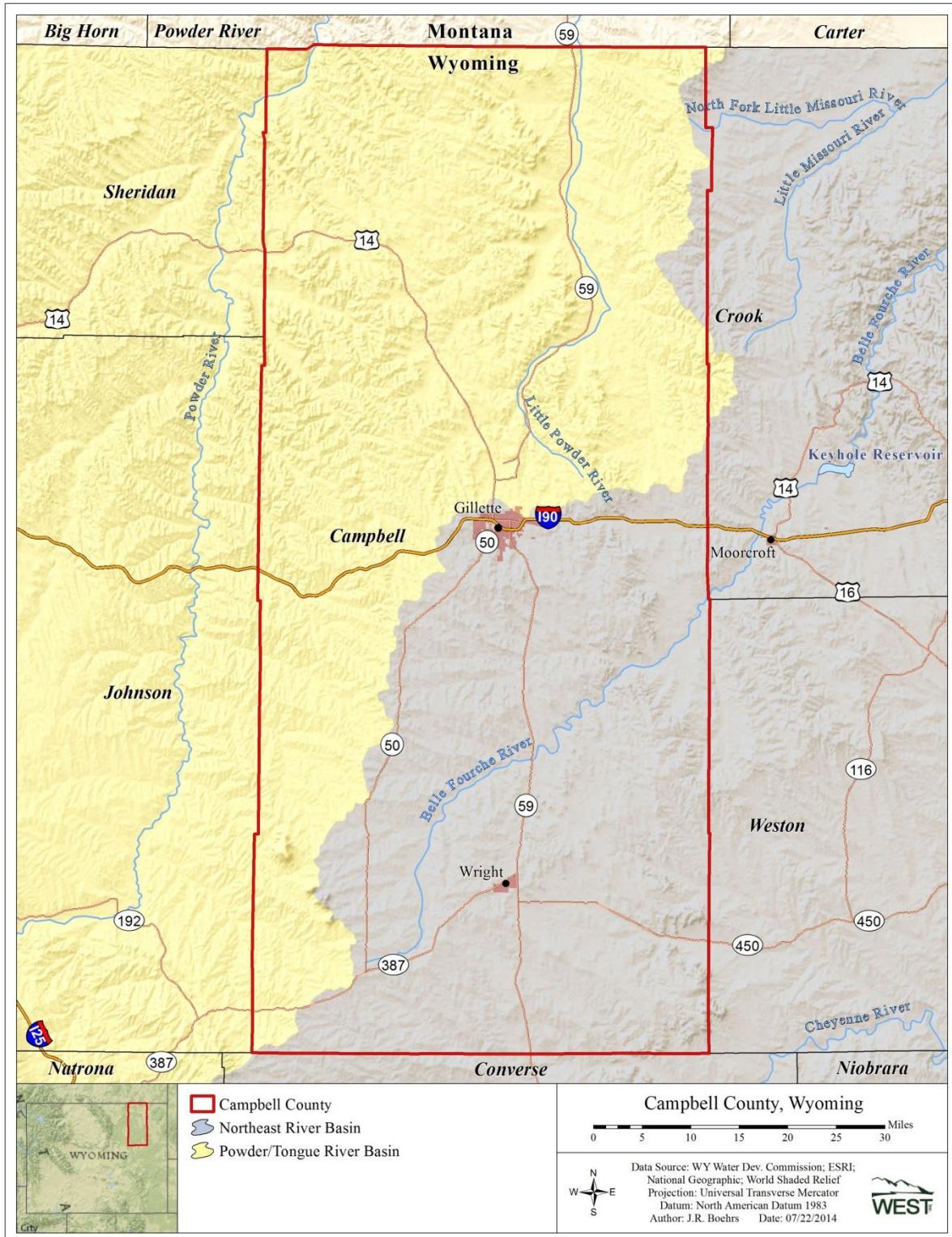
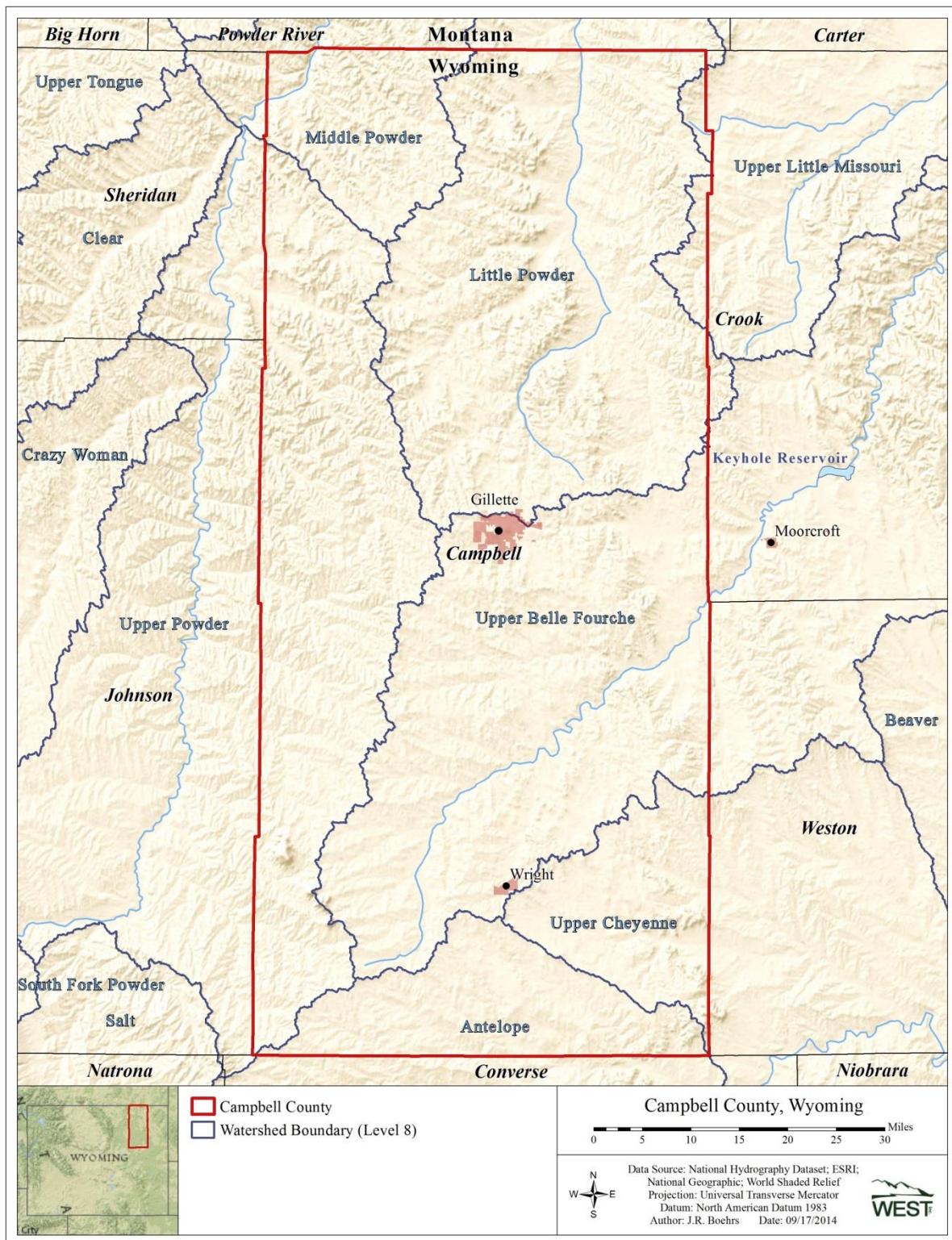
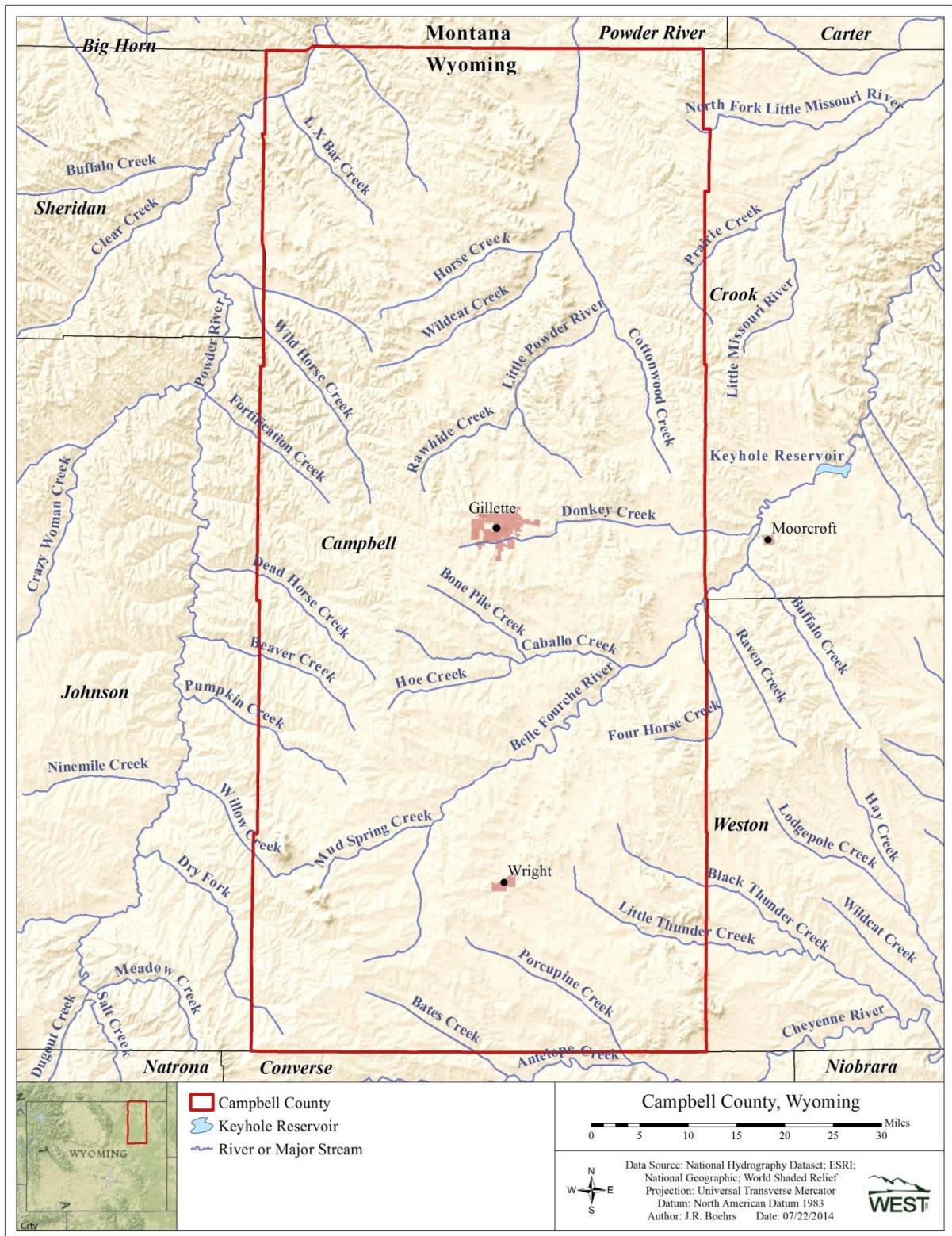


Figure 3-11. Campbell County – Water Basins



**Figure 3-12. Campbell County - Watersheds**



**Figure 3-13. Campbell County – Rivers, Streams, and Reservoirs**

Industrial water use includes electric power generation, coal mining, conventional oil and gas production, coalbed methane production, and oil refining. Industrial water use is primarily from groundwater. A small amount of surface water is used by the Wyodak Plant (east of Gillette). Industrial water use is relatively high for conventional oil and gas and coalbed methane activities. The Powder/Tongue River basin reported groundwater use at 68,000 acre-feet/year, while the Northeast Wyoming River basin reported 46,000 acre-feet (additional 4,700 acre-feet/year for miscellaneous industrial use; WWDC 2002). These are the most current available water use values according to WWDC, however they may not reflect the decline in industrial activities since 2002 (See Chapter 4 - *Mineral Resources* for further details).

Wyoming surface and groundwater law is rooted in the doctrine of prior appropriation, which generally establishes that the first party to put water to a meaningful use has the first right to the water and sets priority as the mechanism for regulation of water rights. The state will not allow a user to waste state water. An applicant may not appropriate the maximum amount of water allowed by law unless that amount can be put to beneficial use. If a user fails to use water or wastes the water, the state may terminate the user's right to use that portion of state's water. Stock water and domestic drinking water uses have consistently had preferred status in Wyoming law. A full description on Wyoming water law can be found in *A History of Wyoming Water Law, Water Rights, and Water Development* (Cooper 2004) and *Wyoming Water Law – A Summary* (Jacobs et al. 2003). These documents provide the foundation for Wyoming water rights. Additional state surface and groundwater regulations and instructions can be found at WSEO (2014d).

Issues related to surface and groundwater includes both quantity and quality. Quantity is generally regulated by the Wyoming State Engineer's Office (WSEO). Wyoming has been segregated into four water divisions. Campbell County is fully contained within Water Division 2: Sheridan. Water quality is regulated by the WYDEQ. The WYDEQ – Water Quality Division includes the Watershed Management Section and is divided into seven closely interrelated programs including Surface Water Standards, Watershed Monitoring, TMDL Development, Nonpoint Source Pollution Planning and Grants, Water Quality Assessment, Section 401 Certification, and Quality Assurance/Quality Control.

The EPA believes Water Quality Standards are the foundation of the water quality-based pollution control program mandated by the CWA. Water Quality Standards define the goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions such as anti-degradation policies to protect waterbodies from pollutants.

The WYDEQ has programs in place to manage surface water quality. Wyoming has four surface water classes and uses designations to identify Wyoming waters: Class 1 – Outstanding waters; Class 2 – Fisheries and drinking water; Class 3 – Aquatic life other than fish; Class 4 – Agriculture, industrial, recreation and wildlife. Each surface water class is provided protection based on the type of the water class. The objectives of the Wyoming water pollution control program are designed to serve the interests of the state and achieve the related goals, objectives, and policies of the CWA. To achieve these objectives, water monitoring throughout the state and specifically in areas with coal-bed methane development have been instituted to track surface water quality and identify potentially impaired waters. Waters identified as impaired on



WYDEQ's 2012 – Wyoming Water Quality Assessment and Impaired Waters List in Campbell County include Donkey Creek, Stonepile Creek, Gillette Fishing Lake, Middle Prong Wild Horse Creek, and Little Powder River (2012 Integrated 305(b) and 303(d) Report; 2006b).

## Goal

To maintain water resources of sufficient quality and quantity to support agriculture, industry, and citizen needs in the present and into the future.

## Objectives

- *Employment of the prior appropriation doctrine as adopted by the State of Wyoming.*
- *Water resource development that assures future growth and protection of Wyoming water rights within agreements with neighboring states.*
- *Management and conservation of water in a manner which benefits the county.*
- *Improvement of quality and quantity of usable water through the efficient management, development and use of water resources.*
- *Continued agricultural and industrial viability as part of the custom and culture and beneficial impacts on state and federal lands.*
- *Wetland and water supply issues resolved at the local level.*
- *Coordinated approach when establishing riparian management plans and use of Best Management Practices.*

## Policies

- *Monitor water policy, water law, water use, water development opportunities and changes in regulation.*
- *Use credible scientific data in decisions regarding water resource restrictions and development.*

Water rights are provided under state law when the water has been obtained by beneficial applications of Wyoming's water law. Preferred water uses shall have preference rights in the following order:

- Water for drinking purposes for both man and beast;
- Water for municipal purposes;
- Water for the use of steam engines and for general railway use, water for culinary, laundry, bathing, refrigerating (including the manufacture of ice), for steam and hot water heating plants, and steam power plants; and
- Industrial purposes.

Interstate compacts controlling the development and use of water in Campbell County include the Belle Fourche River Compact of 1943 and the Yellowstone River Compact of 1950.



The Belle Fourche River Compact of 1943 divides the water between Wyoming and South Dakota. The compact recognizes all rights in Wyoming existing as of the date of the compact, and permits Wyoming unlimited use for stock water reservoirs not exceeding twenty acre-feet in capacity. Wyoming is allowed to deplete the flow of the Belle Fourche River under the conditions existing as of the date of the Compact by an additional 10%. No reservoir constructed subsequent to the date of the compact solely to utilize the water allocated to Wyoming shall have a capacity greater than 1,000 acre-feet.

The Yellowstone River Compact of 1950 controls the development and use of water from the Tongue River, Powder River, and Little Powder River. This compact divides the unappropriated flow of the Tongue River, Powder River, and Little Powder River, after needs for supplemental supply for existing rights are met, as follows:

Tongue River: 40% to Wyoming, 60% to Montana

Powder River and Little Powder River: 42% to Wyoming, 58% to Montana

Article X of the Compact stipulates that no water shall be diverted from the Yellowstone River Basin without the unanimous consent of the three signatory states, Wyoming, Montana, and North Dakota.

Coordination with the WSEO should be maintained to ensure water rights and resource restrictions are understood and followed.

The WYDEQ regulations (Chapter 1 – Section 35 Credible Data) addressed the development of scientifically valid chemical, physical, and biological monitoring data. The WYDEQ further stipulate that data shall be collected using accepted referenced laboratory and field methods employed by specialist with relevant experience. All data collection shall include and document measures to monitor quality assurance throughout the duration of a project. Data used to inform water resource decisions should meet these standards.

- Support the appropriation and utilization of water rights currently provided under Wyoming law for beneficial use as the most effective means for providing water resources for agricultural, municipal, industrial, and domestic purposes.*

Water rights in Wyoming are attached to the land by legal land description (quarter-quarter, section, township and range; State of Wyoming 2000). Anyone seeking water rights information must provide legal land description information for the parcel of interest.

The State Engineer supervises the waters of the state, authorized under W.S. Section 41-3-909. A permit is required any time a person intends to acquire the right to beneficial use of the state's surface or groundwater. An application must be completed and a permit must be obtained from the state prior to performing work which will involve state water. The state provides information and instruction to apply/obtain, adjudicate, and change water use.



The State Engineer has set standards for water well construction to ensure appropriate use and protection of the state's groundwater resources.

Water resources and development potential have been drafted for the City of Gillette (Water Resources Data System Library 2014). The Master Plans apply scientific research to identify key water sources and development potential under the existing water right. In 2002, the Wyoming Water Development Commission published river basin water plans for the Powder/Tongue River and Northeast Wyoming River Basins (WWDC 2014). These plans detail the existing water resources, use, projections, and potential planning for individual basin. Development should follow guidelines provided in these documents. Continued efforts to update and review the "Master Plan" are supported. Developments which are feasible under the "Master Plan" should also be supported or modified to achieve desired objectives.

- *Support the CCCD in its efforts to:*
  - *ensure that productive watersheds are maintained to reduce soil erosion;*
  - *support locally-led watershed based planning;*
  - *support studies of flow and water quality on local watersheds;*
  - *review and provide comments to the Wyoming Department of Environmental Quality; and*
  - *promote public education by providing information to urban and rural communities and legitimate media sources.*
- *Support water conservation and precipitation gathering by industry, agriculture, and the public.*
- *Support stream and lake remediation efforts by local and state agencies.*
- *Support recycling of water, use of appropriately treated reclaimed water, and use of alternative water sources to reduce use of potable water.*

Conservation efforts should be included as part of the county, state and federal planning. There are numerous programs run by various agencies and organizations that are potential sources of assistance to water users. Local Conservation Districts, Ducks Unlimited, Trout Unlimited, Cooperative Extension, Wyoming Association of Conservation Districts, Wyoming Association of Rural Water Systems, Wyoming Department of Agriculture, WYDEQ, WGFD, WSEO, WWDC, BLM, US Army Corps of Engineers (USACE), NRCS, Bureau of Reclamation, USFS, USFWS, and the US Geological Survey (USGS) are all potential sources of information, technical assistance and cost-share funding opportunities. A full description of programs and agencies/organizations and contact information can be found online (WWDC 2009). The water management and conservation assistance programs directory provides an overview of local, state, and federal programs.

Conservation planning should ensure project designs include definition of measurable project objectives by project stakeholders. To meet these objectives, baseline conditions must be defined and continued monitoring must be conducted. Following procedures and design plans outlined in scientific literature are recommended to increase project success (Shields et al. 2003). State and federal agencies have published manuals and guidance to assist project planning.



In 2014, the WYDEQ published a Stream and Lakeshore Restoration BMP Manual (WYDEQ 2014c). The manual outlined 16 BMPs which should be considered when a restoration project is planned.

State standards have been developed for treated water. These standards can be found on the WYDEQ regulations website. Additionally, research that identifies potential methods to treat wastewater has been and is in the process of being completed by the University of Wyoming (UW) –Water Resource Program (UW 2014b). Research opportunities should be considered to help increase technology related to alternative water sources. Potential alternative water sources may include treated effluent, rainwater collected on site, condensate from cooling, graywater, storm water, sump pump discharge or saline sources.

Coordinated efforts to implement state and federal methods should be instituted during project planning. The *Partners of Fish & Wildlife* provided an example of coordination between state resources and land owners by establishing a management plan implemented along the Powder River which included over 70,000 acres of continuous land and protected 13-miles of riparian habitat. Riparian management projects that fence drainage and wetland features may improve wildlife habitat and water quality through a reduction of soil erosion and improving vegetative cover along stream banks (USFWS 2014d).

In addition to riparian management, wetlands should also be considered during development and conservation efforts. Wetlands are an important feature in the Wyoming landscape. In arid climates such as Wyoming, wetland areas provide habitat for resident and migratory wildlife species. Wetlands are utilized by over 75% of all wildlife species (USFWS 2014b).

- ***Review new and revised state and federal policies and decisions for applicability to water issues in Campbell County and provide appropriate comments.***
- ***State and federal agencies shall:***
  - ***require oil, gas and other developments on federal and state trust lands to consult with a local group, i.e., the CCCD to develop monitoring protocols;***
  - ***require water quality monitoring including sampling and data collection for industrial developments affecting waters of the state on state and federal lands;***
  - ***disclose water flow, level, and quality data to the public;***
  - ***use credible scientific data and accepted methods for acquisition of water flow, level, and quality data in hydrology studies and decision making;***
  - ***consult, coordinate and collaborate with affected stakeholders in projects potentially affecting water quality and quantity.***
  - ***incorporate watershed management in all land management plans.***
  - ***notify owners of existing water rights of any attempt to negate and or acquire that water right and not coerce in any manner the existing owner to relinquish that right; and***
  - ***recognize valid water rights.***



Consultation with local groups during the NEPA process might help ensure local consideration and requirements are implemented in conjunction with proposed developments. This can be achieved through the request to be a Cooperating Agency during the NEPA process.

The WYDEQ has set surface and groundwater standards that state waters shall not contain biological, hazardous, toxic or potentially toxic, materials or substances in concentrations or amounts that exceed maximum allowable concentrations. The full surface and groundwater standards can be found in Chapter 1 (surface) and Chapter 8 (ground) of the WYDEQ regulations (WYDEQ 2013, 2005). These standards should be adhered to throughout a development process.

The WYDEQ regulations (Chapter 1 – Section 35 Credible Data) address the development of scientifically valid chemical, physical, and biological monitoring data. The WYDEQ further stipulate that data shall be collected using accepted referenced laboratory and field methods employed by specialist with relevant experience. All data collection shall include and document measures to monitor quality assurance throughout the duration of a project. Monitoring plans should be reviewed by Campbell County to ensure standards are met before construction takes place. Furthermore, sampling records and annual reports should be provided to Campbell County for review.

In 2014, the WYDEQ published Methods for Determining Surface Water Quality Condition and TMDL Prioritization (WYDEQ 2014e). This document outlines standardized methods for assessing surface water. Utilizing a standard approach across all developments will help ensure results are accurate and comparable. Study and sampling design should also incorporate methods to assess water conditions across multiple components associated with a development project, as previous studies have suggested potential differences among project components (Reddy et al. 2009, Sharma et al. 2008). The UW – Water Research Program has published research related to water, specifically coal bed methane projects (UW 2014c). These publications are updated as they are completed, so should be referenced for the most up to date technologies and practices.

The WYDEQ has been an active participant in state and local sampling efforts. Ambient monitoring of surface water quality has occurred state-wide and in a network specifically identified for CBM development. Wyoming participated in an Environmental Monitoring and Assessment Program that produced a Scientific Investigations Report (Peterson et al. 2007). The report compared Wyoming streams, etc. with other western state streams. Additionally, to better estimate the quality of Wyoming's surface waters, WYDEQ added probability monitoring to the surface water monitoring program in 2004. Results of this monitoring have been reported by WYDEQ's Watershed Monitoring Program.

The WYDEQ created the Watershed Monitoring Program (WMP) in 1992. Data inventoried by this program are used to define a range of expected conditions when evaluating the surface water quality of other Wyoming streams of unknown condition. The 2010-2019 Watershed Monitoring Program Water Quality Strategy lists ten program objectives these include: determining water quality standard attainment; identifying impaired waters; identifying causes and sources of impairment; assessing water quality status and trends at multiple scales; evaluating watershed program effectiveness; responding to complaints and emergencies; supporting the development

and implementation of water quality standards; providing data and technical support toward the development and evaluation of Total Maximum Daily Loads (TMDLs); providing data and technical support toward the implementation and evaluation of nonpoint source (NPS) restoration projects; and supporting Wyoming Point Source Discharge Elimination System (WYPDES) permitting and compliance.

Campbell County mining companies have extensive ground and surface water monitoring data in annual reports and permits located at the WYDEQ/LQD offices.

Additional watershed management resources are available online from the EPA (USEPA 2011). This resource provides a range of information to help manage and improve watersheds on a local and regional scale.

- *Campbell County shall oppose the federal control or nationalization of Wyoming's water resources or rights.*
- *Support protection of private rights and interests in water development by the Wyoming State Engineers' Office on state and federal land.*
- *Protect private property rights during water development on state and federal lands.*
- *Water rights desired by the federal government must be obtained through the Wyoming State Engineer's Office under the laws of the State of Wyoming.*

## Weeds, Pests, and Invasive Species

### Custom and Culture

The terms “noxious weed” and “invasive” are often used interchangeably. An “invasive” species, also called “introduced” or “exotic”, is any nonnative species that significantly modifies or disrupts the ecosystems it colonizes. A “noxious weed” is a legal definition bestowed by a governmental authority as injurious to crops, natural habitats, ecosystems, humans and/or livestock. Most noxious weeds are introduced species that are brought into an ecosystem either on purpose or by accident. Typically, they grow very aggressively and multiply quickly without natural controls. Noxious and invasive weeds contribute to the loss of rangeland productivity, increased soil erosion, reduced native species diversity and loss of wildlife habitat and, in some instances, are hazardous to human and animal health and welfare (Federal Noxious Weed Act Federal Noxious Weed Act, Public Law 93-629). Principal vectors for noxious and invasive weed species expansion include waterways, roads, and animals. Control of noxious and invasive weeds requires federal, state, county, and private interests work together.

Campbell County citizens have a custom and culture of controlling noxious weeds and pests in order to maintain quality and productivity of the county’s natural resources and aesthetic value of its natural scenery. Early homesteaders and landowners were concerned with the invasion of noxious weeds and pests, and current landowners are actively involved in efforts to manage, prevent, and eradicate noxious weeds and pests.

The Campbell County Weed & Pest District (CCWPD) was established under the Wyoming Weed and Pest Control Act in 1973 (W.S. 11-5-101 et seq.). Its major function is to implement an effective program for the prevention, containment, and management of noxious weeds and pests on all land within the county.

The Wyoming Board of Agriculture, in conjunction with the Wyoming Weed and Pest Council, determine “Designated Noxious Weeds” (W.S. 11-5-102(a)(xi)) and “Designated Pests” (W.S. 11-5-102 (a)(xii)). These listings provide statewide legal authority to regulate and manage these species. The current list of county and state noxious weeds and pests is included in Appendix B along with descriptions of current weed and pest problems in Campbell County.

At the federal level, the Natural Resources Conservation Service (NRCS) aids in preventing the introduction of invasive species, managing existing invasive species, and minimizing economic, ecological, and human health impacts that invasive species may cause. Their role includes following and supporting all tribal, state, and local laws regarding invasive species in the course of giving technical and financial assistance. The USDA, through the Animal and Plant Health Inspection Service (APHIS), maintains a Federal Noxious Weed List and helps to safeguard U.S. agriculture and natural resources against significant pests (USDA NRCS 2014b).

The control, prevention, and elimination of noxious weeds and pests are important to Campbell County as farming and ranching activities occur on approximately 94 percent of the lands within the county. The invasion and spread of noxious weeds and pests can have a detrimental effect on ranching, farming, haying, and livestock production. Although there is limited grain farming in northern Campbell County, it is important that noxious weeds are controlled so grains produced in Campbell County provide the cleanest and most wholesome food supply possible.

Noxious weeds pose a threat to native species. They often invade and colonize an area after disturbance, such as that associated with coal bed natural gas development, including new well sites, pipelines, roads and reservoirs. Mining and mineral extraction industries are required by federal agencies to monitor and implement noxious weed prevention and management programs as part of their permitting and operating processes. These industries are the most dominant economic forces in Campbell County, and the failure to comply with these requirements impact their operations. Tourism is an ever increasing economic factor in Campbell County and the management and/or elimination of noxious weeds, invasive species, and pests help protect the health and safety of citizens, as well as the aesthetic value of the natural scenery of Campbell County.

Pest species management and control is important to minimize the potential detrimental effect species such as grasshoppers, crickets, and leafhoppers can have on vegetation including crops. These insect species damage the physical structure of vegetation (i.e., chewing grass stems and breaking stalks) and affect the reproduction of the vegetation (i.e., removing reproductive structures and consuming seeds). Another damaging aspect of pests is that they can introduce pathogens such as bacteria, spores, and viruses. Control of these species generally is not for complete eradication, but to maintain levels that do not result in harm to the natural or economic environments. Insecticides are known to effectively control pest insect populations.

The black-tailed prairie dog is a designated pest species in Campbell County that raises great concern to the agricultural base of the community. The agricultural community identifies prairie dogs as competitors with livestock for forage through consumption and clipping to remove vegetation to view approaching predators, and can consume/clip substantial amounts of grain in or near grain fields. Furthermore, in times of drought prairie dogs are believed to damage the root system of plants as evidenced by pock-marked diggings (Montana Department of Agriculture 2013). Although this species is considered a species of concern by the USFWS and a sensitive species by the BLM and USFS, it is designated as a pest species by the State of Wyoming (Wyoming Weed and Pest Council 2014b).

The increasing number of pipelines has provided prairie dogs the means to expand their habitat thereby impacting greater areas. Prairie dogs can carry sylvatic plague, a disease of wild rodents. When people contract the disease it is called bubonic plague. People can become infected from direct contact with a diseased rodent or their fleas.

Noxious weeds and pests alter the ecological balance, increase erosion concerns, reduce crop and timber yields, diminish recreational opportunities, lower land values, clog waterways and can transmit pathogens to crops, humans and livestock.

## **Goal**

Prevention, eradication, control, and monitoring of noxious weeds, invasive species, and pests in order to protect the health, safety, economics, and welfare of the people of Campbell County.

## **Objectives**

- *Eradication of noxious weeds.*
- *Prevention of the introduction of undesirable invasive and noxious plant species.*
- *Management of the spread of undesirable invasive and noxious plant species.*
- *Prevention of the introduction of designated/declared pests.*
- *Control of mammals which have become designated/declared pests, as defined by the Wyoming Department of Agriculture.*
- *Prevention of the introduction of diseases, such as rabies, bubonic plague, tuberculosis, brucellosis, West Nile, tularemia, tick fever and other diseases carried by wild animals and insects.*
- *Control of insects which have become pests, as defined by the Wyoming Department of Agriculture.*
- *Protection of the environment and the aesthetic value of the natural scenery.*

## Policies

- *Require state and federal land management agencies to control prairie dogs on agency owned lands in order to prevent range degradation, reduction of available forage to lessees, and expansion of prairie dogs from state and federal lands to private lands*
- *Require an adequate buffer zone between prairie dog towns on State and Federal lands and private lands to ensure the health, safety and economic protection of neighboring private land owners*
- *Monitor prairie dog colonies for evidence of plague or other communicable diseases. If any evidence is noted, report it to the Wyoming Department of Public Health.*
- *Oppose any translocation and/or introduction of prairie dogs within Campbell County.*

Campbell County is concerned about the impact that prairie dogs may have on the agricultural base within the county. Recently, a review of three commonly made claims regarding the black-tailed prairie dogs in both scientific literature and popular press were evaluated (Vermeire et al. 2004). The claims evaluated were 1) that prairie dogs occupied 40 million to 100 million hectares of short grass and mixed-grass prairie before the settlement of the North America; 2) that prairie dogs cause unique improvements in forage quality that attract large ungulates to colonies for grazing; and 3) that prairie dogs do not reduce carrying capacity for large herbivores. This review conducted an objective evaluation of all the applicable scientific findings of several highly cited scientific studies. The review concluded that substantial evidence exists that the black-tailed prairie dogs did not occupy 100 million hectares in North America before European settlement, however, under extreme conditions the 40 million hectare estimate may be their maximum potential occupancy. According to this review, selective foraging on prairie dog colonies has been demonstrated for bison and pronghorn under limited conditions. However, the review goes on to point out that prairie dogs are not the only species that can produce the vegetative characteristics and species composition that appear to make the colonies more attractive for grazing by bison and pronghorn. The finding of perhaps greatest interest to Campbell County and its livestock operators is that prairie dogs can reduce carrying capacity for livestock and other large grazers. The impact of prairie dogs on carrying capacity varies with habitat type, prairie dog density, colony age, and the proportion of the area colonized (Vermeire et al. 2004).

Another recent study (Derner et al. 2006) supports the concept that prairie dogs do affect livestock operations. This study measured the rate of expansion of prairie dog colonies, evaluated the effects of the percentage of pastures newly colonized by prairies dogs on cattle with gains, and estimated the impact that prairie dogs may have on the economic returns of livestock grazing in shortgrass prairies (Derner et al. 2006). The results of this study relative to the rate of expansion of black-tailed prairie dogs were similar to those results reported by another study conducted nearby (Antolin et al. 2006). Both studies reported colonies expanding more than six-fold from 1999 to 2004 which included four years of below average precipitation. This supports the notion that black-tailed prairie dog colonies rapidly expand during periods of drought without any control mechanisms. Cattle gains during this study decreased as the amount of pasture colonized by prairie dogs increased. The decline was slower than the increase in area colonized by prairie dogs that the authors attribute to the grazing resistance of the short grass



plant species. As a result of the reduction in weight gain by the livestock during the grazing season, the estimated economic returns were affected by the colonization of the prairie dogs.

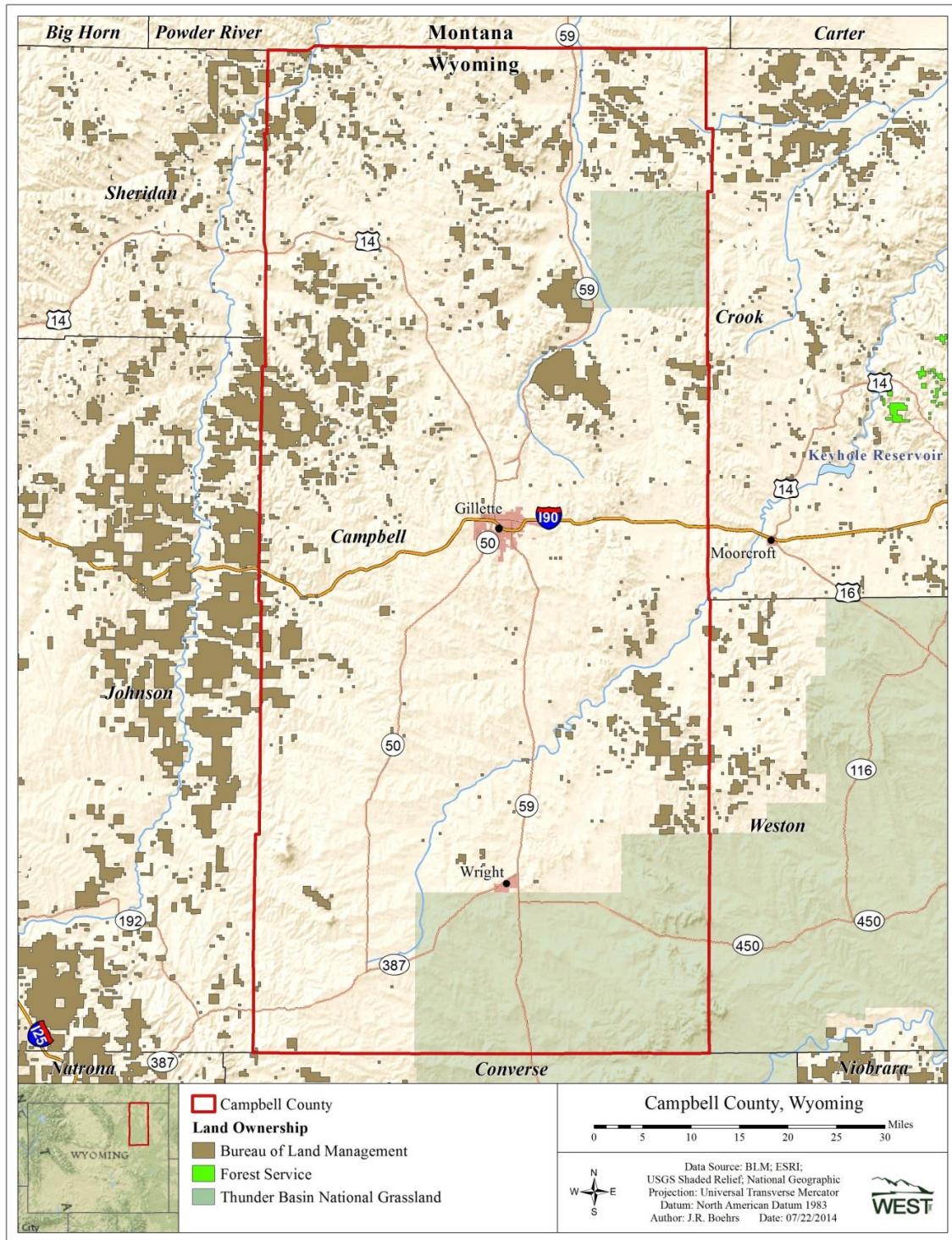
- *Support the environmentally sound prevention and control of noxious weeds, invasive species, and pests into Campbell County.*
- *Facilitate and support cooperative efforts and programs involving private landowners and local, state, and federal land management agencies in the control of designated insect pests (e.g., mosquitoes, grasshoppers, Mormon crickets, etc.) on all lands in Campbell County, including consultation with Campbell County Weed and Pest, as an agency with special expertise.*
- *Oppose the introduction of weed, invasive and pest species into Campbell County absent a compelling public interest in such introduction and extensive coordination and consultation with local government entities, including Campbell County Weed and Pest, and private landowners prior to such introduction. Any introduction of weed, invasive and pest species shall be fully analyzed, with public health, safety, human welfare, private property and socio-economic impacts being fully disclosed, evaluated and mitigated prior to the introduction of such species.*
- *Ensure the implementation of appropriate and proven safeguards to range, human health, human safety and private property prior to the introduction of invasive species and noxious weeds, including effective range sanitation practices*
- *Encourage appropriate safeguards to the introduction of invasive species and noxious weeds, including effective range sanitation practices.*
- *Pursue grant opportunities and/or partnerships to aid in invasive weed or pest prevention and control.*
- *State and federal agencies shall:*
  - *control and manage plant, animal, and insect populations which pose a threat to human health and safety and the health and safety of domestic animals; including the active control or eradication of designated/declared weeds and pests on agency lands;*
  - *strictly adhere to all federal and state statutory and regulatory requirements before any species, specifically including noxious weed, pest or invasive species, is introduced or reintroduced into Campbell County; and*
  - *compensate and/or remediate damages to neighboring private land owners caused by the introduction of noxious weeds, pests or invasive species onto state or federal lands in Campbell County and the expansion of the introduced pest beyond those public lands and required buffers.*

## Threatened, Endangered, and Special Status Species

### Custom and Culture

The expansive grasslands, shrublands, and riparian areas of Campbell County support a variety of wildlife species, including species that are rare enough that they warrant regulated protection or special management attention to ensure population viability and prevent the need for regulated protection. In Wyoming, rare wildlife and plant species have been protected under the Endangered Species Act (ESA) and received special management attention where they occur on lands managed by BLM or USFS. The list of species protected under the ESA changes over time as species are added and others are delisted, or their status changes. Critical habitat for listed species might also be designated. The current list of threatened, endangered, and candidate species that are known to occur or could occur in Campbell County is found in Appendix B. The protection provided listed species under the ESA is described in the Regulatory Framework section of this document.

For BLM-managed lands (Figure 3-14), the BLM Buffalo Field Office maintains a list of sensitive species (Appendix B for USFS managed lands (Figure 3-14), the Region 2 Regional Forester designates sensitive species (Appendix B)). Since the USFS Region 2 sensitive species list is developed for National Forests and Grasslands in Colorado, Nebraska, and South Dakota, as well as Wyoming, not all species on the list may occur in Campbell County. For actions on USFS managed lands, the USFS may require preparation of a Biological Evaluation (BE) that describes Forest Service-listed and sensitive species that may be present and potential impacts to those species, with the goal of preventing impacts to sensitive species populations that may contribute to the need for federal listing (USFS 2001).



**Figure 3-14.** Public lands in Campbell County that are managed by the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). The Thunder Basin National Grassland is administered by the USFS, though lands within the administrative boundary shown on this map are not all managed by USFS; they are a checker board of private, state, and USFS lands.

Campbell County has a custom of being involved with regulatory agencies in the listing and management planning efforts for sensitive wildlife and plants because management decisions for listed and sensitive species have the potential for substantial impacts on the economy of Campbell County. The loss of the ability to use lands that could result from the listing of a threatened or endangered species could hinder the ability to manage resources in a profitable manner. For example, the slowdown in energy development caused by regulatory restrictions due to threatened and endangered species listings could result in loss of jobs and tax revenues, and has the potential to cause companies to go out of business.

Campbell County believes that effective management of wildlife is best achieved when local land owners and managers are invested in the successful implementation and outcome of conservation actions. Therefore, incentives and assistance for protection of wildlife on private land should be encouraged. There must be a positive correlation between the effort and expense of wildlife management tools applied to protect wildlife and the magnitude of the benefit achieved. In addition, wildlife management tools should be as efficient as possible to achieve the best possible result with the maximum economy.

## Goal

Population recovery plans for listed and special status wildlife and plant species utilizing cooperative management with regulatory agencies incorporating input from local and directly-affected stakeholders.

## Objectives

- *State and federal agency notification and coordination with Campbell County as part of the review/evaluation, listing, and management of listed and special status species, and critical habitat for listed species.*
- *Participation by local authorities and affected stakeholders in the listing and management of threatened and endangered species.*
- *The use of the best available scientific and commercial scientific data to make decisions on the listing and management of threatened and endangered species.*
- *Protection of private property rights and interests to the maximum extent possible.*
- *Opposition by Campbell County of the reintroduction of listed and special status species that will cause economic loss.*

## Policies

- *Fully evaluate and document the local economic and social impacts of proposed critical habitat designations with an Environmental Impact Statement before the designation of critical habitat.*
- *Obtain express written permission of the property owner before conducting an inventory of a threatened or endangered species on private property.*
- *Data or inventory collected for a proposed threatened or endangered species listing obtained without the express written permission of an affected property owner may not be used to validate the proposed listing.*

- *Exclude areas implicated with substantial negative economic and/or social impacts from proposed critical habitat designations, species introductions, and reintroduction areas.*
- *Allow existing property uses to continue under any critical habitat designation to the maximum extent practical.*
- *Support efforts to improve habitat and management practices in order to prevent the listing of a species.*
- *Encourage consideration of agreements with state and federal agencies to mitigate impacts to threatened and endangered species (e.g., candidate conservation agreements).*
- *Encourage incentives and assistance for protection of threatened and endangered species on private land.*
- *Support the recovery planning efforts for sensitive, threatened, and endangered species that are consistent with this Plan.*
- *Differentiate between special status species and those formally listed pursuant to the Endangered Species Act in federal land planning efforts because special status species do not require the same levels of protection.*
- *Consider conservation plans, initiatives or agreements to address threats to species and their habitats before listing a species.*
- *State and federal agencies shall:*
  - *Allocate adequate financial and personnel resources to predator management;*
  - *utilize non-biased, objective data substantiated by credible scientific peer-reviewed methods in the collection, manipulation, and interpretation of data to be utilized in threatened and endangered species listings;*
  - *communicate, coordinate, and cooperate with Campbell County in the review/evaluation, listing, and management of threatened and endangered species, including the designation of critical habitat for listed species within Campbell County; and*
  - *abide by recovery objectives in any threatened and endangered species listing and shall promptly remove the listing once those objectives have been met.*
- *Campbell County shall be actively engaged before the listing of threatened or endangered species that potentially affect Campbell County citizens, industries, or economy.*

## Predators

### Custom and Culture

A predator is an organism that hunts and feeds on its prey, the organism that is attacked. Whether it is a mountain lion preying on a deer or a mantis eating a bee, predator and prey interactions are a natural ecological process. Predation becomes a concern when predators turn from their natural prey species, generally due to an overpopulation of predators, and cause harm to humans through



direct encounters or harm to sources of livelihood (i.e., livestock, poultry, or crops and forage production). Exotic and non-native predatory animals, among other factors, pose threats to native species. Introduces non-native fish pose predatory or competitive threats to native species throughout river basins (Barrineau et al. 2007). Terrestrial predators such as coyote, red fox, raccoon, porcupine, skunk, and jackrabbit pose threats to native and sensitive species, and these effects can be magnified when other factors, such as habitat alteration or reduction are involved. Any predator management control strategy should be based on knowledge of predatory animal population trends and dynamics, since they fluctuate as a result of naturally occurring phenomena such as drought, fire, floods, and fluctuations of natural prey base, with subsequent fluctuations on the populations they prey upon. Human related infrastructures such as roads, buildings, pipeline corridors, fences and poles provide hiding habitat for ground predators such as skunks and foxes, with implications for prey populations and sensitive species. For example, ground-nesting birds are exhibiting decreasing population trends due to increased human-adapted predator populations (Naugle et al. 2011).

According to definitions found in Wyoming Statute Title 23 Game and Fish (W.S. Title 23.1.101), “predatory animal” includes: coyote, jackrabbit, porcupine, raccoon, red fox, skunk, stray cat, and grey wolf, when located outside of those areas in Wyoming that they are classified as a trophy game animal. At the time of this writing the grey wolf has been again re-listed as endangered and are not able to be hunted. The same statute defines “predacious bird” as English sparrow and starling. Although coyotes are the main predator species that impact livestock and wildlife in Campbell County, the re-introduction of wolves and recovery of grizzly bears in other parts of Wyoming may pose economic threats to the agriculture and hunting industries as these predators migrate across into non-reintroduced areas.

Since the late 1800’s, production agriculture based on livestock has been a way of life in Campbell County. When predatory animals and predacious birds are destructive to livestock, game, and poultry, and are negatively impacting crops and forage production or human health and safety, management becomes necessary (W.S. 11-6-104(a)). Economic losses to domestic cattle, sheep, and wildlife from predation can be significant. Thus, predator management is an essential part of livestock production and wildlife protection and is considered custom for Campbell County.

The Wyoming Legislature established the Animal Damage Management Program in 1999 for the purposes of lessening damage caused to livestock, wildlife, and crops by predatory animals, predacious birds and depredating animals, or for the protection of human health and safety. This program is administered by the Animal Damage Management Board (ADMB) whose stated mission is to “coordinate and implement an integrated animal damage management program, based on the best available science, for the benefit of both the human, as well as the natural environment.” In accordance with W.S. 11-6-201, the ADMB is composed of a twelve-member board from various interests and appointed by the Governor. Most of the counties have a predator management board. Each predator management board is comprised of six locally elected livestock producers, chosen to represent the interests of producers in the county who have paid into the program through locally assessed predator management fees. In addition to the six livestock producers, each Board of County Commissioners is authorized to appoint one member to the board if the Board of County Commissioners has elected to provide additional



funds to the Predator Board. If the board of directors determines state funding is necessary for an effective predator management program to assure the statutory requirements provided in W.S. 11-6-205 are fulfilled and state funds are appropriated and received for that purpose, then three (3) directors representing sportsmen and hunters from the local district shall be appointed to the board of directors by the county commissioners serving the local district.

The Campbell County Predatory Animal Control Board has working relationships and numerous agreements with agencies, organizations, and livestock producers in Campbell County to resolve human/wildlife conflict issues. The County Board retains the services of four full time contract wildlife specialists. There are two specialists in the south half of the county due to the substantial sheep production there. They also work with the cattle producers in that area and work to benefit wildlife where requested. There is one specialist in the north half of the county to work for the livestock producers, which are mostly cattle, and to benefit wildlife in that area. The Campbell County Predator Board is overseeing an ongoing wildlife protection project that is in its third year and has been well received by area ranchers, outfitters, and sportsmen. The fourth specialist works to resolve urban conflicts with all species of predators and also works extensively to protect the public from rabies, which is mostly carried by skunks locally. The Board has been heavily involved in an ongoing rabies program and receives additional funding from both the city and county to continue this program. The Board also has a working agreement with USDA/APHIS/Wildlife Services for aerial predator control work. They also retain the services of three other commercial aircraft for services as needed for aerial predator control work.

The USFWS does issue depredation permits for migratory bird species (USFWS 2013d). This permit is issued to address short-term relief from blackbirds, cowbirds, grackles, crows, magpies, and resident Canada geese in Wyoming.

## **Goal**

To keep citizens and businesses free from personal injury and property and livestock loss due to predator attacks, to keep wildlife populations sufficient for hunting and recreation opportunities, and to keep balanced predator/prey populations based on credible scientific data.

## **Objectives**

- *Maintenance of all currently recognized and approved methods of predator control, including but not limited to: trapping, artificial calling methods, chemical control, aerial hunting and wildlife habitat improvement.*
- *Monitoring of predator-related activities affecting Campbell County by state and federal agencies.*
- *Participation in decisions made by state and federal agencies in order for Campbell County's economic interests to be represented and protected.*
- *Maintenance of an animal damage control plan for the protection of livestock, wildlife, and crops on private land and bordering state and federal land.*
- *Coordination of predator control actions and regulations by state and federal agencies with those of Campbell County.*
- *Employment of sound science in predator management decisions.*

## Policies

- *State and federal agencies shall:*
  - *Allocate financial and personnel resources to reduce predation on domestic livestock and wildlife;*
  - *consult, coordinate, and cooperate with local governments, including local Predator Boards, and affected stakeholders in decision making regarding predator management at the local level;*
  - *recognize state and county designated predators and cooperate in control and management actions; and*
  - *monitor and collect data regarding the impact on prey species populations when predator species receive special protection through any act or designation by any state or federal agency. State and federal wildlife agencies shall keep predator populations within acceptable limits to protect human populations and domestic animals from disease spread by predators.*
  - *Appoint one (1) agricultural representative to any team-based, decision-making process that state and/or federal agencies undertake pertaining to predator control.*
- *Campbell County will:*
  - *Support efforts by the Wyoming Department of Agriculture, the Wyoming Game and Fish Department, and other wildlife management agencies to reduce predation on domestic livestock and wildlife.*
  - *Support science based predator control and management.*
  - *Support agricultural and wildlife management agencies efforts to dedicate financial and personnel resources to predator management.*
  - *Support predator control based on a balance between the best science available, economics and logistics, and evaluated on a case by case basis.*
  - *State and/or federal agencies undertake pertaining to predator control representative Support at least one agricultural on any team-based, decision-making process.*

The Wyoming ADMB may receive money for predatory animal, predacious bird and depredating animal management from the federal government, state appropriations, counties, agencies, boards, associations, commissions, individuals and any other cooperators, and may expend monies to purchase supplies, materials, services, and to employ or contract personnel for predatory animal, predacious bird, and depredating animal management. The ADMB may make supplies, materials, services and personnel available to cooperators at approximate cost. The board shall annually request one hundred thousand dollars (\$100,000.00) from the Wyoming Game and Fish Commission. These funds shall be expended for wildlife priorities. The Game and Fish Commission may provide recommendations to the board regarding expenditure of these funds. The Campbell County Predator Management Board shall exercise general supervision in determining local priorities for the management of predatory animals and predacious birds that



prey upon and destroy livestock, other domestic animals, wildlife and crops; devise and put in operation those methods that best manage predatory animals and predacious birds, administer funds received to carry out the animal damage management program; maintain existing financial and physical resources; and provide input to the ADMB. The ADMB may enter into cooperative agreements with other governmental agencies, counties, associations, corporations or individuals for carrying out the purposes of Wyoming Title 11, Chapter 6, Article 1 (W.S. 11-6-1). In addition, livestock owners may request assistance from WS on private and public lands.

- ***State and Federal agencies shall, in consultation with local officials and predator management agencies:***
  - ***keep predator populations within acceptable limits to protect agriculture carrying capacity and wildlife populations; and***
  - ***monitor and collect data regarding the impact on prey species populations when predator species receive special protection through any act or designation by any state or federal agency.***
  - ***Examine and evaluate impacts to prey species in any state or federal action which provides special protection to any predator species.***
  - ***Protection of predator species shall not be to the detriment and reduction of prey species.***

Federal actions require NEPA analysis to analyze all aspects of proposed actions, including impacts to prey species resulting from extended protection to predatory species. The USFWS publishes information about listing proposals in the Federal Register. To ensure that the public is aware of listing proposals, the USFWS also publishes press releases in are newspapers, and notifies government personnel at the federal, state, county, and municipal level, as well as local organizations. After publishing in the Federal Register, there is a 60-day public comment period, and a public hearing, if requested, must be held within 45 days of publication in the Federal Register. Campbell County should work to disseminate information about federal listing decisions to residents, and coordinate communication about additional species information and concerns to the USFWS during the comment period. The 60-day public comment period for federal listing proposals is the opportunity for interested citizens and stake holders to provide comments or additional information regarding that proposal. Statements may also be submitted at public hearings, if held. Campbell County should gather pertinent information about species occurrence and potential impacts to industries, businesses, land use, and local economy that could occur due to listing decisions. This pertinent information should be submitted to the USFWS during the public comment period for any listing decisions that affect residents and businesses in Campbell County. Campbell County should work with USFWS to ensure that County-specific concerns and preferences are communicated and considered during the decision-making process.

- *State and federal agencies shall keep predator populations within acceptable limits to protect human populations and domestic animals from disease spread by predators.*
- *Recognize the right of private property owners to protect their property and livestock from predation through state and federally approved control methods*
- *Include any and all recognized methods in predator control and based on science based and peer reviewed data, economics, and logistics of use.*

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- *Recognize the right of private property owners to protect their property and livestock from predation through state and federally approved control methods.*
- *Include any and all recognized methods in predator control and based on science based and peer reviewed data, economics, and logistics of use.*

Predator control programs utilize a wide spectrum of materials and techniques varying in cost and effectiveness. Compound 1080 was widely used but was banned for general use in 1972 along with other toxicants such as strychnine (Executive Order 11643). The M-44 is a highly used method currently. It is a spring loaded device that is buried in the ground, leaving only the bait covered capsule holder projecting above ground surface. Often a coyote will sniff and then pull on the capsule holder in an attempt to remove the bait. In doing so, a trigger is released, and the device projects a sodium cyanide capsule into the animal's mouth, resulting in a swift and humane death. This is a favored method of control, and it is highly regulated by the state and federal government. Users are licensed by the state and numerous hours of training are required.



Despite the problems encountered with cyanide ejector devices over the years, they have been consistently important for coyote control ever since their introduction into governmental control programs around 1940. Minor improvements still can and are being made, but most major problems have been addressed and resolved (Blom and Connolly 2003). Areas where use is prohibited and more restrictions on M-44 use can be found in the Wyoming Department of Agriculture bulletin EPA Reg. No. 35978-1 (USDA APHIS 2010). Shooting coyotes from aircraft is effective but is limited by terrain, vegetation, weather conditions, and most of all cost. Ground shooting, trapping, and den destruction can temporarily alleviate localized coyote damage. The most common hunting method involves using electronic callers or mouth calls to lure in a coyote. Good husbandry practices can also help protect livestock and are a non-lethal damage management method. An example of this is guard animals to protect sheep flocks, which can be very effective (Gese et al. 2014). There are also several local coyote hunts where prizes and money are awarded to the hunters that harvest the most and the largest predators.

## Wildlife

### Custom and Culture

Historically, land in Campbell County has had multiple uses with cattle grazing and farming being common land uses. Private, state and federal land provide vital habitat for wildlife species managed for consumptive and non-consumptive uses, and in Campbell County wildlife has flourished in conjunction with mining, oil and gas development, livestock grazing, and farming, and has not been unduly disturbed by roads, power lines, pipelines, housing developments, etc. Many wildlife species are a common sight in the municipalities of Gillette and Wright, rural housing developments, mining areas and oil and gas fields.

Eighty two percent of the land in Campbell County is privately owned with the remaining 12 percent of federal and 6 percent state land primarily intermingled in small parcels within the private lands. As the state and federal lands are not separately fenced, gaining access and management for public access is very challenging, particularly for hunting and recreation purposes. Many landowners are reluctant to grant access across and within their fenced properties due to the public not respecting the property boundaries, driving in muddy condition, not staying within existing roads, leaving gates open, and shooting and injuring livestock. Although there are a limited number of parcels that have public access, they are typically heavily used and game numbers can become scarce on these parcels due to the heavy use and to the game migrating onto neighboring lands.

This land ownership pattern poses challenges to Wyoming Game and Fish Department (WGFD) in maintaining population numbers for game animals. Out-of-state hunters must apply for a license through a drawing system. They may have difficulty finding a public access hunting area and if booking with an outfitting business or a private landowner, may not draw the license they need to hunt in that specific area.

The current reimbursement that landowners receive from the coupon on a hunting license for game taken on their lands does not provide adequate reimbursement for the amount of habitat and forage provided for the wildlife on their lands. Many landowners have developed a hunting

business or lease their lands to an outfitter to generate additional income to help compensate for the wildlife living on their lands.

The traditional and cultural uses of wildlife such as hunting, outfitting, photography, and recreational enjoyment, are enjoyed by residents and non-residents alike. Hunting for big game, trophy game, and small game species provides economic viability for many private landowners, citizens, and rural communities (WGFD 2014b). Ducks are the predominant waterfowl harvested in the county, with geese and sandhill cranes also migrating through the area during spring and fall (Wyoming Game and Fish Commission 2013, Orabona et al. 2012).

Wildlife and natural landscapes are valued resources to the State of Wyoming evidenced by the Wyoming Legislature forming the Wildlife and Natural Resource Trust (WNRT) in 2005 (W.S. 9 Chapter 15). Three projects have been funded in Campbell County either partially or totally by the WNRT. These projects include sediment removal from the Gillette Fishing Lake, fencing and water development to enhance riparian areas and woody draws along Buffalo Creek, and the construction of the northeastern Wyoming bird rescue barn where injured and orphaned eagles, hawks, owls, and other birds throughout northeastern Wyoming are rehabilitated to be released back to the wild (WNRT 2013).

The WGFD State Wildlife Action Plan (SWAP) is a comprehensive strategy to maintain the health and diversity of wildlife in the state (WGFD 2010). The plan outlines steps to conserve wildlife and habitat before populations are reduced to levels too low to recover or habitats become too costly to restore. The SWAP addresses a variety of wildlife and habitat management challenges, the terrestrial habitat types and aquatic basins that cover a majority of the state, and Wyoming's Species of Greatest Conservation Need ([SGCN], WGFD 2010). The SWAP identifies priority areas that are considered important for the SGCN based on a number of values including overlap with other biological features such as sage-grouse core areas, Strategic Habitat Plan (SHP) priority areas, and key nongame wildlife areas. Several priority areas extend into Campbell County (Figure 3-15).

Three SHP projects were conducted in Campbell County during 2013 including riparian habitat protection, mule deer legume seeding project, and habitat extension services (WGFD 2013b). The riparian habitat protection project involved three new Continuous Conservation Reserve Program Contracts. Two of the projects are adjacent to each other and total approximately 95 acres on Box Draw Creek. The intention of these projects is to restore riparian vegetation and involve excluding cattle use. The third project is located in northcentral Campbell County on the East Fork of Bitter Creek. The mule deer legume seeding project involved planting alfalfa and sainfoin in Crook County and on approximately 110 acres in central Campbell County. The plantings were conducted to provide mule deer with high quality forage. WGFD provided habitat extension services in the form of wildlife reviews for 100 different projects for private landowners, BLM, and NRCS.

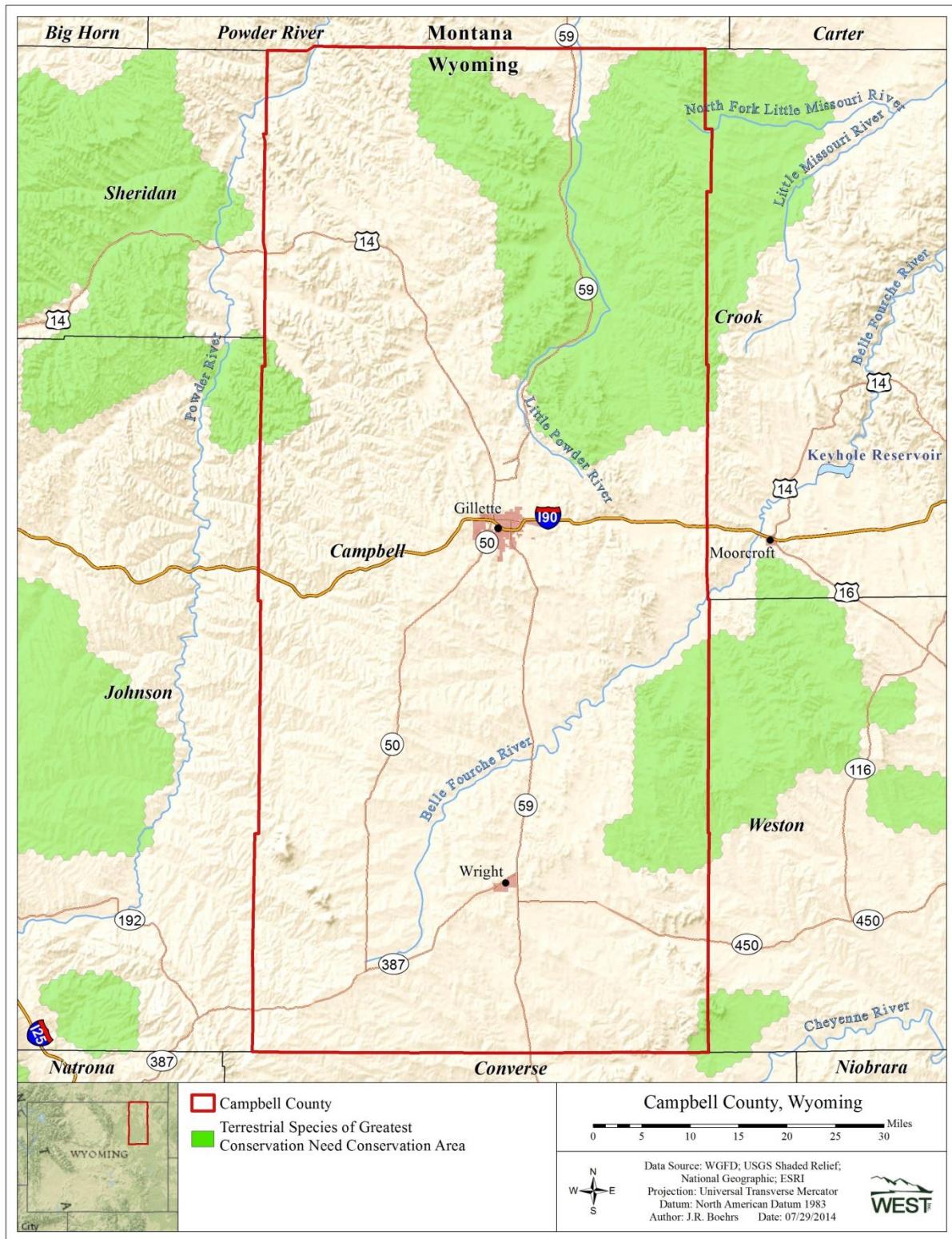


Figure 3-15. Priority areas for terrestrial Species of Greatest Conservation Need.

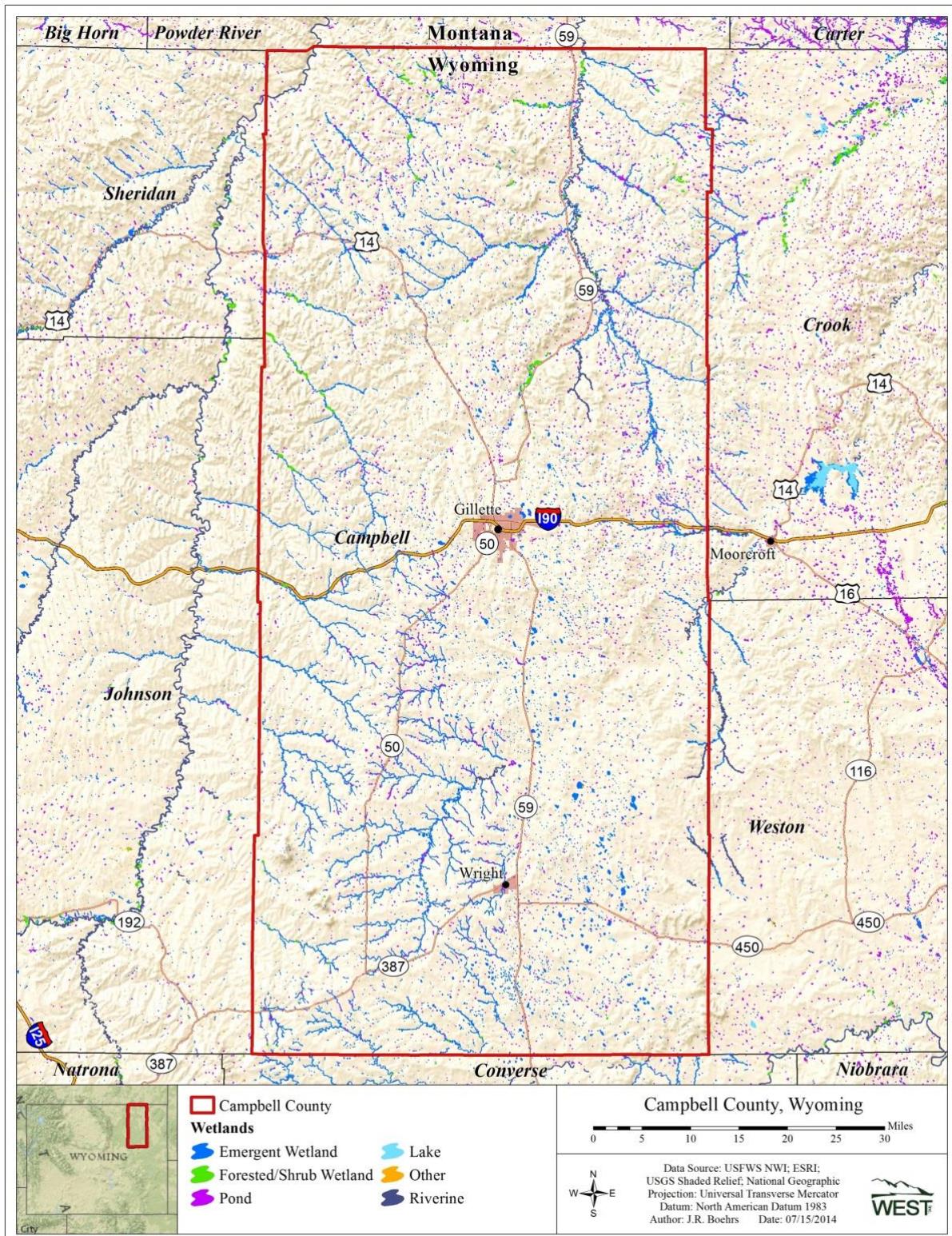
The SWAP habitat types in Campbell County include:

- Prairie Grasslands and Sagebrush Shrublands
- Wetlands, Riparian, and Open Water
- Forests and Woodlands

Prairie Grasslands and Sagebrush Shrublands provide habitat for grassland obligate and shrub-adapted species. Common wildlife species that typically occur in these habitats in Campbell County include prairie rattlesnake, greater short-horned lizard, golden eagle, prairie falcon, Swainson's hawk, sharp-tailed grouse, lark bunting, horned lark, western meadowlark, Brewer's sparrow, lark and vesper sparrow, chestnut collared longspur, American badger, coyote, desert cottontail, black-tailed jackrabbit, kangaroo rat, mule deer, pronghorn, white-tailed deer, and black-tailed prairie dog, among others (Orabona et al. 2012). Among the Species of Greatest Conservation Need identified by the SWAP, olive-backed pocket mouse, black-footed ferret, swift fox, ferruginous hawk, greater sage-grouse, and greater short-horned lizard are among those with the potential to inhabit prairie grasslands and sagebrush shrublands in Campbell County (WGFD 2010).

Wetland, Riparian, and Open Water habitats are important for breeding birds and other wildlife species in prairie landscapes (Knopf and Samson 1994, Scott et al. 2003). Big game species, birds, and small mammals, including bats, all have strong seasonal or year-long associations with riparian habitats, using them as migration corridors, foraging and watering areas, and nesting habitat (Buskirk 1991). In addition, riparian areas are used for agriculture, recreation, travel, water development, and housing. Most communities in Wyoming occur in conjunction with riparian zones, with implications for development and land use planning.

In Campbell County, riparian and wetland habitats cover 5 percent of the county's total area (Table 3-7). Three major river drainages occur in Campbell County: the Powder River, the Cheyenne River, and the Belle Fourche River basins (BLM 2013, Stewart 1996, Bradshaw 1996). Native fish in the Powder River Basin are channel catfish, sauger, shovelnose sturgeon, and stonecat. The Little Powder River, one of the tributaries on the Powder River that runs through Campbell County, supports a constant, healthy fish community and a relatively intact habitat with minimal human influence (Barrineau et al. 2007, Peterson et al. 2010). Native fish communities in the Belle Fourche River and the Cheyenne River basins are limited by turbidity, low-oxygen, and high-temperatures (Barnes 1996, Bradshaw 1996), supporting a less diverse, declining fish populations (WGFD 2008). River systems, artificial and natural ponds, watering holes, and creeks, with their associated riparian/wetland vegetation, can be found throughout Campbell County (Figure 3-16).



**Figure 3-16. Wetlands and Riparian habitats in Campbell County.**

Riparian and wetland habitats provide suitable areas, foraging sources, and connectivity zones for breeding, wintering, migratory and resident wildlife species, including bald eagles, waterfowl, and big game species (WGFD 2010). In Wyoming, the majority of terrestrial vertebrate species are believed to show preference for riparian habitats (Olson and Gerhart 1982). Cottonwood gallery forests, such as those along the Powder River and its tributaries, periodically contribute logs and branches to the river channel, which provide cover for fish (WGFD 2010). Wildlife species that can occur in riparian areas in Campbell County include bull snake, deer mouse, red fox, pronghorn, mule and white-tailed deer, northern harrier, short-eared owl, Savannah and song sparrow, and red-winged blackbird, among others (Orabona et al. 2012).

Forests and Woodlands occur only sporadically throughout the Campbell County; however, these habitats support a unique set of wildlife species. As a result of logging and changes in fire regimes, few old growth, structurally diverse coniferous forests remain in Wyoming (Wyoming State Forestry Division 2009). Only a small percentage of montane/subalpine forests and lower montane forests occur in Campbell County (Figure 3-10, Table 3-7). Wildlife species that can be found in coniferous forest in Campbell County include mourning dove, golden eagle, mountain bluebird, northern flicker, chipping and lark sparrow, mule deer, black-tailed jackrabbit, North American porcupine, and mountain lion (Orabona et al. 2012).

The habitat types described above provide suitable habitat for fish and wildlife species that use the area throughout different phases of their life cycle, representing challenges for conservation, management, and sustainable use.

### ***Fishing and Hunting***

Campbell County harbors diverse and abundant game and non-game fish and wildlife populations, contributing to the long-established customs of fishing, hunting, and aesthetic enjoyment of wildlife in the county. These activities have been a historical force for more than 130 years, and contribute significantly to its tax base (refer to Economics Section).

### ***Fish***

The Powder River Basin (with its tributary, the Little Powder River), the Cheyenne River Basin, and the Belle Fourche River Basin, intersect areas of Campbell County that overlap with the Yellowstone River Basin and the Northeastern Missouri River Basin, two of the six basins described in Wyoming's 2010 SWAP (WGFD 2010). The SWAP addresses aquatic conservation areas within these river basins (Figure 3-17), which in many cases overlap with the SHP and the SGCN areas.

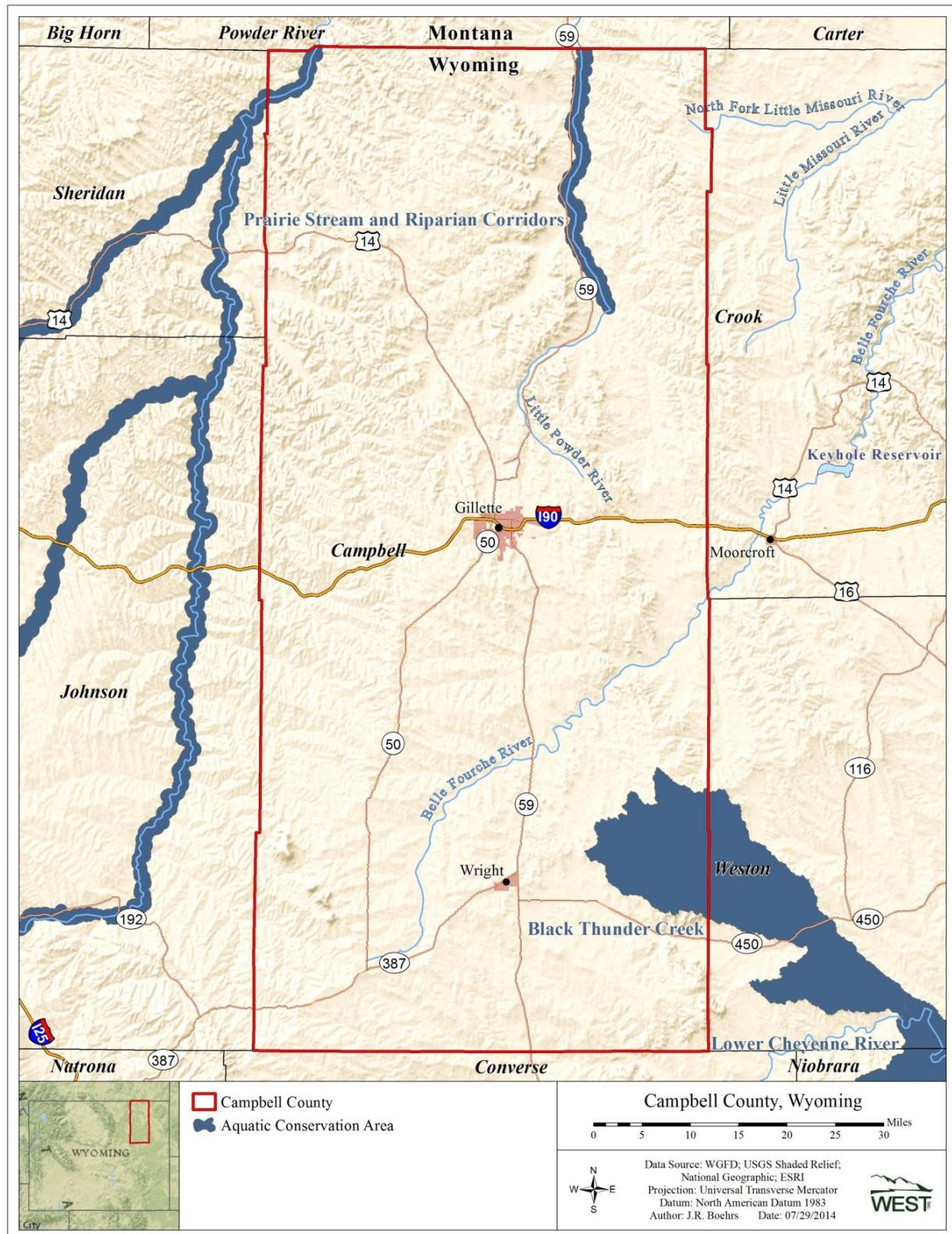


Figure 3-17. Aquatic Conservation Areas in Campbell County.

Sport and consumptive fishing are common practices in Wyoming, (Wyoming State Parks and Cultural Resources 2014). In the Little Powder River and Belle Fourche River basins in Campbell County, many fish species that have been as sport fish or as forage to provide diverse fishing opportunities, and several native and non-native game fish species occur in both basins (Hubert 1993), including black bullhead, channel catfish, stonecat, small-mouth bass, rock bass, green sunfish, sauger, and walleye.

Larger-bodied native game species may occupy the main stem Little Powder River only seasonally (Barrineau et al. 2007), while game fish habitat is restricted to the small, abundant impoundments and to some few stream segments in the Belle Fourche River. Good trout fishing occurs in most streams and lakes on the east side of the Big Horn Mountains, in the northwestern corner of the county. Small waters like Little Thunder Reservoir on the Thunder Basin National Grassland provide opportunities for bluegill and largemouth bass. Coldwater lakes and streams close to mountain ranges, warm water ponds and reservoirs, and cool waters throughout the county, such as the Panther Pond and the Gillette Fishing Lake, offer opportunities for a variety of cold, cool and warm water species such as the smallmouth and largemouth bass, and bluegill (WGFD 2011).

### ***Big Game***

Big game species expected to occur in suitable habitats throughout Campbell County include pronghorn, white-tailed deer, mule deer, and elk. The WGFD has identified various ranges for big game species; the ones that occur in Campbell County include the following:

- a) Summer or Spring-Summer-Fall use is when a population or portion of a population of animals uses the documented habitats in this range annually from the end of previous winter to the onset of persistent winter conditions.
- b) Winter use is when a population or portion of a population of animals uses the documented suitable habitat sites in this range annually and in substantial numbers only during the winter period.
- c) Winter-Yearlong use is when a population or a portion of a population of animals makes general use of the documented suitable habitat sites in this range year round. During the winter months, there is a considerable influx of additional animals into the area from other seasonal ranges.
- d) Yearlong use is when a population of animals makes general use of suitable documented habitat sites in the range year round. Animals might leave the area under severe conditions.
- e) Calving Areas are documented birthing areas commonly used by females. It includes calving areas and fawning areas. These areas might be used as nurseries by some big game species.

These range categories are used in the range distribution maps for the species described below:

Pronghorn Antelope:

This species is most abundant in short-and mixed-grass habitats compared to more xeric habitats (Figure 3-18). Some pronghorn make seasonal migrations between summer and winter habitats, but these migrations are often triggered by availability of succulent plants and not by local weather conditions (Fitzgerald et al. 1994). According to the 2013 Big Game Job Completion Report for Sheridan Region, management objectives for the pronghorn herds in Campbell County are generally below the desired post hunting season population level, with the exception of the Pumpkin Buttes herd (WGFD 2014a). The pronghorn herds in Campbell County have only been below the management objectives for approximately one to two years as a result of the heavy spring snows and cold in the spring of 2009 and 2010.

Mule and white-tailed deer:

Mule deer are distributed throughout the seasonal ranges, occurring in mountains and associated foothills, broken hill country, and prairie grasslands and shrublands (Clark and Stromberg 1987; Figure 3-19). White-tailed deer use woody riparian habitats along creeks and rivers for forage and cover (Figure 3-20). Both species use a variety of habitat types seasonally. Browse and herbaceous vegetation constitute the majority of their diet (Fitzgerald et al. 1994). Mule deer tend to be more migratory than white-tailed deer, traveling from higher elevations in summer to winter ranges that provide more food and cover. According to the 2013 Big Game Job Completion Report for Sheridan Region, management objectives for the mule deer herds in Campbell County are below the desired post hunting season population level and have been for approximately eight years (WGFD 2014a). The lower than desired populations is likely a result of habitat issues, competition from other ungulates for preferred forage, and declining fawn ratios influenced by weather factors since around 2008. White-tailed deer on the other hand are above the management objective for approximately the past ten years. The presence of irrigated croplands and refuge areas allow the white-tailed deer populations to be maintained at levels greater than the management objectives.

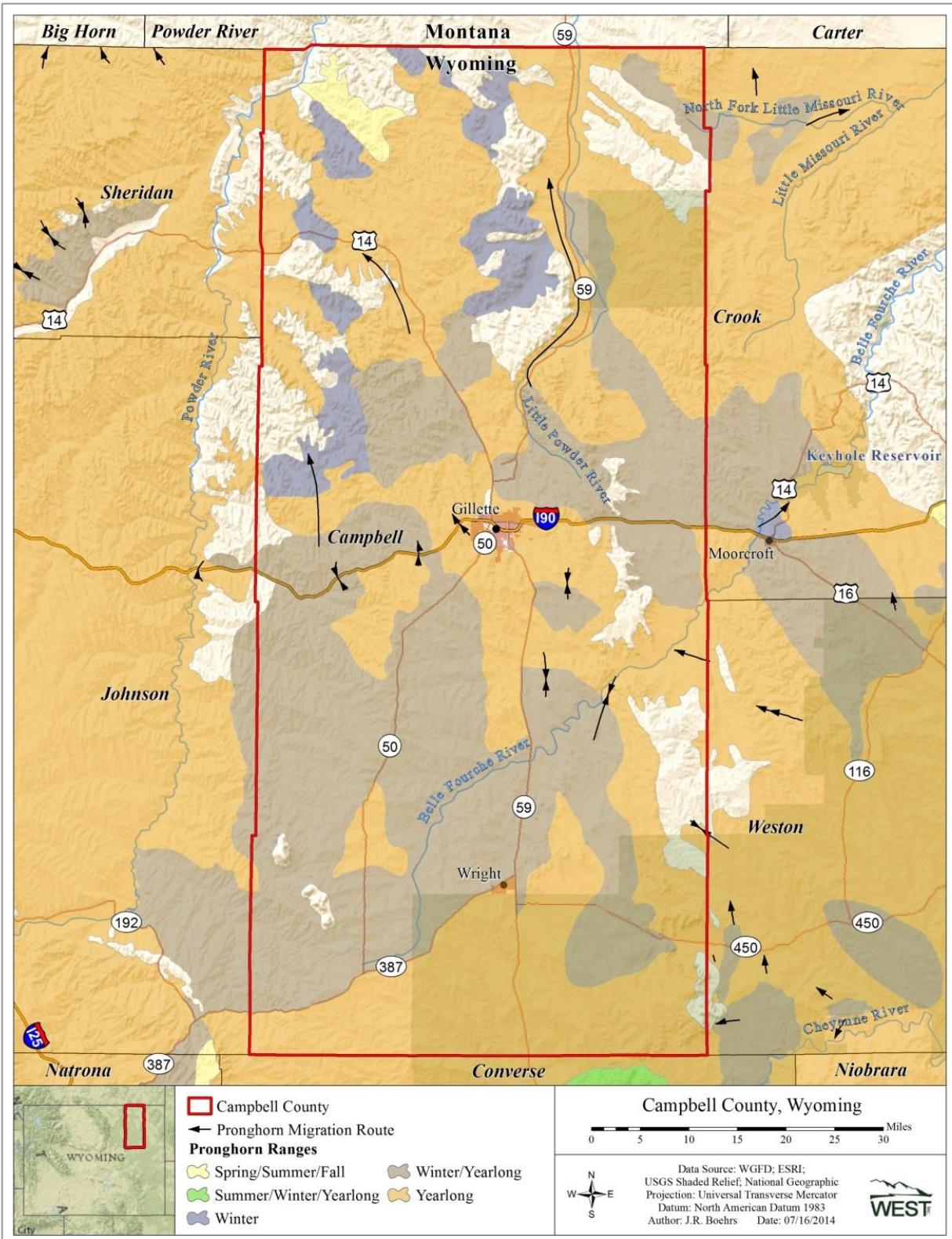


Figure 3-18. Range distribution of pronghorn in Campbell County.

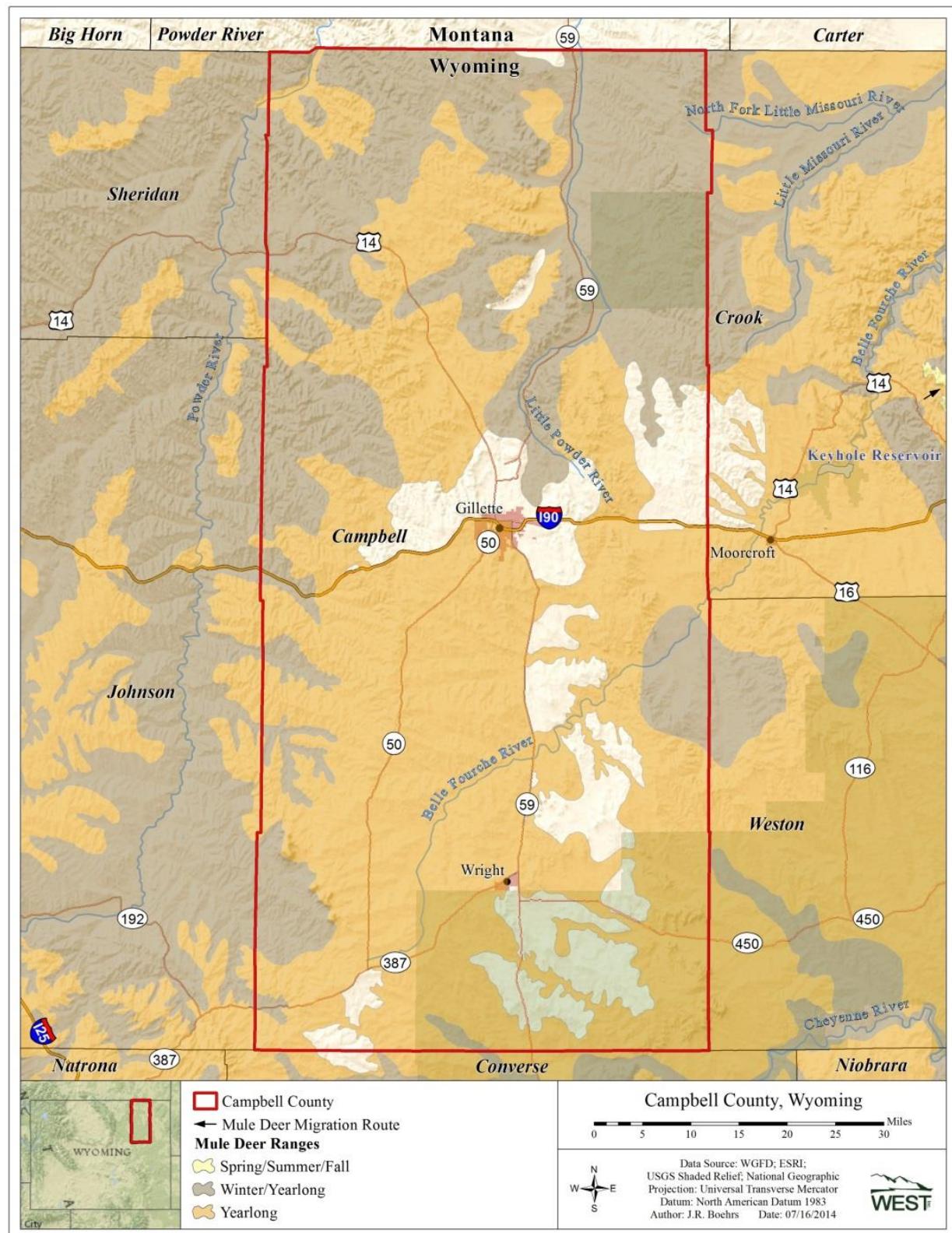


Figure 3-19. Range distribution of mule deer in Campbell County.

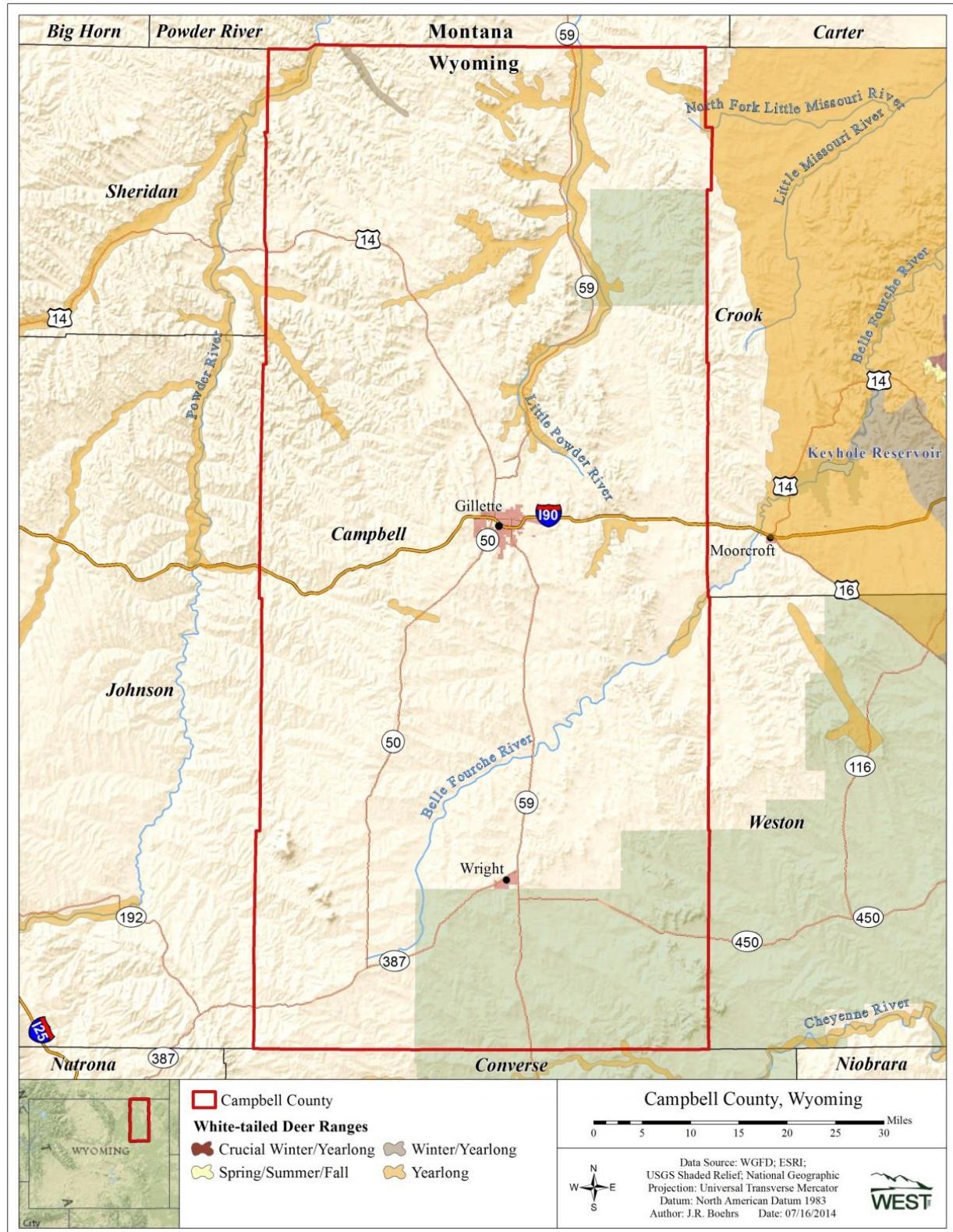
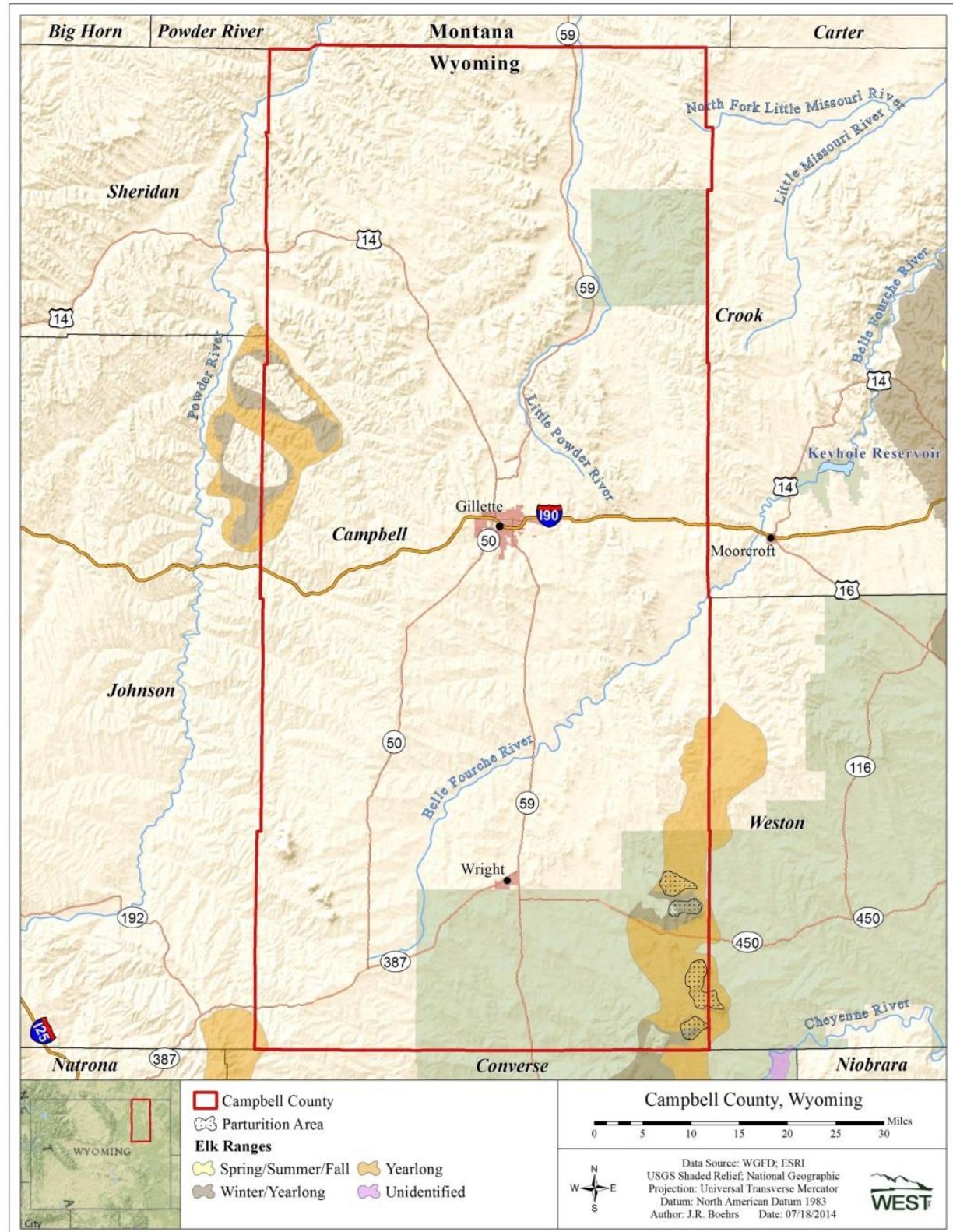


Figure 3-20. Range distribution of white-tailed deer in Campbell County

Elk (*Cervus canadensis*):

Elk are present throughout Wyoming in a variety of habitats, including coniferous forests, short- and mixed-grass prairies, and shrublands (Figure 3-21). In Campbell County, elk are concentrated in the Fortification Creek area west of Gillette, the Pine Ridge area in the south, the Rochelle Hills in the southeast, and smaller populations in the northern portion of Campbell County. The Fortification Creek elk population has been expanding their territory in recent years due to their increasing numbers and landowners are reporting elk on their property where they have not traditionally been seen.

Similar to other members of the deer family, this species relies on a combination of browse, grasses, and forbs, depending on their availability throughout the seasons. Elk tend to be migratory, with high variability in range of seasonal migrations, and some sedentary populations. All herd units within Campbell County have exceeded their population level goals, and increasing trends have been attributed to limited harvest due to lack of public access for hunting (WGFD 2014a).



**Figure 3-21. Range distribution of elk in Campbell County.**

## Game Birds and Small Game

Migratory birds, which may be legally taken during authorized seasons by properly licensed hunters, include doves, ducks, geese, mergansers, and rails (Wyoming Game and Fish Commission 2013). Migratory birds that may not be taken, possessed, transported, sold or bartered include all migratory birds as defined and protected under federal law including bitterns, grebes, herons, egrets, kingfishers, loons, pelicans, insectivorous birds, and songbirds. All nongame birds in Wyoming are protected under the federal MBTA, with the exception of non-native species. All these species or groups of species can be found in Campbell County (Orabona et al. 2012).

Wyoming has three species of cottontails (eastern, desert, and mountain) that are hunted, and one rabbit (pygmy rabbit) that is protected, all of which are present in Campbell County (Orabona et al. 2012). Eastern fox squirrels (reported in Campbell County) are often quite abundant within shelterbelts and stands of cottonwood trees along creek and river bottoms. Red squirrels, common in Wyoming's mountains, have not been reported in Campbell County and are rarely hunted due to poor table quality. Abert's squirrel (not reported in Campbell County) is protected and cannot be hunted in Wyoming (Orabona et al. 2012). Nongame mammals that are protected in Wyoming include the black-footed ferret, among others (WGFD 2013a).

## Diseases

Emergence of infectious diseases often results from interactions among wildlife species, domestic animals, and zoonotic pathogens. Security and public health are threatened by wildlife hosts and vectors that share rangeland with domestic animals and present challenges to current regulatory approaches (Pérez de León et al. 2010). An understanding of the complex ecological relationships among species and between species and the environments that support disease transmission allows for quantification of risk to domestic and wild species, and subsequent implementation of preventative measures to reduce this risk.

WS works with federal and state wildlife, health, and agriculture agencies to monitor and conduct surveillance for diseases in wildlife that could impact agriculture or human health. Information obtained through disease surveillance in wildlife populations enables agencies to better prepare for and respond to outbreaks and emergencies. The wildlife disease biologist in Wyoming plays a supporting role with the WGFD, the Wyoming Livestock Board and USDA Veterinary Services for in-state disease issues, such as chronic wasting disease and brucellosis. The disease biologist also coordinates and conducts statewide surveillance projects at the request of varied state agencies. Since 2005, WS-Wyoming has cooperated to conduct statewide surveillance for plague and tularemia. Statewide surveillance for the incidence of canine heartworm in wild canines demonstrated very low prevalence in Wyoming (USDA APHIS 2012).

- Brucellosis: Brucellosis is a contagious zoonotic disease (a disease that can be transmitted from animals to humans) caused by the bacterium *Brucella abortus* and occurs in cattle, elk and bison (Botzler and Brown 2014). This disease has been eradicated from much of the U.S., however elk and wild bison around the Greater Yellowstone Area are known to carry the disease and are believed to be the vector for detections in cattle herds in the northwestern



portion of Wyoming from 2003 to 2008 (Scurlock et al. 2010). The USFWS started a practice of supplemental feeding elk in 1912 on what is referred to as feeding grounds. There is an elevated prevalence of brucellosis among elk that utilize the feeding grounds and detection in cattle generally occur in those that are near feeding grounds (Surlock et al. 2010). The detection of brucellosis in cattle herds may result in costly testing and restrictions for the cattle producers throughout the entire state, therefore, in 2004 the Wyoming Brucellosis Coordination Team was formed to prepare a plan for the management of brucellosis Wyoming (Scurlock et al. 2010). In 2004, isolated incidences of brucellosis occurred in cattle herds in Campbell County (Brucellosis Coordination Team Minutes 2004). During the follow-up testing of 136 elk from Campbell County, no brucellosis was detected and it was suggested that the detections in the cattle herd may have been a result of an error in the South Dakota lab.

- Plague: Plague is disease caused by the bacterium, *Yersinia pestis* that is contracted by animals (referred to as “sylvatic plague”) and humans (referred to as “bubonic plague”). The common vector for the spread of the plague bacteria is through fleas and/or contact with infected or flea-carrying animal (USFS 2002a). Four human cases of bubonic plague have been documented in Wyoming since 1970 and none of the cases involved casual contact (USFS 2002a). Three of the cases involved hunter/trappers and the other was a veterinary technician from contact with an infected cat. The prairie dog population on the Thunder Basin National Grassland was impacted by the sylvatic plague in 2002, 2006, and 2007, which resulted in a colony reduction from 22,890 acres in 2001 to only 4,322 acres in 2007. The colony has recovered and extends over 23,000 acres as of March 2014 (USFS 2014a).
- Toxoplasmosis: One worldwide zoonotic pathogen is the obligate intracellular protozoan *Toxoplasma gondii*. Cats have an important role in the life cycle of this parasite because they are the only definitive host for this parasite. Intermediate hosts such as rodents, swine, sheep and man become infected with *T. gondii* by ingestion of sporulated oocysts, ingestion of tissue cysts from another intermediate host, or transplacentally. Humans can become infected by ingestion of sporulated oocysts via the fecal-oral route due to direct exposure of oocysts with in cat feces. People can also consume sporulated oocysts due to contaminated water or food products (Bowie et al. 1997, Jones and Dubey 2012). Ingestion of infective tissue from livestock species that contain tissue cysts with bradyzoites is yet another potential source for exposure in people (Dubey et al. 1995).
- Rabies: This disease is caused by virus in the genus *Lyssavirus* (Blanton et al. 2011). Rabies is a progressive fatal neurologic disease and in people may manifest as general weakness, discomfort, headache, and fever. Rabies is a widespread zoonotic disease within the United States and control programs have been established since the 1950s (Gerhold and Jesup 2013). According to a study in 2010, 7.9% of rabid cases were seen in domestic animals, although there is an enzootic strain that is common in wildlife such as raccoons, skunk, bats, and foxes (Blanton et al. 2011, Tuzio 2005).
- Tularemia, Rocky Mountain spotted tick fever, Lyme disease, and babesiosis: Adult ticks generally parasitize medium- and large-sized mammals, while larvae and nymphs feed on a wide variety of small- to large-sized mammals and ground-feeding birds (Cooley and Kohls 1944). Ticks are efficient vectors of numerous infectious disease agents to vertebrate animals, including livestock and humans, they have a broad range of hosts including humans,



and are potential vectors of pathogens causing Rocky Mountain spotted tick fever, tularemia, Lyme disease, and babesiosis, among others (Campbell and Bowles 1994, Merten and Durden 2000, Childs and Paddock 2003, Cooney and Burgdorfer 1974, Schulze et al. 1984). For these reasons, ticks have been identified as a vector of public health significance and of economic importance in the United States (Childs and Paddock 2003, Assadian and Stanek 2002).

- West Nile Virus: This is a mosquito-borne disease that can cause encephalitis or brain infection. West Nile virus is expanded from infected mosquitoes that produce their young in standing water. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. Though less than one percent of mosquitoes are infected with West Nile virus, they still are very effective in transmitting the virus to humans, horses, and wildlife. Although most of the attention focused on human health issues, the virus has had an impact on vertebrate wildlife populations. For example, in 2003 it was reported that West Nile virus had been detected in 157 bird species, horses, 16 other mammals, and alligators (Marra et al. 2004). In the eastern U.S., avian populations have incurred very high mortality, particularly crows, jays, and related species. In Wyoming, seven human, four avian, and five equine cases were reported in 2012 (Wyoming Department of Health 2013). Population impacts of West Nile virus on raptors are unknown at present, yet this group of birds may be susceptible to the disease (Farmer and Smith 2009).

Campbell County believes that effective management of wildlife is best achieved by giving focused value for those who live with it. Therefore, incentives and assistance for protection of wildlife on private land should be encouraged. There must also be a positive correlation between the quality and benefit of the wildlife management tools applied to protect wildlife and the magnitude of the benefit achieved. The effect of the management tools applied to protect wildlife should be as small as practical to achieve the desired benefit. Wildlife management efforts shall reduce predation of sensitive species, maintain existing hunting and fishing opportunities, increase opportunities within appropriate carrying capacities if warranted, decrease game damage conflicts, and generally balance wildlife numbers with other factions representing the custom, culture, and multiple use values of the county.

## **Goal**

To achieve and maintain sustainable wildlife populations of game and non-game species for hunting, recreation, tourism, economic development, and ecosystem balance through management and conservation based on credible scientific data.

## Objectives

- *Cooperative efforts and collaborative agreements between citizens, county, local, state, and federal governments; wildlife management agencies; and industry stakeholders.*
- *Predator control based on economics, logistics, and Credible Scientific Data.*
- *Improved health and disease management of wildlife and prevention of transmission of wildlife diseases to domestic livestock and human populations.*
- *Local participation in wildlife management decisions involving harvest and conservation strategies.*
- *Adequate open space capable of supporting diverse wildlife populations.*
- *Local participation in federal designation of wildlife management and habitat areas.*

## Policies

- *Hunting and fishing opportunities shall remain available in Campbell County.*
- *Base wildlife habitat conservation, development, and management decisions on credible scientific data.*
- *Keep mapping data current and validated by source and credible scientific data collection methods.*
- *State and federal agencies shall:*
  - *allocate sufficient resources to protect, restore, and reclaim game-damaged agricultural resources, pursuant to state law and regulation; and*
  - *implement cooperative partnerships with affected stakeholders to address energy development and wildlife conflicts.*

Fish and wildlife management should include actions to appropriately mitigate surface-disturbing activities and maintain or improve fish and wildlife habitat. Management calls for collaboration with agencies and other stakeholders to manage migration and movement barriers, to regulate activities potentially affecting native and desirable non-native species, and to control harmful non-native vegetation in important habitats. Fish and wildlife habitats are maintained or improved through vegetative manipulations, habitat improvement projects, livestock grazing strategies, and fishing and hunting regulations. The development and implementation of these wildlife habitat management and conservation activities should be based on Credible Scientific Data, should be shared and encouraged among private landowners, and should be supported and guided by State and Federal agencies responsible for land and wildlife management, in order to provide enhanced habitat and resources for wildlife. In addition, State and Federal land and wildlife management agencies should allocate sufficient resources to protect, restore, and reclaim game-damaged agricultural resources and should implement cooperative partnerships with affected stakeholders to address energy development and wildlife conflicts.

Multi-agency cooperation is instrumental for managing habitat and wildlife populations. Managing barriers to fish passage in cooperation with agencies and other stakeholders would



have a beneficial effect on sensitive fish species because these barriers can be used to allow certain species to move into new habitats or to keep competitor fish out of specific water bodies. Management activities with the potential to affect native and desirable non-native fish species should benefit special status species, and cooperation and input from several players is instrumental in achieving realistic goals and strategies.

- ***Predator control shall be a component of wildlife management.***

Anthropogenic structures and human practices can provide access for predator species, with detrimental effects. For wildlife, for example, Barrineau et al. (2007) identified the biggest concern for native fish species conservation as the establishment of non-native piscivorous fishes (e.g., green sunfish). Predator control should be a component of wildlife management. Predatory species such as coyote, red fox, raccoon, porcupine, skunk, and jackrabbit, may be hunted or trapped without a license, and there is no closed season. USDA APHIS-WS conducts predatory animal damage-control activities on public lands (BLM 2000). USDA APHIS-WS performs these activities in response to requests from individuals, organizations, and agencies experiencing damage caused by wildlife. Animal damage-control activities primarily include mechanical (trapping, shooting, and denning), chemical (poison), and nonlethal methods (e.g., noise devices and aversive conditioning). Through the ADMB, the State of Wyoming also performs animal damage-control activities, particularly actions involving rabies and other diseases.

The management challenge for animal damage-control activities is to implement a program that responds to predation problems and remains socially acceptable and safe in accordance with applicable laws and regulations.

- ***State and federal agencies shall allocate necessary finances, personnel, and laboratory resources to wildlife disease containment and eradication; and use all available means to reduce and eliminate the transmission of wildlife disease to domestic livestock and human populations.***

Natural variability in wildlife health, population levels, and habitat conditions are part of the natural, stochastic processes driving population dynamics. Periods of mild or severe weather and outbreaks of wildlife disease or insects and plant diseases that impact habitat could impact wildlife population levels. However, disease spread and prevalence can be avoided and minimized through outreach, and educational opportunities will increase with increased recreational access to fisheries and wildlife.

Of importance is the ability of multiple stakeholders and agencies to work together to educate the public of these diseases, as well as provide suggestions of preventive measures. Consideration of public health should play a role in management strategies with implications for zoonotic diseases (Lee et al. 2010). Many times field studies examining the role of hosts in sustaining and spreading diseases and vectors are not permitted due to regulatory restrictions (Pound et al. 2010), illustrating the threats posed to eradication programs and to enterprises. Several methods, including culling and exclusion, have been put in place for eradicating outbreaks involving



wildlife hosts (Hood and Inglis 1974, George 1990, Willadsen et al. 1995). Methods of prevention and eradication should be carefully evaluated before being implemented to minimize costs and time, and to maximize success. For example, cattle fever tick eradication was achieved in Florida only after several deer were killed (Shillinger 1938).

New concepts are needed to prevent continued spread that will result in an increase in economic and animal health burdens for producers/landowners, and for the general public. Vaccination of domestic animals is an alternative to chemical controls for some diseases (Hernández 1998), however, many times vaccine effects are not immediate and their action takes place over long periods of time, therefore, multiple strategies have to be out in place simultaneously (Ruvalcaba-Fernández 2009). Habitat management and land use practices, such as proper disposal of stagnant surface water from mining and livestock water facilities, are linked to the control of some diseases. Biological control is also available for some diseases, with variable outcomes (Wesenberg et al. 2012).

The timing of seasonal fluctuations of hosts relative to that of the vector life stages may be a critical aspect of vector-borne pathogen dynamics in nature, and landscape changes that affect host diversity and community composition can affect disease risk to humans, therefore it is important to determine the efficacy of host-targeted treatments as alternative approaches to control of vectors populations (Schmidt and Ostfeld 2001, Schauber and Ostfeld, 2002, LoGiudice et al. 2003). Exclusion of definitive hosts often has been suggested as a method of disease control (Ginsberg et al. 2002, Perkins et al. 2006), and cost-effectiveness of control schemes can be increased by using a combination of control methods designed for specific landscapes.

Current eradication and prevention programs are faced with a number of challenges including lack of scientific information, widespread occurrence of these diseases, increasingly restrictive regulatory policies pertaining to the use of pesticides, multi-species communities of wild hosts, and changing plant communities that provide an abundance of habitats favorable to the survival of vectors (Pérez de León et al. 2012).

- *Appoint one (1) local wildlife/animal interest representative to any state or federal agency team-based decision making process pertaining to wildlife resources.*
- *State and federal agencies shall seek public input in setting licensing, harvesting, and population management numbers for wildlife.*
- *Federal land management planning decisions be implemented to support recommended licensing/harvesting numbers as articulated by the Wyoming Game & Fish Commission.*
- *State and federal land management decisions shall not reduce currently existing access for hunting and fishing opportunities.*
- *Recognize and uphold private property rights in negotiations and/or acquisition of private lands for public access to state and federal lands for hunting and fishing opportunities.*

- *Support land exchanges in acquiring access to state and federal lands for hunting and fishing opportunities.*

Recognition of the limited capacity of natural populations to recover from hunting pressure guided the first attempts at conservation and restoration of wildlife, and more recently by other leaders and organizations after the recognition that other environmental stressors, such as habitat degradation and fragmentation, are important components of conservation (Bbrowne 2010, Soule 1985). Public workshops on the subject, conducted by educative institutions such as community colleges, or government agencies could be targeted to the middle-aged population, since they would be the fraction of the population most likely interested in wildlife management and conservation, especially in the current era of rapid climate change, loss of biodiversity, and value of ecosystem services, subjects widely commented in the news.

Campbell County has a rich culture of respect for hunting and its economy and social stability depend largely on such activity. Big game hunting defines the custom and economic viability for many private landowners, citizens, and rural communities. Uses of wildlife such as hunting, outfitting, photography, and recreational enjoyment are part of the custom and culture of Campbell County and can be used in favor or management and conservation practices.

Several big game herds within the county have greatly exceeded their desired number of individuals (WGFD 2009a). Causes for management challenges of these populations that are substantially higher than the objective include limited hunter access to private lands for hunting at a level sufficient to allow effective herd management, migration and movement of animals between regulated and non-regulated hunt areas, lack of accurate classification samples and density estimates, and hunter/harvest distribution associated with private versus public lands. (WGFD 2007). These challenges can be reduced by: a) securing the availability of hunting and fishing opportunities, b) seeking public input in setting licensing, harvesting , and population management numbers for wildlife c) implementing Federal land management planning decisions that comply with recommended licensing/harvesting numbers as articulated by the Wyoming Game and Fish Commission, d) recognizing and upholding private property rights in negotiations and/or acquisition of private lands for public access to state and federal lands for hunting and fishing, e) supporting land exchanges in acquiring access to state and federal lands for hunting and fishing, f) maintaining of currently existing access for hunting and fishing opportunities by State and federal land management decisions, and g) considering and opposing, if warranted, perpetual wildlife conservation easements and/or specially designated wildlife conservation areas that prohibit, preclude, or impair the ability of future generations to utilize land resources for future needs.

- *Wildlife shall be managed to population objectives based in the land's carrying capacity in balance with other land uses.*

Wildlife numbers have to be managed in accordance with the land's carrying capacity in balance with other land uses, however, range management practices have traditionally focused on providing forage and suitable habitat for domestic animals only. Only recently, interest in wildlife income has required modification of traditional practices to embrace the wildlife



component. In many cases, several species of ungulates can be found in a given rangeland, making even more difficult the assessment and implementation of management plans. Livestock management practices can have a profound impact on wildlife population dynamics, and the key to a successful holistic management is to consider both domestic and wild animals as integrated parts of the ecosystem (Ortega and Bryant 2005). Ranchers managing multi-species herds could use input from agencies to evaluate and anticipate species-specific impacts on forage resources. Information related to the demands of different herbivores on different forage categories would be useful in making appropriate stocking rate adjustments to avoid overgrazing and long-term deterioration of range conditions, with implications for wildlife.

Management actions for fish generally address water sources and rights, land tenure along river basins; habitat restoration, improvement, connectivity, and conservation; and impacts from authorized activities. Major threats to species associated with aquatic, riparian, and wetland habitats are habitat alteration caused by channelization and dam construction, inducing replacement of estuarine and flooded areas by permanent lakes, sedimentation, increased concentrations of salts and metals, fuel and drilling fluid runoff, introductions of predatory fish, increased clarity and alteration of flow stabilization, and alteration of water flow and temperature. These changes have altered riverine communities throughout the county. For example, comparisons of data collected over the past 50 years suggest that of the fish species present in the Belle Fourche River Basin, nine have declined over from 1960s to 1990s at different spatial scales (WGFD 2008). On the other hand, Gerhardt and Hubert (1991) estimated very low overall fishing pressures on the Powder River. Proactive fish management includes performing restoration of important stream segments for fish habitat and designing crossings to maintain connectivity and flow of nutrients, food, and fishes.

Since much of the funding generated for wildlife and conservation programs has traditionally originated from revenue associated to hunting and fishing activities of game species, efforts of government agencies have traditionally focused toward programs geared to sustainability of such game species, overlooking other aspects of wildlife management (Williams 2010, Bolen and Robinson 2003). Conservation of fish and wildlife resources can be achieved through the application of management strategies aimed at moderate levels of resource use and by setting realistic, attainable objectives of resource use.

Over the last century, there has been an overlap in the consumptive and non-consumptive uses of wildlife, viewing the enjoyment of nature as a more passive activity (Connelly et al. 1985). Programs for additional funding have been established by individual states, and money raised in such manner has been used for management of non-game species, but income from such sources is very fluctuating and impedes the successful implementation of several long-term programs for management of non-game species (Harpman and Reuler 1985). Interest in non-game species has increased, and initiatives for their conservation and management greatly reside on private agencies, non-governmental organizations, and academic institutions. The success of any conservation strategy for both fish and wildlife populations will largely depend on involvement of local communities, reasonable restrictions, and trade-offs between goals and regulations.

- *State and federal agencies shall:*
  - *consult, coordinate, and cooperate with local governments and affected stakeholders in the establishment of any wildlife management area or habitat conservation area; and*
  - *address and mitigate negative impacts to wildlife using locally based solutions and cooperative efforts with affected stakeholders.*

Since a vast percentage of the land in Campbell county is privately owned (Figure 3-22), and given that properly managed harvested crops and grazed lands could provide valuable wildlife habitat by serving as feeding areas for migrating and wintering species such as cranes and waterfowl, this type of multi-scale approach is only possible through involvement of local communities, which should help in guiding management and conservation strategies aimed at achieving and maintaining desired wildlife population levels at sustainable harvesting rates. Therefore state and federal land management planning decisions shall address and mitigate negative impacts to wildlife using locally based solutions and cooperative efforts with affected stakeholders, with one local wildlife/animal interest representative being appointed to any state or federal agency team-based decision making process pertaining to wildlife resources.

- *State and federal agencies shall be encouraged to provide financial and material support for private landowners in resource enhancement to provide enhanced habitat for wildlife.*

Habitat suitability for wildlife is determined by resource availability, and by patch characteristics including patch size, shape, connectivity, and vegetative composition (Pulliam and Dunning 1987, Ginter and Desmond 2005, Graham and Blake 2001, Pearson and Simons 2002). Habitat conversion and fragmentation cause a shift in resources and landscape configuration, and this degradation contributes to a reduction in livestock carrying capacity, a decrease in biodiversity, alteration of nutrient cycling, changes in species composition, and increased soil erosion (Nielson 1986, Winter et al. 2000, Davis 2004, Whitford 2002).

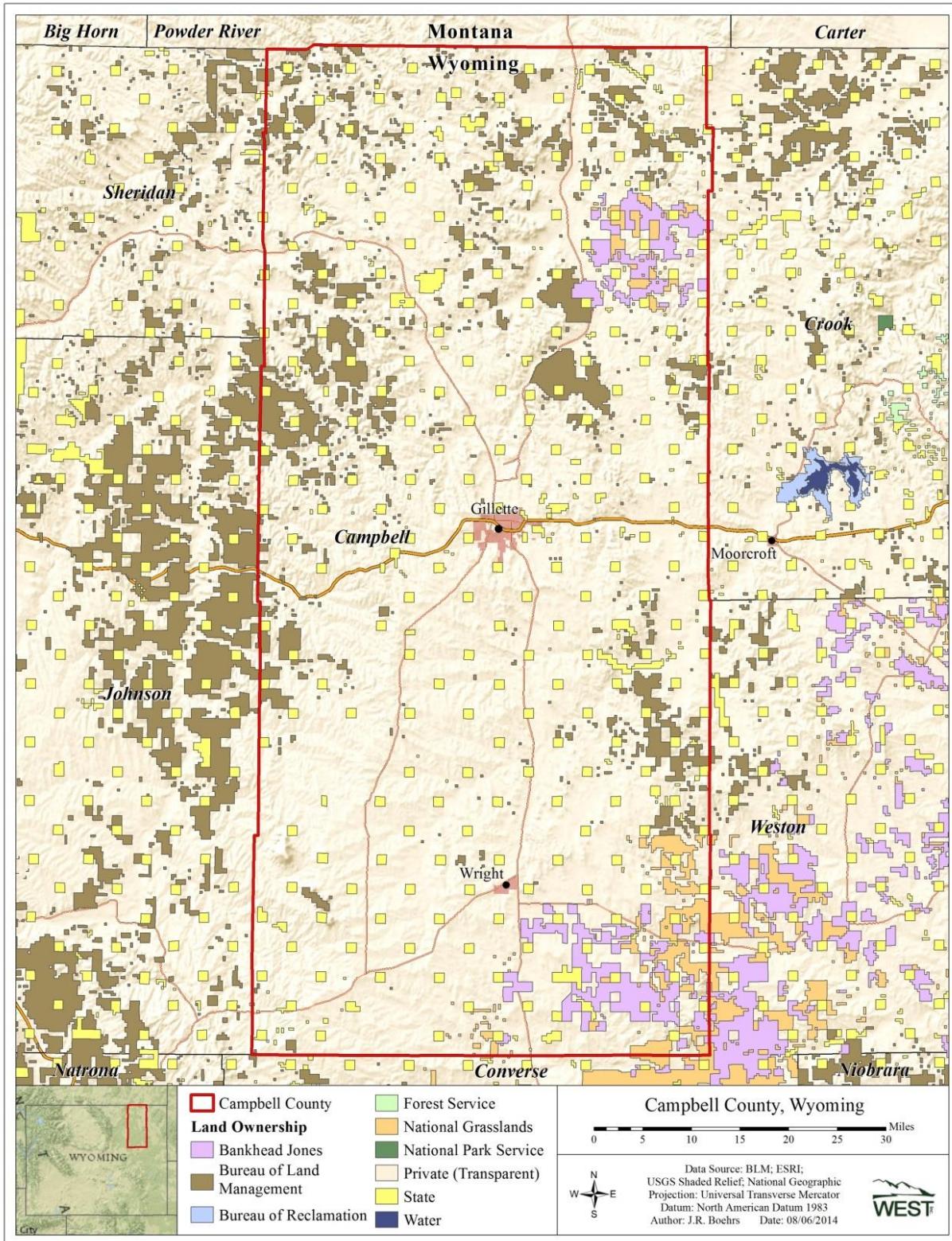


Figure 3-22. Land ownership in Campbell County.

Loss of open space has been defined as one of the threats faced by forests and grasslands (USFS 2006). Development of open space affects the ability to manage national forests and grasslands, as well as the ability to help private landowners and communities manage their land for public and private benefits (USFS 2014b). Approximately 40% of the original sagebrush extension in North America has already been lost and the vast majority of what remains has been heavily modified (Connelly et al. 2004). Sagebrush shrub steppe associations are widespread in Wyoming (WGFD 2009b). Wildlife associations with this habitat include several species including one federal candidate species (greater sage-grouse). A strategy that provides a framework to focus existing and new actions for conserving open space is needed in order to maintain ecosystem function and processes to minimize impacts and maintain connectivity, areas of native grassland and shrubland areas that are currently in good condition should be avoided, and when not possible, mitigation strategies should be implemented.

Campbell County contains a considerable amount of grassland/herbaceous and shrub/scrub cover, with the potential to support grassland sensitive species and shrubland adapted birds that are likely to be negatively affected by development. Species potentially affected include several grassland obligate species and area sensitive species such as the mountain plover, burrowing owl, lark bunting, McCown's longspur, and Sprague's pipit (Ribic et al. 2009), as well as shrub adapted, area dependent species such as the greater sage grouse, the Brewer's sparrow, and the lark sparrow.

The Little Powder and Belle Fourche Rivers, lined with wetland and riparian features, run through the county, providing herbaceous and woody wetland habitats as well as aquatic connectivity and habitat for several native species and species of concern (WGFD 2009b). Riparian and wetland habitat should be maintained in those areas where watershed integrity is still high, and actions should be taken to improve this habitat where integrity has been degraded.

Wetlands and riparian areas are incredibly diverse and valuable habitats. Many wildlife species depend on these habitats for all or part of their life-cycles and some are present in no other habitat types. Water development projects that alter discharges, turbidities, water temperatures, and sediment transport, likely result in a change to the endemic fish and wildlife community. Small irrigation diversion structures and impassable road crossings fragment habitat and could be interfering with some life-cycle requirements of some native fish species, while alteration of the riparian habitats associated with rivers and open water might have effects on terrestrial wildlife. Improving and maintaining water quality in streams and rivers, and improving the conditions of riparian habitats are key components to managing aquatic and wildlife resources throughout the county.

State and federal land and wildlife management agencies shall consult, coordinate, and cooperate with local governments and affected stakeholders in the establishment of any wildlife management area or habitat conservation area.

- *Keep raptor nesting and population maps current and distinguish between active and inactive nests.*
- *Collect credible scientific data regarding effects of increasing raptor populations on prey species.*

- *Substantiate raptor protection from human activity by credible scientific data that warrants protection and provides proof that raptors cannot co-exist with human activity.*

Campbell County provides suitable habitats for a diverse composition of bird species including many raptors. Raptors are included in all land management decisions by state and federal agencies as they are offered protection along with a majority of other bird species in the US by the MBTA (16 U.S.C. 703). Eagles are further protected under the BGEPA (16 U.S.C. 668). The BLM Buffalo Field Office, which manages BLM lands in Campbell County, maintains a database of raptor survey data from studies conducted on the lands they manage (BLM 2014h). These data are used in the evaluation of proposed projects requesting various permits from the BLM as well as establishing mitigation measures and permit requirements. One important use of the BLM data involves the application of the USFWS raptor seasonal nesting protective buffers around active nests. These buffers are designed to minimize the potential “take” of raptors during any human-related activity. Campbell County conducted an independent review of the accuracy and consistency of the raptor nest location data that the BLM maintains (Ecosystem Research Group 2014). In summary, the independent review involved verification of the data through ground-based and aerial survey efforts conducted during April 2014. The study stated that the database maintained by the BLM was generally accurate, effective, and thorough as it related to past raptor nest survey efforts. The study did identify several nuances and factors that are important to consider regarding the BLM raptor nest location data. These include the fact that the BLM continues to map and buffer nests that are in the database, but the data associated with the nest states that the nest is no longer in existence. The result of this is that areas within Campbell County are being protected when perhaps no nest exists. Additionally, post-discovery follow-up survey efforts are inconsistent across the nests with some nests sites surveyed multiple times while other nests not visited with the last 15 to 20 years. Updating the data could provide valuable information for understanding the relationship between raptor nest occupancy and energy and residential development. This study suggests that the application of protective buffers on species that are known to be highly tolerant of human presence and activities, such as American kestrels, red-tailed hawks, and great horned owls, are relatively ineffective barriers and offer no critical conservation value to these raptor species (Johnson and Anderson 2002, Stout et al. 2006, Utah National Guard 2011). It is suggested that the USFWS protective buffers be applied to the most sensitive raptor species or those listed as species of concern by the BLM.

The BLM raptor database is the foundation of another study conducted by the Chalfoun Lab of the Wyoming Cooperative Fish and Wildlife Research Unit that evaluated changes in raptor nest use in the Powder River Basin, which includes Campbell County. This study proposed to determine (1) temporal and spatial trends in raptor nest activity in relation to coal bed methane (CBM) development, (2) differing reactions between raptor species to an increasingly disturbed environment, and (3) additional environmental factors (besides the CBM wells) that may be influencing changes in raptor activity (Wyoming Cooperative Fish and Wildlife Research Unit 2010). The BLM proposes to use the results to evaluate their current timing limitations typically stated in the Conditions of Approval (COA) for CBM wells and to develop species-specific disturbance-free buffer zones around CBM wells (Wyoming Cooperative Fish and Wildlife Research Unit 2010). A manuscript presenting the results of this study is in process, however a poster highlighting the findings is available and concludes that raptor nest use is declining and



the data do not implicate energy development as the direct cause (Wyoming Cooperative Fish and Wildlife Research Unit 2010). Other factors known to negatively affect raptors include decreased prey abundance, drought, lack of quality nest sites, encroachment of invasive grasses and human disturbances may be partially affecting the decline in nest use (USFWS 2008).

According to the WGFD, Threatened, Endangered, and Nongame Bird and Mammal Investigations Annual Completion Reports from 2013 and 2014, it appears that golden eagle and ferruginous hawk populations are stable in Wyoming, while the bald eagle populations may have increased slightly in the Green River Basin (WGFD 2013c, 2014c). The data collected by the WGFD in these studies will be used to determine the potential impacts of human related activities (i.e., oil and gas development) on these raptor species. The report related to the ferruginous hawk states that the availability of prey may limit the abundance of nesting pairs in various regions supporting the notion that the management of prey species will affect the raptor population. Similarly, if the raptor population should increase this type of monitoring should continue regarding the prey species.

Thunder Basin National Grasslands maintains a raptor database, Thunder Basin Database, tracking over 1,200 known raptor nest within the grasslands (both in and out of Campbell County). Ferruginous hawk and golden eagles dominate the Thunder Basin Database, which appears to support WGFD data that these species' populations are stable. The majority of the Thunder Basin's surveys are ground based and associated with projects on the grasslands with an estimated 85% of nest locations known. Jim Byer of the USFS Douglas field office and whom oversees the Thunder Basin Database, identified the database as containing information about sensitive species and therefore not made available to the public (Hillis et al. 2015). Mr. Byer's also described the Thunder Basin Database as unwieldly in size and difficult to keep nest status current making it difficult to maintain consistency in nest data between different agency databases (Hillis et al. 2015).

Campbell County presented a symposium in 2015 that focused on the science needed to strike a better balance between energy development and raptor habitat protections in the State of Wyoming. The symposium was based on the premise that the stipulations in place to prevent the taking of raptors under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act of 1940 are based on limited data for many species and vary from locality and agency. The symposium was designed to identify how the existing data could be used to improve the stipulations and to identify the new data needed to improve the stipulations. The symposium fostered a greater cooperation between the entities engaged in surveying, monitoring, and decision-making regarding habitat use and energy development. This symposium exemplified the interest and commitment Campbell County has related to this issue.

- *Oppose single species management on state and federal lands.*

Campbell County is concerned that management decisions to improve habitat for one species may result in negative impacts to another species. There are several approaches for conservation and management of wildlife including single-species, multi-species, umbrella species, flagship species, keystone species, and indicator species. It has been shown that any one approach



contains advantages and disadvantages (Block et al 1995, Roberge and Angelstam 2004, and Simberloff 1998).

In Wyoming, state and federal agencies applied the umbrella species concept for the conservation and management of the greater sage-grouse. An umbrella species is generally defined as one whose conservation confers protection to a large number of naturally co-occurring species (Roberge and Angelstam 2004). The umbrella species concept, defined as a way to use species requirements as a basis for conservation planning, has received growing attention. The assumption is that this concept will identify the minimum size for conservation areas and set minimum standards for the composition, structure, and processes of the ecosystem to be included. Wildlife biologists have expressed concerns regarding the validity of the umbrella concept to protect other species (Simberloff 1998, Roberge and Angelstam 2004, Ozaki et al 2006). Concerns with this concept revolve around the ability to verify that the co-occurring species are being protected as well. In some cases, the umbrella species was able to adapt to changes in habitat conditions while the co-occurring species cannot and that larger home ranges for umbrella species affect their ability to adapt (Ozaki et al. 2006, Roberge and Angelstam 2004). A study is underway to determine if the Wyoming greater sage-grouse umbrella concept is providing conservation for non-game species and at what spatial scale for the co-occurring species (Wyoming Cooperative Fish and Wildlife Research Unit 2014). This study will be valuable to determine if the objectives for the co-occurring species within the umbrella concept are being met through the greater sage-grouse conservation.

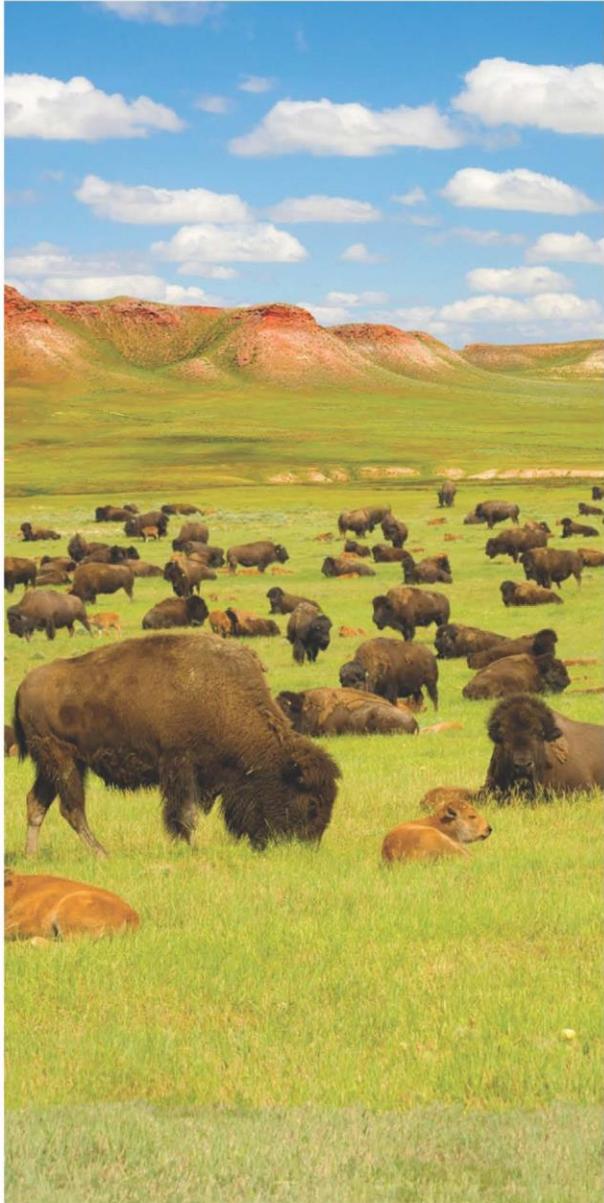
### **Campbell County Position Summary**

Based on the information regarding wildlife presented above, and the importance of resource extraction to the economy of Campbell County, it is the overall position of Campbell County to encourage and support current and future resource extraction activities within the county.

It is Campbell County's position that resource extraction can be performed in a responsible manner that allows wildlife to continue to flourish within the county. Campbell County does have concerns regarding the application of current and future protective buffers applied to wildlife habitat and elements (such as raptor nests). The buffers identify areas where the types and timing of activities are restricted or not permitted in an effort to protect wildlife. These buffers impact both the industry and the private landowner. Industry has to develop operation plans to address these restrictions that can include altering work schedules or locations of infrastructure. Landowners may be restricted from allowing development to occur on their property. Because of the economic implications to the industry and private landowners, Campbell County requests that the application of any productive buffer be based on current data and that the economic implication of the buffer be evaluated. It is Campbell County's intentions to continue to work with stakeholders and state and federal agencies to further the dialogue related to the application of protective buffers.

# Campbell County State and Federal Land Use Policy

## Chapter 4 ECONOMIC AND RESOURCE USES



## Chapter 4 – Economics and Resource Uses

### Economics

#### Custom and Culture

Campbell County's economy has historically revolved around ranching and energy resource development, especially coal mining and oil production. Although ranching and farming currently account for a relatively modest amount of income, jobs and assessed valuation in the county, this sector is important as a basic economic sector or engine of economic activity. Agriculture is an important part of the CCNRLUP because of its extensive amount of land use, the interface of agricultural land use with state and federal property, and the pillars ranching represent to the Campbell County social and political structure.

Since the 1980's, the energy industry has been the largest driver of the county's economy and that situation continues today. As part of the Powder River Basin, the volume of Campbell County coal production is internationally noteworthy. Besides coal and oil, Campbell County is a large producer of natural gas and there is coal-fired electricity generation. Energy development activities have created the support for other energy-connected or "satellite" industries, as well as secondary stimulus to construction, retail and wholesale trade, transportation, accommodations and food service and local government.

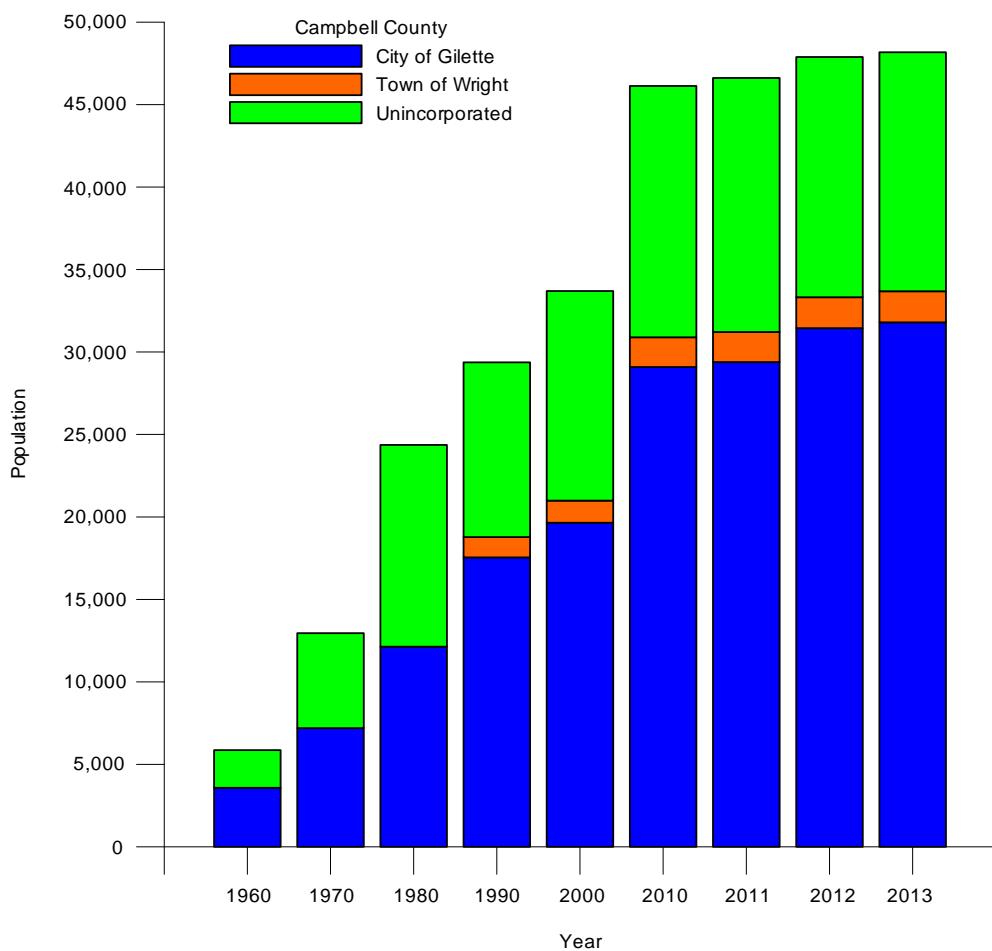
The benefits of the "boom" times of the energy industry include employment and income opportunities as well as a general increase in local commerce and other economic activity. However, price volatility and other factors create "bust" periods, resulting in decreases in employment and economic activity. The county has experienced several "boom and bust" cycles over the last century, more commonly with the petroleum industry. The coal mining sector has been relatively stable in Campbell County. The Livestock and Grazing, Mineral Resources and Energy sections of the CCNRLUP provide additional detail about the specific customs and culture in Campbell County related to ranching, mineral extraction and energy development. Those sections outline Campbell County's goals specifically related to those topics. The Economics section presents a broader picture of the county's economy, along with goals, policies and objectives aimed at supporting the comprehensive set of industries in the county and ensuring the continuation of a variety of economic activities. Overall, Campbell County is aware and supportive of the role that mining and energy development play in the local economy. In addition, Campbell County encourages economic diversification and is interested in supporting activities that are sustainable and which will provide long-term economic stability to the area. Campbell County believes in the use of state and federal properties to support economic development or other activities that will result in additional employment, income and revenue streams to jurisdictions at all levels.

#### Population Trends

With a 2013 population of about 48,200 people (USCB 2014), Campbell County is currently the third most populous county in the State of Wyoming. The majority of County residents (about 66 percent) live in the City of Gillette and a small number of additional residents (about 1,800



people or 4 percent of the county's population) live in the Town of Wright. The approximately 16,000 residents living outside Gillette or Wright live in rural, unincorporated areas throughout the county; these areas may be more likely to feel the direct effects of development or other activities occurring on state or federal lands. The county has experienced substantial increases in population since the 1960s, when mining in the area began in earnest; in fact, the county has grown at a faster rate than the state as a whole since that time. Figure 4-1 illustrates the population growth in Campbell County since 1960.



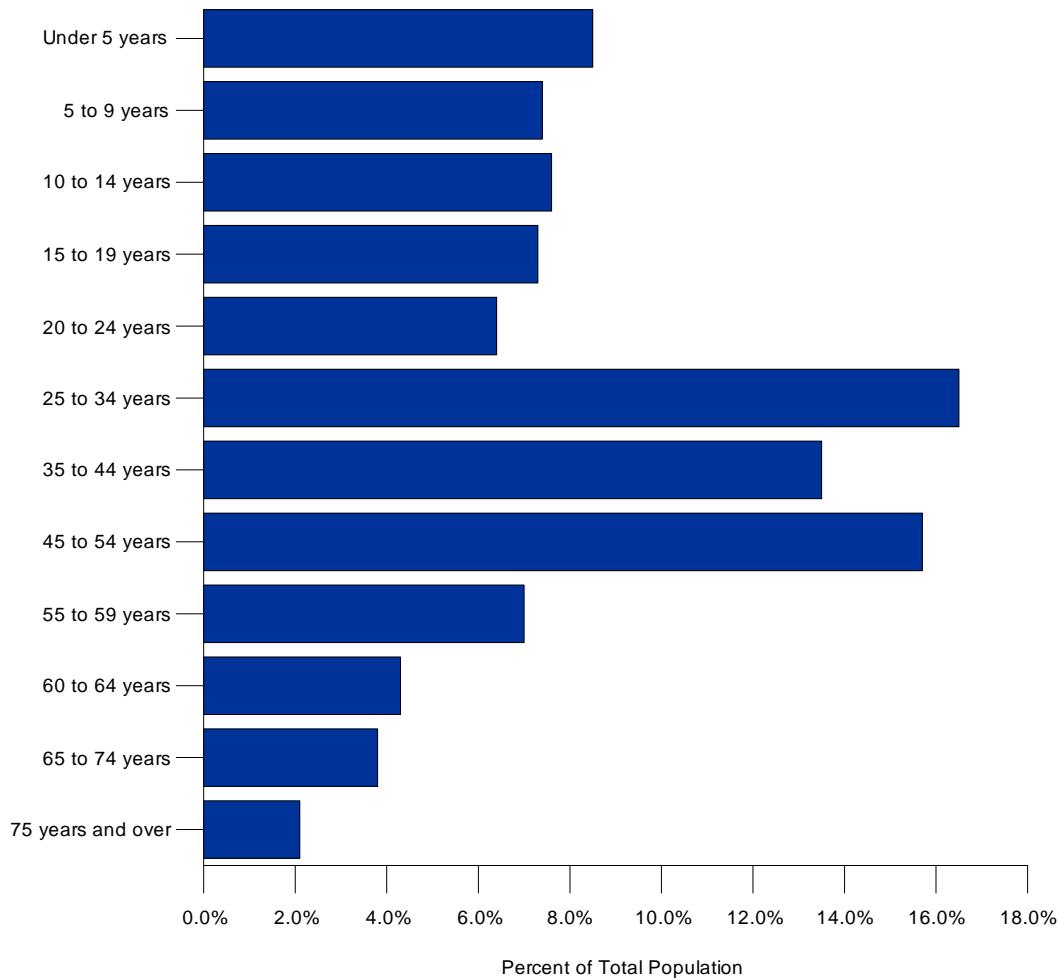
**Figure 4-1. Historical Population in Campbell County, 1960 – 2013.**

Campbell County's population is projected to grow by about 43 percent between 2010 and 2030, to a total population of about 66,000 people, or about 1.8 percent per year (Wyoming Department of Administration and Information 2011). Increases in the county's population are due to a number of factors, including natural population change (births and deaths) and net migration (movement into and out of the county). Since 2010, net migration has been a small portion of the overall increase in the county's population; however, that small number may mask larger numbers of people moving into and leaving the county. In recent years, at any one point in time, between about 7 and 9 percent of the population had recently moved into Campbell County, either from other counties in Wyoming or from out of state.<sup>1</sup> In earlier years (between

<sup>1</sup> U.S. Census Bureau, American Community Survey Data.

2000 and 2011), net migration into Campbell County was a much larger component of the county's overall population change. Net migration amounted to a population increase of over 6,300 people during that period, about 58 percent of the total population change (Economic Profile System- Human Dimensions Toolkit 2012).

Overall, the residents of Campbell County are relatively young, with a median age of about 32 years, compared to a statewide median age of about 37 years. This is consistent with the type of work available in the county, mainly mining related, the majority of which is physically demanding and more likely to attract younger workers. Figure 4-2 presents an age distribution of the Campbell County population. Almost 31 percent of the county's population is 19 years of age or younger; children make up a large portion of total County residents and may require a considerable amount of County investment, i.e. educational services, social services or other types of County funded services. Only a small portion, about 6 percent, of residents are elderly, aged 65 years or more; this group typically requires some level of County supported services. The vast majority of Campbell County citizens are of working age and between the ages of 25 to 55 years.



**Figure 4-2. Age Distribution of Campbell County Residents, 2010 – 2012.**

## ***Housing Availability and Price***

As the population of Campbell County has grown over time, so too has the number of housing units, as shown in Table 4-1.

**Table 4-1. Number of Housing Units in Campbell County, 1980 - 2013**

Year	Campbell County	
	Housing Units	Annual Growth
1980	9,505	NA
1990	11,538	1.96%
2000	13,288	1.42%
2010	18,955	3.62%
2013	19,438	0.84%

The pace and type of energy development activities often dictate the demand for various types of housing units. Coal mining workers often seek more permanent type housing, such as single family homes and apartments. Petroleum industry workers will generally look for more temporary type of units such as motels, mobile homes, apartments and even campers. The majority of housing units in Campbell County are single family homes (60 percent), about 24 percent are mobile homes and about 10 percent are apartments (Wyoming Housing Database Partnership 2014). As of 2010, about 73 percent of occupied housing units were owner-occupied and the remaining 27 percent were renter occupied. Vacancy rates in Campbell County have been about 9.5 percent in recent years; however only about half of vacant units are available for rent or sale.<sup>2</sup>

Between 2010 and 2012, the median value of owner-occupied housing units in Campbell County was about \$199,500, higher than the statewide median of about \$183,200. Rental rates for apartments, mobile homes and houses in Campbell County were slightly higher than statewide average rates for similar properties. For the fourth quarter of 2013, the average rental rate for an apartment in Campbell County was \$707 per month, slightly higher than the statewide average of \$691 per month and about 5.3 percent higher than a year earlier in Campbell County.

## ***Employment and Income Data***

Total employment in Campbell County has grown substantially since 1970, from about 6,000 jobs in 1970 to over 32,500 by 2012. Employment in the mining sector increased from about 1,200 jobs to over 8,700 jobs during that period and increased as a percentage of total County employment. Agriculture employment has remained relatively constant in terms of employees, but has dropped considerably as a percentage of total employment over time. Table 4-2 provides the employment changes in certain key sectors of the economy between 1970 and 2012.

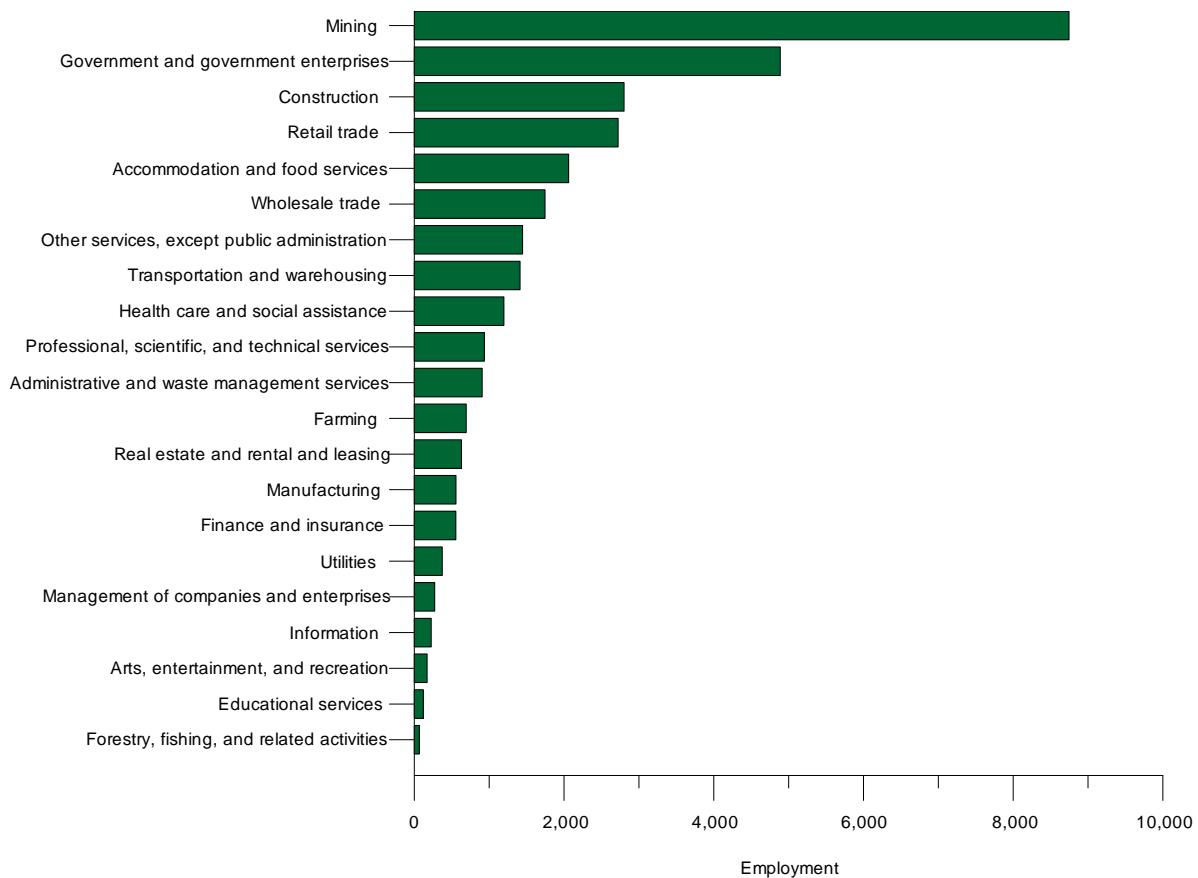
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<sup>2</sup> U.S. Census Bureau, American Community Survey Data

**Table 4-2. Campbell County Employment by Industry, 1970 - 2012**

Industry	1970	1980	1990	2000	2010	2012	% Chg (1970 -2012)	% of Total (1970)	% of Total (2012)
Mining	1,221	4,412	4,863	5,688	8,370	8,746	616%	20.3%	26.9%
Agriculture	732	727	737	899	755	761	4%	12.1%	2.3%
Construction	592	2,641	953	2,013	4,047	2,802	373%	9.8%	8.6%
Retail Trade	1,051	2,378	2,940	3,515	2,680	2,722	159%	17.4%	8.4%
Government	785	1,763	3,005	3,420	4,587	4,888	523%	13.0%	15.0%
All Others	1,645	4,932	6,161	7,665	12,138	12,608	666%	27.3%	38.8%
<b>Total Employment</b>	<b>6,026</b>	<b>16,853</b>	<b>18,659</b>	<b>23,200</b>	<b>32,577</b>	<b>32,527</b>	<b>440%</b>		

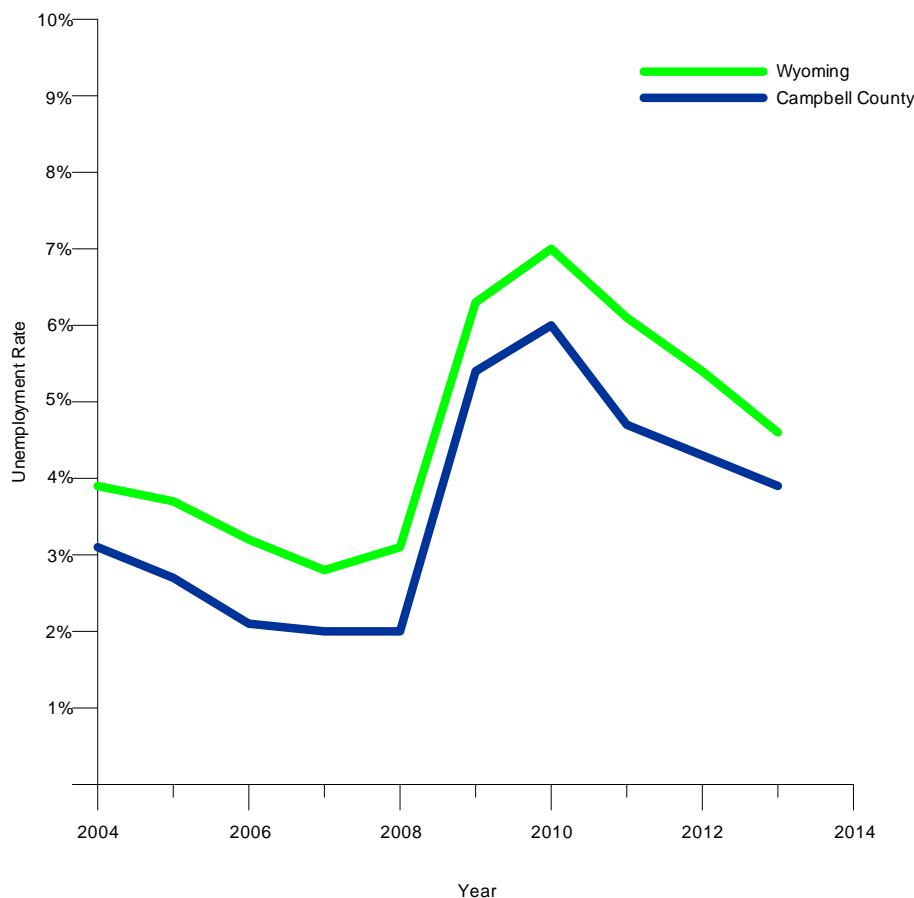
Mining employment currently makes up almost 27 percent of total employment in Campbell County (8,746 employees), far more than any other industry. Figure 4-3 depicts employment by industry for Campbell County in 2012.



**Figure 4-3. Campbell County's Employment by Industry, 2012.**

Economic conditions in Campbell County have resulted in relatively low unemployment rates. Unemployment rates in the county have historically been lower than those of Wyoming, even during recessionary periods or other times of reduced energy activity. As of April 2014, Campbell County's unemployment rate was 2.6 percent, compared to 3.6 percent for the state as a whole. Figure 4-4 offers a comparison of recent unemployment rates in Campbell County and Wyoming through 2013, the last complete year of available data.





**Figure 4-4. Historical Unemployment Rates in Campbell County and Wyoming, 2004 – 2013.**

Campbell County is currently home to about 1,480 business establishments, including 200 in the construction industry, 182 in retail trade and 159 in the mining, quarrying and oil and gas extraction industries.<sup>3</sup> As of 2013, the largest employers in Campbell County included a number of energy, mining and mining support companies, as well as the Campbell County School District, Campbell County Memorial Hospital, Wal-Mart, Campbell County itself, and the City of Gillette (Campbell County Economic Development Corporation [CCEDC] 2014).

Farming and ranching activities currently take place on almost 2.9 million acres and over 740 farms in Campbell County. Livestock production and sales (\$63.3 million) made up about 95 percent of total agricultural activity and related revenues (\$67.2 million) in the county in 2012. Both the number of farms and number of acres used for agricultural purposes was up in 2012, as compared to 2007 (USDA 2012).

The average wage per job in the county has historically been higher than the statewide average, reflecting the existence of relatively high paying mining related jobs. By 2012, the average wage in Campbell County was about 25 percent higher than that of the state. In 2012, the median

<sup>3</sup> Census Bureau, County Business Patterns.

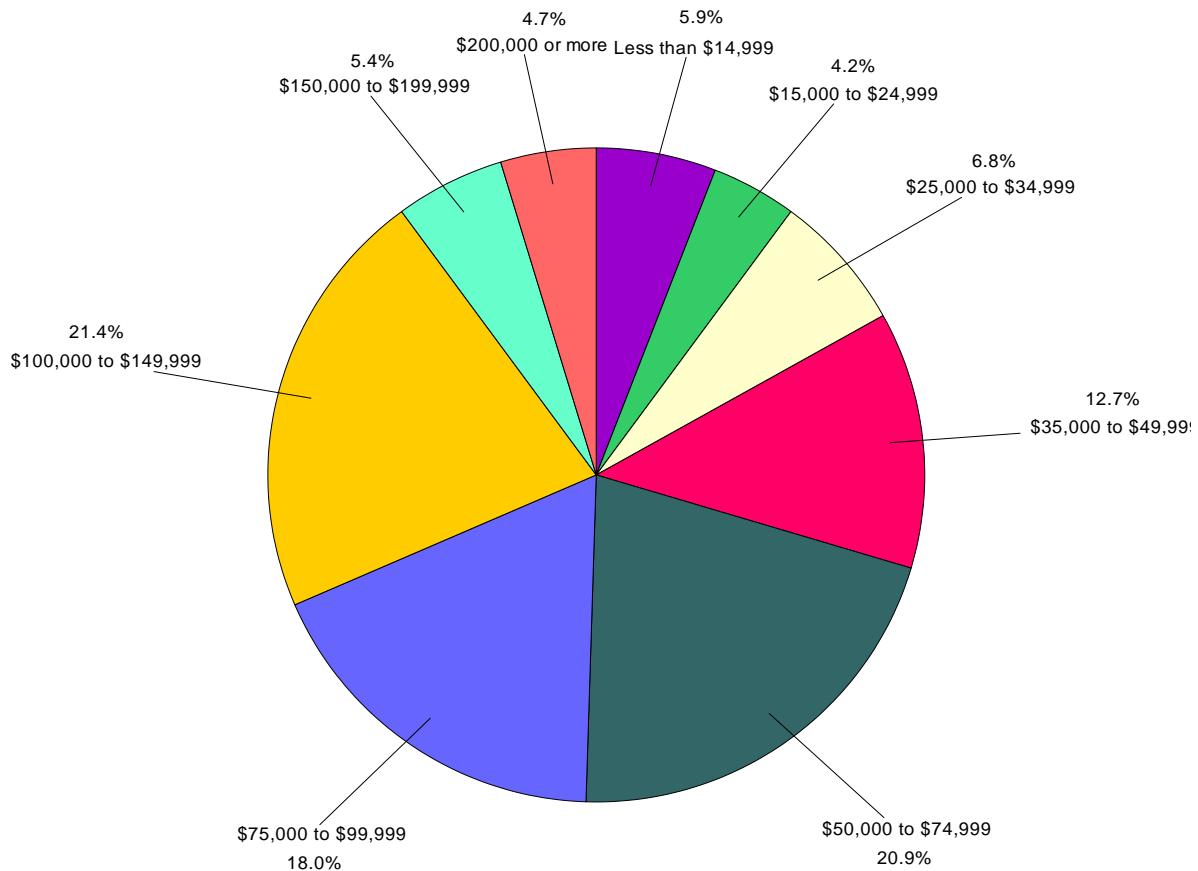
household income in Campbell County was about \$74,200, which was almost a 13 percent increase compared to the median household income in Campbell County in 2000 (after adjustment for inflation) and was about 33 percent higher than that of Wyoming's 2012 median household income. Per capita incomes in Campbell County have historically been higher than or similar to those of the state. Table 4-3 provides wage and income information for Campbell County and Wyoming.

**Table 4-3. Historical Wage and Income Levels for Campbell County and Wyoming, 1970 – 2012.**

Year	Average Wage Per Job		Median Household Income		Per Capita Income	
	Campbell County	Wyoming	Campbell County	Wyoming	Campbell County	Wyoming
1970	\$6,676	\$6,070	\$10,836	\$8,486	\$3,521	\$4,017
1980	\$18,682	\$15,335	\$26,060	\$19,994	\$13,820	\$11,494
1990	\$25,622	\$20,058	\$37,055	\$27,096	\$18,383	\$17,973
2000	\$33,389	\$27,138	\$49,536	\$37,892	\$27,439	\$28,930
2010	\$55,654	\$42,642	\$76,863	\$53,512	\$46,961	\$45,066
2012	\$56,754	\$45,260	\$74,233	\$55,979	\$48,872	\$50,567

Historical wage and income data offers a picture of the economic conditions affecting the average County citizen. Figure 4-5 presents a distribution of Campbell County households by income level. About 10 percent of households had an income of \$25,000 or less between 2010 and 2012. These households may be ones which require additional financial or other types of support from various Campbell County agencies. About 60 percent of households had incomes between \$50,000 and \$150,000 and a small portion of households earned more than \$150,000 per year.

About 6.2 percent of the Campbell County population lived below the poverty level between 2010 and 2012. The portion of County residents below the poverty level is much lower than that of Wyoming as a whole, which has a poverty rate of 11.9 percent.



**Figure 4-5. Distribution of Campbell County Households by Income Level, 2010 – 2012.**

### *Cost of Living*

The cost of living in Campbell County has been higher than for the state as a whole, historically. By the end of 2013, overall living costs in the county were about 4 percent higher than the statewide average (Wyoming Department of Administration and Information 2014). This phenomenon is mainly due to higher costs for housing as compared to some other areas of the state, although food and medical costs in Campbell County are higher than the statewide average. The relatively high cost of living in the county is not unusual for an area that has experienced rapid population and employment growth, along with higher income levels; these factors increase the demands for available housing and place pressures on prices for other goods and services.

### *Fiscal Conditions*

In FY 2013, Campbell County received about \$119.9 million in revenue from a number of sources, including property taxes, sales and use taxes, other tax sources, grants and contributions and other revenue sources (Campbell County 2013b). Property taxes made up about \$64.6 million, more than half of total revenues. In that same year, County expenditures amounted to about \$112 million, including capital outlays and debt service. About 18 percent of total expenditures went towards public safety, including the Sheriff's Office, emergency management and the Joint Powers Fire Board. Another approximately 15 percent went towards public works, including road and bridge projects.

In recent years, the amount of annual property taxes collected by the county increased by several million dollars (from \$58.8 million in 2009 to \$64.6 million in 2013); property tax revenues have increased as a proportion of total revenues (44.8 percent in 2009 to 54.1 percent in 2013). Sales and use tax revenues have decreased in recent years, moving from about \$30 million in 2009 to about \$22 million in 2013. Total County revenues fluctuated between 2009 and 2013 (\$131.3 million in 2009 and \$119.9 in 2013) based on changes in a number of revenue sources. In 2009 revenues were relatively high due to a large amount of grants and contributions in that year; 2011 and 2012 County revenues were \$116.2 million and \$112.4 million, respectively (Campbell County 2009, 2011, 2012, 2013b).

Total County expenditures ranged between about \$125.7 million in 2009 to about \$112 million in 2013. The relatively high 2009 expenditures were related to a large amount of capital investment in that year; 2011 and 2012 County expenditures were \$106.2 million and \$96.2 million, respectively (Campbell County 2009, 2011, 2012, 2013b).

### ***County Facilities and Services***

Campbell County offers a wide variety of public services and maintains a number of facilities. Services relevant to this CCNRLUP include the Campbell County Sheriff's Office and the Campbell County Fire Department. These agencies provide additional law enforcement services and emergency response services to state and federal lands in Campbell County.

- The Campbell County Sheriff's Office provides law enforcement, detention and administrative service to the citizens of Campbell County. The Sheriff's Office includes 151 full-time staff, including five deputies stationed in the Wright area. Facilities include a County detention center with a current inmate population of about 3,000 people. Sheriff's Office staff responded to over 12,400 calls in 2013 (Campbell County 2013a).
- The Campbell County Fire Department is responsible for fire, rescue, EMS and hazardous materials response calls over about 5,000 square miles of land, including Gillette, Wright and rural portions of the county. The Department includes 29 career firefighters and over 150 volunteer firefighters. Volunteer firefighters provide county wide coverage from ten stations and eleven wildland support stations throughout the county. The career staff runs 24-hour coverage out of Fire Station 1 in Gillette and augments volunteer stations. The Department responds to about 2,000 calls a year (Campbell County 2013a).

### ***Social Setting***

In addition to the generally positive economic conditions, a number of other factors contribute to the quality of life for Campbell County residents. Consumer expenditures, driven by relatively high income levels, have attracted additional retail outlets, restaurants and other commercial operations. Tax revenues and funding from other sources have allowed Campbell County, Gillette and Wright to invest in public infrastructure projects and other non-mining related ventures to maintain and improve the quality of life, including educational, recreational and social opportunities for County residents. Both Campbell County Memorial Hospital and Gillette

College have undergone expansions of facilities and programs. Campbell County offers a number of recreational opportunities and events facilities.

Despite the numerous benefits from the energy sector, there are some challenges to the county's social conditions from this development. New residents bring different backgrounds and values compared with existing residents. The promise of opportunity brings transients and job seekers who might not be employable. The energy industry itself is subject to volatility, resulting in rapid inflow and outflow of people. The county and other public jurisdictions are under pressure to provide expanded capacity and improved quality infrastructure and services in a short time. When energy prices fall, county and other facilities must absorb the costs of overcapacity. Periodic housing shortages and surpluses produce a different set of stresses.

## Goal

Strengthen and expand Campbell County's economic base while preserving and building upon the social conditions in the county.

## Objectives

- *Coordination, consultation, and cooperation with state and federal agencies to support and sustain existing economic activities, including energy and mining; agriculture and recreation.*
- *Support for future economic activities on state and federal land that are compatible with other existing or future uses and county goals.*
- *Encouragement for economic diversification in the county that will provide sustainable economic opportunities for residents.*
- *Assurance that activities on state and federal lands are properly mitigated to minimize or eliminate any negative social or economic effects.*

## Policies

- *State and federal agencies shall notify, at the earliest point, Campbell County of any proposed action, change of existing activities, newly permitted activities or changes in regulations that may affect the economic base of the county.*

Proposed actions or permitted activities might include a small event that may result in mainly local impacts or a much larger event that may have larger scale, county-wide impacts. These actions, small or large, have the capability to affect social and economic conditions in Campbell County and impact residents of Gillette, Wright or rural areas. Changes in public land management planning philosophies, strategies or regulations are important to the county's economic activities. For example, a change in grazing regulations would affect agricultural operations, which are a mainstay of the county's economy and heritage. Campbell County desires an open line of communication between the Board of Campbell County Commissioners and the local offices of state and federal agencies regarding the potential for new developments or other activities. The knowledge of what may be to come will allow the county to prepare and plan for the future needs of its staff, businesses and residents.



- *State and federal agencies shall include Campbell County in the review of any proposed developments and in any decision making processes.*

As emphasized throughout the CCNRLUP, Campbell County is supportive of energy development and other economic activities occurring in the county now, as well as those that may take place in future years. Campbell County realizes that at least some of these activities are likely to occur on public lands or require state or federal level analyses for permitting or other purposes. As individuals or agencies charged with providing leadership regarding the direction of County initiatives and ensuring the economic and social viability of the county itself, Campbell County welcomes the opportunity to work closely with state and federal agencies to ensure that projects are beneficial to all stakeholders potentially affected. Inclusion of Campbell County in the proposal review process is likely to have a number of benefits, including access to local knowledge about economic, social or other conditions, development of local credibility and building of trust between agencies. In addition, involving Campbell County in the early stages of project review and discussion could alert state and federal agencies to potential issues and concerns at a time when those projects may be more easily altered or otherwise revised to avoid certain undesirable effects. Campbell County's early and continued involvement in the review process may be able to inform the discussion in such a way as to reduce the need for extensive mitigation once the project is operational or after the project has been completed.

Campbell County's involvement could take many forms, including that of cooperating agency in an EIS or as reviewer and commenter on smaller projects, but Campbell County would like a place at the table during the review process and the opportunity to fully participate and provide feedback and input to state and federal agencies as issues and propositions arise on lands in or affecting the county.

- *State and federal agencies shall collaborate and consult with county agencies and the public to determine the full scope of potential social and economic effects of activities occurring on public lands and Campbell County should be notified of such discussions.*

Discussions with a number of Campbell County representatives, agencies or other groups are appropriate for state and federal agencies as part of the process of identifying potential countywide social and economic impacts of activities occurring on public lands. These groups could include, but are not limited to, the following:

- Campbell County Board of County Commissioners
- Campbell County Economic Development Corporation (CCEDC)
- Northeast Wyoming Economic Development Corporation (NEWEDC)
- Campbell County Planning and Zoning Commission
- Campbell County Weed and Pest Board
- Joint Powers Regional Water Panel

- City of Gillette
- Town of Wright
- Campbell County residents at large

Representatives of these groups are experts in their field and leaders in the community. They are knowledgeable about the historical and existing demographic and economic resources of Campbell County and can provide specific comments and input regarding potential impacts to specific recourse areas. As part of the consultation effort, Campbell County anticipates that state and federal agencies will incorporate comments and inputs into any analysis or final land management decision. Campbell County will work with state and federal agencies to provide the data and other inputs necessary for developing an accurate analysis of potential economic impacts.

- ***State and federal agencies shall:***
  - *entertain opportunities for economic development based on project merits and a comprehensive evaluation of the impacts to local or regional economic conditions;*
  - *perform a socioeconomic impact analysis for each land management activity or decision related to state and federal properties; these analyses shall be conducted by experts familiar with the area's unique history, culture, economy and resources.*
- *Include in socioeconomic impact analyses a description of existing social, demographic, and economic conditions; the analytical methodologies; and the impacts to a comprehensive set of topics, including, but not limited to: population, employment, income levels, industry activity, housing, community services, utility services, schools, fiscal impacts to the county and local jurisdictions, public revenues, public expenditures, transportation, social conditions, and quality of life.*
- *Address in socioeconomic impact analyses the impacts of all phases of development or other activities, including construction and long-term operations, and all impacts of changes in regulations or other long-term planning strategies.*
- *Make socioeconomic impact analyses developed by state and federal agencies publicly available to all county officials, residents, or other citizens.*

The extent, degree and nature of socioeconomic impacts would be specific to individual projects, but small and large scale activities proposed to take place on state or federal lands have the potential to result in a host of social and economic impacts, both positive and negative, to Campbell County and its citizens. If requested by Campbell County, a comprehensive socioeconomic analysis would identify, analyze and quantify the full scope of potential impacts of a project and address both the positive and negative aspects of such a development. These analyses generally include both direct and indirect effects of proposed projects, which may require the use of various economic modeling tools, such as IMPLAN or RIMS multipliers (IMPLAN 2014, US Department of Commerce 2014). Such an analysis would be useful to



Campbell County in planning for impacts and mitigation activities. If an analysis were conducted, Campbell County would prefer a final document that was easily readable to county citizens, in terms of understanding the topics addressed, the methodological approaches used, the anticipated project impacts and the implications for the county. Other options for information dissemination might include a public meeting or other types of presentations.

Socioeconomic impacts are, of course, only one component of a larger analysis and review of any project. State and federal agencies will evaluate all aspects of a project before coming to a final decision on any proposal. However, Campbell County encourages these agencies to actively and seriously consider the socioeconomic effects, as these factors are likely to have far reaching and long-lasting effects on the county.

- ***State and federal agencies shall:***
  - *collaborate with county agencies to develop a meaningful and relevant mitigation plan to address any direct or indirect negative social or economic effects resulting from a state or federal agency permitted activity or planning action; and*
  - *enforce the economic mitigations set forth in approved mitigation plans.*
- ***Revise and modify socioeconomic mitigation plans over time in response to actual, on the ground conditions. Monitoring socioeconomic impacts and adapting the response to those impacts will be needed in order to properly mitigate certain actions.***

Mitigation plans are often required as part of state or federal permitting processes as a way to minimize or eliminate undesirable impacts of a proposed development. These plans include specific activities or other approaches that are to be implemented by certain parties to address the negative impacts of a project. Socioeconomic mitigation actions should be uniquely tailored to the specific effects of individual projects, which can be identified as part of the socioeconomic impact analysis. In fact, it is a clear understanding of the type, location, degree and duration of each project's socioeconomic effects which will form the basis for the development of mitigation plans that are meaningful to the County. Beyond the understanding of project effects is the need to include affected parties and other necessary information in the crafting of those plans to ensure that they are relevant and responsive to County concerns.

Campbell County believes that responses to the following questions can be used to drive the development of meaningful and relevant mitigation plans. Those responses, and the surrounding discussion, will provide focus and direction to these plans and can also work to identify the potential participants to be included in plan development:

- ***Who will be affected by project impacts?*** A project may result in impacts to specific entities, jurisdictions or groups of individuals within the County. Representatives of those groups should be included in the discussion of mitigation activities and in the development of the mitigation plan. Those parties will have a unique stake in project outcomes and may be able to aid in the design of useful mitigation strategies;

- **What County agencies will be responsible for responding to project effects?** Project proponents will be responsible for completing mitigation activities, but affected parties may also look to specific agencies within Campbell County for support or guidance in the event of adverse project effects. Those agencies should also be included in the process of developing mitigation plans. They may have insight into creative mitigation strategies based on the availability of existing infrastructure, programs or processes, or the potential to develop alternative approaches and actions;
- **Which socioeconomic impacts will have the “largest” effects on County residents, agencies or other jurisdictions?** The term “largest” may refer to duration, geographic extent or the value of impact. The degree of effect should also consider any “offsetting” of negative effects resulting from other, beneficial, project outcomes. This question may spur discussion of what types of impacts to focus on in the mitigation plan, or how to prioritize mitigation actions, if that becomes necessary;
- **What impacts are the most important to the County?** It may be the impacts identified as the “largest”, or ones which result in the most interest or concern on the part of County residents. Some socioeconomic project impacts may have the potential to affect the County’s goals or policy objectives for other resources. A discussion on this point may direct state and federal agencies to include certain impacts in the focus of the mitigation plan;
- **Are some resources more sensitive to changes than others?** Some resources may be permanently altered, or experience a worsening of conditions over time, as a result of project activity, without intervention from mitigation actions. It may be a priority to the County or others to address those resources in the mitigation plan in order to avoid irreversible effects;
- **How will the overall mitigation plan and individual mitigation actions be implemented?** In addition to identifying specific mitigation strategies, an implementation plan must be developed to ensure that those strategies are actually put into place and are working to reduce effects. Implementation actions may include identifying the party or parties responsible for performing specific mitigation actions, as well as the timeline for completing those actions.

These questions offer an initial approach to the development of project mitigation plans. They are intended to spur discussion among the County, state and federal agencies and others in order to define project specific mitigation actions and strategies. Campbell County realizes that all projects result in different effects and therefore, mitigation plans will also differ. These questions can be used as an initial framework for developing those plans, although other questions may arise over time.

In all cases, the development of the mitigation plan will benefit from being an inclusive process. Campbell County will work with state and federal agencies to identify and develop appropriate mitigation strategies for socioeconomic resources in response to proposed management activities. Campbell County would also like to have the opportunity to become involved in other phases of plan development, as well as to review and comment on the completed mitigation plan



before it becomes final. The Campbell County perspective, in both plan formulation and execution, will contribute to both the efficiency of that plan and its likelihood for success.

Campbell County anticipates that state and federal agencies will enforce the approved mitigation plan. Enforcement is likely to include monitoring of certain conditions or activities to determine when changes occur as a result of development or other land management activities. County officials and residents must have the expectation that mitigation strategies will be implemented and enforced in order to plan for the future. However, Campbell County acknowledges that resource conditions may change over time for a number of reasons; these changes may result in revision or modifications of any mitigation plan.

Monitoring actual socioeconomic impacts should be a consistent feature of federal or state oversight of newly approved regulations, actions and permits. Projected effects are always subject to unknown influences and may lead to unintended consequences. Regular and explicit monitoring should be performed, leading to corrective action as needed.

- *Campbell County reserves the right to appeal or seek other courses of action when the economic effects of management activities on state and federal land are not fully evaluated, considered, monitored or mitigated as part of any land management decision.*

## **Socioeconomic Considerations for Future Actions**

Given the breadth and sensitivity to socioeconomic resources, the proposed actions or future permitted activities of state or federal agencies, private groups or other parties will undoubtedly result in some level of demographic, economic and/ or social effects within Campbell County. The challenge will be to identify the specific types of socioeconomic effects, the stakeholders that may be affected, the intensity of effects and the period of time over which those effects will occur. Impacts may be widespread, affecting large portions of the population or the economy, or they may be more focused on a particular geographic area, segment of the population or economic group. More than likely, projects will result in a mix of both positive and negative effects and the key socioeconomic issue will be the balance of the tradeoffs. Whatever the extent or degree of potential impacts, the socioeconomic effects to Campbell County residents, businesses, economy and quality of life are important considerations in the evaluation of proposed projects or actions. Clearly, potential changes in demographic, economic or social conditions should be considered in the decision of whether or not to support the permitting of a project, the design of the development or implementation plan of project components and activities or alternatives, and the mitigation plan to address any negative effects.

The analysis of socioeconomic effects for any project or action should begin with a thorough understanding of the action itself. How exactly will that action take place? What existing resources will change as a result of that action? Who is using those resources now or in the future and how will they be affected by the alteration in those resources? When those resources are changed will the effects be positive or negative to present users? How important are those positive or negative effects? This is the starting point for any socioeconomic evaluation.



There are a number of socioeconomic analyses or considerations which may be relevant to all types of projects; beyond that, the specific focus of individual projects would require an emphasis on certain additional socioeconomic factors. The following discussion provides a general outline of the components of socioeconomic analyses, as well as guidance about the resources and data that should be addressed in all impact analyses. Additional topics or issues have been identified for three specific types of projects: the re-introduction of a listed species; changes to air quality regulations; and mineral extraction. However, the complete set of analyses conducted for any project should be determined by the specific characteristics of that project. Additionally, it is important to remember that not all socioeconomic benefits can be quantified; many benefits may only be conducive to a qualitative discussion, however, these may be of equal importance in a socioeconomic evaluation.

### ***General Components of a Comprehensive Socioeconomic Analysis***

A useful and informative socioeconomic analysis will include the following components:

- A detailed description of the socioeconomic attributes of the proposed action itself. This step will define what will occur and how that will affect socioeconomic resources. The specific attributes of the proposed action will provide the focus for the subsequent impact study and evaluation;
- Baseline conditions relevant to the focus of the project in question and the geographic locations potentially affected by project alternatives. For example, the baseline description for a project anticipated to affect agricultural conditions in one area of the county should include data on farms, farm activities, farm income and current agricultural conditions in that area in addition to other socioeconomic characteristics. This element should include an interpretation and discussion of the baseline data to provide a vivid description of the area, in terms of its demographic, economic and social characteristics;
- Analyses of both short-term and long-term impacts. The socioeconomic impacts of the initial stages of a project (i.e. construction activities) may be very different than those experienced in later stages of the project (i.e. operational activities). The socioeconomic impact analysis should identify affected groups and describe specific effects to each of those groups in the short and long-terms;
- An evaluation of total project effects that addresses both direct and indirect impacts. While certain economic sectors will be directly affected by project activities in terms of employment, income or sales, the circulation of money throughout the county will also result in indirect impacts to additional sectors;
- An interpretation of what the impacts mean to the area in terms of intensity, i.e. are impacts negligible or significant;
- A discussion of how the project will impact the area in combination with other projects occurring during the same time period or likely to occur in the future.

## *Socioeconomic Resources Relevant to all Types of Projects*

The following items should be addressed as part of any thorough socioeconomic analysis. This list provides a general idea of the individual topics to be addressed, but may not be a complete set of all possible topics:

- *Population trends and demographic characteristics:* population growth, age distribution, migration patterns, perhaps racial make-up;
- *Housing conditions:* number of housing units, types of housing units, vacancy rates; median home values, rental rates;
- *Economic conditions:* employment by industry; unemployment rates; wages by industry, personal income levels, poverty levels, number and type of businesses, sales volume, cost of living information;
- *Public facilities and services:* water, wastewater, electricity, law enforcement, fire protection, education, waste disposal, medical and social services;
- *Municipal, county, school district or state level fiscal conditions:* revenue sources, revenues by category, expenditures by category;
- *Social context:* values held by local residents related to growth, community, industry activity or other topics;
- Some socioeconomic impact analyses include information about current land ownership patterns and land uses.

## *Additional Analyses Related to the Reintroduction of ESA Listed Species*

In addition to the items listed above, a project or action focusing on the reintroduction of a threatened or endangered animal species, should also take into account the following items:

- A more detailed evaluation of the impacts to private property rights. This should include an examination of any limitations placed on the use of private property or any changes in the value of that property as a result of the proposed action. The socioeconomic effects could include a loss of income or wealth, reduced employment or reduced tax base;
- Potential changes in the allowed uses of public lands, i.e. temporary or permanent closures of certain areas in order to support wildlife or restrictions that may curtail recreation, grazing or other activities on public lands. Limitations on the use of public lands may result in economic impacts to agricultural, recreational or other industries;
- Social and economic effects might extend to a loss of viability for ranchers to the point that they must leave the area;

- The potential for more or less tourism or recreational activity due to the existence of the listed species in the area and the associated spending of those additional visitor days.

### ***Additional Analyses Related to Changes in Air Quality Regulations***

An economic evaluation of a project or action that results in changes to air quality standards or regulations will also include the following:

- A focused analysis on the impacts to specific directly affected industries. If an industry is curtailed, what will the economic losses be? The analysis might address changes in employment and employee income levels, industry sales and revenues or costs incurred to meet new regulations;
- Associated industries might also be affected. Industries that supply the regulated sector should be identified and assessed;
- Changes in county or state level agency revenues related to changes in industry production or activity. This analysis might also identify the items that are funded by agency dollars; for example, education;
- Economic benefits to those industries that may rely on cleaner air, including perhaps the tourism and recreation sectors, and the positive impacts of additional visitor spending;
- The value of improved health, in terms of a reduction in medical visits and medical spending related to air quality issues.

### ***Additional Analyses Related to Mineral Extraction Projects***

Mineral extraction or other projects that focus on energy development will have a variety of socioeconomic effects. Therefore, the social, demographic and economic impact analyses for these types of projects must address a number of components in greater detail than warranted for in other types of projects; these include:

- *Housing resources* – impacts on housing availability and price by type of unit as a result of an influx of workers and other possibly transient people. The housing analysis may also look at the potential for displacement of local residents due to changes in housing prices;
- *Public infrastructure, utilities and services* – rapid increases in local populations place pressure on public agencies to provide continuous, quality service to all users;
- *Timing of industry activity*, in terms of the duration of various project activities and the need for workers at specific points in the process. This factor is of great importance because of the large capital expenditures and long planning and construction periods required to provide new people with items like housing and utilities;



- *Quality of life issues* – the construction and operation of the infrastructure required for mineral extraction may result in heavy traffic volume, safety concerns, noise, dust or other factors that affect residents' perceived quality of life. Large increases in local population, especially due to transient workers may change the “feel” of an area, as well as the social patterns of local residents;
- *Local employment and income levels* – these types of projects will create job opportunities in a number of sectors, including mining, construction, retail and other industries. Generally, the jobs offered by the mining or energy industry are well-paying, often higher than average wages in other industries. In addition, business opportunities and activity may increase for local residents, expanding employment opportunities and possibly increasing income levels. Landowners may see increased income due to lease payments. However, other industries may experience losses of employees or difficulty hiring new employees because of the high wages offered by mining companies;
- *Fiscal conditions of local, county and state agencies and other jurisdictions* –mineral extraction and energy development projects will result in increased revenues to various municipal, state and other agencies; these might include property tax revenue, sales tax revenue and severance taxes. On the other hand, expenditures for items such as road maintenance, public safety and education are likely to increase as well.
- *Impacts to private property values* – certain facilities or other developments in close proximity to these properties may reduce property values as a result of traffic levels, equipment noise, smoke or dust, visual impacts or an influx of transient workers.

## Timber

### Custom and Culture

In Campbell County, timber has provided material for fencing, building, and heating since settlement times. Pine, juniper, and cottonwood trees continue to be a source of lumber, although most timber cutting has been on a small scale.

Native tree species that occur in Campbell County are boxelder (*Acer negundo*), plains cottonwood (*Populus deltoides*), balsam poplar (*Populus balsamifera*), aspen (*Populus tremuloides*), Rocky Mountain juniper (*Juniperus scopulorum*), ponderosa pine (*Pinus ponderosa*), and limber pine (*Pinus flexilis*). Boxelder, plains cottonwood, and balsam poplar can be found in riparian areas; boxelder is also a component of some aspen deciduous forest (Figure 3-10). Rocky Mountain juniper, ponderosa pine, and limber pine occur in xeric and lower montane forests (Figure 3-10). Green ash (*Fraxinus pennsylvanica*) is an ornamental species that has been popular as a street, park and yard tree across the country and in Campbell County municipalities.

Wyoming's timber harvest has been from mountainous regions of the state, where sufficient moisture allows timber to achieve a merchantable size. The nearest current commercial timber

harvesting in northeast Wyoming has been in neighboring Crook County where there are two sawmills, as well as sawmills in nearby South Dakota. Merchantable timber in Campbell County could be taken to these nearby sawmills for processing. Although timber is a minor industry in Campbell County, it is an important resource that has helped many citizens. Currently, agricultural services, including forestry, account for approximately 2.3 percent of total employment in Campbell County (Table 4-2). Local wood products provide reasonably priced heat for homes, fencing supplies, and building materials.

Activities such as timber harvest and fire suppression have changed the composition of forest stands from uneven-aged, where relatively large age differences are found between individual trees; to even-aged, in which all the trees are close to the same age. This leaves forests vulnerable to insects and disease. The current mountain pine beetle infestation might be one of the largest insect blights ever seen in North America (Petit 2007). Beetles favor mature trees more than 14 inches in diameter (Letherman et al. 2011), but have been known to impact trees down to 7-inches in diameter (Means 2014). More than four million acres have been affected in Wyoming since the first signs of the mountain pine beetle outbreak in 1996 (USFS 2013). Aerial survey results from 2015 show that the epidemic is declining in most of Wyoming, with the exception of the northeastern part of the state, where an ongoing outbreak continues in the Black Hills National Forest (USFS 2015). This outbreak could put forests in Campbell County at risk.

In addition to the pine beetle outbreak, the climate and rural character of Campbell County makes the forests vulnerable to catastrophic wildland fires. The past 100+ years of wildland fire suppression has led to heavy vegetation growth that escalates the fuels available to intensify a wildfire. Add to this a growing wildland/urban interface due to subdivisions being developed to house employees of the growing energy industry and protection of these developments could involve more than available fire-fighting equipment can provide. (Wyoming Homeland Security 2011).

All of Wyoming is facing unparalleled disturbances of its forestland due to insects, disease, forest fires, invasive species and drought; these disturbance are both widespread and acute (UW 2010). Campbell County has not escaped these conditions. The impacts of these disturbances limit the ways forests are used and enjoyed, inhibit sustained yields of forest resources, pose a threat to housing and infrastructure at the wildland-urban interface, and degrade wildlife habitat and water quality. In conjunction with the impacts from drought, wildfire, and disease, the ability to apply effective management strategies for dealing with these issues and restoring forests is decreasing due to the fact that the forest products industry in Wyoming has been downsizing over the past three decades (Pappas 2013).

Campbell County believes timber management should occur by working with landowners and government agencies to promote forest health by integrating land management programs to: reduce insect and disease damaged stands and the potential for future infestations; augment fire suppression and defensible space; enhance wildlife habitat, grazing, oil and gas, and recreational opportunities.

## Goal

A sustained timber resource managed for optimum utilization, economic return, and environmental benefit while supporting multiple uses by Campbell County citizens.

## Objectives

- *Diversify age classes and species in timbered areas.*
- *Reduction of insect & disease damage.*
- *Prevention of build-up of excessive fuel loads.*
- *Improvement of wildlife habitat.*
- *Improvement of fire suppression and defensible space.*
- *Utilization of timbered areas for local economic and social benefit.*

## Policies

- *Support private, state, and federal land managers in proper management of harvestable timber areas through best forest management practices, including, but not limited to: timber harvest, thinning, select cutting and clear cut, fire management, and managed grazing practices for the prevention of catastrophic wildfires, insect infestations, and disease outbreaks.*
- *State and federal agencies shall manage for sustaining multiple uses in timbered areas (e.g. timber harvest, livestock grazing, mining, oil & gas production, and recreation).*

It is Campbell County's policy to support private, state, and federal land managers and private landowners in proper management of forested areas through a variety of techniques that will promote diverse age classes and species. Management of timber should focus on maintaining and promoting diverse age classes and species while considering what the desired structure should look like in 100 years. Management techniques may include but are not limited to: timber harvest, thinning, fire management, and managed grazing practices.

Timber harvesting requires advanced planning. For federal agencies, the timber sale planning is analyzed through the NEPA process. For state and private entities, the development of a timber sale plan can be anywhere from an analysis similar to the NEPA process to just a verbal declaration of the expectations from the harvest. It is recommended that a timber sale plan be written and agreed to for all timber sale operations regardless of ownership. The analysis should evaluate the potential for impacts and cumulative effects on the soil and water resources. The planning document should incorporate Wyoming Forestry and Silviculture BMPs whenever the planned activity impacts an area that could be mitigated by employing one or more of the BMPs. Information on field audits of these BMPs is provided in Appendix B. Timber sales should be designed to ensure that timber harvest will maintain or improve hydrographic characteristics by increasing runoff quantity and/or extending the runoff period, maintain water quality and soil productivity, and reduce soil erosion and sedimentation (WDEQ 2004). Additional information on Wyoming BMPs regarding Streamside Management Zones is found in Appendix B. References to soils are found in several federal laws and State Forest Practices Acts (Puffer



1991). Wyoming does not have a Forest Practices Act, so soil management and protection measures during forestry activities are voluntary.

- *Support timber harvest of insect and disease damaged timber stands to improve forest health and prevent catastrophic wild fires and future infestations.*
- *State and federal agencies shall coordinate efforts with all landowners and local governments in treating timber stands for insect and disease outbreaks.*

Specific management actions that Campbell County supports regarding forest insects and disease, fire, and wildlife habitat are described in Appendix B. These actions include the most up-to-date approaches to managing insects and disease based on current science; potential treatments for specific insects and diseases are discussed. Information in Appendix B is kept current to address changing conditions regarding forest insects and disease and the related impacts, such as changes to wild fire cycles and wildlife habitat.

- *Support the ability of its citizens to derive economic and social benefits from timbered areas, including the use of timber products from state and federal lands for private, personal use.*
- *State and federal agencies shall recognize and encourage commercial timber harvest in Campbell County to promote forest health and economic development.*

A viable forest products industry is essential for effective forest management; forest management project expenses become unreasonable without it. A predictable, dependable supply of forest products is critical to retaining the industry infrastructure. The development of non-traditional markets, such as those for biomass, could become important. There is the potential to use some biomass (1 percent) at coal fired plants, thereby reducing CO<sub>2</sub> emissions. Assessments should be undertaken to identify forest landscape areas where there is potential to access and supply traditional, non-timber, and/or emerging markets such as those for biomass or ecosystem services. Assessments can identify viable and high potential working forest landscapes where landowner assistance programs can be targeted. In addition to supporting the forest products industry, the proper treatment of timber stands aids in reducing fuel loads, thus preventing catastrophic fires. Restrictions on the use of timbered areas would be a detriment to hunting, recreation, mining, oil and gas, and agriculture industries.

- *Encourage use of living snow fences and shelter belts.*

Windbreaks and living snow fences are snow capturing linear plantings of single or multiple rows of trees or shrubs for the purpose of wind reduction. In Wyoming, they are essential for controlling blowing and drifting snow. It is Campbell County's policy to encourage the use of living snow fences and shelter belts. Funding can be a limiting factor, as most landowners require some direct support to install living snow fences off a highway right-of-way. The Wyoming State Forestry Division (WSFD), WYDOT, and Wyoming Association of Conservation Districts have snow fence programs funded by the USDA Conservation Reserve Program (CRP) to provide financial assistance to landowners for living snow fence installation.



Specific tree species that could be used in Campbell County for living snow fences and shelter belts are described in Appendix B.

- ***Promote the use of appropriate species in urban and rural forestry planning.***

While many people think of Wyoming as a rural state, 69 percent of the population lives within urban areas, or incorporated cities and towns, as compared to 80 percent of the U.S. population living in urban areas. Urbanites depend on the essential ecological, economic, and social benefits provided by urban trees and forests (Hamerlinck et al. 2013). Urban forests provide a myriad of essential services that include reduced energy use; improved water, air, and soil quality; diverse wildlife habitat; noise abatement; and increased human health and well-being (Nowak et al. 2010). Management decisions influence the amount and types of benefits derived from the urban forest now and for future generations. Knowledge of urban forest ecology and how to conserve these essential resources is critical to developing appropriate management strategies to enhance optimal urban forest cover and to sustain urban forest health and benefits into the future. Additional information on urban forestry is included in Appendix B.

## **Livestock and Grazing**

### **Custom and Culture**

Grazing by native ungulates such as bison, elk, mule deer, and pronghorn antelope pre-dates settlement in Campbell County. Domestic livestock grazing by settlers was established in Campbell County in the late 1800s. Grazing has been a means of economic viability in Campbell County since the county was originally settled. Grazing and raising livestock is a smaller industry economically when compared to other industries, but remains significant for the cultural heritage and environmental management of Campbell County. The mix of livestock species and number and size of ranching operations has vacillated through time, but from the time that Campbell County was settled, grazing and livestock production has been an important industry in the county supporting local businesses and contributing to the local tax base thereby providing local government services and support for the local school system and retaining open spaces for wildlife. Many ranching operations in Campbell County are run by families who often have long-term commitments to the land and natural resources and are involved in community activities. The traditions of Campbell County are tied to grazing and raising livestock, making the sustainable continuation of these practices imperative to upholding the historic culture of the county. Appendix B contains the current composition of the livestock industry in Campbell County.

Grazing leases are one way that state and federal land managers work with private livestock producers to manage livestock grazing in Campbell County. BLM and USFS grazing leases are present throughout Campbell County. The Buffalo BLM field office is responsible for managing BLM grazing leases in Campbell County, while the Douglas Ranger District manages USFS grazing allotments in the county. Approximately 223,888 acres of land in Campbell County are managed by the BLM, 161,841 acres of land are managed by the USFS, state land accounts for 188,662 acres, and private land accounts for approximately 2,514,835 acres. Grazing allotments span the county and are present on federal, state and private lands. Grazing allotments within the county vary in size, use dates, and livestock number and kind depending on the individual



grazing operators issued lease(s)/permit(s). Management statuses are applied to individual grazing leases depending on the status of the lease. Few grazing leases in Campbell County fall under the “improve” management status with most grazing leases falling under “custodial” or “maintain” status (Table 4-4). Livestock grazing typically occurs on grazing allotments through the spring, summer, and fall months with permittees/lessees moving livestock off of the grazing allotments sometime in the fall.

**Table 4-4. Summary of grazing allotments Buffalo BLM field office.**

Field Office	Management Status	Number of Allotments	Total Acres*
Buffalo Field Office	Custodial	152	976,907
	Improve	6	97,552
	Maintain	31	410,567
	Unclassified	1	13,957
	Unknown	3	-
<b>Total Row</b>	<b>-</b>	<b>193</b>	<b>1,498,983</b>

\* Acreage includes public, state and private lands. Source: GeoCommunicator 2014  
Excludes USFS grazing allotments, approximately 101,500 acres

The landscape of Campbell County is conducive to livestock grazing and a thriving livestock industry. While forested and urban environments exist in Campbell County, the majority of the landscape consists of two types of rangelands: Wyoming sagebrush shrublands and prairie grasslands. Sagebrush shrublands are an important habitat type in Campbell County both in terms of size and utility for wildlife and grazing. Campbell County contains approximately 1,698,318 acres of sagebrush shrublands accounting for over 55% of the land area in Campbell County (Figure 3-10). Plant species composition and structure vary in sagebrush shrublands. Sagebrush shrublands can be made up of monocultures of sagebrush or contain high levels of shrub diversity (WGFD 2010). Sagebrush shrublands can be productive environments for grazing depending on soils, microclimate, plant species composition, distribution of sagebrush and many other factors. Prairie grasslands are an important habitat type in the county, accounting for approximately 968,756 acres or over 32% of the land area in Campbell County (WGFD 2010) (Figure 3-10). Prairie grasslands are an important grazing resource in Campbell County and across Wyoming. Prairie grasslands are productive for grazing and support many wildlife species.

The culture of Campbell County is grounded in rural values, conservation, wise use of natural non-renewable and renewable resources, and the preservation of private property rights. Grazing livestock on private, state, and federal land continues to be part of Campbell County’s western heritage. Proven methods of livestock grazing continue to maintain the health and productivity of grazing lands and provide improved wildlife habitat, healthy watersheds, and soil erosion control. A large part of Campbell County’s present and future economic viability is strongly tied to the land and its productivity.

## Goal

An allowance for continued livestock grazing on private, state, and federal lands and the maintenance of current and/or historic animal unit month (AUM) levels, while sustaining and improving grazing land production, rangeland health and wildlife habitat.



## Objectives

- *Healthy grazing lands and wildlife habitat.*
- *Reduction of soil erosion.*
- *Diversification of native plant populations.*
- *Maintenance of a strong and viable livestock production industry.*
- *Continued livestock grazing on state and federal land.*
- *Grazing potential, distribution and flexibility in the grazing season on state and federal land.*
- *Management and control of noxious weeds, invasive species and pests.*

## Policies

- ***Use relevant scientific data and rangeland monitoring data to support any modification of AUM's on state and federal lands.***

As provided for in allotment agreements, various monitoring activities are conducted by the BLM and USFS on all grazing allotments including actual use by livestock (i.e., number of animals within an allotment provided by leasee), use supervision (i.e., count of livestock during field visits), and vegetation status and trend. Data are collected within areas that are representative of a large percentage of the public land within the allotment and are generally visited every five years unless there are extenuating circumstances, such as severe drought, in which case they are visited more frequently.

- ***Make immediately available access for permittees/lessees to any data collected on their grazing permit/lease, including field notes.***

Data collected on grazing leases can be used by private livestock producers to make informed management decisions. By providing data to livestock producers, state and federal land managers are providing livestock producers with the tools to make land management decisions that are beneficial to the livestock industry and the landscape of Campbell County.

- ***Consult and consider the input of permittees/lessees on any proposed changes of use to permits/leases.***
- ***State and federal agencies shall consult and coordinate with permittees/lessees on any proposed grazing rest prescriptions due to wildfires or prescribed burns. Any AUM reductions shall be temporary and based on scientific data and monitoring and rangeland health standards and guidelines.***

Private livestock producers are often knowledgeable about their grazing leases including plant communities, wildlife and natural resource concerns. State and federal land managers will gain knowledge by collaborating with livestock producers and livestock producers will be made aware of proposed changes to their permits/leases. Campbell County's natural resources, state



and federal land managers, and livestock producers all stand to benefit from consistent communication between state and federal land managers and livestock producers.

- ***State and federal agencies shall not permit the relinquishment, transfer, or retirement of livestock grazing AUMs in favor of conservation, wildlife, or other uses.***

The optimization of rangeland resources and AUMs is critical to the continuation of a strong livestock production industry in Campbell County. Livestock grazing can be used to conserve natural resources (Hubbard et al. 2004) and improve natural resource health and wildlife habitat (Vavra 2005, Johnson and Sandercock 2010). Alternative grazing practices such as rotation grazing within leases should be considered prior to suggested reduction in AUMs. Land managers should employ iterative land management strategies rather than simply reducing AUMs. Adaptive management techniques can be employed that satisfy the needs of multiple resource users (Williams and Brown 2012) without the unnecessary reduction of AUMs on grazing leases.

- ***State and federal agencies shall:***
  - *recognize, venerate, and actively promote and protect all property rights associated with grazing permits/grazing leases, including but not limited to water rights and rights-of-ways (ROWS) on state and federal lands,*
  - *protect the rights of privacy and shall not release personal and private information of permittees/lessees, such as phone numbers, home address, contact information or financial data to members of the public or media unless expressly approved in writing by the permittees/lessees. This policy shall not prohibit exchanges of data between state and federal agencies and local emergency service providers.*
- ***Issue grazing permit/lease renewals and grant extensions to permittees/lessees if state and federal agencies are unable to process such renewals before the expiration of such permit/lease.***

In Campbell County, over 70% of non-privately held land under grazing allotments is managed by the BLM. The BLM grazing regulations require grazing permits issued by the agency to contain terms and conditions that ensure conformance with BLM Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Land Administered by the BLM. These standards and guidelines address the health, productivity, and sustainability of public rangelands. The BLM Wyoming standards and guidelines assess the four fundamentals of rangeland health: properly functioning watersheds; naturally cycling water, nutrients and energy; acceptable air and water quality; and viable habitats for special status species. Allotments are categorized as Improve, Maintain, or Custodial to prioritize and concentrate funding and on-the-ground management efforts to those allotments where resources are needed most, as per BLM Instruction Memorandum 2009-18 (BLM 2009a). Within Campbell County, the BLM categorized 6 allotments as Improve, 31 as Maintain, and 152 Custodial. As provided for in allotment agreements, various monitoring activities are conducted by the BLM on all grazing allotments including actual use by livestock (i.e., number of animals within an allotment



provided by leasee), use supervision (i.e., BLM count of livestock during field visits), and vegetation status and trend. If federal land managers are not able to complete monitoring activities prior to the expiration of permits/leases, extensions and renewals shall be granted.

The USFS manages 29 grazing allotments totaling approximately 101,500 acres in Campbell County. Forest Service Handbook (FSH) 2209.13 outlines the qualifications, requirements, and terms of use for USFS grazing allotments. FSH 2209.13 identifies the general land practices required to graze on USFS allotments while specific LRMP identify more detailed objectives, practices and prohibitions that may be associated with a grazing permit. Individual USFS grazing permits can further delineate the permitted actions or requirements of a permittee. USFS is required to monitor permittee activities (USFS 1992a) and can terminate a permit if a permittee is found to be in violation of the terms outlined in the grazing permit (USFS 1992a).

- *State and federal agencies shall not impede the control of noxious weeds and pests in order to maintain the long term economic productivity of the rangeland for livestock and wildlife grazing.*

It is Campbell County's policy to encourage the management and control of noxious weeds, invasive species, and pests to maintain the productivity and integrity of Campbell County's natural resources (See Chapter 3 *Weed, Pests, and Invasive Species*). State and federal land managers should facilitate the control of noxious weeds and pests on state and federal lands in order to maintain the long term economic productivity of Campbell County rangelands for livestock grazing and wildlife. Management techniques might include preventing the introduction of undesirable species through early detection and proper weed identification, early detection and eradication of weeds, mapping the spatial extent of undesirable species, educating state and federal land managers and the public through plant identification courses and outreach programs, and inventory of undesirable species for land management planning and weed and pest control through long term monitoring and treatment (BLM 2008). Campbell County supports management strategies to control noxious weeds, invasive species, and pests including, but not limited to, herbicide and pesticide applications in accordance with federal, state, and local regulations and standards, biological control strategies that utilize best available scientific evidence and planning prior to biological introductions and mechanical controls. Grazing strategies should consider the species mix of individual plant communities including non-native species. Efforts should be made to reduce the transfer of non-native plants and noxious weeds that have the potential to reduce the richness and productivity of native plant populations.

## Mineral Resources

### Custom and Culture

Mineral extraction industries have long been part of the history and economy in Campbell County (Ritthaler 1995). Mineral resources include, but are not limited to coal, oil, natural gas, uranium, scoria, gravel and others. These vast reserves have been utilized by residents as the region was settled and ultimately exported for the nation's energy needs as development, production, and transportation infrastructure was put into place.



Campbell County's economic viability is highly dependent on the ability to produce, market, and deliver mineral and energy products to consumers in Campbell County, within the State of Wyoming, and across the US. This continued development is a critical component of the county's economic base. The ability to continue this economic activity is dependent on a number of factors, and can be hindered by excessive environmental regulation and lack of transportation.

### ***Coal***

Campbell County is situated on the eastern edge of what is probably the largest single deposit of coal in the US that is economically recoverable by surface mining methods (Figure 4-6). "Using a geology-based assessment and methodology, the U.S. Geological Survey estimated in-place resources of 1.07 trillion short tons of coal in the Powder River Basin, Wyoming and Montana. Of that total, with a maximum stripping ratio of 10:1, recoverable coal was 162 billion tons. The estimate of economically recoverable resources was 25 billion tons." The Gillette Coal Field, which lies in central Campbell County, contains 10 billion tons recoverable by surface mining methods (USGS 2013).

One of the first coal mines opened in 1922 was the Peerless. It became WYODAK Coal Mine in 1927, and it has been a steady source of employment ever since. There are currently 12 mines operating in Campbell County. In Campbell County, coal production ranged from 451,714,827 tons in 2008 to 354,060,413 tons in 2012. Production in 2013 reached 374,372,470 tons.<sup>4</sup> Top producing mines in the country are located in Campbell County making it the nation's prime source of domestic coal production. Coal mines in Campbell County produce about ninety five percent 95% of the coal mined in Wyoming, which produces about forty percent (40 %) of the nation's coal used for electrical generation.

Thunder Basin National Grassland contains the nation's largest coal mine, North Antelope Rochele, most of which is located in Campbell County as well as portions of Black Thunder and School Creek mines. The USFS has authority and responsibility to determine which lands are available for leasing and for prescribing lease terms that protect the surface resources and values (USFS 2001). The Secretary of the Interior has the authority to administer operations on such lands leased, licensed, or permitted. The Office of Surface Mining is responsible for coal, and the BLM is responsible for other minerals (USFS 2001).

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<sup>4</sup> State Inspector of Mines of Wyoming Annual Reports

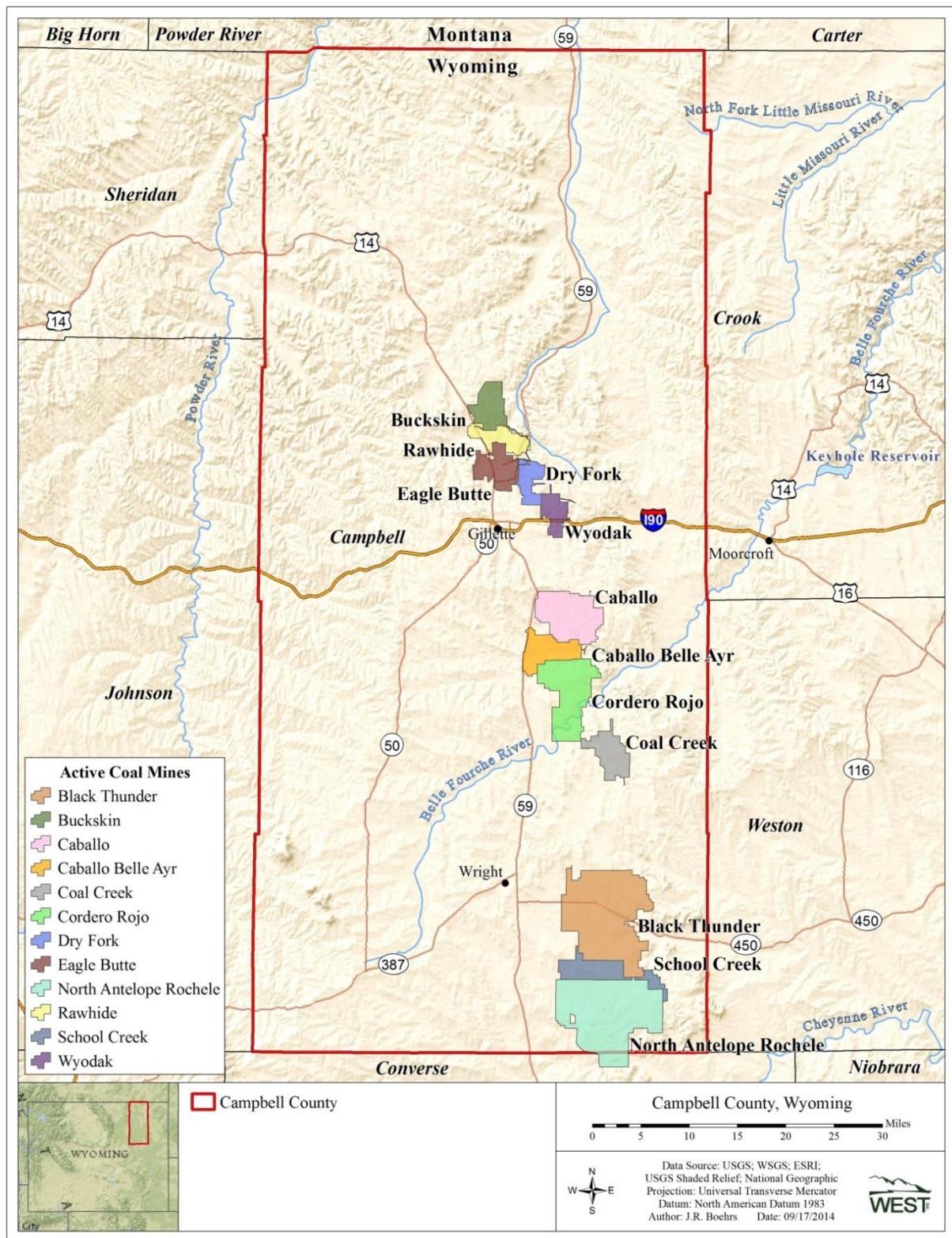


Figure 4-6. Coal mine locations in Campbell County.

## ***Oil and Gas***

The first oil well was drilled in Campbell County in 1941 starting the era of oil exploration, and the first commercial oil field was discovered in 1948. Production boomed in the late 1960's and early 1970's, earning Gillette the title of "Energy Capital of the Nation". This was followed by the "bust" in 1986 with oil production on the decline until 2006, when it experienced its first increase in 20 years.

Most of the oil and gas producing fields in the county are stratigraphic traps, as opposed to anticlinal traps common to the major producing fields in other parts of Wyoming. The stratigraphic traps are thick, discontinuous channels, beach, or offshore sands. Beach and offshore sands usually have a north-south trend to them in Campbell County, while the discontinuous channels have an irregular configuration. Production comes from the middle portion of the stratigraphic column. More than one-half of the oil production comes from the Muddy Sandstone, and over 50% of that comes from the Minnelusa, Dakota Sandstone, Mowry Shale, Turner Sandstone, Niobrara Shale, Sussex, Parkman and Ferguson Sandstones. The Muddy Sandstone yields 97% of the total conventional gas production with most of the remainder primarily coming from the Ferguson and Sussex Sandstone (Rithaler 1995).

Conventional natural gas production followed similar lines of oil production until the 1990's when new technologies were developed to extract coalbed natural gas from the coal seams in Campbell County. Sporadic development began in the late 1970's, but no large scale efforts were seen until the late 1980's. The early development focused on shallow coal targets in areas of proven reserves, such as those by the Campbell County Airport, along the Highway 59 corridor between Gillette and Wright, and isolated targets near Recluse. Production went into full swing by the late 1990's, driven by several factors, including the increasing price of natural gas and new technologies that decreased well costs. Those technologies have continued to evolve into more efficient methods of extracting the gas from the coal seams.

A by-product of this production is water, which must be drawn off the coal seams in order to release the gas. Companies must use environmentally sound, acceptable methods of handling the quantities of water that are produced. Water management plans are created by the company to meet local, state, and federal regulations, as well as the surface owner's needs. Stock ponds, wetlands, wildlife ponds, and irrigation are some of the ways that the produced water is managed and put to beneficial use. Because of the fine textured soil which is predominant in Campbell County, a great deal of care must go into using this water for irrigation purposes. Companies are re-injecting the water into deeper formations as another way to handle the produced water.

There are over 30,000 completed oil and gas wells within the borders of Campbell County (Figure 4-7), about 20,000 of which are coalbed natural gas wells (Figure 4-8). About one half of the oil wells have been plugged and abandoned (P&A); about thirty eight percent (38%) of the coal bed natural gas wells are P&A (Wyoming Oil and Gas Conservation Commission [WOGCC] 2014d).

Natural gas production in Campbell County has steadily decreased from peak production of 216,644,280 thousand cubic feet (Mcf) in 2006 to 104,957,124 Mcf in 2013. Crude oil



production over the same period varied from a low of 7,483,481 barrels (bbls) in 2009 to 13,020,199 bbls in 2013 – leading the state in crude production (WOGCC 2014d).

Nationally, Wyoming ranked 7<sup>th</sup> in production of crude oil and 5<sup>th</sup> in natural gas production during 2013. In 2009, Wyoming recorded its highest level of natural gas production, while the same year marked the lowest level of crude oil production since 1954. Campbell County was the leading crude oil producer in 2013 followed by Park and Sublette Counties (Petroleum Association of Wyoming 2014).

The number of well permit applications (APDs) has varied through the years depending on petroleum market demands. APDs for oil increased almost twenty seven percent (27%) in Campbell County in 2013 over the number in 2012 (Wyoming State Geological Survey 2014).

### ***Uranium***

When the Atomic Energy Commission began looking in 1946 for domestic sources of uranium, it guaranteed a market and tempted prospectors with bonuses. Since uranium had been known in Wyoming since 1918, people bought Geiger counters and went hunting. The uranium they found varied from high-grade in eastern Fremont County to low-grade in the Pumpkin Buttes area of Campbell County and what they found was 35% of this nation's known uranium reserves.

Two uranium mines are permitted in the county today. Substantial uranium deposits exist in the county (Figure 4-9), and future mining would depend on demand.

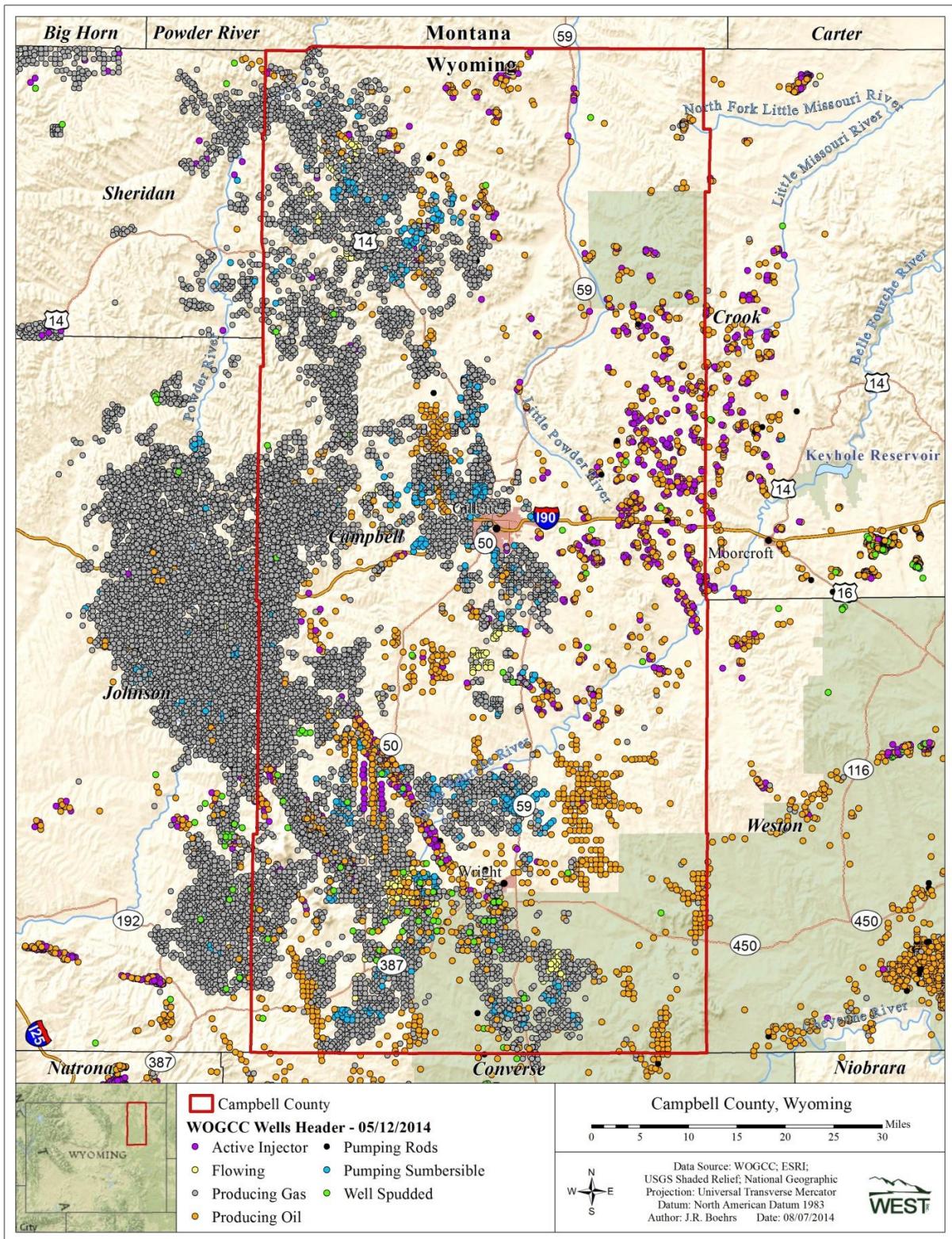


Figure 4-7. Completed oil and gas wells in Campbell County.

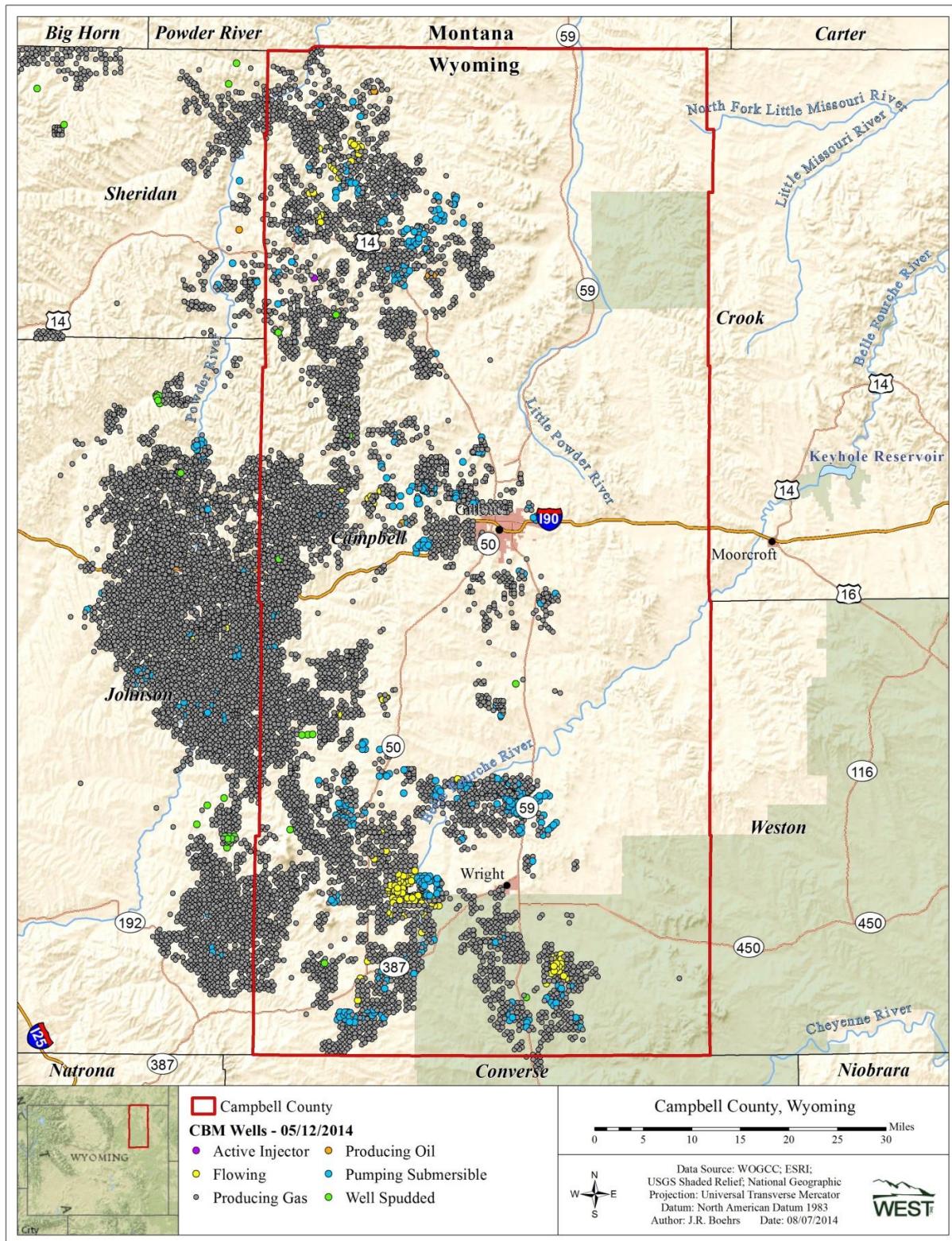
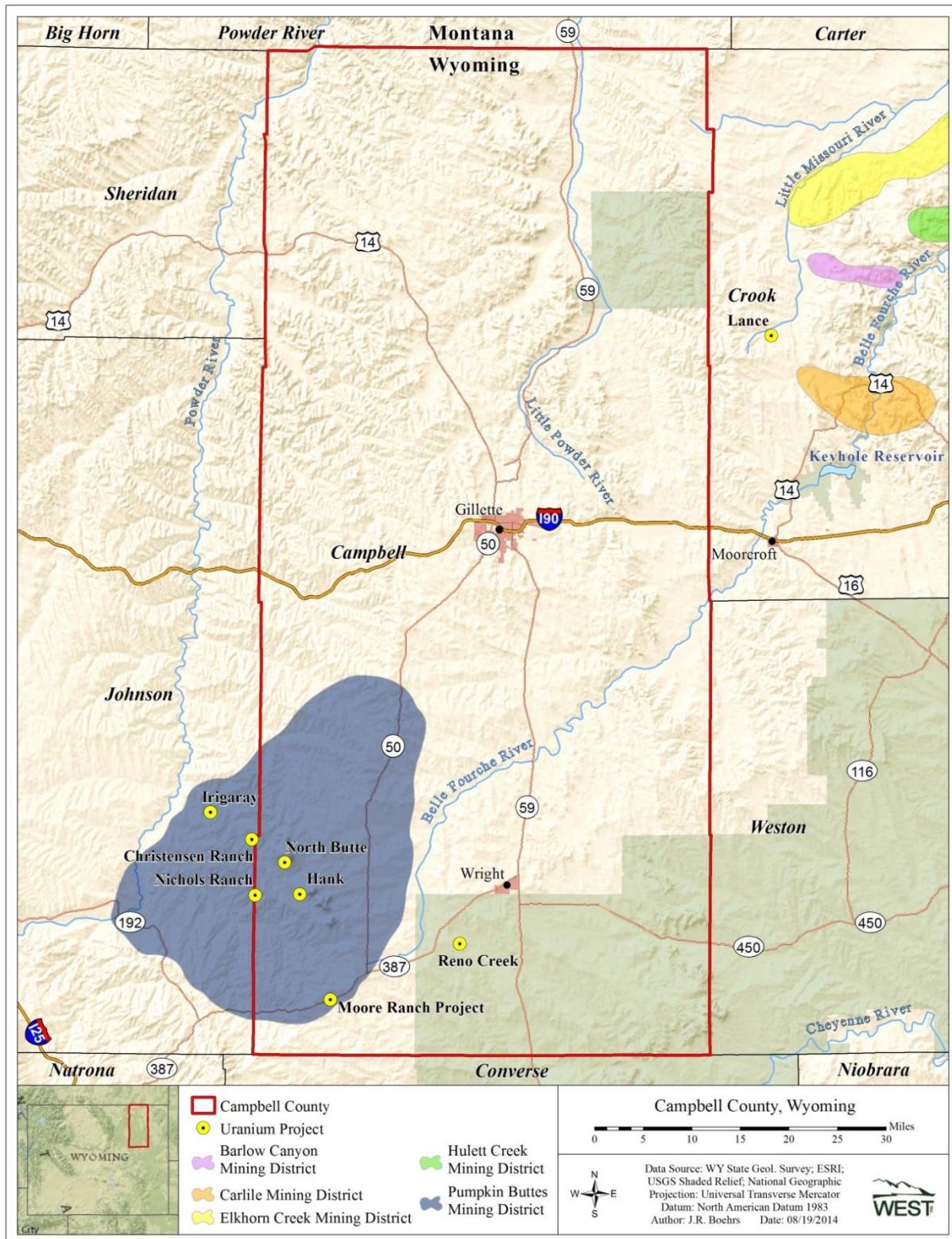


Figure 4-8. Completed coalbed wells in Campbell County.



**Figure 4-9. Uranium deposits in Campbell County.**

## Goal

Continued exploration, development, and production of valuable mineral resources while maintaining and enhancing the environment.

## Objectives

- *Timely and successful reclamation practices in accordance with state law.*
- *Mineral resource development with minimized land use impacts.*
- *Positive, coordinated, and cooperative working relationships with stakeholders involved in mineral resource development.*
- *Timely access to state and federal mineral resources with reasonable stipulations based on credible scientific data and economic sustainability.*
- *Identification, prioritization, periodic review, updating, and mapping of mineral development locations in order to mitigate conflict with rural development, roads, and infrastructure.*
- *Conflict resolution and mitigation of split estate and eminent domain issues while protecting and preserving private property rights and other valid existing rights.*
- *Active participation with state and federal agency decisions regarding mineral development within Campbell County.*
- *Plan for short and long term sustained development of mineral resources to maximize economic return and minimize impacts.*
- *Reasonable state and federal environmental regulations that do not deter or delay the production of mineral resources.*
- *Protection, preservation, and respect of surface and mineral private property rights in relation to mineral resource development.*
- *Timely mineral resource projections to aid in local, state, and federal land use planning.*
- *The employment of credible scientific, engineering, and economic data in decisions regarding mineral resource development.*
- *Support for and implementation of new technologies to develop new energy resources.*
- *Active participation with state and federal agencies regarding existing, pending and future mineral development actions and proposals.*

## Policies

- *Except for Congressional withdrawals, federally managed lands shall remain open and available for mineral resource exploration, development and production, unless administrative withdrawal or other action is necessary to protect the national security and withdrawal procedures are fully followed.*

BLM managed lands in Campbell County include federal owned surface and minerals, and split estate lands where the minerals are federal owned and the surface is private owned. The BLM is required to manage these lands based upon the principles of multiple use and sustained yield. Uses of these federal lands are acknowledged in the BLM Resource Management Plan (RMP) for the Buffalo Field Office (BFO) (BLM 2014d). Federal mineral resource exploration, development and production on federally owned or privately owned surface lands is allowed following certain procedures. Management of oil and gas development in the BFO is governed by a separate document (BLM 2003a).

- ***State and federal agencies shall:***
  - *coordinate, cooperate, and consult with local governments and potentially affected stakeholders, including private landowners, on proposed and pending federal actions regarding mineral development;*
  - *meet with local governments on at least an annual basis to discuss existing, pending and future mineral development actions and proposals;*
  - *consider all available and relative economic data to determine and document economic impacts to the mineral industry, to county and local governments, and to county residents from any proposed land management and/or natural resource planning decisions; and*
  - *coordinate and tier to Environmental Assessments and Environmental Impact Statements required for projects in order to avoid duplication of EA's and EIS's and costly, unnecessary delays to projects.*
- ***Campbell County shall actively participate as a cooperating agency in federal planning actions to ensure Campbell County remains a top producer of mineral resources.***

The preparation of RMPs includes determining impacts through compliance with NEPA. Typically, an Environmental Impact Statement (EIS) is prepared, and the draft RMP/EIS with various management alternatives and associated impacts is subjected to review and comment from the public and from relevant agencies. In addition, Campbell County would typically be invited to participate in the preparation of the draft RMP/EIS associated with lands in Campbell County. During this participation, Campbell County can voice their opinion of various BLM and USFS management alternatives.

- ***State and federal agencies shall:***
  - *recognize and venerate private property rights in mineral resource development;*
  - *recognize and venerate the right of private property owners to determine standards and practices on their private land; and*
  - *coordinate, cooperate and consult with local governments, private property owners, private lessees and permittees, and mineral resource development companies in developing and implementing reclamation standards and requirements.*
- ***Provide adequate bonding requirements to ensure removal and successful reclamation of abandoned energy and mineral resource projects.***

- *Provide for immediate, interim, and final reclamation as conditions and development warrant with reclamation practices and standards that are appropriate to industries' specific needs.*

Campbell County has vast sub-surface mineral resources that in some areas are owned by state and federal agencies while the surface is privately owned. This is referred to as a split-estate. To ensure all ownership rights are respected, Wyoming passed Wyoming Statute 35-11-416 that requires the solid mineral developers to prepare a bond to secure payment for damages to the surface, crops, forage and tangible improvements of the surface owner and requires financial reimbursement for loss related to disruption to operations. In 2005, Wyoming enacted the Wyoming Split Estate Act under which oil and gas operators are required to reach an agreement with the surface owner regarding the use of the surface to explore or extract oil and gas resources. The surface use agreement addresses reclamation activities.

- *State and federal agencies shall:*
  - *have efficient, stream-lined permitting processes in order to timely process and approve plans of development;*
  - *not limit or infringe upon the ability of private mineral owners to access, extract and transport their mineral resource, including in areas determined set aside for no mineral leasing on federal lands, if that determination takes place after leasing has already occurred or adequate compensation shall be provided;*
  - *provide clearly defined mapping and data to warrant any kind of cultural, paleo, plant or wildlife inventory on private lands;*
  - *recognize that cultural artifacts on private lands are owned by the private land owner, shall recognize the right of the property owner to deny a cultural resource survey being conducted on privately owned lands, and shall not deny a mineral extraction permit or application due to the refusal of a property owner to allow a cultural survey; and*
  - *honor industry and company developed agreements and processes to mitigate and address competing mineral resource development.*
- *Oppose the imposition of barriers to mineral resource production and development.*
- *Base wildlife buffers, occupancy stipulations, and restrictions on peer reviewed and approved credible scientific data and share in writing with any affected private property owner upon request.*
- *Make available voluntary, compensatory, mitigation measures, both on and off-site, to mineral resource development companies conducting activities within wildlife buffers, occupancy stipulations, and restrictions.*
- *Do not make public wildlife, plant, paleo and cultural information gathered on private property in conjunction with mineral resource development. It shall be available to the private property owner.*
- *Resolve conflicts between competing mineral resource industries in an effort to maximize production and sustained economic returns.*

- *Base federal climate change policies on peer reviewed and credible scientific data.*
- *Make available opportunities for year-round gravel crushing and screening operations where materials are needed and where it is economically feasible to extract them.*
- *Make available new gravel pit excavation possibilities on state and federal lands.*

## Campbell County Position Summary

Based on the importance of resource extraction to the economy of Campbell County, it is the overall position of Campbell County to continue to encourage and support the current and future mineral development activities within the county.

It is Campbell County's position that, due to the split-estate that occurs throughout much of the county, the private property rights of the surface owner and neighbors be respected and recognized during federal mineral development activities. Campbell County expects that all mineral development that occurs on split-estates within the county will adhere to the Wyoming Split Estate Law and the process therein.

Campbell County recognizes the position of the BLM, as stated in Appendix A of the Buffalo Draft RMP, and the USFS, as stated in Forest Service Manual (FSM) 1000 Section 1013.01a, that they do not have legal authority regarding the management of private property. However, the BLM and USFS do have statutory authority and responsibility to reduce, or minimize through reasonable measures, the potential environmental impacts that may result from mineral extraction in the split-estate situation. Under NEPA, the BLM and USFS consider activities occurring on private land related to the development of federal minerals as connected actions. Therefore, the BLM and USFS are required to analyze potential impacts and propose mitigation measures on the private land as it relates to the mineral development. Campbell County requests that such analysis and mitigation measures are developed with involvement from the private land owner.

Campbell County has concerns regarding future restrictions and regulations by federal agencies, and the corresponding impacts to the operation of current and future resource extractions within the county. It is Campbell County's intent to work with stakeholders and state and federal agencies in continuing to mitigate the impacts of future regulation changes on the mineral extraction industry.

## Energy

### Custom and Culture

Campbell County is known for its vast coal, oil and uranium reserves, gas production, mining and power generation facilities. Development of these resources and associated facilities are supported by the people of Campbell County. Mining and mineral exploration is an important historic and economic multiple use of private, state, and federal land resources. The infrastructure needed to mine, develop, produce and transport the products of these industries has been built throughout the years as needed.



Split estate issues and eminent domain issues must be addressed in the acquisition of land and negotiation of surface use agreements for energy development and infrastructure.

As Campbell County looks to the future, clean coal technologies, oil and gas reserves, and renewable energy sources have the potential to play an important role in developing a diverse energy portfolio in the region. In addition, as Campbell County moves toward increased coal generation, such items as emissions reductions, offsets provided by renewable energy and the use of clean coal technologies will become increasingly important. Renewable energy resources include wind, solar, and biomass.

## **Goal**

The development, enhancement, production, and transportation of all available energy resources and technologies in Campbell County.

## **Objectives**

- *Electrical power generation using low-sulfur Powder River Basin coal, oil and gas, and renewable energy resources.*
- *Use of land and resources to accommodate new growth and foster economic development.*
- *Diversification of the county's economic base through the development and demonstration of renewable energy and clean coal technologies such as fuel enhancement, coal-to-fuels, coal to value added products and advanced combustion.*
- *Improvement of rail, pipeline, and electrical transmission facilities to transport energy to markets throughout the region and the United States.*
- *Public utility facility corridors planned, designed and located in a coordinated manner.*
- *Mitigation of eminent domain and split estate issues.*
- *Protection of private property rights.*

## **Policies**

- *Encourage and support energy development projects that will ensure an affordable and reliable supply of electricity, utilizing all methods of feasible energy production.*
- *Promote the investment and permitting of a regional transmission grid to efficiently facilitate the transfer of resources out-of-state.*
- *Locate energy transmission infrastructure, such as oil and gas pipelines and high voltage electric transmission lines in existing utility corridors and on state and federal lands, where feasible.*
- *Use streamlined permitting processes to enable the placement of energy transmission infrastructure on state and federal lands rather than impacting private property owners.*
- *Encourage and assist carbon capture and sequestration projects and development of pipelines to transfer carbon dioxide to markets.*

- *Encourage the delineation and management of oil and gas fields, and associated residual oil zones, that are amenable to tertiary recovery efforts.*
- *Encourage the delineation of carbon dioxide, water and oil and gas pipeline infrastructure to facilitate tertiary recovery efforts in Campbell County.*
- *Encourage coordination and cooperation between competing energy interests on same and adjacent lands to maximize development of available energy resources.*
- *Campbell County shall:*
  - *meet at least annually with state and federal agencies, including but not limited to: Bureau of Land Management, U.S. Forest Service, and the Wyoming State Planning Office regarding potential and proposed energy development and infrastructure projects that may impact Campbell County citizens, industries, and economy; and*
  - *be a cooperating agency, in preplanning implementation, Environmental Assessments, and Environmental Impact Statements for energy development and infrastructure projects.*
- *Campbell County authorities and affected stakeholders shall receive ample notice and mapping for potential eminent domain, energy development, and infrastructure projects that may affect citizens and industries.*
- *Private property owners shall:*
  - *receive ample notice, maps, and relevant information concerning potential eminent domain actions against them in the placement of energy development and infrastructure project; and*
  - *receive full compensation for eminent domain acquisitions pursuant to state and federal law.*

## Renewable Energy

Wyoming has benefited from the production of conventional energy sources, but has strong potential to benefit from the production of renewable energy including wind, solar, and geothermal (American Council On Renewable Energy [ACORE] 2013). However, only wind energy development has achieved meaningful production in Wyoming. Wyoming's hydroelectric dams are smaller, older, and owned by the federal government (US Energy Information Administration [EIA] 2013). Wyoming has no requirement of renewable energy, but does provide net metering for residential, commercial, and industrial customers with small renewable energy facilities (US EIA 2013).

The only commercial renewable energy resource in Wyoming that has been developed at a large-scale is wind energy. Wind energy provided approximately eight percent of Wyoming's energy load during 2013 and has the potential to provide more than the entire electricity load for the state (American Wind Energy Association [AWEA] 2014). Wyoming currently has 24 wind projects with 960 utility-scale turbines on line (AWEA 2014). These projects are located in Unita, Carbon, Albany, Laramie, Natrona, and Converse Counties. No utility-scale project is located within Campbell County.



## **Objectives**

- *Economically viable renewable energy sources.*
- *Utilization of sustainable technologies.*
- *Removal and reclamation of abandoned renewable energy projects.*

## **Policies**

- *Operate renewable energy projects under comparable state and federal regulations and guidelines as existing energy production methods.*
- *Encourage the development of renewable energy resources and cogeneration where commercially viable.*
- *Obtain full bonding to ensure removal and reclamation of abandoned renewable energy projects.*
- *Campbell County shall be a cooperating agency in proposed renewable energy projects.*

## **Electricity**

### **Objectives**

- *Electrical power generation using low-sulfur Powder River Basin Coal, oil, gas, and renewable energy resources.*

### **Policies**

- *Adopt and encourage clean coal technologies for use in existing and proposed coal-fired power plants.*
- *Determine economic sustainability and cost to consumers in permitting power plants using any or all available sources of energy.*

## **Rail Transportation**

### **Objectives**

- *Adequate railway capacity to ensure transportation of Campbell County energy resources to markets.*
- *Safe and cost effective shipping of energy resources.*

### **Policies**

- *Place new railway corridors within existing transportation corridors where feasible and with respect to private property rights.*
- *Support railroad track expansions to ensure adequate rail capacity in the Powder River Basin for safe and efficient transportation of energy resources and other goods.*
- *Support access to Gulf and Pacific Coast port facilities for export of Campbell County energy resources.*



- *State and federal agencies shall cooperate and collaborate with local governments and affected stakeholders in planning and locating new railway corridors.*

## Transmission

### *Custom and Culture*

Campbell County has an established network of transmission mains for electrical energy to be conveyed both north, south, east, and west (Figure 4-10). They have been developed across private, state, and federal lands.

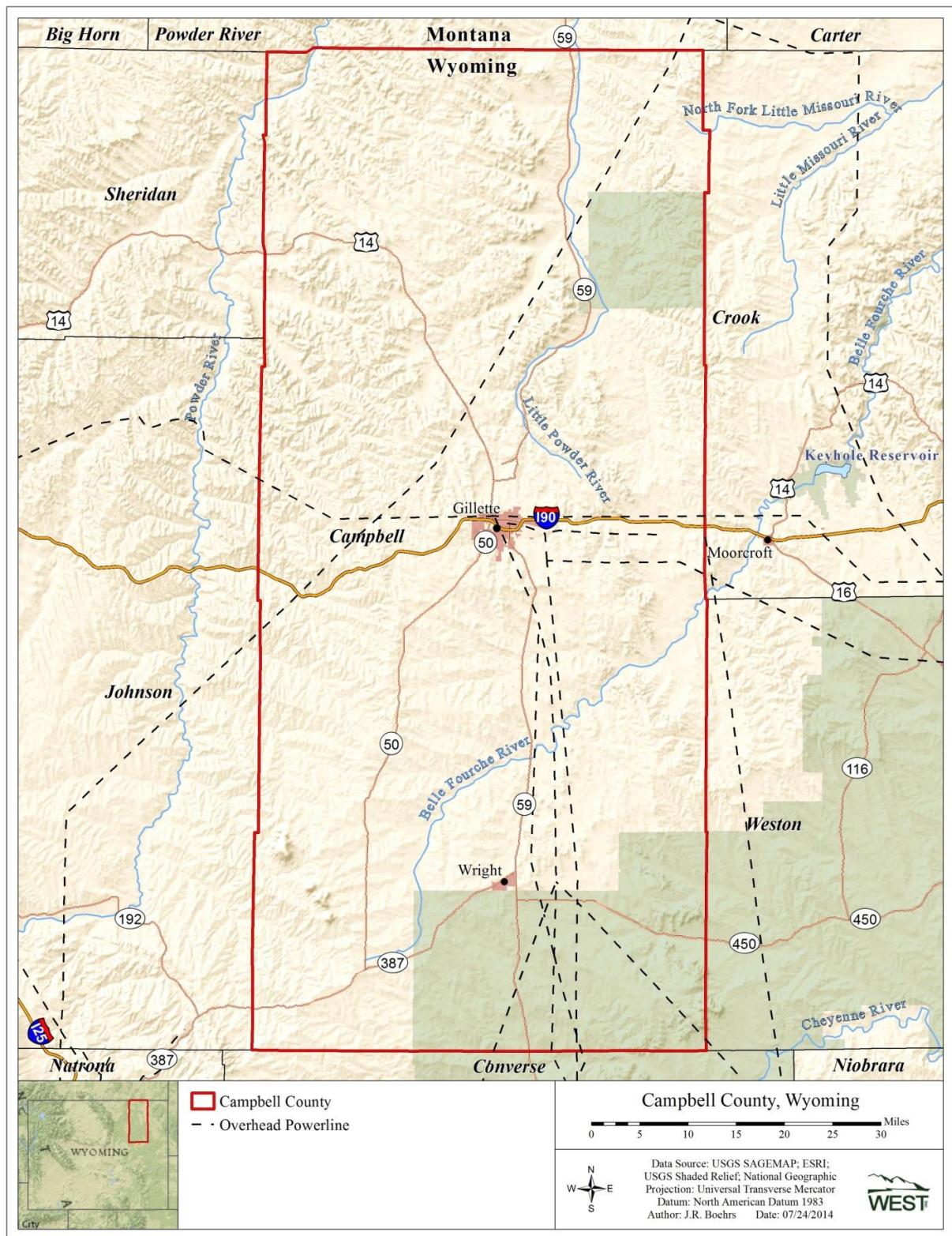


Figure 4-10. Major Transmission lines in Campbell County.

## **Major Existing Transmission Network**

A summary of the major transmission mains and brief description is shown above (Figure 4-10).

North I-90: 40 miles north of I-90 extending from the county line of Crook and Campbell to the county line of Johnson and Campbell.

East of Wyoming State Highway 59: Series of transmission mains extending from the county line of Campbell and Converse County to Gillette.

South I-90 to Montana: 50 miles of transmission main extending from south west corner of Johnson and Campbell County to the Wyoming/ Montana State Line.

## **Objectives**

- *Transmission infrastructure located in planned utility corridors.*

## **Policies**

- *Develop a memorandum of understanding establishing a cooperating agency relationship between the Wyoming Infrastructure Authority and Campbell County for transmission planning.*
- *Notify affected stakeholders and provided them with all relevant information in proposed transmission infrastructure.*
- *State and federal agencies and affected staked holders shall coordinate and collaborate with the Wyoming Infrastructure Authority in pre- planning utility corridors and transmission infrastructure.*
- *The Board of County Commissioners shall encourage transmission facilities to be located in a manner that is safe, environmentally sensitive, and minimize negative aesthetic impacts to existing residents of Campbell County.*

## **Outdoor Recreation**

### **Custom and Culture**

The majority of Campbell County is comprised of privately owned property. In fact, only a small portion of Campbell County surface is state and federal land, which poses a challenge and presents limitations for public outdoor recreation. In addition to the small amount of public land in the county, there is limited public access to those properties, as many of them are isolated parcels surrounded by privately owned lands.

However, Campbell County supports outdoor recreation on public lands and is interested in working with state and federal agencies to manage those activities. In addition, some private landowners have demonstrated a willingness to work with state and federal agencies to create additional access to public properties. There appears to be public support for programs that increase accessibility to public lands or private properties for recreational purposes without



converting privately owned land to public ownership. Campbell County citizens have historically opposed the conversion of private property into additional public lands within the county and that philosophy continues today. It is important to Campbell County that private properties and the rights associated with private land ownership are preserved into the future.

Overall, there are a broad range of outdoor recreational opportunities on state and federal lands in Campbell County, including, but not limited to, hunting, fishing, camping, nature appreciation, wildlife viewing, equestrian activities, radio-controlled aircraft flying, cycling, hiking, snowmobiling, and all-terrain vehicle use where access is available. Recreational activity in Campbell County is generally made up of local area residents and public lands are popular locations for those activities.

### ***U.S. Forest Service- Thunder Basin National Grassland***

The TBNG, managed by the Douglas Ranger District, is located in northeastern Wyoming in the Powder River Basin between the Big Horn Mountains and the Black Hills. Approximately 139,956 acres of TBNG are located in Campbell County; the remaining acreage is located in Converse, Weston and Niobrara Counties. The TBNG's Hilight Bill Geographic Area is located throughout the southeast corner of Campbell County; another, separate, small piece of the TBNG (the Spring Creek Geographic Area) is located in the area about 30 miles northeast of Gillette. Overall, the TBNG is made up of non-contiguous parcels of land, which are intermingled with other federal, state and private properties.

The Spring Creek Geographic Area covers about 48,740 acres of land, almost completely located in Campbell County (USFS 2014). Its unique attributes include ponderosa pine forests, scenic landscapes and hunting of pronghorn and mule deer. The Hilight Bill Geographic Area covers about 100,780 acres of land, not all of which are located in Campbell County. Minerals exploration and development (coal, uranium, oil and gas) and livestock grazing are significant activities in this area; hunting for mule deer, elk and pronghorn antelope is common. In addition to recreation, mining and grazing activities, the Forest Service conducts various wildlife management activities related to prairie dogs and sage grouse.

According to Douglas Ranger District staff, hunting is by far the most popular recreational activity on the TBNG in Campbell County; the majority of that activity occurs in the Spring Creek area and the adjacent Weston Hills recreation area (co-managed with the BLM). Four-wheeling is a popular activity and off-highway vehicle (OHV) use can be heavy in the Weston Hills area. Other minor summertime uses of the TBNG include wildflower viewing, sage grouse viewing, and prairie dog shooting. Additional allowable recreational opportunities include hiking, sightseeing, fishing and wildlife viewing. There are no developed campgrounds; however, dispersed camping is allowed. The majority of recreational use on USFS land in Campbell County is by local residents.

### ***Bureau of Land Management Property***

The BLM's BFO manages approximately 223,887 acres of BLM property in Campbell County. Included in that acreage are the Burnt Hollow and Weston Hills (managed jointly with the USFS) Recreation Areas, the Fortification Creek Wilderness Study Area (WSA) and the Cabin Canyon area (Figure 4-11). The Burnt Hollow and Weston Hills Recreation Areas are located to



the north of Gillette, along Highway 59. The Fortification Creek WSA is located along Campbell County's western border; a portion of the WSA is located in Johnson County.

The Burnt Hollow area (Figure 4-11) is described as "more than 18,000 acres of public land in sagebrush country with dramatic geologic formations and a diversity of wildlife species. This primitive non-motorized recreation area offers hunting, backpacking, hiking, and horseback riding. Trails are not marked, but several miles of old roads provide a network for riding or hiking. Several stock water ponds and small reservoirs are located within the unit, but potable water is not provided. There are no visitor facilities within the unit" (BLM 2013b). Public access to this area is from Highway 59 and Cow Creek Road only.

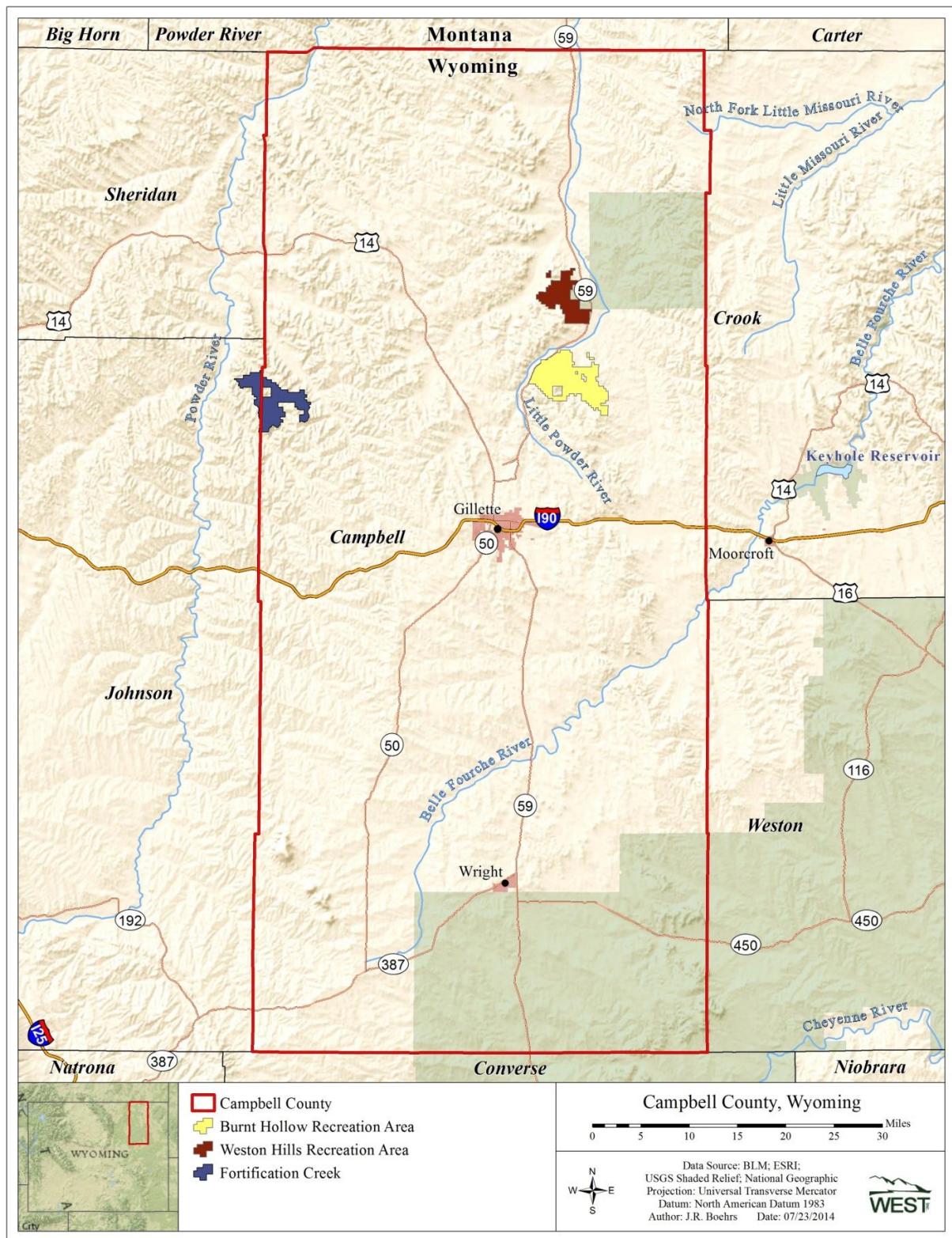


Figure 4-11. BLM recreation areas in Campbell County.

The Weston Hills area is a 9,500 acre area that includes about 10 miles of roads open to OHV use and another 6.4 miles of trail open to non-motorized use. The area is most popular for OHV use and hunting. Mule deer, antelope, elk, turkey, and eagles are present in the area. Camping is allowed and campfires are permitted in accordance with statewide fire restrictions; target shooting is prohibited. Vehicle travel in this recreation area, including all OHVs, is limited to designated routes and riders can expect challenging features along trails. Two staging areas are located near the entrance to the recreation area, as is a fishing pond (Weston Fish Pond).

The BFO is currently going through the process of revising its RMP under NEPA (BLM 2014d). According to the Draft RMP and EIS, under all alternatives, the Burnt Hollow and Weston Hills areas would be designated as Special Resource Management Areas (SRMAs), which would result in a number of benefits, including the identification of recreation as the predominant use in the area, the ability to apply for additional funding and a focused attention on the recreational demands of the public in that area. The Burnt Hollow and Weston Hills areas each see an estimated 3,000 to 4,500 visitors per year.<sup>5</sup>

Wilderness Study Areas (WSA) “are undeveloped federal lands that retain their primeval character and influence, without permanent improvements or human habitation, and are managed to preserve their natural conditions” (BLM 2013c, 2014e). The Fortification Creek WSA covers about 12,419 acres of public land and 640 acres of private land. There is no direct public access to the WSA; access is controlled by adjacent private landowners and landowner permission is required to cross any private lands. An estimated 150 people per year may visit this WSA, mainly consisting of outfitters and guides and adjacent landowners. Hunting, fishing, hiking, horseback riding, camping and other non-motorized recreational activities are permitted. The WSA has been designated as crucial year-round range for elk.

BLM lands outside the recreation areas and the WSA are managed to meet basic recreational needs. Recreation is allowed, but is not the priority on those properties; they are managed to allow recreational uses that are not in conflict with the primary uses of these lands. The Cabin Canyon area is a 1,400 acre area located about 22 miles southeast of Gillette and is adjacent to about an addition 2,500 acres of state owned land. Current uses are predominately mineral extraction and grazing, but motorized recreational use is slowly increasing.

Currently, all BLM land in Campbell County is open to the public; however, some parcels are inaccessible due to the existence of surrounding private properties or other publicly inaccessible lands. Recreation occurring on land without public access is primarily by adjacent private land owners or commercial outfitters and guides operating under a special recreation permit (SRP) (BLM 2013c).<sup>6</sup> The Buffalo Field Office estimates a total of about 30,000 recreational visits per year to all BLM land in Campbell, Sheridan and Johnson Counties (the Buffalo Planning Area). Hunting, camping, fishing, and vehicle touring are among the most common recreational activities on BLM land in the Buffalo planning area, although numerous other activities are

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<sup>5</sup> As estimated by traffic counters at various locations; there are likely to be additional visitors that use ATV roads to access these properties that do not cross traffic counters.

<sup>6</sup> Special Resource Permits (SRPs) are required for commercial or organized recreational uses of public lands and related waters. The Buffalo Field Office currently manages 46 SRPs, most for commercial outfitting and guide services.



allowed, including horseback riding, photography and wildlife viewing. During the summer months (June through August), BLM lands experience relatively high use for non-consumptive activities (hiking, camping); hunting activity generally occurs in the fall season (September through November). Overall, recreational use of BLM land is predominantly by local residents; Currently, BLM properties do not appear to be a regional draw (BLM 2013c).

### ***Bankhead-Jones Land***

The Bankhead-Jones Farm Tenant Act of 1937 authorized the federal government to acquire privately owned sub-marginal agricultural land for various purposes. The majority of these lands are managed by either the USFS or the BLM. Many USFS owned and managed Bankhead-Jones lands have become National Grasslands, including TBNG.

Campbell County has approximately 87,072 acres of Bankhead-Jones land within its borders; these properties are now a part of the TBNG and are managed by the USFS Douglas Ranger District (refer to Figure 2-1).

### ***State Owned and Managed Properties***

The State of Wyoming owns and manages a number of non-contiguous properties (approximately 188,662 total acres) more or less evenly scattered throughout Campbell County in a checkerboard pattern. More than half of these state owned parcels have no known public access, mainly due to the lack of public road access or the fact that they are surrounded by privately owned properties. Legally accessible State Trust Lands can be used for hunting, fishing and general recreational purposes with certain restrictions, including the prohibition of off-road vehicle use, overnight camping and hunting on cultivated land. A small number of state owned parcels in Campbell County are closed to firearms and all motorized vehicles.

### ***Wyoming Game and Fish Department Managed Recreation***

The WGFD provides wildlife and habitat management and wildlife associated recreational opportunities (including fishing, hunting and wildlife viewing) throughout the state. In Campbell County, the WGFD manages walk-in hunting access to specific private properties; stocks a number of lakes, ponds and reservoirs; and manages hunt areas for specific game species.

### **Private Lands Public Wildlife Access Program**

As of 2013, the WGFD's Private Lands Public Wildlife Access (PLPW) Program had opened up access to almost 3 million acres of private land and landlocked public lands throughout the state for the purposes of hunting and fishing activities. Through the Walk-in Area Program, the Department has made agreements with a number of private landowners for walk-in fishing access and walk-in hunting access on specific private properties, as well as access to landlocked public acreage. The Hunter Management Program is aimed at developing agreements with landowners that control large expanses of open areas in Wyoming to enhance public access specifically for hunting opportunities. The Hunter-Landowner Assistance Program is available to private landowners that would like to open up their properties to a small number of hunters for various purposes, including the control of wildlife populations or the decrease of agricultural damage.

As of mid-2014, there were no agreements with private landowners for walk-in fishing access in Campbell County. The Walk-in Hunting Area program in Campbell County currently includes 6 large areas ranging in size from about 1,200 acres to about 4,350 acres, covering a total of about 13,700 private acres in the county. As of 2014, there were no Hunter Management Areas in Campbell County and there were no Landowner Assistance programs in the county in that year.

#### Fishing Opportunities

WGFD managed fishing areas include Donna Reservoir (north central Campbell County), Gillette Fishing Lake, High Country Park Pond (west of Gillette), Panther Pond (in Wright) and Little Thunder Reservoir (outside of Wright), all managed by the WGFD. The WGFD managed reservoirs, lakes and ponds are all stocked, mainly with a variety of trout species, including rainbow trout, brown trout, lake trout, golden trout and or brook trout. Panther Pond and Gillette Lake are probably the most popular fishing locations in the county and see the highest level of use given the ease of access to those areas (up to 100 anglers per day at Panther Pond and up to 200 anglers per day at Gillette Lake on busy summer weekend); other locations experience relatively low fishing use.

#### Hunting Opportunities

Hunting in Campbell County is largely focused on big game species, including pronghorn, elk and mule deer. In 2014, the county was included in the following hunt areas:

- Pronghorn (Figure 4-12): Hunt areas 17, 18 and 19 (all located north of I-90) and areas 23, 24, 26 and 27 (south of I-90). Hunt areas 23, 26 and 27 also include portions of other counties. Area 23 is extremely productive for pronghorn and offers the most pronghorn tags of any hunt area in the state (3,050 in 2013). Hunt area 24 offers a substantial number of pronghorn tags (1,100 in 2013).
- Elk (Figure 4-13): The majority of Campbell County is included in hunt area 129. Hunt areas 2, 113 and 123 include portions of Campbell County. Although the elk population in the county is increasing, there are currently not many elk tags offered in the area. The elk in this area are generally large trophy quality elk. Hunt area 123 is one of the more popular areas in the state for elk hunting.
- Mule Deer (Figure 4-14): Campbell County is included in hunt areas 10 (partial), 17, 18, 19, 20, 21 and 22 (partial). The mule deer population in Campbell County is decreasing, which has generally reduced the quality of the hunting experience in recent years; however, there are certain areas in the county where there are still good opportunities for hunting that species. There are some white-tail deer hunting opportunities in the county.

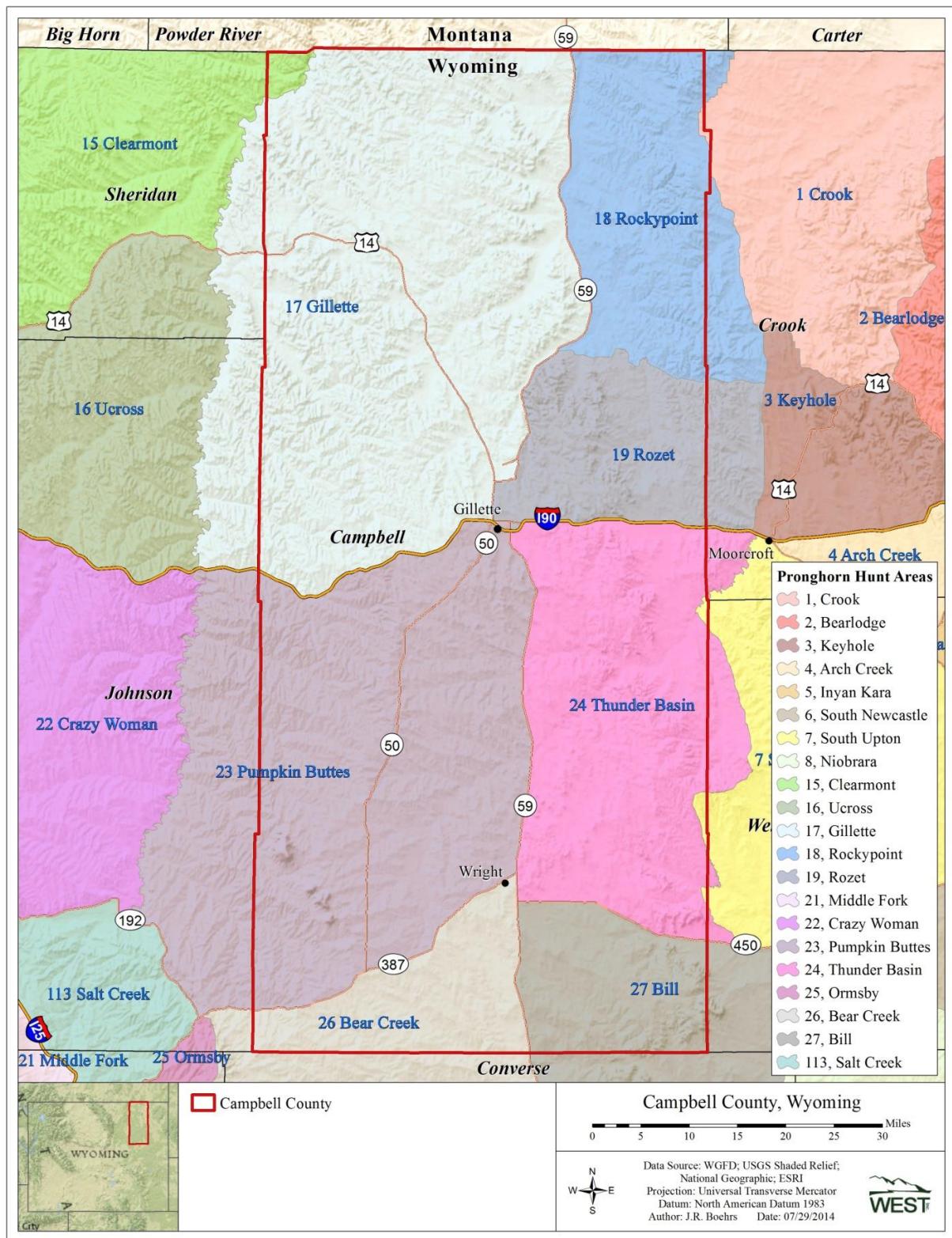
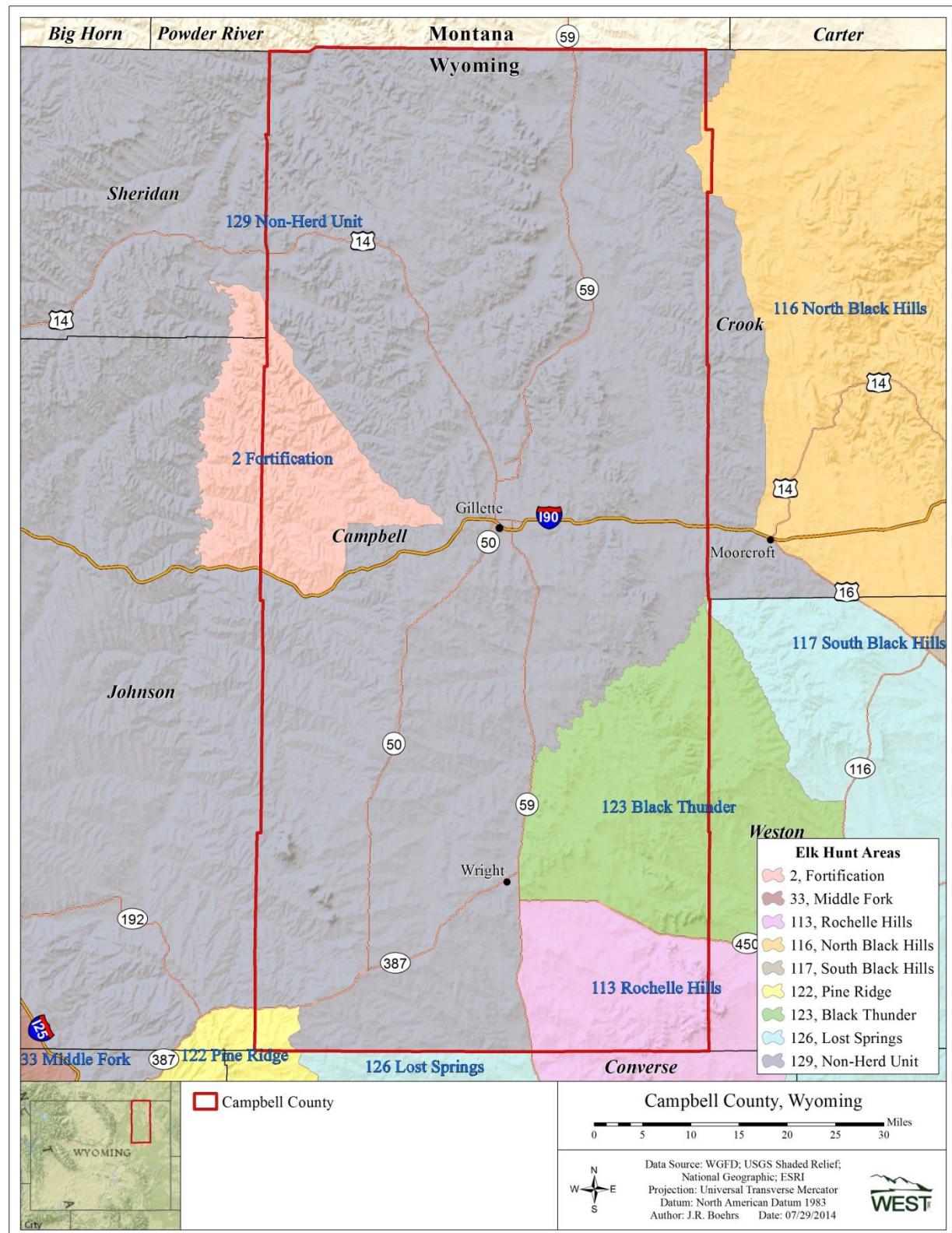


Figure 4-12. Pronghorn hunt areas in Campbell County.



**Figure 4-13. Elk hunt areas in Campbell County.**

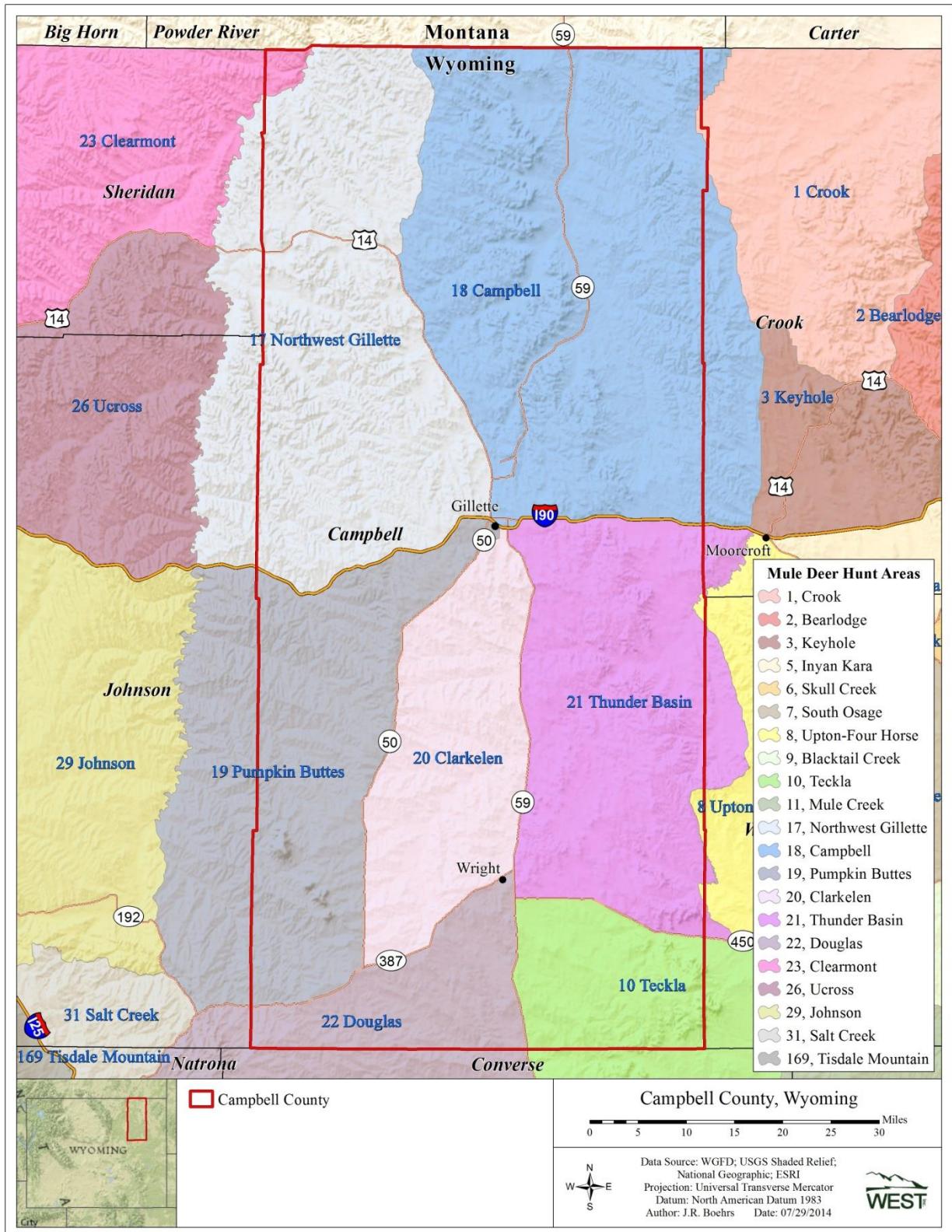


Figure 4-14. Mule deer hunt areas in Campbell County.

The abundance of private property in Campbell County results in heavy use of public lands for hunting purposes. As discussed earlier, the WGFD's walk-in hunting area program has opened up many acres of private property in Campbell County to hunting activity.

### ***Recreational Economy***

Recreational activity supports only a small portion of Campbell County's total economy. About 170 people were employed in the Arts, Entertainment and Recreation industry in Campbell County in 2012.<sup>7</sup> Employment in that industry made up less than one percent of total County employment and compensation of those employees was about \$10,000 per employee per year. The Census Bureau's County Business Patterns program reported only 16 establishments in that industry in 2012 (about one percent of total County establishments). However, the existence of a variety of recreational opportunities may be an added attraction to regional visitors, may promote interest in Campbell County and is one component of the larger tourism sector of the Campbell County economy.<sup>8</sup> In fact, total travel related spending by visitors to Campbell County exceeded \$111 million in 2013, generating over \$27 million in employee earnings, about 1,130 jobs and about \$1.8 million in local taxes (Dean Runyan Associates 2014). A portion of that spending was due to the existence of outdoor recreational activities in the county.

Anglers and hunters together (including residents and non-residents of Wyoming) spent over \$752 million in Wyoming in 2011 on trip related expenditures (lodging, food, and transportation), equipment and other items (USFWS 2011). Wildlife watchers spent another \$350 million on trips throughout Wyoming. This level of spending reflects the interest in and importance of outdoor recreation to the state as a whole and to the tourism industry in particular. As the population of Campbell County increases and as interest in traveling to the county for any number of reason grows, so too is the likelihood that recreation will be an important component in the Campbell County lifestyle and quality of life.

### ***Goal***

Sustain and enhance outdoor recreation opportunities on state and federal lands.

### ***Objectives***

- *Coordination, consultation and cooperation with state and federal agencies to protect and expand outdoor recreation opportunities on federal or state lands.*
- *Support and promotion of use of negotiated agreements to provide outdoor recreation opportunities.*
- *Protection of resources used in outdoor recreation activities.*

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<sup>7</sup> Estimated by Harvey Economics based on historical Campbell County data obtained from the Bureau of Economic Analysis (BEA). The historical data may or may not include outfitters and guides that do not have an established base of operations.

<sup>8</sup> The tourism sector includes Arts, Entertainment and Recreation industries as well as the Accommodations and Food Services industries, which make up the majority of the tourism sector in Campbell County.



- *Encouragement of responsible outdoor recreation use.*
- *Pursuance and promotion of land and water management activities and policies that enhance outdoor recreational opportunities.*

## Policies

- *Coordinate with state and federal land management agencies and seek local citizen input on land management planning decisions for outdoor recreation.*
- *Support and promote state and federal planning efforts for outdoor recreation which best reflects the culture/custom of Campbell County.*
- *Support existing access and opportunities for outdoor recreation, including hunting and fishing.*
- *Support the closing of state and federal lands that become damaged by irresponsible outdoor recreation use and re-opening once the damage has been mitigated and the damage rehabilitated.*
- *Assist state and federal land management agencies in the prosecution of outdoor recreation users who willfully damage resources and facilities and those operating in any illegal manner.*
- *Recognize and uphold private property rights in negotiations and acquisition of public access to state and federal lands.*
- *Support land swaps in acquiring access to state and federal lands for outdoor recreation use.*
- *Oppose any net increase in state and federal lands and agencies shall provide data verifying this in any proposed acquisition of private lands.*
- *Oppose state and federal acquisition of private lands which would decrease the tax revenue stream for local governments and economic production capabilities of its citizens.*
- *Carefully consider, and oppose if warranted, perpetual conservation easements that prohibit, preclude, or impair the ability of future generations to utilize land resources for future needs.*
- *State and federal agencies shall:*
  - *cooperate, consult, and coordinate with local governments, private landowners and lease holders potentially impacted by a special recreation area designation;*
  - *work with Campbell County to educate outdoor recreation users on multiple use mandates and promote respect and cooperation between recreation users;*
  - *provide and maintain signage identifying agency lands available to the public for outdoor recreation and identifying private lands with no trespassing/private property signs in the Thunder Basin National Grassland and other intermingled private/state/federal lands;*



- *seek to avoid and minimize resource user conflicts and impacts;*
- *coordinate, consult, and cooperate with local government agencies and private landowners who are negatively impacted by outdoor recreation conflicts and damage to resources by recreation users;*
- *recognize the intermingling of private lands within agency lands and coordinate and cooperate with private landowners in planning decisions and oversight of outdoor recreation; and*
- *make updated and current maps available to the public clearly identifying agency lands available for public outdoor recreation.*
- ***State and federal land management decisions shall:***
  - *comply with recommended licensing/harvesting numbers as articulated by the Wyoming Game & Fish Commission,*
  - *not favor one recreation use to the detriment of others,*
  - *promote recreation that benefits the larger general public not special interest(s), and*
  - *reflect the needs of local recreational business in Campbell County.*

## Transportation and Rights-of-Ways (ROWs)

### Custom and Culture

Campbell County has an extensive network of county roads, state highways, railways, and federal interstate system available for transportation products to and from markets, and enabling citizens to travel to their various destinations (Figure 4-15). The rights-of-ways for these networks were developed across private, state, and federal lands through different methods of acquisition.



Figure 4-15. Transportation network in Campbell County

The Campbell County roadway network is based on a range of different types of facilities with varying characteristics. These facilities range from interstate highways, which serve higher speed longer distance trips, to local streets that are designed for lower speeds and shorter distances.

### ***Roadway Functional Classifications***

- **Interstates:** Roadways that serve high speed and high volume regional traffic. Access to Freeways is limited to grade separated interchanges without mainline traffic signals (e.g. I-90).
- **State Highways:** Roadways that serve high speed and high volume regional traffic. Access is limited without traffic signals (e.g. State Highway 59, State Highway 50).
- **Principal Arterials:** Roadways that serve higher speed and higher volume traffic over long distances. Access is highly controlled with a limited number of intersections, medians with infrequent openings, and no direct parcel access. Adjacent existing and future land uses shall be serviced by other network roadways, service roads and inter parcel connections (e.g. Gillette, WY: State Highway 59, State Highway 50).
- **Minor Arterials:** Roadways that currently serve higher speed and higher volume traffic over medium distances. Access is restricted through prescribed distances between intersections, use of medians, and or limited direct parcel access.
- **Collectors:** Roadways that service as links between local streets facilities and arterial facilities over medium to long distances, outside of or adjacent to subdivision developments. Collectors are managed to maximize the safe operation of through movements and to distribute traffic to local access.
- **Locals:** Roadways that provide direct parcel access and deliver parcel generated trips to the collector network (e.g. many rural subdivision and neighborhood streets).

### ***Major Roadways and Primary Uses***

A summary of the major roadways signed name and brief description is shown below.

**I-90:** 37.47 miles of mainline divided interstate roadway.

**Wyoming State Highway 59:** 113.60 miles of undivided two lane roadway extending from the county line of Campbell and Converse County to the Mountain State line.

**Wyoming State Highway 50:** 51.27 miles of undivided two lane roadway extending from Wyoming State Highway 59 to WY State Highway 387.

**Wyoming State Highway 51:** 20.68 miles of undivided two lane roadway extending from Wyoming State Highway 59 to the East line of Campbell County and Crook County.

**U.S. Highway 16:** 41.90 miles of undivided two lane roadway extending from the county line of Campbell and Johnson County to Wyoming State Highway 59.

**Wyoming State Highway 450:** 20.62 miles of undivided two lane roadway extending from the county line of Campbell and Weston County to State Highway 59.

**Wyoming State Highway 387:** 32.53 miles of undivided two lane roadway extending from the county line of Campbell and Johnson County to Wyoming State Highway 59.



## **Primary Issues of Existing Transportation Network**

- **Sustainable Roadway Maintenance/ Rehabilitation**

Typical roadways are designed to last between 20 and 25 years or longer. With regular maintenance, the roadway will remain in good condition over its lifetime. However, if the road is under-designed or if maintenance is not performed regularly, roads deteriorate quickly.

Based on the Campbell County 2013 Comprehensive Plan (CCPDZ 2013) a majority of subdivision roads within the county are publicly owned and maintenance is the responsibility of the landowners along the roadway. The Board of Campbell County Commissioners currently offers a matching grant program to homeowners and subdivisions that form Improvement and Service Districts to help maintenance costs.

As costs increase, the sustainability of implementing and funding proper maintenance may become an issue over an extended period of time.

- **Dust and Air Pollution**

The network of unpaved County roads and subdivision roads provides an efficient and cost effective means of developing a roadway network. However, this type of roadway surface depending on climatic conditions, dust pollution could have negative impacts to residents of Campbell County.

## **Goal**

Development of new, efficient transportation methods and rights-of-ways, and preservation of active transportation methods and rights-of-ways across private, state and federal lands.

## **Objectives**

- *Preservation of active rights-of-way and routes across state and federal land in pursuit of mining, ranching, farming, logging, recreational activities, motorized vehicle use, and all other historic uses.*
- *Preservation and development of highways and transportation systems, railroads, utility corridors, and other forms of rights-of-way and routes to best serve Campbell County and its citizens.*
- *Enhancement of economic development with efficient transportation methods, routes, and rights-of-way.*
- *Mitigation of eminent domain issues in development of transportation rights-of-way.*
- *Local involvement in roadless designations by the USFWS.*
- *Reasonable access for all property owners to their property.*

## **Policies**

- ***Utilize mitigation and reclamation policies for “utility” or “infrastructure” rights-of-ways and routes.***



The objective of reclamation is to return the disturbed areas of to approximately pre-construction use and capability. This involves the treatment of soil as necessary to preserve approximate pre-construction capability and the stabilization of the work surface in a manner consistent with the initial land use. The type necessary will be dependent upon the existing environmental conditions (i.e. rangeland, stream, etc.).

- ***Oppose road closures, obliterations, re-construction, retirement, or any other term used where there may be possible R.S. 2477 (see agency mandates) rights-of-way across federal lands.***

An 1866 statute known as Revised Statutes (R.S.) 2477 granted rights of way for the construction of highways over unreserved public lands. On January 6, 2003, the Department of the Interior published broad new “disclaimer of interest” regulations under § 315 of the FLPMA and stated that disclaimers would be used to acknowledge R.S. 2477 rights of way. Congress has directed that no rules “pertaining to” recognition or validity of an R.S. 2477 rights of way can be effective unless authorized by Congress, and the use of disclaimers in the R.S. 2477 context may be controversial. More recently, the Department of the Interior (DOI) has issued new guidance regarding recognition of R.S. 2477 rights of way that again mentions the use of disclaimers for that purpose. This report discusses R.S. 2477 rights of way, the disclaimer regulations and DOI guidance, the congressional directive, and legislation. It will be updated as warranted.

The 1866 statute that became R.S. § 2477 stated that “... the right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted.” The FLPMA repealed this act but protected valid R.S. 2477 rights of way in existence at the time of repeal. Certain rights of way asserted under R.S. 2477 may be controversial because they run either through undeveloped areas that might otherwise qualify for wilderness designation or across lands that are now private or included in federal reserves (such as parks or national forests).

- ***State and federal agencies shall utilize public input meetings and collaborative decision making with Campbell County agencies and stakeholders in developing new transportation routes.***
- ***Support the nomination of a County representative to be a member of the National Association of Counties (NACO) Public Lands Steering Committee and Transportation Steering Committee.***

In accordance with Section 102(a)(2), FLPMA (P.L. 94-579, October 21, 1976), "The national interest will be best realized if the public lands . . . and their present and future use is projected through a land use planning process coordinated with other state and federal planning efforts."

Furthermore, in accordance with Section 309(a), (P.L. 95-514, 1978), “ The secretary shall establish advisory councils of not less than ten and not more than fifteen members appointed by him from among persons who are representative of the major citizens’ interests concerning problems relating to land use planning or the management of public lands located within the area for which an advisory council is established.”



Development of Memorandum of Understanding establishing a cooperation agency relationship between the Bureau of Land Management Casper Field Office and Campbell County establishing a cooperating agency relationship in transportation planning.

- *Notify within a reasonable time period all potentially affected land holders regarding proposed new transportation routes, re-routing or closure of transportation routes affecting their property by entity proposing such routes.*
- *State, federal, and local agencies shall:*
  - *maintain, and provide to the public, updated mapping and visual data regarding proposed and existing transportation rights of ways; and*
  - *incorporate Campbell County's current transportation plan into their transportation planning process.*
- *State, federal and private transportation projects sited on state and federal lands where such lands are available.*
- *Streamline the permitting processes on state and federal lands in order to facilitate location of state, federal, and private transportation projects on such lands.*
- *Do not encumber or restrict private property rights or privileges with access to or across state or federal lands.*

The Wyoming Transportation Commission governs activities of the Department of Transportation (W.S. 24-2-101). The commission is composed of seven members appointed by the governor, with approval of the Senate. Board of County Commissioners are appointed to six-year terms and they represent districts which include three or four counties.

Each county within a commission district is represented, in turn, by successive appointments. Campbell County is within Commission District 4 comprised of Sheridan, Johnson, and Campbell Counties. State law requires the minority party be represented on the commission. The commission generally meets monthly.

## Literature Cited

### Chapter 1 References

Bass, R. E., A. I. Herson, and K. M. Bogdan. 2001. *The NEPA Book: A Step-by-Step Guide on How to Comply with the National Environmental Policy Act*. Solano Press Books, Point Arena, California.

Bureau of Land Management (BLM). 2012. *A Desk Guide to Cooperating Agency Relationships and Coordination with Intergovernmental Partners*. Available online at: [http://www.ntc.blm.gov/krc/uploads/623/BLM\\_DeskGuide\\_CA\\_Relationships\\_2012.pdf](http://www.ntc.blm.gov/krc/uploads/623/BLM_DeskGuide_CA_Relationships_2012.pdf)

Bureau of Land Management (BLM). 2013. *Draft Resource Management Plan and Environmental Impact Statement for the Buffalo Field Office Planning Area*. Prepared by US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. June 2013.

Campbell County Division of Planning and Zoning (CCDPZ). 2013. *Campbell County, Wyoming: 2013 Comprehensive Plan*. Orion Planning Group, Collins Planning Associates, and MMI Planning. Available online at: <http://www.ccgov.net/834/Comprehensive-Plan> and <http://www.ccgov.net/DocumentCenter/Home/View/227>

Federal Land Policy and Management Act (FLPMA). 1976. 43 United States Code (USC) §§ 1701-1736, 1737-1782. October 1, 1976.

Hulme, D., C. Andersen, K. Parady, J. Hamerlinck, S. Lieske, and I. Burke. 2009. *Wyoming's State of the Space: A Comprehensive Review of Land Use Trends in Wyoming*. Ruckelshaus Institute of Environment and Natural Resources. University of Wyoming, Laramie, Wyoming.

National Environmental Policy Act (NEPA). 1969. 42 United States Code (USC) 4321-4347. Pub. L. 91-190, § 2, Jan. 1, 1970, 83 Stat. 852.

National Forest Management Act (NFMA). 1976. 16 United States Code (USC) §§ 1600-1687. October 22, 1976.

State of Wyoming. 2014. Wyoming Office of State Lands and Investments. Accessed August 2014. Available online at: [www.wyo.gov](http://www.wyo.gov) and <http://lands.wyo.gov/lands>

US Forest Service (USFS). 2002. *Thunder Basin National Grassland Land and Resource Management Plan*. USFS Rocky Mountain Region Thunder Basin National Grassland (TBNG). July 31, 2002.

Williams, Byron. 2010. *Adaptive Management of Natural Resources – Framework and Issues*. Journal of Environmental Management. Available online at: <http://www.webpages.uidaho.edu/fish510/PDF/Williams%202011%20adaptive%20mgt.pdf>

Wyoming State Land Use Planning Act. 1975. Wyoming Statute (W.S.) 9-8-101 through 9-8-302.



## Chapter 2 References

Bureau of Land Management (BLM). (no date). Wyoming 100k Index with Surface Ownership. Wyoming BLM. Information available online at: [http://www.blm.gov/wy/st/en/resources/public\\_room/gis/mapsgis.html](http://www.blm.gov/wy/st/en/resources/public_room/gis/mapsgis.html) and <http://www.blm.gov/pgdata/etc/medialib/blm/wy/resources/gis/state/images.Par.6690.Image.-1.-1.1.gif>

ESRI. 2014. Geographic Information System (GIS) Online Topographic Base Map and World Imagery Map. ArcGIS Resource Center. ESRI, producers of ArcGIS software. Redlands, California.

National Geographic Society (National Geographic). 2014. World Maps. Digital Topographic Map.

North American Datum (NAD). 1983. NAD83 Geodetic Datum.

US Geological Survey (USGS). 2014. The National Map/US Topo. Last updated January 5, 2014. Homepage available at: <http://nationalmap.gov/ustopo/index.html>

## Chapter 3 References

40 Code of Federal Regulations (CFR) 6. 2011. Title 40 - Protection of the Environment. Part 60 - Standards of Performance for New Stationary Sources. 40 CFR 6 Part 60 §§ 60.1 et seq. July 1, 2011. Available online at: <http://www.gpo.gov/fdsys/pkg/CFR-2011-title40-vol6/xml/CFR-2011-title40-vol6-part60.xml>

40 Code of Federal Regulations (CFR) 22. 1999. Title 40: Protection of Environment; Chapter I - Environmental Protection Agency; Subchapter D - Water Programs; Part 22 - EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. 40 CFR § 122.1-122.64. 7 U.S.C. 136(l); 15 U.S.C. 2615; 33 U.S.C. 1319, 1342, 1361, 1415 and 1418; 42 U.S.C. 300g-3(g), 6912, 6925, 6928, 6991e and 6992d; 42 U.S.C. 7413(d), 7524(c), 7545(d), 7547, 7601 and 7607(a), 9609, and 11045. 64 FR 40176, July 23, 1999.

42 United States Code (USC) §§ 7401-7515. 1970. Title I - Air Pollution Prevention and Control. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title1.html>

42 United States Code (USC) §§ 7521-7590. 1970. Title II - Emission Standards for Moving Sources. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title2.html>

42 United States Code (USC) §§ 7601-7627. 1970. Title III - General Provisions. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title3.html>

42 United States Code (USC) §§ 7651-7651o. 1970. Title IV - Acid Deposition Control. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title4.html>

42 United States Code (USC) §§ 7661-7661f. 1970. Title V - Permits. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title5.html>

42 United States Code (USC) §§ 7671-7671q. 1970. Title VI - Stratospheric Ozone Protection. Clean Air Act (CAA). 42 USC §§ 7401-7671q. Available online at: <http://www.epa.gov/air/caa/title6.html>

74 Federal Register (FR) 62: 15123-15188. 2009. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Final Rule to Identify the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and to Revise the List of Endangered and Threatened Wildlife; Final Rule. Department of the Interior, Fish and Wildlife Service. RIN 1018-AW37. April 2, 2009. Available online at: <http://www.gpo.gov/fdsys/pkg/FR-2009-04-02/pdf/E9-5991.pdf>



74 Federal Register (FR) 175: 46836-46879. 2009. 50 CFR Parts 13 and 22. Eagle Permits; Take Necessary to Protect Interests in Particular Localities. Final Rule. September 11, 2009.

77 Federal Register (FR) 175: 55530-55604. 2012. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Removal of the Gray Wolf in Wyoming from the Federal List of Endangered and Threatened Wildlife and Removal of the Wyoming Wolf Population's Status as an Experimental Population; Final Rule. Final Rule. Department of the Interior, Fish and Wildlife Service. RIN 1018-AX94. September 10, 2012. Available online at: <http://www.gpo.gov/fdsys/pkg/FR-2012-09-10/pdf/2012-21988.pdf>

Animal Damage Control Act. 1931. 7 United States Code § 426-426c. March 2, 1931.

Antolin, M. F., L. T. Savage, and R. J. Eisen. 2006. Landscape Features Influence Genetic Structure of Black-Tailed Prairie Dogs (*Cynomys Ludovicianus*). *Landscape Ecology* 21: 867-875.

Assadian, O. and G. Stanek. 2002. Theobald Smith--the Discoverer of Ticks as Vectors of Disease. *Wiener klinische Wochenschrift* 114(13-14): 479-481.

Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 United States Code (USC) § 668-668d. Bald Eagle Protection Act of 1940, June 8, 1940, Chapter 278, § 2, 54 Statute (Stat.) 251; Expanded to include the related species of the golden eagle October 24, 1962, Public Law (PL) 87-884, 76 Stat. 1246. As amended: October 23, 1972, PL 92-535, § 2, 86 Stat. 1065; Nov. 8, 1978, PL 95-616, § 9, 92 Stat. 3114.

Barnes, M. D. 1996. Aquatic Ecology Assessment of Sand Creek, Black Hills, Crook County, Wyoming. The Nature Conservancy, Wyoming Field Office, Lander, Wyoming.

Barrineau, C., B. Bear, and L. Tooker. 2007. Status of Habitat and Native Species in Northeastern Wyoming Prairie Streams. Wyoming Game and Fish Department (WGFD) Administrative Report. WGFD, Cheyenne, Wyoming.

Belle Fourche River Compact. 1943. Wyo. Stat. 941-488 (1957) [Act of March 3, 1943, Wyo. Sess. Laws p. 153] S.D. Comp. Laws 946-30-1 (1967) [Act of March 4, 1943, Sess. Laws p. 281].

Blanton, J. D., D. Palmer, J. Dyer, and C. E. Rupprecht. 2011. Rabies Surveillance in the United States During 2010. *Journal of the American Veterinary Medical Association* 239(6): 773-783.

Block, W. M., D. M. Finch, and L. A. Brennan. 1995. Single-Species Versus Multiple-Species Approaches for Management. Chapter 16. Pp. 461-476. In: *Ecology and Management of Neotropical Migratory Birds: A Synthesis and Review of Critical Issues*. T. E. Martin and D. M. Finch, eds. Oxford University Press, New York, New York. Available online at: [http://www.fs.fed.us/rm/pubs\\_other/rmrs\\_1995\\_block\\_w001.pdf](http://www.fs.fed.us/rm/pubs_other/rmrs_1995_block_w001.pdf)

Blom, F. S. and G. Connolly. 2003. Inventing and Reinvention Sodium Cyanide Ejectors: A Technical History of Coyote Getters and M-44s in Predator Damage Control. Research Report 03-02. US Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) National Wildlife Research Center. Available online at: [http://www.aphis.usda.gov/wildlife\\_damage/nwrc/publications/03pubs/Sodium%20Cyanide.pdf](http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/03pubs/Sodium%20Cyanide.pdf)

Bolen, E. G. and W. L. Robinson. 2003. *Wildlife Ecology and Management*. Fifth Edition. Prentice Hall, Upper Saddle River, New Jersey. 634 pp.

Bowie, W. R., A. S. King, D. H. Werker, J. L. Isaac-Renton, A. Bell, S. B. Eng, and S. A. Marion. 1997. Outbreak of Toxoplasmosis Associated with Municipal Drinking Water. *Lancet* 305: 173-177.

Botzler, R. G. and R. N. Brown. 2014. *Foundations of Wildlife Diseases*. University California Press, Oakland, California.

Bradley, B. A., D. S. Wilcove, and M. Oppenheimer. 2010. Climate Change Increases Risk of Plant Invasion in the Eastern United States. *Biological Invasions* 12: 1855-1872.

Bradshaw, B. 1996. Cheyenne River Basin Management Plan. (FXSN8CR). Wyoming Game and Fish Department (WGFD), Sheridan, Wyoming.

Brown, R. 2010. A Conservation Timeline. *The Wildlife Professional* Fall 2010: 28-75.

Brucellosis Coordination Team. 2004. Brucellosis Coordination Team Minutes: August 26, 2004. Information available online at: <http://www.wyomingbrucellosis.com/bct.asp>

Bureau of Land Management (BLM). 1985. Record of Decision for the Resource Management Plan/Final Environmental Impact Statement for Buffalo Resource Area (Incorporating Rangeland Program Summary). Campbell, Johnson, and Sheridan Counties, Wyoming. October 1985. US Department of the Interior (USDI) BLM. Casper, Wyoming. Available online at: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/planning/rmps.Par.32859.File.dat/bfo-rmp.pdf>

Bureau of Land Management (BLM). 1987. Renewable Resource Improvement and Treatment Guidelines and Procedures. BLM Handbook H-1740-1.

Bureau of Land Management (BLM). 1998. Measuring and Monitoring: Plant Populations. BLM/RS/ST-98/005+1730. BLM Technical Reference 1730-1. Prepared by Elzinga, C.L., D. W. Salzer, J.W. Willoughby. Available online at: <http://www.blm.gov/nstc/library/pdf/MeasAndMon.pdf>

Bureau of Land Management (BLM). 2000. Draft National Memorandum of Understanding with APHIS-Wildlife Services. BLM Instruction Memorandum No. 2000-038. US Department of the Interior (USDI) BLM. June 2000.

Bureau of Land Management (BLM). 2005a. Assessing Big Sagebrush at Multiple Spatial Scales: An Example in Southeast Oregon. BLM Technical Note 417. August 2005. Available online at: <http://www.blm.gov/nstc/library/pdf/SagebrushTN417.pdf>

Bureau of Land Management (BLM). 2005b. Land Use Planning Handbook. BLM Handbook H-1601-1. March 11, 2005. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.38665.File.dat/h1601-1.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.38665.File.dat/h1601-1.pdf) and [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/planning.Par.45838.File.dat/landuse\\_hb.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/planning.Par.45838.File.dat/landuse_hb.pdf)

Bureau of Land Management (BLM). 2005c. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. Knowledge Resource Center, BLM. Available online at: [http://www.ntc.blm.gov/krc/uploads/281/Monitoring%20Manual%20for%20Grassland,%20Shrubland%20and%20Savanna%20Ecosystems%20Vol.%20I\\_Quick%20Start.pdf](http://www.ntc.blm.gov/krc/uploads/281/Monitoring%20Manual%20for%20Grassland,%20Shrubland%20and%20Savanna%20Ecosystems%20Vol.%20I_Quick%20Start.pdf) and <http://www.ntc.blm.gov/krc/uploads/281/Monitoring%20Manual%20for%20Grassland,%20Shrubland%20and%20Savanna%20Ecosystems%20Vol.%20II.pdf>

Bureau of Land Management (BLM). 2008. Integrated Vegetation Management. BLM Handbook H-1740-2. March 25, 2008. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.59510.File.dat/H-1740-2.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.59510.File.dat/H-1740-2.pdf)

Bureau of Land Management (BLM). 2009a. BLM Programmatic Environmental Impact Statement Final Vegetation Treatments Using Herbicides in 13 Western States.

Bureau of Land Management (BLM). 2009b. Noxious and Invasive Weed Management Plan for Oil and Gas Development Areas. September 23, 2009. Available online at: <http://www.wy.blm.gov/jio-papo/papo/reclamation/WeedMgmtPlan.pdf>

Bureau of Land Management (BLM). 2011. Multi-Program Guidance. Plant Conservation Program, Wyoming US Department of the Interior BLM. Last updated May 16, 2011. Information available online at: <http://www.blm.gov/wy/st/en/programs/pcp/mgmt/multi.html>

Bureau of Land Management (BLM). 2012. Vegetative Monitoring. Plant Conservation Program, Wyoming. US Department of the Interior (USDI) BLM. Last updated January 26, 2012. Information available online at: <http://www.blm.gov/wy/st/en/programs/pcp/mgmt/veg.html>

Bureau of Land Management (BLM). 2013. Draft Resource Management Plan and Environmental Impact Statement for the Buffalo Field Office Planning Area. Prepared by US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. June 2013. Available online at: <https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=48300>

Bureau of Land Management (BLM). 2014a. BLM WY Invasive Weed and Pest Control. BLM Federal Grants. Accessed June 2014. Information available online at: <http://www.federalgrants.com/BLM-WY-Invasive-Weed-and-Pest-Control-45105.html>

Bureau of Land Management (BLM). 2014b. Buffalo Field Office NEPA Documents. US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. Last updated August 4, 2014. Information available online at: <http://www.blm.gov/wy/st/en/info/NEPA/documents/bfo.html>

Bureau of Land Management (BLM). 2014c. Buffalo RMP Revision. US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. Last updated June 2, 2014. Information available online at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo.html>

Bureau of Land Management (BLM). 2014d. Document Library: Buffalo RMP Revision. US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. Last updated May 28, 2014. Information available online at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo/docs.html>

Bureau of Land Management (BLM). 2014e. Sensitive Species List. BLM Buffalo Field Office. US Department of the Interior (USDI) BLM Wyoming. March 26, 2014. Last updated April 2, 2014. Available online at: [http://www.blm.gov/wy/st/en/field\\_offices/Buffalo/wildlife/s-species.html](http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife/s-species.html)

Bureau of Land Management (BLM). 2014f. Visual Resource Management. National Recreation Programs, US Department of the Interior (USDI) BLM. Last updated May 21, 2012. Information available online at: [http://www.blm.gov/wo/st/en/prog/Recreation/recreation\\_national/RMS.html](http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS.html)

Bureau of Land Management (BLM). 2014g. Weeds & Pests. BLM Wyoming Programs. Last updated March 4, 2014. Information available online at: [http://www.blm.gov/wy/st/en/programs/weeds\\_pests.html](http://www.blm.gov/wy/st/en/programs/weeds_pests.html)

Bureau of Land Management (BLM). 2014h. Wildlife Data. BLM Buffalo Field Office. US Department of the Interior (USDI) BLM Wyoming. Last updated April 2, 2014. Accessed October 6, 2014. Information available online at: [http://www.blm.gov/wy/st/en/field\\_offices/Buffalo/wildlife/data.html](http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife/data.html)

Bureau of Land Management (BLM), US Forest Service (USFS), and Natural Resources Conservation Service (NRCS). 2010. Rangeland Interagency Ecological Site Manual. US Department of the Interior (USDI), Department of Agriculture (USDA) Forest Service, and the USDA NRCS. June 2010. Available online at: <http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=27123.wba>

Bureau of Land Management (BLM), US Forest Service (USFS), and Natural Resources Conservation Service (NRCS). 2013. Ecological Site Descriptions: Handbook for Rangelands. US Department of the Interior (USDI), Department of Agriculture (USDA) Forest Service, and the USDA NRCS. Janauary 2013. Available online at: <http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=33943.wba>

Bureau of Land Management (BLM), US Geological Survey (USGS), Natural Resources Conservation Service (NRCS), and Agriculture Research Service (ARS). 2005. Interpreting Indicators of Rangeland Health. Technical Reference 1734-6. Version 4. BLM, USGS, US Department of Agriculture (USDA) NRCS, and USDA ARS. Available online at: <http://www.blm.gov/nstc/library/pdf/1734-6rev05.pdf>

Buskirk, S. W. 1991. Terrestrial Vertebrates in Riparian Habitats of Wyoming. Proceeding of the Riparian Workshop, University of Wyoming.

Campbell, B. and D. Bowles. 1994. Human Tick Bite Records in a United States Air Force Population, 1989-1992: Implications for Tick-Borne Disease Risk. Journal of Wilderness Medicine 5: 450-412.

Campbell County Conservation District (CCCD). 2014. Campbell County Conservation District. Accessed June 2014. Information available online at: <http://www.cccdwy.net/>

Campbell County Division of Planning and Zoning (CCDPZ). 2010. Subdivision Regulations. February 2, 2010. Information available online at: <http://www.ccgov.net/835/Subdivision-Regulations> and <http://www.ccgov.net/DocumentCenter/Home/View/473>

Campbell County Division of Planning and Zoning (CCDPZ). 2011. Zoning Regulations. Revised May 2011. Information available online at: <http://www.ccgov.net/833/Zoning-Regulations> and <http://www.ccgov.net/DocumentCenter/Home/View/474>

Campbell County Division of Planning and Zoning (CCDPZ). 2013. Campbell County, Wyoming: 2013 Comprehensive Plan. Orion Planning Group, Collins Planning Associates, and MMI Planning. Available online at: <http://www.ccgov.net/834/Comprehensive-Plan> and <http://www.ccgov.net/DocumentCenter/Home/View/227>

Campbell County Division of Planning and Zoning (CCDPZ). 2014. Weed and Pest. Information available online at: <http://www.ccgov.net/189/Weed-Pest>

Childs, J. E. and C. D. Paddock. 2003. The Ascendancy of *Amblyomma americanum* as a Vector of Pathogens Affecting Humans in the United States. Annual Review of Entomology 48: 307-337.

Clark, T. W. and M. R. Stromberg. 1987. Mammals in Wyoming. University Press of Kansas, Lawrence, Kansas. 314 pp.

Clean Air Act. 1970. 42 United States Code (USC) § 7401-7671q.

Clean Water Act (CWA). 1972. Clean Water Act. October 18, 1972. 33 United States Code (USC) § 1251-1387, 1251 et seq., 2000.

Connelly, N. A., D. J. Decker, and T. L. Brown. 1985. New Opportunities with a Familiar Audience: Where Esthetics and Harvest Overlap. Wildlife Society Bulletin 13: 399-403.

Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. Pp. 7-46.

Connelly, J. W., K. P. Reese, and M. A. Schroeder. 2003. Monitoring of Greater Sage-Grouse Habitats and Populations. College of Natural Resources Experiment Station, Station Bulletin 80, University of Idaho, Moscow, Idaho.

Cooley, R. A. and G. M. Kohls. 1944. The Genus *Amblyomma* (*Ixodidae*) in the United States. Journal of Parasitology 30: 77-111.

Cooney, J. C. and W. Burgdorfer. 1974. Zoonotic Potential (Rocky Mountain Spotted Fever and Tularemia) in the Tennessee Valley Region: I. Ecologic Studies of Ticks Infesting Mammals in Land between the Lakes. American Journal of Tropical Medicine and Hygiene 23: 99-108.

Cooper, M. S. 2004. A History of Water Law, Water Rights and Water Development in Wyoming: 1868-2002. Cooper Consulting, LLC, Riverton, Wyoming. June 2004. Available online at: [http://wwdc.state.wy.us/history/Wyoming\\_Water\\_Law\\_History.pdf](http://wwdc.state.wy.us/history/Wyoming_Water_Law_History.pdf)

Cooperative Extension Service, US Forest Service (USFS), Natural Resources Conservation Service (NRCS), and Bureau of Land Management (BLM). 1996. Sampling Vegetation Attributes. BLM/RS/ST-96/002+1730. Interagency Technical Reference: Cooperative Extension Service, US Department of Agriculture (USDA) Forest Service, USDA NRCS, and US Department of the Interior (USDI) BLM. Revised in 1997 and 1999. Available online at: <http://www.blm.gov/nstc/library/pdf/samplveg.pdf>

Cooperrider, A. Y., R. J. Boyd, and H. R. Stuart, eds. 1986. Inventory and Monitoring of Wildlife Habitat. BLM/Ya/Pt-87/001+6600. US Department of the Interior (Usdi) Bureau of Land Management (BLM), Denver, Colorado. Available online at: <http://www.ntc.blm.gov/krc/uploads/255/Inventory%20and%20Monitoring%20of%20Wildlife%20Habitat.pdf>. Additional information available online at: <http://www.blm.gov/wy/st/en/programs/pcp/mgmt/veg.print.html>

Davis, S. K. 2004. Area Sensitivity in Grassland Passerines: Effects of Patch Size, Patch Shape, and Vegetation Structure on Bird Abundance and Occurrence in Southern Saskatchewan. Auk 121: 1130-1145.

Derner, J. D., J. K. Detling, and M. F. Antolin. 2006. Are Livestock Weight Gains Affected by Black-Tailed Prairie Dogs? . Frontiers in Ecology and the Environment 9(4): 459-464.

Dobkin, D. S. 1992. Neotropical Migrant Landbirds in the Northern Rockies and Great Plains. US Fepartment of Agriculture (USDA) Forest Service Publication R1-93-34. Missoula, Montana.

Dubey, J. P., R. M. Weigel, A. M. Siegel, P. Thulliez, U. D. Kitron, M. A. Mitchell, A. Mannelli, N. E. Mateus-Pinilla, S. K. Shen, O. C. H. Kwok, and K. S. Todd. 1995. Sources and Reservoirs of Toxoplasma Gondii Infection on 47 Swine Farms in Illinois. Journal of Parasitology 81: 723-729.

Ecosystem Research Group. 2014. Campbell and Johnson Counties Raptor Survey Report. Memorandum to M. Shober, Campbell County Commissioner, and J.S. Gibb, Johnson County Commissioner, from G. Kennett and C. Jourdonnais, Ecosystem Research Group. July 1, 2014.

Endangered Species Act (ESA). 1973. 16 United States Code (USC) § 1531-1544, Public Law (PL) 93-205, December 28, 1973, as amended, PL 100-478 [16 USC 1531 *et seq.*]; 50 Code of Federal Regulations (CFR) 402.

ESRI. 2014a. Geographic Information System (GIS) Online Topographic Base Map. ESRI, producers of ArcGIS software. Redlands, California.

ESRI. 2014b. World Imagery Map. ArcGIS Resource Center. ESRI, producers of ArcGIS software. Redlands, California.

Executive Order 11643. 1972. Environmental Safeguards on Activities for Animal Damage Control on Federal Lands. President R. Nixon. 37 Federal Register (FR) 2875; Feb. 9, 1972. February 8, 1972.

Farmer, C. J. and J. P. Smith. 2009. Migration Monitoring Indicates Widespread Declines of American Kestrels (*Falco sparverius*) in North America. *Journal of Raptor Research* 43: 263 - 273.

Federal Land Policy and Management Act (FLPMA). 1976. 43 United States Code (USC) §§ 1701-1736, 1737-1782. October 1, 1976.

Federal Noxious Weed Act. 1975. 42 Public Law (PL) 93-629 § 7 United States Code (USC) 2801 et seq.; 88 Statute (Stat.) 2148. January 2, 1975.

Fertig, W. and B. Heidel. 2007. Wyoming Plant Species of Concern - *Spiranthes diluvialis* (Ute Ladies'-Tresses). Wyoming Natural Diversity Database (WNDD), University of Wyoming, Laramie, Wyoming. .

Fitzgerald, J. P., C. A. Meaney, and D. A. Armstrong. 1994. Mammals of Colorado. University Press of Colorado, Niwot, Colorado. 467 pp.

Forest and Rangeland Renewable Resources Planning Act (RPA). 1974. Public Law (PL) 93-378. August 17, 1974.

George, J. E. 1990. Wildlife as a Constraint to the Eradication of *Boophilus* spp. (Acari: Ixodidae). *Journal of Agricultural Entomology* 7(2): 119-125.

Gerhardt, D. R. and W. A. Hubert. 1991. Population Dynamics of a Lightly Exploited Channel Catfish Stock in the Powder River System, Wyoming-Montana. *North American Journal of Fisheries Management* 11(2): 200-2005.

Gerhold, R. W. and D. A. Jessup. 2013. Zoonotic Diseases Associated with Free-Roaming Cats. *Zoonoses and Public Health* 60(3): 189-195. doi: 10.1111/j.1863-2378.2012.01522.x.

Gese, E. M., S. P. Keenan, and A. M. Kitchen. 2014. Lines of Defense: Coping with Predators in the Rocky Mountain Region. Available online at: [http://www.aphis.usda.gov/wildlife\\_damage/protecting\\_livestock/downloads/predators\\_booklet7.pdf](http://www.aphis.usda.gov/wildlife_damage/protecting_livestock/downloads/predators_booklet7.pdf)

Ginsberg, H. S., R. A. Lebrun, K. Heyer, and E. Zhioua. 2002. Potential Nontarget Effects of *Metarhizium anisopliae* (Deuteromycetes) Used for Biological Control of Ticks (Acari: Ixodidae). *Environmental Entomology* 31: 1191-1196.

Ginter, D. and M. J. Desmond. 2005. Site Fidelity and Movement Patterns of Wintering Savannah Sparrows on North Padre Island, Texas. *Wilson Bulletin* 117: 63-71.

Graham, C. H. and J. G. Blake. 2001. Influence of Patch- and Landscape-Level Factors on Bird Assemblages in a Fragmented Tropical Landscape. *Ecological Applications* 11: 1709-1721.

Gregory, S. V., F. J. Swanson, W. A. McKee, and K. A. Cummins. 1991. An Ecosystem Perspective of Riparian Zones. *Bioscience* 41: 540-551.

Hall, S. 2014. "Commissioners Vote to Restrict Burning," *Gillette News Record*, July 31, 2014. Available online at: [http://www.gillettenewsrecord.com/news/local/article\\_61d728ac-86b7-5897-bf7a-8b10b3f38e72.html](http://www.gillettenewsrecord.com/news/local/article_61d728ac-86b7-5897-bf7a-8b10b3f38e72.html)

Harpman, D. A. and C. F. Reuler. 1985. Economic Aspects of the Nongame Checkoff. *Nongame Newsletter* 3(5): 4-8.

Heidel, B., W. Fertig, F. Blomquist, and T. Abbot. 2008. Wyoming's Threatened and Endangered Species: Ute Ladies'-Tresses Orchid. Wyoming Bureau of Land Management (BLM) in collaboration with Wyoming Natural Diversity Database (WYNDD).

Hernández, C. M. 1998. Revisión Sobre la Problemática y Los Últimos Avances en el Control de la Garrapata *Boopilus microplus*. Encuentro 30: 40-46.

Hester, S. G. and M. B. Grenier. 2005. A Conservation Plan for Bats in Wyoming. Wyoming Game and Fish Department (WGFD), Nongame Program, Lander, Wyoming.

Hillis, M., B. Irey, and G. Kennet. 2015. 2015 Campbell County, Wyoming. Raptor Symposium Proceedings, March 11-12, 2015, Gillette College Technical Education Center, Gillette, Wyoming.

Homer, C. G., C. L. Aldridge, D. K. Meyer, M. J. Coan, and Z. H. Bowen. 2009. Multiscale Sagebrush Rangeland Habitat Modeling in Southwest Wyoming. US Geological Survey Open-File Report 2008-1027. Available online at: <http://pubs.usgs.gov/of/2008/1027/pdf/ofr2008-1027.pdf>. Additional information available online at: <http://www.blm.gov/wy/st/en/programs/pcp/mgmt/veg.print.html>

Hood, R. E. and J. M. Inglis. 1974. Behavioral Responses of White-Tailed Deer to Intensive Ranching Operations. *Journal of Wildlife Management* 38: 488-498.

Hubert, W. S. 1993. The Powder River: A Relatively Pristine Stream on the Great Plains. Pp. 387-395. In: Proceedings of the Symposium on Restoration Planning for the Rivers of the Mississippi River Ecosystem. L. W. Hesse, C. B. Stalnaker, N. G. Benson, and J. R. Zuboy, eds. Biology Report 19. US Department of the Interior, National Biological Survey, Washington, D.C.

Jacobs, J. J., P. T. Tyrrell, and D. J. Brosz. 2003. Wyoming Water Law: A Summary. B-8490R. Agricultural Experiment Station, University of Wyoming, Laramie, Wyoming. Available online at: <http://www.wyomingextension.org/agpubs/pubs/b849r.pdf>

Jarmusz, T. S. 2014. "Invasive Plant Encroaching on Wyoming Grasslands," *Gillette News Record*, June 30, 2014. Available online at: [http://www.gillettenewsrecord.com/news/wyoming/article\\_a8431801-246c-5f8b-9caa-b5d702fb58d3.html](http://www.gillettenewsrecord.com/news/wyoming/article_a8431801-246c-5f8b-9caa-b5d702fb58d3.html)

Johnson, A. S. and S. H. Anderson. 2002. Conservation Assessment for the American Kestrel in the Black Hills National Forest, South Dakota and Wyoming. US Department of Agriculture (USDA) Forest Service, Custer, South Dakota. December 2002. Accessed October 6, 2014. Available online at: <http://www.avibirds.com/pdf/A/Amerikaanse%20Torenvalk14.pdf>

Jones, J. L. and J. P. Dubey. 2012. Foodborne Toxoplasmosis. *Clinical Infectious Diseases* 55(6): 845-851.

Knight, D. H. 1994. Mountains and Plains: The Ecology of Wyoming Landscapes. Yale University Press.

Knopf, F. L. and F. B. Samson. 1994. Scale Perspectives on Avian Diversity in Western Riparian Ecosystems. *Conservation Biology* 8(3): 669-676.

Kornfeld, M., G. C. Frison, and M. L. Larson. 2010. Prehistoric Hunters-Gathers of the High Plains and Rockies. Left Coast Press, Inc., Walnut Creek, California.

Larson, T. A. 1978. History of Wyoming. Second Edition (Revised). University of Nebraska Press, Lincoln, Nebraska.

Leatherman, D. A., I. Aguayo, and T. M. Mehall. 2011. Mountain Pine Beetle. No. 5.528. Colorado State University Extension. September 2011. Accessed October 2014. Information available online at: <http://www.ext.colostate.edu/pubs/insect/05528.html>

Lee, H. J., J. S. Kwon, D. H. Lee, Y. N. Lee, H. N. Youn, Y. J. Lee, M. C. Kim, O. M. Jeong, H. M. Kang, J. H. Kwon, J. B. Lee, S. Y. Park, I. S. Choi, and C. S. Song. 2010. Continuing Evolution and Interspecies Transmission of Influenza Viruses in Live Bird Markets in Korea. *Avian Diseases* 54(1 Supplement: Proceedings of the Seventh International Symposium on Avian Influenza): 738-748.

LoGuidice, K., R. S. Ostfeld, K. A. Schmidt, and F. Keesing. 2003. The Ecology of Infectious Disease: Effects of Host Diversity and Community Composition on Lyme Disease Risk. *Proceedings of the National Academy of Sciences of the USA* 100: 567-571.

Marra, P. P., S. Griffing, C. Caffrey, A. M. Kilpatrick, R. McLean, C. Brand, E. Saito, A. P. Dupuis, L. Kramer, and R. Novak. 2004. West Nile Virus and Wildlife. *Bioscience* 54: 393-402.

Mead, M. H. 2011. Executive Order 2011-5. Greater Sage-Grouse Core Area Protection. M. Mead, Governor. Office of the Governor, State of Wyoming Executive Department. June 2, 2011. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SAGEGROUSE\\_EO\\_COREPROTECTION0000651.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SAGEGROUSE_EO_COREPROTECTION0000651.pdf)

Means, R. E. 2014. (2014, June 5), Personal Interview. US Department of the Interior (USDI) Bureau of Land Management (BLM) Wyoming State Forester.

Merten, H. and L. Durden. 2000. A State-by-State Survey of Ticks Recorded from Humans in the United States. *Journal of Vector Ecology* 25: 102-113.

Migratory Bird Treaty Act (MBTA). 1918. 16 United States Code (USC) § 703-712. July 13, 1918.

Miller, R. F. and L. E. Eddleman. 2000. Spatial and Temporal Changes of Sage-Grouse Habitat in the Sagebrush Biome. Oregon Agricultural Experiment Station Technical Bulletin 151, Oregon State University, Corvallis, Oregon.

Montana Department of Agriculture. 2013. Prairie Dog Management. Montana Department of Agriculture, Helena, Montana. June 17, 2013. Accessed October 2014. Available online at: <http://agr.mt.gov/agr/Programs/PestMgt/VertebratePest/Bulletins/pdf/PraireDog.PDF>

Multiple Use - Sustained Yield Act. 1960. Public Law (PL) 86-517; 16 United States Code (USC) §§ 528-531. June 12, 1960.

National Environmental Policy Act (NEPA). 1969. 42 United States Code (USC) 4321-4347. Pub. L. 91-190, § 2, Jan. 1, 1970, 83 Stat. 852.

National Forest Management Act (NFMA). 1976. Public Law (PL) 94-588; 16 United States Code (USC) §§ 1600-1687, August 17, 1974, as amended 1976, 1978, 1980, 1981, 1983, 1985, 1988 and 1990. October 22, 1976.

National Geographic Society (National Geographic). 2014. World Maps. Digital Topographic Map.

National Historic Preservation Act (NHPA). 1966. 16 United States Code § 470 et seq. October 15, 1966.

Naugle, D. E., K. E. Doherty, B. L. Walker, M. J. Holloran, and H. E. Copeland. 2011. Energy Development and Greater Sage-Grouse. Pp. 489-503. *In: Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and Its Habitats. Studies in Avian Biology* (Vol. 38). S. T. Knick and J. W. Connelly, eds. University of California Press, Berkeley, California.

Nicholoff, S. H., compiler. 2003. Wyoming Bird Conservation Plan, Version 2.0: Wyoming Partners in Flight. Wyoming Game and Fish Department (WGFD), Lander, Wyoming. May 1, 2003. <http://www.blm.gov/wildlife/plan/WY/Wyoming%20Bird%20Conservation%20Plan.htm>

Nicholopoulos, J. 1999. The Endangered Species Listing Program. *Endangered Species Bulletin* 24(6): 6-9. Available online at: <http://digitalmedia.fws.gov/cdm/fullbrowser/collection/document/id/1830/rv/singleitem>

Nielson, R. P. 1986. High Resolution Climatic Analysis and Southwest Biogeography. *Science* 232: 27-34.

North American Datum (NAD). 1983. NAD83 Geodetic Datum.

Northeast Wyoming Sage-Grouse Working Group (NWSWG). 2006. Northeast Wyoming Sage-Grouse Conservation Plan. August 15, 2006. Available online at: [http://wgfd.wyo.gov/wtest/Departments/Wildlife/pdfs/SG\\_NECONSERVATIONPLAN0000678.pdf](http://wgfd.wyo.gov/wtest/Departments/Wildlife/pdfs/SG_NECONSERVATIONPLAN0000678.pdf)

Olson, R. A. and W. A. Gerhart. 1982. A Physical and Biological Characterization of Riparian Habitat and Its Importance to Wildlife in Wyoming. Wyoming Game and Fish Department (WGFD), Cheyenne, Wyoming.

Orabona, A., C. Rudd, M. Grenier, Z. Walker, S. Patla, and B. Oakleaf. 2012. *Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming*. Wyoming Game and Fish Department (WGFD) Nongame Program, Lander, Wyoming.

Ortega, J. A. and F. C. Bryant. 2005. Cattle Management to Enhance Wildlife Habitat in South Texas. Management Bulletin No. 6. *Wildlife Management Bulletin of the Caesar Kleberg Wildlife Research Institute*, Texas A&M University, Kingsville, Texas.

Organic Administration Act. 1897. 16 United States Code (USC) §§ 473-478, 479-482 and 551, June 4, 1897, as amended 1905, 1911, 1925, 1962, 1964, 1968, and 1976. June 4, 1987.

Ozaki, K., M. Isono, T. Kawahara, S. Iida, T. Kudo, and K. Fukuyama. 2006. A Mechanistic Approach to Evaluation of Umbrella Species as Conservation Surrogates. *Conservation Biology* 20(5): 1507-1515. Available online at: [http://www.fs.fed.us/eme/nfma/includes/2007\\_rule/2006\\_10\\_Ozaki\\_et\\_al\\_Umbrella%20Species%20Evaluation%20article.pdf](http://www.fs.fed.us/eme/nfma/includes/2007_rule/2006_10_Ozaki_et_al_Umbrella%20Species%20Evaluation%20article.pdf)

Paige, C. and S. A. Ritter. 1999. Birds in a Sagebrush Sea: Managing Sagebrush Habitats for Bird Communities. Partners in Flight Western Working Group, Boise, Idaho. Available online at: <https://fishandgame.idaho.gov/public/wildlife/nongame/brochureBirdSagebrush1.pdf>

Pappas, G. S. 2013. Bark Beetles in Western North America: An Annotated Bibliography for Natural Resource Managers. University of Wyoming, Laramie, Wyoming. Accessed June 2014. Available online at: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprd3791214.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3791214.pdf)

Pearson, S. M. and T. R. Simons. 2002. Spatial Analysis of Stopover Habitats of Habitats of Neotropical Migratory Birds. Chapter 52. Pp. 581-592. In: *Predicting Species Occurrences: Issues of Scale and Accuracy*. J. M. Scott, P. Heglund, M. L. Morrison, and P. H. Raven, eds. Island Press, Washington, D.C.

Pérez de León, A. A., D. A. Strickman, D. P. Knowles, D. Fish, E. Thacker, J. de la Fuente, P. J. Krause, S. K. Wikel, R. S. Miller, G. G. Wagner, C. Almazán, R. Hillman, M. T. Messenger, P. O. Ugstad, R. A. Duhaime, P. D. Teel, A. Ortega-Santos, D. G. Hewitt, E. J. Bowers, S. J. Bent, M. H. Cochran, T. F. McElwain, G. A. Scoles, C. E. Suarez, R. Davey, J. M. Howell Freeman, K. Lohmeyer, A. Y. Li, F. D. Guerrero, D. M. Kammlah, P. Phillips, and J. M. Pound. 2010. One Health Approach to Identify Research Needs in Bovine and Human Babesioses: Workshop Report. *Parasites and Vectors* 3: 36-.

Pérez de León, A. A., P. D. Teel, A. N. Auclair, M. T. Messenger, F. D. Guerrero, G. Schuster, and R. J. Miller. 2012. Integrated Strategy for Sustainable Cattle Fever Tick Eradication in USA Is Required to Mitigate the Impact of Global Change. *Frontiers in Physiology* 3: 195-.



Perkins, S. E., I. M. Cattadori, V. Tagliapietra, A. P. Rizzoli, and P. J. Hudson. 2006. Localized Deer Absence Leads to Tick Amplification. *Ecology* 87: 1981-1986.

Peterson, D. A., M. L. Clark, K. Foster, P. R. Wright, and G. K. Boughton. 2010. Assessment of Ecological Conditions and Potential Effects of Water Produced from Coalbed Natural Gas Development on Biological Communities in Streams of the Powder River Structural Basin, Wyoming and Montana, 2005-08. Scientific Investigations Report 2010-5124. US Geological Survey (USGS).

Peterson, D. A., E. G. Hargett, P. R. Wright, and J. R. Zumberge. 2007. Ecological Status of Wyoming Streams, 2000–2003. Scientific Investigations Report 2007–5130. Prepared in cooperation with the Wyoming Department of Environmental Quality. Department of the Interior US Geological Survey (USGS) Available online at: <http://pubs.usgs.gov/sir/2007/5130/pdf/sir2007-5130.pdf>

Pimm, S. L. 1986. Community Stability and Structure. In: *Conservation Biology: The Science of Scarcity and Diversity*. M. E. Soulé, ed. Sinauer Associates, Inc., Sunderland, Massachusetts.

Pound, J. M., J. E. George, D. M. Kammlah, K. H. Lohmeyer, and R. B. Davey. 2010. Evidence for the Role of White-Tailed Deer (Artiodactyla: Cervidae) in the Epidemiology of Cattle Ticks and Southern Cattle Ticks (Acari: Ixodidae) in Reinfestations Along the Texas/Mexico Border in South Texas - a Review and Update. *Journal of Economic Entomology* 103: 211-218. doi: 10.1603/EC09359.

PRISM. 1995. 2.5-Minute Digital Elevation Model (DEM) for the Conterminous U.S. GIS Raster Data. The PRISM Climate Group at Oregon State University, Corvallis, Oregon. Information available online at: [http://oldprism.nacse.org/docs/meta/dem\\_25m.htm](http://oldprism.nacse.org/docs/meta/dem_25m.htm)

PRISM. 2014. 30-Year Normals: 1981-2010. PRISM Climate Group, Northwest Alliance for Computational Science and Engineering, Oregon State University, Corvallis, Oregon. Information available online at: <http://www.prism.oregonstate.edu/normals/>

Pulliam, H. R. and J. B. Dunning. 1987. The Influence of Food Supply on Local Density and Diversity of Sparrows. *Ecology* 68: 1009-1014.

Reddy, K. J., R. A. Olson, and D. E. Legg. 2009. Geochemistry of Coalbed Natural Gas Produced Water across Five Wyoming Watersheds. Final Report. Project Duration: 03/01/2003 - 02/28/2006. Department of Renewable Resources, University of Wyoming, Laramie, Wyoming. September 11, 2009. Available online at: [http://www.uwyo.edu/owp/\\_files/finalreportp10.pdf](http://www.uwyo.edu/owp/_files/finalreportp10.pdf)

Reddy, K. J., R. A. Olson, and D. E. Legg. 2009. Geochemistry of Coalbed Natural Gas Produced Water across Five Wyoming Watersheds. Final Report. Project Duration: 03/01/2003 - 02/28/2006. Department of Renewable Resources, University of Wyoming, Laramie, Wyoming. September 11, 2009. Available online at: [http://www.uwyo.edu/owp/\\_files/finalreportp10.pdf](http://www.uwyo.edu/owp/_files/finalreportp10.pdf)

Resource Conservation and Recovery Act (RCRA). 1976. Public Law (PL) 94-580, 90 Statute (Stat.) 2795, 42 United States Code (USC) § 6901 et seq. October 21, 1976.

Ribic, C. A., R. R. Koford, J. R. Herkert, D. H. Johnson, N. D. Niemuth, D. E. Naugle, K. K. Bakker, D. W. Sample, and R. B. Renfrew. 2009. Area Sensitivity in North American Grassland Birds: Patterns and Process. *Auk* 126: 233-244.

Rivers and Harbors Act. 1899. 33 United States Code § 401 et seq. July 13, 1918.

Roberge, J.-M. and P. Angelstam. 2004. Usefulness of the Umbrella Species Concept as a Conservation Tool. *Conservation Biology* 18: 76–85.

Ruvalcaba-Fernández, M. 2009. Manejo Integrado de *Boophilus microplus*. Perspectivas de Control Biológico Parasitario y Nuevas Alternativas en el Sector Pecuario. Libro Científico Inifap 2.

Schauber, E. M. and R. S. Ostfeld. 2002. Modeling the Effects of Reservoir Competence Decay and Demographic Turnover in Lyme Disease Ecology. *Ecological Applications* 12: 1142-1162.

Schmidt, K. A. and R. S. Ostfeld. 2001. Biodiversity and the Dilution Effect in Disease Ecology. *Ecology* 82: 609-619.

Schulze, T. L., M. F. Lakat, W. E. Parkin, J. K. Shisler, D. J. Charette, and E. M. Bosler. 1984. Comparison of Rates of Infection by the Lyme Disease Spirochete in Selected Populations of *Ixodes dammini* and *Amblyomma americanum* (Acari: Ixodidae). *Zentralblatt für Bakteriologie, Mikrobiologie und Hygiene. Series A: Medical Microbiology, Infectious Diseases, Virology, Parasitology* 263(1-2): 72-78.

Scorecard. 2011. Criteria Air Pollutant Report: Campbell County, Wyoming. County Report, Smog and Particulates, Pollution Locator. Scorecard: The Pollution Information Site. Accessed September 2014. Information available online at: [http://scorecard.goodguide.com/env-releases/cap/county.tcl?fips\\_county\\_code=56005](http://scorecard.goodguide.com/env-releases/cap/county.tcl?fips_county_code=56005)

Scott, M. L., S. K. Skagen, and M. F. Merigliano. 2003. Relating Geomorphic Change and Grazing to Avian Communities in Riparian Forests. *Conservation Biology* 17:284-296.

Scurlock, B. M., W. H. Edwards, T. Cornish, and L. L. Meadows. 2010. Using Test and Slaughter to Reduce Prevalence of Brucellosis in Elk Attending Feedgrounds in the Pinedale Herd Unit of Wyoming: Results of a 5 Year Pilot Project. Wyoming Game and Fish Department (WGFD), Cheyenne, Wyoming.

Sharma, S., K. J. Reddy, and C. Frost. 2008. A New Method for Tracing Seepage from Cbng Water Holding Ponds in the Powder River Basin, Wyoming. Final Report for a 2-Year Project (March 2008-February 2010). Available online at: [http://www.uwyo.edu/owp/\\_files/finalrpt23sharma.pdf](http://www.uwyo.edu/owp/_files/finalrpt23sharma.pdf)

Shields, F.D. Jr., R. R. Copeland, P. C. Klingeman, M. W. Doyle, and A. Simon. 2003. Design for Stream Restoration. *Journal of Hydraulic Engineering* 129(8): 575-584. doi: 10.1061/(ASCE)0733-9429(2003)129:8(575). Available online at: [http://afrsweb.usda.gov/sp2UserFiles/person/5120/design\\_stream\\_restoration.pdf](http://afrsweb.usda.gov/sp2UserFiles/person/5120/design_stream_restoration.pdf)

Shillinger, J. E. 1938. Deer in Relation to Fever Tick Eradication in Florida. *Transactions of the North American Wildlife Conference* 3: 882-885.

Simberloff, D. 1998. Flagships, Umbrellas, and Keystones: Is Single-Species Management Passé in the Landscape Era? *Biological Conservation* 83(3): 247-257.

Smith, M. A. and S. F. Enloe. 2006. Cheatgrass Ecology and Management in Wyoming. MP-111.06. Wyoming Range Facts. University of Wyoming Cooperative Extension Services, Laramie, Wyoming.

Soule, M. 1985. What Is Conservation Biology? *Bioscience* 35: 727-734.

State Historic Preservation Office (SHPO). 2008. State Level Agreement between the Natural Resources Conservation Service and the Wyoming State Historic Preservation Office. June 27, 2008. Available online at: [http://wyoshpo.state.wy.us/pdf/NRCS\\_SLA.pdf](http://wyoshpo.state.wy.us/pdf/NRCS_SLA.pdf)

State of Wyoming. 2000. Living on a Small Acreage in Wyoming: Irrigation State Board of Control, State of Wyoming. March 2000. Available online at: <http://www.shoshoneirrigation.com/documents/livingonsmallacreage.pdf>

State of Wyoming. 2014a. Chapter 13: Public Hunting, Fishing and General Recreational Use. Rules and Regulations, Board of Land Commissioners. Accessed September 2014. Available online at: <http://soswy.state.wy.us/Rules/RULES/899.pdf>

State of Wyoming. 2014b. Chapter 14: Temporary Use Permits. Rules and Regulations, Board of Land Commissioners. Accessed September 2014. Available online at: <http://soswy.state.wy.us/Rules/RULES/4618.pdf>

Stewart, B. 1996. Little Powder Basin Management Plan. (FXSN8LP). Wyoming Game and Fish Department (WGFD), Sheridan, Wyoming, and Wyoming Animal Damage Management Board.

Stout, W. E., S. A. Temple, and J. R. Cary. 2006. Landscape Features of Red-Tailed Hawk Nesting Habitat in an Urban/Suburban Environment. *Journal of Raptor Research* 40(3): 181-182.

Surface Mining Control and Reclamation Act (SMCRA). 1977. Public Law (PL) 95-87. August 3, 1977.

Tuzio, H., D. Edwards, T. Elston, L. Jarboe, S. Kudrak, J. Richards, and I. Rodan. 2005. Feline Zoonoses Guidelines from the American Association of Feline Practitioners. *Journal of Feline Medicine and Surgery* 7(4): 243-274.

University of Montana. 2014. INVADERS Database System. Division of Biological Sciences, University of Montana, Missoula, Montana. Accessed June 2014. Information available online at: <http://invader.dbs.umt.edu/>

University of Wyoming (UW). 2014a. Plants as Pests. Pest Information: Summaries and Maps. Wyoming Cooperative Agricultural Pest Survey, UW, Laramie Wyoming. Accessed June 2014. Information available online at: <http://www.uwyo.edu/capsweb/pest-information-summaries-maps/plants-as-pests/>

University of Wyoming (UW). 2014b. Water Research Program. Office of Water Programs, UW, Laramie, Wyoming. Accessed June 2014. Information available online at: <http://www.uwyo.edu/owp/>

University of Wyoming (UW). 2014c. Water Research Program Completed Projects. WRP Projects. Office of Water Programs, UW, Laramie, Wyoming. Accessed June 2014. Information available online at: [http://www.uwyo.edu/owp/wrp\\_projects/](http://www.uwyo.edu/owp/wrp_projects/)

University of Wyoming (UW). 2014d. Wyoming Weed Identification Site. Wyoming Plant Science Department and Wyoming Cooperative Extension Service, UW, Laramie, Wyoming. Accessed June 2014. Information available online at: <http://www.uwyo.edu/ces/wyoweed/wyoweed.htm>

Upper Columbia River Basin (UCRB) Draft Environmental Impact Statement (DEIS). 1997. Interior Columbia Basin Ecosystem Management Project. BLM-ID-PT-96-021+1610. United States Department of Agriculture, Forest Service, and United States Department of the Interior, Bureau of Land Management. May 1997.

US Army Corps of Engineers (USACE). 2014. Wyoming. Wyoming Information and Agency Links, Wyoming Regulatory Office, Cheyenne, Wyoming. Accessed June 2014. Information available online at: <http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Wyoming.aspx>

US Census Bureau (USCB). 2014. Wyoming State and County QuickFacts. USCB. Revised July 8, 2014. Available online at: <http://quickfacts.census.gov/qfd/states/56000.html>

US Department of Agriculture (USDA) Animal and Plant Health Inspection Services (APHIS). 1998. Pre-Decisional Environmental Assessment (EA) for Predator Damage Management in Eastern Wyoming, Including the Counties of Albany, Campbell, Crook, Goshen, Johnson, Natrona, Niobrara, Sheridan, and Weston. Prepared by US Department of Agriculture (USDA) APHIS Wildlife Service (WS) in cooperation with USDA US Forest Service, US Department of the Interior (USDI) Bureau of Land Management (BLM), Wyoming Game and Fish Department (WGFD), Wyoming Department of Agriculture (WDA), and Wyoming State Lands and Investments (WSLI). Available online at: <http://www.aphis.usda.gov/regulations/pdfs/nepa/WY%20Eastern%20PDM%20EA.pdf>

US Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS). 2010. M-44 Cyanide Capsules, M-44 Use Restrictions. EPA Registration No. 56228-15. October 7, 2010. Accessed October 2014. Available online at: [http://www.aphis.usda.gov/wildlife\\_damage/nwrc/registration/content/56228-15%20M44%20Use%20Restrictions%2010-10.pdf](http://www.aphis.usda.gov/wildlife_damage/nwrc/registration/content/56228-15%20M44%20Use%20Restrictions%2010-10.pdf)

US Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS). 2012. Wyoming State Report: FY 2012. USDA APHIS Wildlife Service (WS), Casper, Wyoming. Available online at: [http://www.aphis.usda.gov/wildlife\\_damage/informational\\_notebooks/2012/WS%20State%20Operations/52-wyoming.pdf](http://www.aphis.usda.gov/wildlife_damage/informational_notebooks/2012/WS%20State%20Operations/52-wyoming.pdf)

US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2014a. Gridded Soil Survey Geographic (gSSURGO) Database. USDA Soil Survey Staff, NRCS. Information available online at: [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_053628#release](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053628#release) and <http://datagateway.nrcs.usda.gov/>

US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). 2014b. Introduced, Invasive, and Noxious Plants: Federal Noxious Weeds. Accessed June 2014. Available online at: <http://plants.usda.gov/java/noxious>

US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). 2014c PLANTS Database. Accessed June 2014. Available online at: <http://www.plants.usda.gov/java/>

US Environmental Protection Agency (USEPA). 2005. Fact Sheet - Final Amendments to the Regional Haze Rule and Guidelines for Best Available Retrofit Technology (BART) Determinations. Fact Sheet - Final Clean Air Visibility Rule. USEPA, Washington, D.C. June 15, 2005. Information available online at: [http://www.epa.gov/visibility/pdfs/fs\\_2005\\_6\\_15.pdf](http://www.epa.gov/visibility/pdfs/fs_2005_6_15.pdf)

US Environmental Protection Agency (USEPA). 2008a. Control of Emissions from Nonroad Spark-Ignition Engines and Equipment. 40 Code of Federal Regulations (CFR) Parts 9, 60, 80, 85, 86, 89, 90, 91, 92, 94, 1027, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1060, 1065, 1068, and 1074. RIN 2060-AM34. 73 Federal Register (FR) 196: 59034-59380. October 8, 2008. Available online at: <http://www.gpo.gov/fdsys/pkg/FR-2008-10-08/pdf/E8-21093.pdf>

US Environmental Protection Agency (USEPA). 2008b. Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters Per Cylinder; Republication. 40 Code of Federal Regulations (CFR) Parts 9, 85, 86, 89, 92, 94, 1033, 1039, 1042, 1065, and 1068. RIN 2060-AM06. 73 Federal Register (FR) 126: 37096-37350. June 30, 2008. Available online at: <http://www.gpo.gov/fdsys/pkg/FR-2008-06-30/pdf/R8-7999.pdf>

US Environmental Protection Agency (USEPA). 2011. Watershed Management Resources at EPA. January 2011. Available online at: [http://water.epa.gov/type/watersheds/datait/watershedcentral/upload/WMR\\_factsheet\\_508.pdf](http://water.epa.gov/type/watersheds/datait/watershedcentral/upload/WMR_factsheet_508.pdf)

US Environmental Protection Agency (USEPA). 2012a. Diesel Fuel. Fuels and Fuel Additives. Transportation and Air Quality, USEPA, Washington, D.C. Last updated November 23, 2012. Information available online at: <http://www.epa.gov/otaq/fuels/dieselfuels/index.htm>



US Environmental Protection Agency (USEPA). 2012b. Mercury and Air Toxics Standards (MATS). Air and Radiation. USEPA, Washington, D.C. Updated April 10, 2012. Information available online at: <http://www.epa.gov/mats/basic.html>

US Environmental Protection Agency (USEPA). 2012c. National Ambient Air Quality Standards (NAAQS). Air and Radiation. USEPA, Washington, D.C. Updated December 14, 2012. Information available online at: <http://www.epa.gov/air/criteria.html>

US Environmental Protection Agency (USEPA). 2012d. NESHAPS - Maximum Achievable Control Technology (MACT) Standards. Air and Radiation. USEPA, Washington, D.C. Last updated November 15, 2012. Information available online at: <http://www.epa.gov/epawaste/hazard/tsd/td/combust/index.htm>

US Environmental Protection Agency (USEPA). 2012e. New Source Performance Standards and State Implementation Plans. USEPA Compliance Monitoring. USEPA, Washington, D.C. Last updated June 13, 2012. Information available online at: <http://www.epa.gov/compliance/monitoring/programs/caa/newsouce.html>

US Environmental Protection Agency (USEPA). 2012f. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews. 40 Code of Federal Regulations (CFR) Parts 60 and 63. Rin 2060-AP76. 77 Federal Register (FR) 159: 49490-49600. August 16, 2012. Available online at: <http://www.gpo.gov/fdsys/pkg/FR-2012-08-16/pdf/2012-16806.pdf>

US Environmental Protection Agency (USEPA). 2013a. The 2011 National Emissions Inventory. Version 1 (released September 30, 2013). Technology Transfer Network, Clearinghouse for Inventories and Emissions Factors. USEPA, Washington, D.C. Available online at: <http://www.epa.gov/ttnchie1/net/2011inventory.html>

US Environmental Protection Agency (USEPA). 2013b. Reformulated Gasoline (RFG). Fuels and Fuel Additives. Transportation and Air Quality, USEPA, Washington, D.C. Last updated March 29, 2013. Information available online at: <http://www.epa.gov/OTAQ/fuels/gasolinefuels/rfg/index.htm>

US Environmental Protection Agency (USEPA). 2014a. Annual Summary Data. AirData, USEPA. Accessed August 2014. Information available online at: [http://aqsdr1.epa.gov/aqsweb/aqstmp/airdata/download\\_files.html#Annual](http://aqsdr1.epa.gov/aqsweb/aqstmp/airdata/download_files.html#Annual)

US Environmental Protection Agency (USEPA). 2014b. Clean Power Plan Proposed Rule. Carbon Pollution Standards. USEPA, Washington, D.C. Last updated August 14, 2014. Information available online at: <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>

US Environmental Protection Agency (USEPA). 2014c. EPA Region 8 (Mountains and Plains). About EPA. USEPA Region 8, Denver, Colorado. Last updated July 28, 2014. Information available online at: <http://www2.epa.gov/aboutepa/epa-region-8-mountains-and-plains>

US Environmental Protection Agency (USEPA). 2014d. Gasoline Boats and Personal Watercraft Nonroad Engines, Equipment, and Vehicles. Transportation and Air Quality, USEPA, Washington, D.C. Last updated March 24, 2014. Information available online at: <http://www.epa.gov/otaq/marinesi.htm>

US Environmental Protection Agency (USEPA). 2014e. Heavy Trucks, Buses, and Engines. On-road Vehicles and Engines. Transportation and Air Quality, USEPA, Washington, D.C. Last updated August 11, 2014. Information available online at: <http://www.epa.gov/otaq/hd-hwy.htm>

US Environmental Protection Agency (USEPA). 2014f. Laws and Regulations. USEPA, Washington, D.C. Last updated July 1, 2014. Information available online at: <http://www2.epa.gov/laws-regulations>

US Environmental Protection Agency (USEPA). 2014g. Nonroad Diesel Engines. Nonroad Engines, Equipment, and Vehicles. Transportation and Air Quality, USEPA, Washington, D.C. Last updated August 11, 2014. Information available online at: <http://www.epa.gov/otaq/nonroad-diesel.htm>

US Environmental Protection Agency (USEPA). 2014h. RACT/BACT/LAER Clearinghouse (RBLC) Clean Air Technology Center, USEPA. Accesed July 2014. Information Available online at: <http://cfpub.epa.gov/rbcl/>

US Environmental Protection Agency (USEPA). 2014i. Snowmobiles, Dirt Bikes, and ATVs. Nonroad Engines, Equipment, and Vehicles. Transportation and Air Quality, USEPA, Washington, D.C. Last updated August 8, 2014. Information available online at: <http://www.epa.gov/tier2/>

US Environmental Protection Agency (USEPA). 2014j. Tier 2 Vehicle and Gasoline Sulfur Program. On-road Vehicles and Engines; Cars and Light Trucks. Transportation and Air Quality, USEPA, Washington, D.C. Last updated July 11, 2014. Information available online at: <http://www.epa.gov/tier2/>

US Fish and Wildlife Service (USFWS). 1987. Northern Rocky Mountain Wolf Recovery Plan. Prepared by the USFWS in cooperation with the Northern Rocky Mountain Wolf Recovery Team. Available online at: [http://www.fws.gov/montanafieldoffice/Endangered\\_Species\\_Recovery\\_and\\_Mgmt\\_Plans/Northern\\_Rocky\\_Mountain\\_Gray\\_Wolf\\_Recovery\\_Plan.pdf](http://www.fws.gov/montanafieldoffice/Endangered_Species_Recovery_and_Mgmt_Plans/Northern_Rocky_Mountain_Gray_Wolf_Recovery_Plan.pdf)

US Fish and Wildlife Service (USFWS). 2004. Delisting a Species: Section 4 of the Endangered Species Act. Endangered Species Program, USFWS Department of the Interior. February 2004. Available online at: <http://www.fws.gov/idaho/species/delisting%20copy.pdf>

US Fish and Wildlife Service (USFWS). 2008. Guidelines for Raptor Conservation in the Western United States Draft. USFWS, Region 9, Division of Migratory Bird Management, Washington D.C. February 2008. Accessed July 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands\\_and\\_minerals/oil\\_and\\_gas/february\\_20120\\_.Par.52166.File.dat/FWSRaptorGuidelines.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/lands_and_minerals/oil_and_gas/february_20120_.Par.52166.File.dat/FWSRaptorGuidelines.pdf)

US Fish and Wildlife Service (USFWS). 2009a. Our Endangered Species Program and How It Works with Landowners. Endangered Species Program, USFWS Department of the Interior. July 2009. Available online at: <http://www.fws.gov/endangered/esa-library/pdf/landowners.pdf>

US Fish and Wildlife Service (USFWS). 2009b. Title 50 - Wildlife and Fisheries. Chapter I - United States Fish and Wildlife Service, Department of the Interior (Continued). Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants. Part 17 - Endangered and Threatened Wildlife and Plants. Subpart a - Introduction and General Provisions: Pre-Act Wildlife. 50 CFR § 17.4. November 10, 2009.

US Fish and Wildlife Service (USFWS). 2009c. Title 50 - Wildlife and Fisheries. Chapter I - United States Fish and Wildlife Service, Department of the Interior (Continued). Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants. Part 17 - Endangered and Threatened Wildlife and Plants. Subpart D - Threatened Wildlife: Prohibitions. 50 CFR § 17.31. November 10, 2009.

US Fish and Wildlife Service (USFWS). 2009d. United States Fish and Wildlife Service, Department of the Interior. 50 CFR 13 and 22. Eagle Permits; Take Necessary to Protect Interests in Particular Localities. 74 Federal Register (FR) 46836-46879. September 11, 2009.



US Fish and Wildlife Service (USFWS). 2011a. Critical Habitat: What Is It? Endangered Species Program, USFWS Department of the Interior. September 2011. Available online at: [http://www.fws.gov/endangered/esa-library/pdf/critical\\_habitat.pdf](http://www.fws.gov/endangered/esa-library/pdf/critical_habitat.pdf)

US Fish and Wildlife Service (USFWS). 2011b. Habitat Conservations Plans under the Endangered Species Act. Endangered Species Program, USFWS Department of the Interior. April 2011. Available online at: <http://www.fws.gov/endangered/esa-library/pdf/hcp.pdf>

US Fish and Wildlife Service (USFWS). 2011c. Wyoming Wolf Weekly- April 18, 2011 through May 6, 2011. Wyoming Gray Wolf Recovery Status Report. Gray Wolves in the Northern Rocky Mountains. USFWS Mountain-Prairie Region. Updated January 24, 2012. Available online at: <http://www.fws.gov/mountain-prairie/species/mammals/wolf/wyomingstatus2011/05062011-gray-wolf-report.html>

US Fish and Wildlife Service (USFWS). 2012. Conservation Banking: Incentives for Stewardship. Endangered Species Program, USFWS Department of the Interior. August 2012. Available online at: [http://www.fws.gov/endangered/esa-library/pdf/conservation\\_banking.pdf](http://www.fws.gov/endangered/esa-library/pdf/conservation_banking.pdf)

US Fish and Wildlife Service (USFWS). 2013a. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Eastern Small-Footed Bat and the Northern Long-Eared Bat as Endangered or Threatened Species; Listing the Northern Long-Eared Bat as an Endangered Species. Docket No. FWS-R5-ES-2011-0024. October 2, 2013.

US Fish and Wildlife Service (USFWS). 2013b. Endangered Species Listings: Frequently Asked Questions. Endangered Species Program, USFWS Department of the Interior. July 2013. Available online at: [http://www.fws.gov/nebraskaes/ESA%20Landowner%20Fact%20Sheet\\_080713.pdf](http://www.fws.gov/nebraskaes/ESA%20Landowner%20Fact%20Sheet_080713.pdf)

US Fish and Wildlife Service (USFWS). 2013c. ESA Basics: 40 Years of Conserving Endangered Species. Endangered Species Program, USFWS Department of the Interior. January 2013. Available online at: [http://www.fws.gov/endangered/esa-library/pdf/ESA\\_basics.pdf](http://www.fws.gov/endangered/esa-library/pdf/ESA_basics.pdf)

US Fish and Wildlife Service (USFWS). 2013d. What You Should Know About a Federal Migratory Bird Depredation Permit. Form 3-200-13. Revised December 2013. Accessed October 2014. Available online at: <http://www.fws.gov/forms/3-200-13.pdf>

US Fish and Wildlife Service (USFWS). 2014a. Candidate Species Report. USFWS Environmental Conservation Online System (ECOS). Last updated March 2014. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Candidate species list available online at: [http://ecos.fws.gov/tess\\_public/pub/candidateSpecies.jsp](http://ecos.fws.gov/tess_public/pub/candidateSpecies.jsp)

US Fish and Wildlife Service (USFWS). 2014b. Conservation Strategies. USFWS Partners for Fish and Wildlife, Wyoming. Accessed June 2014. Information available online at: <http://www.fws.gov/mountain-prairie/pfw/wy/wy2c.htm>

US Fish and Wildlife Service (USFWS). 2014c. Listings and Occurrences for Wyoming USFWS Environmental Conservation Online System (ECOS). Accessed June 2014. USFWS Endangered Species Program homepage: <http://www.fws.gov/endangered/>; ECOS: <http://ecos.fws.gov/ecos/indexPublic.do>; Threatened and Endangered Species System (TESS) listings for Wyoming: [http://ecos.fws.gov/tess\\_public/pub/stateListingAndOccurrenceIndividual.jsp?state=WY](http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=WY); Individual species profiles and status information available from the ECOS webpage.

US Fish and Wildlife Service (USFWS). 2014d. Lower Missouri River Drainage. USFWS Partners for Fish and Wildlife, Wyoming. Accessed June 2014. Information available online at: <http://www.fws.gov/mountain-prairie/pfw/wy/wy3d.htm>

US Fish and Wildlife Service (USFWS). 2014e. News, Information and Recovery Status Reports. Gray Wolves in the Northern Rocky Mountains. USFWS Mountain-Prairie Region. Updated June 20, 2014. Information available online at: <http://www.fws.gov/mountain-prairie/species/mammals/wolf/>

US Fish and Wildlife Service (USFWS). 2014f. Northern Long-Eared Bat Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5, and 6. January 6, 2014. Available online at: <http://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf>

US Fish and Wildlife Service (USFWS). 2014g. Species Profiles. USFWS Environmental Conservation Online System (ECOS). Updated June 2014. ECOS available at: <http://ecos.fws.gov/ecos/indexPublic.do>; Northern bat species profile available online at: <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE>

US Forest Service (USFS). 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agriculture Handbook No. 701. US Department of Agriculture (USDA) Forest Service. December 1995. Available online at: [http://www.fs.fed.us/cdt/carrying\\_capacity/landscape\\_aesthetics\\_handbook\\_701\\_no\\_append.pdf](http://www.fs.fed.us/cdt/carrying_capacity/landscape_aesthetics_handbook_701_no_append.pdf)

US Forest Service (USFS). 2001. Thunder Basin National Grassland Land and Resource Management Plan 2001 Revision. (Medicine Bow - Routt National Forest). USFWS.

US Forest Service (USFS). 2002a. Supplemental Information Report to the Northern Great Plains Plans Revision Final Environmental Impact Statement and 2001 Revision Thunder Basin National Grasslands Plan Disclosing Changes to Black-Tailed Prairie Dog Habitat within Proposed Management Area 3.63 of the Thunder Basin National Grassland Plan Resulting from 2001 Sylvatic Plague Outbreak. Converse and Campbell Counties, Wyoming. January 14, 2002. Available online at: [http://www.fs.fed.us/ngp/final/Prairie\\_Dog\\_SIR\\_Jan\\_14\\_02.pdf](http://www.fs.fed.us/ngp/final/Prairie_Dog_SIR_Jan_14_02.pdf)

US Forest Service (USFS). 2002b. Thunder Basin National Grassland Land and Resource Management Plan. USFS Rocky Mountain Region Thunder Basin National Grassland (TBNG). July 31, 2002.

US Forest Service (USFS). 2005. Final Environmental Impact Statement for the Black Hills National Forest Land and Resource Management Plan Phase II Amendment, Custer, Fall River, Lawrence, Meade and Pennington Counties, South Dakota, and Crook and Weston Counties, Wyoming. Amendment to the 1997 Land and Resource Management Plan. Black Hills National Forest, Rocky Mountain Region, USFS. October 2005. Available online at: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm9\\_011678.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_011678.pdf)

US Forest Service (USFS). 2006. Four Threats. Four Threats to the Health of the Nation's Forests and Grasslands. Last updated October 30, 2006. Accessed Spetember 2014. Information available online at: <http://www.fs.fed.us/projects/four-threats/>

US Forest Service (USFS). 2014a. Black-Tailed Prairie Dog and Black-Footed Ferret. US Department of Agriculture (USDA) Forest Service Update. March 2014. Available online at: [http://www.fs.fed.us/biology/resources/pubs/issuemapers/IssueUpdate\\_PrairieDogFerret\\_March2014.pdf](http://www.fs.fed.us/biology/resources/pubs/issuemapers/IssueUpdate_PrairieDogFerret_March2014.pdf)

US Forest Service (USFS). 2014b. Open Space Conservation. US Department of Agriculture (USDA) Forest Service. Accessed September 2014. Information available online at: <http://www.fs.fed.us/openspace/>

US Forest Service (USFS). 2014c. Thunder Basin National Grassland Land and Resource Management Plan. Medicine Bow-Routt National Forests and Thunder Basin National Grassland, Laramie, Wyoming. Accessed July 2014. Information available online at: [http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3\\_025111](http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3_025111)



US Geological Survey (USGS). 2014a. National Hydrography Dataset (NHD). USGS NHD Extracts. Accessed June 2014. Information available online at: <http://nhd.usgs.gov/>

US Geological Survey (USGS). 2014b. The National Map/US Topo. Last updated January 5, 2014. Homepage available at: <http://nationalmap.gov/ustopo/index.html>

US Geological Survey (USGS). 2014c. Water Resources of Wyoming and Montana. USGS Wyoming-Montana Water Science Center, . Last updated August 21, 2014. Information available online at: <http://wy-mt.water.usgs.gov/>

US Government Accountability Office (US GAO). 2005. Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife. US GAO Report to Congressional Requesters. GAO-05-906. September 2005.

Utah National Guard. 2011. Great Horned Owls (*Bubo virginianus*). Utah National Guard Environmental Resources Management. Accessed October 6, 2014. Available online at: <http://www.ut.ngb.army.mil/environ/Documents/GreatHornedOwls.pdf>

Vermeire, L. T., R. K. Heitschmidt, P. S. Johnson, and B. F. Sowell. 2004. The Prairie Dog Story: Do We Have It Right? *Bioscience* 54(7): 689-695.

Wesenberg, K., R. Dusek, E. Hofmeister, and C. Ladino. 2012. West Nile Virus Imperils Humans and Wildlife. US Geological Survey (USGS). December 2012. Available online at: [http://www.usgs.gov/blogs/features/usgs\\_top\\_story/west-nile-virus-imperils-humans-and-wildlife/](http://www.usgs.gov/blogs/features/usgs_top_story/west-nile-virus-imperils-humans-and-wildlife/)

Water Resources Data System Library. 2014. Gillette. Online database of documents and reports. Water Resources Data System Library, Wyoming Water Development Commission Projects and Studies, University of Wyoming, Laramie, Wyoming. Accessed June 2014. Information available online at: <http://library.wrds.uwyo.edu/wwdcrept/wwdcrept.html>

WeatherSpark. 2014. Average Weather for Gillette, Wyoming, USA. 1998-2012. Accessed July 2014. Available online at: <http://weatherspark.com/averages/30345/Gillette-Wyoming-United-States>

Western Region Climate Center. 2009. Station: Gillette-Campbell Co. Airport (KGCC), WY. Climatological Summary. Period of Record: July 1998 to December 2008. SOD USA Climate Archive. Western Region Climate Center, Desert Research Institute, Reno, Nevada. Available online at: <http://www.wrcc.dri.edu/summary/gcc.wy.html>

Whitford, W. G. 2002. Ecology of Desert Systems. Elsevier Science Ltd., London, UK.

Wildlife and Natural Resource Trust (WNRT). 2013. District 6 (Crook, Weston, and Campbell Counties). Funded WNRT Projects. Last updated 2013. Accessed October 5, 2014. Information available online at: <https://sites.google.com/a/wyo.gov/wnrt/projects-funded/district-6>

Willadsen, P., P. Bird, G. S. Cobon, and J. Hungerford. 1995. Commercialization of a Recombinant Vaccine against *Boophilus microplus*. *Parasitology* 110: S43–S50.

Williams, S. 2010. Wellspring of Wildlife Funding: How Hunter and Angler Dollars Fuel Wildlife Conservation. *Wildlife Professional* 4(3): 35-38.

Winter, M., D. H. Johnson, and J. Faaborg. 2000. Evidence for Edge Effects on Multiple Levels in Tallgrass Prairie. *Condor* 102: 256-266.

Wyoming Cooperative Fish and Wildlife Research Unit. 2010. Raptor Energy Project. Chalfoun Lab, Wyoming Cooperative Fish and Wildlife Research Unit. Last updated 2010. Accessed October 2014. Information available online at: <http://www.wyocoopunit.org/index.php/chalfoun-group/projects/raptor-energy-project/>

Wyoming Cooperative Fish and Wildlife Research Unit. 2014. Umbrella Species Project. Chalfoun Lab, Wyoming Cooperative Fish and Wildlife Research Unit. Accessed October 2014. Information available online at: <http://www.wyocoopunit.org/index.php/chalfoun-group/projects/umbrella/>

Wyoming Department of Agriculture. 2014. Statutes, Rules and Regulations. Technical Services, WDA. Accessed June 2014. Information available online at: <http://wyagric.state.wy.us/divisions/ts/statutes-rules-a-regulations>

Wyoming Department of Environmental Quality (WYDEQ). 1997. Oil and Gas Production Facilities. Chapter 6, Section 2 Permitting Guidance. Last revised September 2013. Available online at: [http://deq.state.wy.us/aqd/Resources-New%20Source%20Review/Oil%20and%20Gas/September%202013%20FINAL\\_Oil%20and%20Gas%20Revision\\_UGRB.pdf](http://deq.state.wy.us/aqd/Resources-New%20Source%20Review/Oil%20and%20Gas/September%202013%20FINAL_Oil%20and%20Gas%20Revision_UGRB.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2004. Water Quality Division Rules. WYDEQ, Cheyenne, Wyoming. Last updated September 27, 2004. Available online at: <http://deq.state.wy.us/wqd/wqdrules/>

Wyoming Department of Environmental Quality (WYDEQ). 2005. Quality Standards for Wyoming Groundwaters. Chapter 8, Water Quality Rules and Regulations. Water Quality Division Rules. WYDEQ, Cheyenne, Wyoming. Adopted March 16, 2005, approved April 26, 2005. Available online at: [http://deq.state.wy.us/wqd/wqdrules/Chapter\\_08.pdf](http://deq.state.wy.us/wqd/wqdrules/Chapter_08.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2006a. Natural Events Action Plan for the Coal Mines of the Powder River Basin of Campbell & Converse Counties, Wyoming. WYDEQ Air Quality Division. October 2006. Available online at: [http://deq.state.wy.us/aqd/Resources-Monitoring/2.DOcs-to-be-moved-NEAP%20Files/1-23-07NEAP\\_vb.pdf](http://deq.state.wy.us/aqd/Resources-Monitoring/2.DOcs-to-be-moved-NEAP%20Files/1-23-07NEAP_vb.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2006b. Wyoming's 2006 305 (B) State Water Quality Assessment Report and 2006 303(D) List of Waters Requiring TMDLs. Available online at: [http://deq.state.wy.us/wqd/watershed/Downloads/305b/2006/2006\\_305b.pdf](http://deq.state.wy.us/wqd/watershed/Downloads/305b/2006/2006_305b.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2012. Wyoming Department of Environmental Quality, Air Quality Division, Standards and Regulations. Ambient Standards. Effective December 19, 2012. Available online at: <http://soswy.state.wy.us/Rules/RULES/8887.pdf>

Wyoming Department of Environmental Quality (WYDEQ). 2013. Wyoming Surface Water Quality Standards. Chapter 1, Water Quality Rules and Regulations. Water Quality Division Rules. WYDEQ, Cheyenne, Wyoming. Revised June 2013, adopted July 11, 2013. Available online at: [http://deq.state.wy.us/wqd/wqdrules/Chapter\\_01.pdf](http://deq.state.wy.us/wqd/wqdrules/Chapter_01.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2014a. DEQ News. WYDEQ, Cheyenne, Wyoming. Accessed June 2014. Information available online at: <http://deq.state.wy.us/>

Wyoming Department of Environmental Quality (WYDEQ). 2014b. Natural Events Action Plan (NEAP). Notices of Meetings, Minutes of Meetings, Handouts and Documents. Accessed September 2014. Information available online at: <http://deq.state.wy.us/aqd/NEAP.asp>

Wyoming Department of Environmental Quality (WYDEQ). 2014c. Stream and Lakeshore Restoration: Best Management Practice Manual. Conservation Practices to Protect Surface and Ground Water. 2014 Update. Document #14-0532. WYDEQ, Water Quality Division, Nonpoint Source Program. Available online at: [http://deq.state.wy.us/wqd/watershed/nps/NPSFrontPage/STREAM\\_RESTORATION\\_FINALwithDocNum6-20-14.pdf](http://deq.state.wy.us/wqd/watershed/nps/NPSFrontPage/STREAM_RESTORATION_FINALwithDocNum6-20-14.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2014d. Title V Operating Permits Issued. Accessed July 2014. Information available online at: <http://deq.state.wy.us/aqd/TitleVPermitsIssued.asp>



Wyoming Department of Environmental Quality (WYDEQ). 2014e. Wyoming's Methods for Determining Surface Water Quality Condition and TMDL Prioritization. Water Quality Division, WYDEQ, Cheyenne, Wyoming. April 29, 2014. Available online at: [http://deq.state.wy.us/wqd/watershed/Downloads/305b/WDEQ2014\\_AssessmentMethodology.pdf](http://deq.state.wy.us/wqd/watershed/Downloads/305b/WDEQ2014_AssessmentMethodology.pdf)

Wyoming Department of Health. 2013. West Nile Virus. Prevent West Nile Virus: Bad Skeeter. Preventative Health and Safety Division, Wyoming Department of Health. Last updated 2013. Information available online at: <http://www.health.wyo.gov/phsd/skeeter/index.html>

Wyoming Department of Transportation (WYDOT). 2009. Wyoming Scenic Byways and Backways Program. WYDOT. March 2009. Available online at: <http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Planning/The%20Wyoming%20Scenic%20Byways%20Program%20Book%202009.pdf>

Wyoming Game and Fish Commission. 2013. Chapter 14: Late Migratory Game Bird Hunting Seasons. Accessed July 15, 2014. Available online at: [http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS\\_CH14.pdf](http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS_CH14.pdf)

Wyoming Game and Fish Commission. 2014. Chapter 46: Fishing Regulations. Accessed July 2014. Available online at: [http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS\\_CH46.pdf](http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS_CH46.pdf)

Wyoming Game and Fish Department (WGFD). 2007. Sheridan Region Annual Big Game Herd Unit Report - 2006. WGFD, Cheyenne, Wyoming.

Wyoming Game and Fish Department (WGFD). 2008. Wyoming Game and Fish Department Basin Management Plan, Belle Fourche Basin. (8BF). WGFD, Cheyenne, Wyoming.

Wyoming Game and Fish Department (WGFD). 2009a. Sheridan Region Annual Big Game Herd Unit Reports - 2009. WGFD, Cheyenne, Wyoming.

Wyoming Game and Fish Department (WGFD). 2009b. Strategic Habitat Plan. January 2009. Accessed September 2014. Available online at: [https://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/HABITAT\\_STRATEGICHABITATPLAN0000352.pdf](https://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/HABITAT_STRATEGICHABITATPLAN0000352.pdf)

Wyoming Game and Fish Department (WGFD). 2010. Wyoming State Wildlife Action Plan (SWAP). WGFD, Cheyenne, Wyoming. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SWAP\\_2010\\_FULL\\_OCT0003090.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SWAP_2010_FULL_OCT0003090.pdf); Species of Greatest Conservation Need available at: [http://gf.state.wy.us/web2011/Departments/Wildlife/pdfs/SWAP\\_SPECIESCONSERVATIONINTRO0000411.pdf](http://gf.state.wy.us/web2011/Departments/Wildlife/pdfs/SWAP_SPECIESCONSERVATIONINTRO0000411.pdf)

Wyoming Game and Fish Department (WGFD). 2011. Wyoming Fishing Guide. Accessed July 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Fishing/pdfs/WGFD\\_FISHINGGUIDE0000393.pdf](http://wgfd.wyo.gov/web2011/Departments/Fishing/pdfs/WGFD_FISHINGGUIDE0000393.pdf)

Wyoming Game and Fish Department (WGFD). 2013a. Hunting Regulations. Accessed July 2014. Available online at: <http://wgfd.wyo.gov/web2011/hunting-1000179.aspx>

Wyoming Game and Fish Department (WGFD). 2013b. Sheridan Region. Strategic Habitat Plans. Accessed September 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SHP13\\_SHERIDANREGION0005852.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SHP13_SHERIDANREGION0005852.pdf)

Wyoming Game and Fish Department (WGFD). 2013c. Threatened, Endangered, and Nongame Bird and Mammal Investigations. Annual Completion Report. Period Covered: 15 April 2012 to 14 April 2013. A. C. Orabona, ed. WGFD Nongame Program, Biological Services Section, Wildlife Division. June 2013. Accessed October 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR\\_NONGAMEACR\\_20130004383.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR_NONGAMEACR_20130004383.pdf)

Wyoming Game and Fish Department (WGFD). 2014a. Big Game Job Completion Report for Sheridan Region: 2013. Accessed July 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR\\_BGSHERCOMP\\_20130006076.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR_BGSHERCOMP_20130006076.pdf)

Wyoming Game and Fish Department (WGFD). 2014b. Hunting Information. Accessed July 15, 2014. Available online at: <http://wgfd.wyo.gov/web2011/hunting-1000045.aspx>

Wyoming Game and Fish Department (WGFD). 2014c. Threatened, Endangered, and Nongame Bird and Mammal Investigations. Annual Completion Report. Period Covered: 15 April 2013 to 14 April 2014. A. C. Orabona and N. Cudworth, eds. WGFD Nongame Program, Biological Services Section, Wildlife Division. August 2013. Accessed October 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR\\_NONGAMEACR\\_20140006134.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR_NONGAMEACR_20140006134.pdf)

Wyoming Legislature Service Office. 2012. 2012 Budget Session, 61st Legislature, House Bills Index / Senate Files Index. Available online at: <http://legisweb.state.wy.us/2012/billindex/BillCrossRef.aspx?type=ALL>

Wyoming Interagency Vegetation Community. 2002. Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management. Wyoming Game and Fish Department (WGFD) and Wyoming Bureau of Land Management (BLM), Cheyenne, Wyoming.

Wyoming Joint Ventures Steering Committee (WJVSC). 2010. Wyoming Wetlands Conservation Strategy. Version 1.0. Wyoming Game and Fish Department (WGFD), Cheyenne, Wyoming.

Wyoming State Engineer's Office (WSEO). 2011. Water Well Construction. Regulations and Instructions Part III. Accessed September 2014. Information available online at: <https://sites.google.com/a/wyo.gov/seo/ground-water/water-well-construction>

Wyoming State Engineer's Office (WSEO). 2014a. Applications, Forms, and Instructions. Accessed September 2014. Information available online at: <https://sites.google.com/a/wyo.gov/seo/applications-forms>

Wyoming State Engineer's Office (WSEO). 2014b. Contact Us. Accessed September 2014. Information available online at: <https://sites.google.com/a/wyo.gov/seo/>, contact information at: <https://sites.google.com/a/wyo.gov/seo/home/contact>

Wyoming State Engineer's Office (WSEO). 2014c. Division II - Sheridan. Accessed June 2014. Information available online at: <https://sites.google.com/a/wyo.gov/seo/agency-divisions/division-ii---sheridan>

Wyoming State Engineer's Office (WSEO). 2014d. Regulations and Instructions. Accessed September 2014. Information available online at: <https://sites.google.com/a/wyo.gov/seo/regulations-instructions>

Wyoming State Forestry Division. 2009. Wyoming Statewide Forest Resource Assessment: Describing Conditions, Trends, Threats, and Priorities. Office of State Lands and Investments. September 2009. Accessed July 17, 2014. Available online at: <http://slf-web.state.wy.us/forestrydivision/StatewideAssessment.pdf>

Wyoming State Parks and Cultural Resources. 2014. Wyoming State Parks and Cultural Resources website. Accessed July 20, 2014. Information available online at: <http://wyospcr.state.wy.us/>

Wyoming Statute (W.S.) 9-15. Title 9 - Administration of the Government; Chapter 15 - Wildlife and Natural Resource Funding; 9-15-101/9-15-911. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title9/T9CH15.htm>

Wyoming Statute (W.S.) 11-5-101-406. Title 11 - Agriculture, Livestock and Other Animals; Chapter 5 - Weed and Pest Control. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11/T11CH5.htm>

Wyoming Statute (W.S.) 11-6-1. Title 11 - Agriculture, Livestock and Other Animals; Chapter 6 - Predatory Animals; Article 1 - Control Generally. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11/T11CH6AR1.htm>

Wyoming Statute (W.S.) 11-6-104. Title 11 - Agriculture, Livestock and Other Animals; Chapter 6 - Predatory Animals; Article 1 - Control Generally; 11-6-104. Centralized and Coordinated Rodent and Predator Control Plan Authorized; Release of Information Restricted. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11/T11CH6.htm>

Wyoming Statute (W.S.) 11-6-201. Title 11 - Agriculture, Livestock and Other Animals; Chapter 6 - Predatory Animals; Article 2 - Districts and District Boards; 11-6-201. Creation and Designation of Districts; State Predator Management Advisory Board. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11/T11CH6.htm>

Wyoming Statute (W.S.) 11-16-101-135. Title 11 - Agriculture, Livestock and Other Animals; Chapter 16 - Conservation Districts. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11/T11CH16.htm>

Wyoming Statute (W.S.) 11. Title 11 - Agriculture, Livestock and Other Animals; Chapters 1-48. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title11>Title11.htm>

Wyoming Statute (W.S.) 23-1-101. Title 23 - Game and Fish; Chapter 1 - Administration; Article 1 - General Provisions; 20-1-101. Definitions of Wildlife. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title23>Title23.htm>

Wyoming Statute (W.S.) 41-3-909. Title 11 - Water; Chapter 16 - Water Rights; Administration and Control; Article 9 - Underground Water; 909 - State Engineer; Powers Generally. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title41/T41CH3AR9.htm>

Wyoming Statute (W.S.) Title 23. Title 23 - Game and Fish; Chapters 1-6. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles>Title23>Title23.htm>

Wyoming Water Development Commission (WWDC). 2002. State of Wyoming 2002 Water System Survey Report. Available online at: <http://wwdc.state.wy.us/watsys/2002/watsys.pdf>

Wyoming Water Development Commission (WWDC). 2009. Water Management and Conservation Assistance Programs Directory. C. Nicholson, P. Ogle, and J. Wade, eds. 4th Edition. WWDC, Cheyenne, Wyoming. Accessed June 2014. Information available online at: <http://wwdc.state.wy.us/wconsprog/WtrMgmtConsDirectory.html>

Wyoming Water Development Commission (WWDC). 2014. Summary of the State Water Planning Process. Wyoming State Water Plan, Wyoming Water Development Office, Cheyenne, Wyoming. Accessed June 2014. Information available online at: <http://waterplan.state.wy.us/>

Wyoming Weed and Pest Control Act. 1973. Wyoming Statutes (WS) 11-5-102 (a)(xi). Also called Wyoming Weed and Pest Law. Information available online at: [http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/wy/technical/ecoscience/pest/?cid=nrcs142p2\\_026797](http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/wy/technical/ecoscience/pest/?cid=nrcs142p2_026797)

Wyoming Weed and Pest Council. 2014a. Wyoming's Defense against Invasives. Information available online at: <http://www.wyoweed.org/>

Wyoming Weed and Pest Council. 2014b. Wyoming Weed & Pest Control Act Designated Pest List. Accessed September 2014. Available online at: <http://www.wyoweed.org/pests/state-designated-pests>

Yellowstone River Compact. 1950. Wyo. Stat. 41-511 (1957) [Act of Jan. 27, 1951, Wyo. Session. Laws p.7] Mont. Rev. Code 89-903 (1947) [Act of February 13, 1951, Mont. Laws p. 58] N. D. Century Code Ann. 61-23-01 (1960) [Act of March 7, 1951, N. D. Laws p. 505].

## Chapter 4 References

American Council On Renewable Energy (ACORE). 2013. Renewable Energy in Wyoming. Pp. 31-32. In: Renewable Energy in the 50 States: Western Region. Accessed July 2014. Available online at: <http://www.acore.org/files/pdfs/states/Wyoming.pdf>

American Wind Energy Association (AWEA). 2014. State Wind Energy Statistics: Wyoming. April 20, 2014. Accessed July 2014. Information available online at: <http://www.awea.org/Resources/state.aspx?ItemNumber=5096>

Bankhead-Jones Farm Tenant Act. 1937. 7 United States Code (USC) § 1000 et seq. July 22, 1937.

Bureau of Land Management (BLM). 2003a. Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project. WY-070-02-065. BLM Buffalo Field Office. January 2003. Accessed July 2014. Available online at: [http://www.blm.gov/wy/st/en/info/NEPA/documents/bfo/prb\\_eis.html](http://www.blm.gov/wy/st/en/info/NEPA/documents/bfo/prb_eis.html)

Bureau of Land Management (BLM). 2003b. Record of Decision and Resource Management Plan Amendments for the Powder River Basin Oil and Gas Project. WY-070-02-065. BLM Buffalo Field Office. April 2003. Accessed July 2014. Available online at: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/prb-rod.Par.71614.File.dat/00rod.pdf>

Bureau of Land Management (BLM). 2005. Land Use Planning Handbook. BLM Handbook H-1601-1. March 11, 2005. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.38665.File.dat/h1601-1.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.38665.File.dat/h1601-1.pdf) and [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/planning.Par.45838.File.dat/landuse\\_hb.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/planning.Par.45838.File.dat/landuse_hb.pdf)

Bureau of Land Management (BLM). 2006. Split Estate: Private Surface / Public Minerals. What Does It Mean to You? Presentation. Accessed July 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS\\_REALTY\\_AND\\_RESOURCE\\_PROTECTION/bmps.Par.41235.File.dat/Split%20Estate%20Presentation%202006.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/bmps.Par.41235.File.dat/Split%20Estate%20Presentation%202006.pdf); or at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS\\_REALTY\\_AND\\_RESOURCE\\_PROTECTION/bmps.Par.45013.File.dat/Split%20Estate%20Presentation%202006.ppt](http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/bmps.Par.45013.File.dat/Split%20Estate%20Presentation%202006.ppt)

Bureau of Land Management (BLM). 2008. Integrated Vegetation Management. BLM Handbook H-1740-2. March 25, 2008. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.59510.File.dat/H-1740-2.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.59510.File.dat/H-1740-2.pdf)



Bureau of Land Management (BLM). 2009a. Instruction Memorandum No. 2009-018. Process for Setting Priorities for Issuing Grazing Permits and Leases. Expires September 30, 2010. Available online at: [http://www.blm.gov/wo/st/en/info/regulations/Instruction\\_Memos\\_and\\_Bulletins/national\\_instruction/2009/IM\\_2009-018.html](http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-018.html)

Bureau of Land Management (BLM). 2009b. Split Estate. Oil and Gas BMPs. Last updated October 20, 2009. Accessed July 2014. Information available online at: [http://www.blm.gov/wo/st/en/prog/energy/oil\\_and\\_gas/best\\_management\\_practices/split\\_estate.html](http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/split_estate.html)

Bureau of Land Management (BLM). 2012. Split Estate Mineral Ownership. BLM Minerals Program. Last updated April 18, 2012. Accessed July 2014. Information available online at: [http://www.blm.gov/wy/st/en/programs/mineral\\_resources/split-estate.html](http://www.blm.gov/wy/st/en/programs/mineral_resources/split-estate.html)

Bureau of Land Management (BLM). 2013a. Decision Record: Park Wildland Urban Interface (WUI) Thinning Categorical Exclusion (CX). WY-070-CX12-202. BLM Buffalo Field Office. Accessed October 2014. Available online at: [http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/bfodocs/park\\_wildland.Par.66118.File.dat/CXparkwildland.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/bfodocs/park_wildland.Par.66118.File.dat/CXparkwildland.pdf)

Bureau of Land Management (BLM). 2013b. Developed Recreation Sites. BLM Buffalo Field Office. Last updated January 16, 2013. Accessed July 2014. Information available online at: [http://www.blm.gov/wy/st/en/field\\_offices/Buffalo/recreation/developed-sites.htm](http://www.blm.gov/wy/st/en/field_offices/Buffalo/recreation/developed-sites.htm)

Bureau of Land Management (BLM). 2013c. Draft Resource Management Plan and Environmental Impact Statement for the Buffalo Field Office Planning Area. Prepared by US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. June 2013. Available online at: <https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=48300>

Bureau of Land Management (BLM). 2013d. NEPA - Cooperating Agencies. Last updated August 26, 2013. Accessed July 2014. Information available online at: [http://www.blm.gov/wo/st/en/info/nepa/cooperating\\_agencies.html](http://www.blm.gov/wo/st/en/info/nepa/cooperating_agencies.html)

Bureau of Land Management (BLM). 2014a. BLM Recreation Strategy: Connecting with Communities. 2014-2019. BLM Recreation and Visitor Services Program. Accessed July 2014. Available online at: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/recreation/strategy.Par.10216.File.dat/ConnectWithCommunities.pdf>

Bureau of Land Management (BLM). 2014b. BLM website. Accessed July 2014. Information available online at: <http://www.blm.gov/wo/st/en.html>

Bureau of Land Management (BLM). 2014c. BLM Wyoming Directory. Accessed July 2014. Information available online at: <http://www.blm.gov/wy/st/en/info/offices.html>

Bureau of Land Management (BLM). 2014d. Buffalo RMP Revision. US Department of the Interior (USDI) BLM Buffalo Field Office, Buffalo, Wyoming. Last updated June 2, 2014. Information available online at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo.html>

Bureau of Land Management (BLM). 2014e. Wilderness Study Areas. BLM Wyoming. Last updated March 27, 2014. Accessed July 2014. Information available online at: <http://www.blm.gov/wy/st/en/programs/nlcs/wsa.html>

Campbell County. 2009. Financial Report for the Fiscal Year Ended June 30, 2009. Campbell County Government. Available online at: <http://ww3.ccgov.net/commissioners/Audit/Campbell%20County%20Audit%20ending%20June%2030%202009.pdf>

Campbell County. 2011. Financial Report for the Fiscal Year Ended June 30, 2011. Campbell County Government. Available online at: <http://www.ccgov.net/ArchiveCenter/ViewFile/Item/428>



Campbell County. 2012. Financial Report for the Fiscal Year Ended June 30, 2012. Campbell County Government. Available online at: <http://www.ccgov.net/ArchiveCenter/ViewFile/Item/427>

Campbell County. 2013a. 2013 Campbell County Annual Report. Campbell County Government. Available online at: <http://www.ccgov.net/ArchiveCenter/ViewFile/Item/425>

Campbell County. 2013b. Financial Report for the Fiscal Year Ended June 30, 2013. Campbell County Government. Available online at: <http://www.ccgov.net/DocumentCenter/View/54>

Campbell County Division of Planning and Zoning (CCDPZ). 2010. Subdivision Regulations. February 2, 2010. Information available online at: <http://www.ccgov.net/835/>, Subdivision-Regulations and <http://www.ccgov.net/DocumentCenter/Home/View/473>

Campbell County Division of Planning and Zoning (CCDPZ). 2011. Zoning Regulations. Revised May 2011. Information available online at: <http://www.ccgov.net/833/>, Zoning-Regulations and <http://www.ccgov.net/DocumentCenter/Home/View/474>

Campbell County Division of Planning and Zoning (CCDPZ). 2013. Campbell County, Wyoming: 2013 Comprehensive Plan. Orion Planning Group, Collins Planning Associates, and MMI Planning. Available online at: <http://www.ccgov.net/834/>, Comprehensive-Plan and <http://www.ccgov.net/DocumentCenter/Home/View/227>

Campbell County Economic Development Corporation (CCEDC). 2014. Leading Employers. Accessed July 2014. Information available online at: <http://www.ccedc.net/LeadingEmployers.php>

Campbell County Economic Development Corporation (CCEDC). no date. Five Year Strategic Plan for Economic Development in Campbell County: 2010-2015. Accessed October 2014. Available online at: <http://www.ccedc.net/uploaded/984a2b6e34.pdf>

Chilton, J. 2013. "Invasive Emerald Ash Borer Makes Its Way West," *Wyoming Tribune Eagle*, October 18, 2013. Available online at: [http://wyomingnews.com/articles/2013/10/19/news/01top\\_10-19-13.txt#.VDMfexaC3eI](http://wyomingnews.com/articles/2013/10/19/news/01top_10-19-13.txt#.VDMfexaC3eI)

City of Gillette. 2005. Trees and Shrubs of Gillette and Campbell County. Accessed July 2014. Available online at: <http://www.gillettewy.gov/modules>ShowDocument.aspx?documentid=567>

Colorado Public Utilities Commission. 2014. Colorado Public Utilities Commission website. Accessed July 2014. Information available online at: <http://cdn.colorado.gov/cs/Satellite?c=Page&childpagename=DORA-PUC/DORALayout&cid=1251614750747&pagename=CBONWrapper>

Community Builders, Inc. (CBI). 2013. CBI Focus on Campbell County October 2013. Accessed July 2014. Available online at: [http://www.consultcbi.com/images/CBI\\_Focus\\_on\\_Campbell\\_County\\_2013-10.pdf](http://www.consultcbi.com/images/CBI_Focus_on_Campbell_County_2013-10.pdf)

Council on Environmental Quality (CEQ). 1997. Environmental Justice, Guidance under the National Environmental Policy Act. Accessed October 2014. Available online at: [http://www.epa.gov/compliance/ej/resources/policy/ej\\_guidance\\_nepa\\_ceq1297.pdf](http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf)

Dean, K. 2012. "Local Crews Scramble to Save Pines Trees," News Letter Journal, May 24, 2012. Accessed July 2014. Available online at: [http://smalltownnews.com/\\_article.php?catname=Economy&pub=News%20Letter%20Journal&pid=96&aid=149810](http://smalltownnews.com/_article.php?catname=Economy&pub=News%20Letter%20Journal&pid=96&aid=149810)

Dean Runyan Associates. 2014. Wyoming Travel Impacts 2000-2013. Prepared for the Wyoming Office of Tourism. April 2014.

Dozier, H. 2000. Invasive Plants and the Restoration of the Urban Forest Ecosystem. Chapter 9. M. L. Duryea, E. K. Binelli, and L. V. Korhnak, eds. *In: Restoring the urban forest ecosystem*. Circular 1266, Fact Sheet FOR98. University of Florida, School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences. Gainesville, Florida.

Economic Profile System- Human Dimensions Toolkit. 2012. A Profile of Socioeconomic Measures. Selected Geographies: Campbell County, Wyoming.

Ellig, T. 2008. MSU Deals with Mountain Pine Beetle Infestation. Montana State University (MSU), Bozeman, Montana.

Emerald Ash Borer Info. 2014. Emerald Ash Borer website. Accessed September 2014. Information available online at: <http://emeraldashborer.info/#sthash.JkIBqtvF.dpbs>

ESRI. 2014. Geographic Information System (GIS) Online Topographic Base Map. ESRI, producers of ArcGIS software. Redlands, California.

Executive Order 12898. 1994. Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. President W. Clinton. 59 Federal Register (FR) 7629; Feb. 16, 1994. February 16, 1994. Available online at: <http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf>

Federal Energy Regulatory Commission. 2014. Federal Energy Regulatory Commission website. Accessed July 2014. Information available online at: <http://www.ferc.gov/default.asp>

Federal Highway Administration. 2014. Federal Highway Administration website. Federal Highway Administration, US Department of Transportation. Accessed July 2014. Information available online at: <http://www.fhwa.dot.gov/>

Federal Land Policy and Management Act (FLPMA). 1976. 43 United States Code (USC) §§ 1701-1736, 1737-1782. October 1, 1976.

FedLaw. 2014. Land and Water Conservation Fund Act of 1965 Accessed July 2014. Information available online at: <http://www.thecre.com/fedlaw/legal3/lwcfact.htm>

Forestpathology.org. 2009. White Pine Blister Rust. Last modified December 30, 2009. Accessed September 2014. Available online at: [http://www.forestpathology.org/dis\\_wpbr.html](http://www.forestpathology.org/dis_wpbr.html)

Geils, B. W., K. E. Hummer, and R. S. Hunt. 2010. White Pines, *Ribes*, and Blister Rust: A Review and Synthesis. Forest Pathology 40: 147-185.

GeoCommunicator. 2014. GeoCommunicator website. Publication site for data from the Bureau of Land Management (BLM). Accessed October 2014. Information available online at: [www.GeoCommunicator.gov](http://www.GeoCommunicator.gov)

Hamerlinck, J. D., S. N. Lieske, and W. J. Gribb. 2013. Understanding Wyoming's Land Resources: Land-Use Patterns and Development Trends, Ruckelshaus Institute Publication Series on Local Government Land-Use Planning in Wyoming. CES Publication B-1244. University of Wyoming (UW) Ruckelshaus Institute, Laramie, Wyoming.

Holechek, J. L., R. D. Pieper, and C. H. Herbel. 2004. Range Management: Principles and Practices. Pearson Education, Inc. Upper Saddle River, New Jersey.

Hubbard, R. K., G. L. Newton, and G. M. Hill. 2004. Water Quality and the Grazing Animal. Journal of Animal Science 82: E255-E263.

IMPLAN. 2014. IMPLAN - the Leading Provider of U.S. Economic Impact Data. Accessed September 2014. Infomation available online at: <https://implan.com/>

Johnson, T. N. and B. K. Sandercock. 2010. Restoring Tallgrass Prairie and Grassland Bird Populations in Tall Fescue Pastures with Winter Grazing. *Rangeland Ecology and Management* 63(6): 679-688.

Kearns, H. S. J., W. R. Jacobi, R. M. Reich, R. L. Flynn, K. S. Burns, and B. W. Geils. 2014. Risk of White Pine Blister Rust to Limber Pine in Colorado and Wyoming, USA. *Forest Pathology* 44(1): 21-38.

Land and Water Conservation Fund (LWCF) Act. 1965. 16 United States Code (USC) § 4601-4 et seq.

Land and Water Conservation Fund Act. 1965. 16 United States Code (USC) § 4601-4 through 4601-11. September 3, 1964.

Letherman, D. A., I. Aguayo, and T. M. Mehall. 2011. Mountain Pine Beetle. No. 5.528. Colorado State University Extension. September 2011. Accessed October 2014. Information available online at: <http://www.ext.colostate.edu/pubs/insect/05528.html>

Liebhold, A. M., W. L. MacDonald, D. Bergdahl, and V. C. Mastro. 1995. Invasion by Exotic Forest Pests: A Threat to Forest Ecosystems. Monograph 30, supplement to *Forest Science* 41(2): 1-49.

Means, R. E. 2014. (2014, June 5), Personal Interview. US Department of the Interior (USDI) Bureau of Land Management (BLM) Wyoming State Forester.

National Association of Counties (NACO). 2014. Transportation Steering Committee. Accessed July 2014. Information available online at: <http://www.naco.org/legislation/policies/Pages/Transportation.aspx>

National Environmental Policy Act (NEPA). 1969. 42 United States Code (USC) 4321-4347. Pub. L. 91-190, § 2, Jan. 1, 1970, 83 Stat. 852.

National Gas Supply Association. 2014. National Gas Supply Association website. Accessed July 2014. Information available online at: <http://www.ngsa.org/>

National Geographic Society (National Geographic). 2014. World Maps. Digital Topographic Map.

National Wind Coordinating Collaborative. 2014. National Wind Coordinating Collaborative website. Accessed July 2014. Information available online at: <http://nationalwind.org/>

North American Datum (NAD). 1983. NAD83 Geodetic Datum.

Nowak, D. J., S. M. Stein, Paula B. Randler, E. J. Greenfield, S. J. Comas, M. A. Carr, and R. J. Alig. 2010. Sustaining America's Urban Trees and Forests: A Forests on the Edge Report. General Technical Report PRS-62. Available online at: [http://www.fs.fed.us/openspace/fote/reports/nrs-62\\_sustaining\\_americas\\_urban.pdf](http://www.fs.fed.us/openspace/fote/reports/nrs-62_sustaining_americas_urban.pdf)

Petit, C. 2007. "In the Rockies, Pines Die and Bears Feel It," *The New York Times*, January 30, 2007.

Petroleum Association of Wyoming. 2014. Facts and Figures. 2014 edition. Accessed July 2014. Available online at: <http://www.pawyo.org/facts-figures.pdf>

Public Law 108-7. 2003. Consolidated Appropriations Resolution, 2003. September 30, 2003.

Public Rangelands Improvement Act. 1978. 43 United States Code (USC) § 1901-1908. October 25, 1978. Statute available online at: <http://www.gpo.gov/fdsys/pkg/STATUTE-92/pdf/STATUTE-92-Pg1803.pdf>

Puffer, A. 1991. Legal Perspectives Related to Soil Resource Management. In: *Proceedings of the Management and Productivity of Western-Montane Forest Soils*, April 10-12, 1990, Boise, Idaho. US Department of Agriculture (USDA) Forest Service General Technical Report INT-280, Intermountain Research Station, Ogden Utah.



Revised Statute (R.S.) 2477. 1866. Rights-of-Way. Repealed by the Federal Land Policy and Management Act of 1976 (FLPMA).

Ritthaler, S. 1995. Through Cooperation of People-- 50 Years of Service. History written for Tri-County Electric (now PRE-Corp). 77 pp.

SAGEMAP. 2014. A GIS Database for Sage-Grouse and Shrubsteppe Management in the Intermountain West. SAGEMAP, US Geological Survey (USGS). Information available online at: <http://sagemap.wr.usgs.gov/index.aspx>

Schoettle, A. W., R. A. Snieszko, A. Kegley, and K. S. Burns. 2014. White Pine Blister Rust Resistance in Limber Pine: Evidence for a Major Gene. *Phytopathology* 104(2): 163-173. doi: 10.1094/PHYTO-04-13-0092-R.

Shoemaker, J. 2010. NASA Satellites Reveal Surprising Connection between Beetle Attacks, Wildfire. National Aeronautics and Space Administration (NASA),. September 9, 2010. Accessed October 2014. Available online at: <http://www.nasa.gov/topics/earth/features/beetles-fire.html>

Spyratos, V., P. S. Bourgeron, and M. Ghil. 2007. Development at the Wildland-Urban Interface and the Mitigation of Forest-Fire Risk. *Proceedings of the National Academy of Sciences* 104(36): 14272-14276.

State of Wyoming. 2014a. Chapter 13: Public Hunting, Fishing and General Recreational Use. Rules and Regulations, Board of Land Commissioners. Accessed September 2014. Available online at: <http://soswy.state.wy.us/Rules/RULES/899.pdf>

State of Wyoming. 2014b. Chapter 14: Temporary Use Permits. Rules and Regulations, Board of Land Commissioners. Accessed September 2014. Available online at: <http://soswy.state.wy.us/Rules/RULES/4618.pdf>

Taylor Grazing Act. 1934. 43 United States Code (USC) § 315-316o. June 28, 1934.

Transportation Research Board (TRB). 2014a. Transportation Needs of National Parks and Public Lands. TRB Committee ADA40. Federal Highway Administration TRB. Accessed July 2014. Information available online at: <http://www.trb.org/ADA40/ADA40.aspx>

Transportation Research Board (TRB). 2014b. Trb website. Accessed July 2014. Information available online at: <http://www.trb.org>

United States Department of Agriculture (USDA). 2012. 2012 Census of Agriculture County Profile: Campbell County Wyoming. Accessed July 2014. Available online at: [http://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/County\\_Profiles/Wyoming/cp56005.pdf](http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Wyoming/cp56005.pdf)

University of Wyoming (UW). 2010. Bark Beetles in the Intermountain West: Redefining Post-Disturbance Forests and Management Strategies for Minimizing Impacts. *In: Proceedings of a Workshop*, October 4-5, 2010, Laramie, Wyoming. Accessed September 2014. Available online at: [http://www.uwyo.edu/haub/ruckelshaus-institute/\\_files/docs/publications/2010-bark-beetle-workshop-proceedings.pdf](http://www.uwyo.edu/haub/ruckelshaus-institute/_files/docs/publications/2010-bark-beetle-workshop-proceedings.pdf)

University of Wyoming (UW). 2013. Governor's Task Force on Forests. Draft 1.2. Ruckelshaus Institute of Environment and Natural Resources, Haub School of Environment and Natural Resources. December 18, 2013. Accessed October 2014. Available online at: [http://www.uwyo.edu/haub/ruckelshaus-institute/\\_files/docs/forests/forest-task-force-charter-draft-1.2.pdf](http://www.uwyo.edu/haub/ruckelshaus-institute/_files/docs/forests/forest-task-force-charter-draft-1.2.pdf)

US Census Bureau (USCB). 2014. Wyoming State and County QuickFacts. USCB. Revised July 8, 2014. Available online at: <http://quickfacts.census.gov/qfd/states/56000.html>



US Department of Agriculture (USDA). 2012. Wyoming State and County Data. Ac-12-A-50. Volume 1- Geographic Area Series; Part 50. 2012 Census of Agriculture. May 2014. Available online at: [http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/Wyoming/wyv1.pdf](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Wyoming/wyv1.pdf)

US Department of Commerce, Bureau of Economic Analysis. 2014. RIMS II Online Order and Delivery System. Regional Input-Output Model (RIMS) II MOdified Economic Model. Accessed September 2014. Information available online at: <https://www.bea.gov/regional/rims/rimsii/>

US Department of Energy. 2014. Energy.gov website. Accessed July 2014. Information available online at: <http://www.energy.gov/>

US Energy Information Administration (EIA). 2013. Wyoming. State Profile and Energy Estimates. Accessed August 2014. Information available online at: <http://www.eia.gov/state/analysis.cfm?sid=WY>

US Environmental Protection Agency (USEPA). 2012. Pasture, Rangeland, and Grazing Operations - Best Management Practices (BMPs). Accessed September 2014. Information available online at: <http://www.epa.gov/oecaagct/anprgbmp.html>

US Fish and Wildlife Service (USFWS). 2011. 2011 National Survey of Fishing, Hunting and Wildlife- Associated Recreation, Wyoming. Revised January 2014.

US Forest Service (USFS). 1992a. Forest Service Handbook 2209.13 – Grazing Permit Administartion Handbook, WO Amendment 2209.13-92-1, Effective August 3, 1993. Access April 19, 2016. Available online at: <http://www.fs.fed.us/rangelands/whowear/directives.shtml>

US Forest Service (USFS). 1992b. Forest Service Manual Washington, Title 1000 – Organization and Management, Amendment No. 1000-92-2, Effective May 6, 1992. Accessed April 18, 2016. Available online at: [http://www.fs.fed.us/cgi-bin/Directives/get\\_dirs/fsm?1000](http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?1000)

US Forest Service (USFS). 1994a. Forest Service Manual – Title 2300 – R2 Supplement No. 2300-94-1. Effective June 15, 1994. FSM 2300 – Recreation, Wilderness and Related Resource Management. Accessed April 2016. Available online at: <http://www.fs.fed.us/im/directives/field/r2/fsm/2300/2320.1-2323.26b.doc>

US Forest Service (USFS). 1994b. Forest Service Manual – Title 7700 – R2 Supplement No. 7700-94-2. Effective July 1, 1994. FSM 7700 – Transportation System. Accessed April 2016. Available online at: [http://www.fs.fed.us/im/directives/field/r2/fsm/7700/7700\\_zero\\_code.doc](http://www.fs.fed.us/im/directives/field/r2/fsm/7700/7700_zero_code.doc)

US Forest Service (USFS). 1997. Forest Service Manual – Title 2800 – Supplement No. 2800-97-1. Effective April 28, 1997. FSM 2800 – Minerals and Geology. Accessed April 2016. Available online at: [http://www.fs.fed.us/im/directives/field/r2/fsm/2800/2817.2\\_2819.3.doc](http://www.fs.fed.us/im/directives/field/r2/fsm/2800/2817.2_2819.3.doc)

US Forest Service (USFS). 2001. Final Environmental Impact Statement for the Northern Great Plains Management Plans Revision. May 2001. Accessed April 13, 2016. Available online at: [http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3\\_025111](http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3_025111)

US Forest Service (USFS). 2003. Forestwide Direction. Chapter 1. *In: Medicine Bow National Forest, Revised Land and Resource Management Plan. Rocky Mountain Region, US Department of Agriculture (USDA) Forest Service. December 2003.* Information available online at: [http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3\\_025109](http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3_025109); Chapter 1 available online at: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5163437.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5163437.pdf)

US Forest Service (USFS). 2008. Forest Service Manual - Chapter 1970 - Economic and Social Evaluation. Amendment No. 1900-2008-2. FSM 1900 – Planning. September 25, 2008. Accessed September 2014. Available online at: [www.fs.fed.us/im/directives/fsm/1900/1970.doc](http://www.fs.fed.us/im/directives/fsm/1900/1970.doc)

US Forest Service (USFS). 2012. National Best Management Practices for Water Quality Management on National Forest System Lands. Volume 1: National Core BMP Technical Guide. FS-990a. US Deaprtment of Agriculture (USDA) Forest Service. Accessed September 2014. Available online at: [http://www.fs.fed.us/biology/resources/pubs/watershed/FS\\_National\\_Core\\_BMPs\\_April2012.pdf](http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf)

US Forest Service (USFS). 2013. Aerial Detection Survey: 2013 Wyoming Highlights. Accessed September 2014. Information available online at: <http://www.fs.usda.gov/detail/r2/forest-grasslandhealth/?cid=stelprdb5447304>

US Forest Service (USFS). 2014. Thunder Basin National Grassland Land and Resource Management Plan. Medicine Bow-Routt National Forests and Thunder Basin National Grassland, Laramie, Wyoming. Accessed July 2014. Information available online at: [http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3\\_025111](http://www.fs.usda.gov/detail/mbr/landmanagement/planning/?cid=fsbdev3_025111)

US Forest Service (USFS). 2015. Greater Sage-Grouse Record of Decision for Northwest Colorado and Wyoming, and Land Management Plan Amendments for the Routte National Forest, Thunder Basin National Grassland, Bridger-Teton National Forest, and Medicine Bow National Forest Prepared by the US Department of Agriculture (USDA) Forest Service. September 2015. Accessed April 2016. Available online at: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprd3855560.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3855560.pdf)



US Forest Service (USFS). no date. Forest Service Handbook - Economic and Social Analysis Handbook. FSH 1909.17. Accessed Spetember 2014. Information available online at: [http://www.fs.fed.us/cgi-bin/Directives/get\\_dirs/fsh?1909.17](http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?1909.17)

US Geological Survey (USGS). 2013. Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana. Fact Sheet 2012-3141. February 2013.

US Geological Survey (USGS). 2014. The National Map/US Topo. Last updated January 5, 2014. Homepage available at: <http://nationalmap.gov/ustopo/index.html>

Vavra, M. 2005. Livestock Grazing and Wildlife: Developing Compatibilities. *Rangeland Ecology and Management*: 58(2): 128-134.

Western Area Power Administration. 2014. Western Area Power Administration website. Accessed July 2014. Information available online at: <http://ww2.wapa.gov/sites/western/Pages/default.aspx>

Western Electric Coordinating Council. 2014. Western Electric Coordinating Council website. Accessed July 2014. Information available online at: <http://www.wecc.biz/Pages/Default.aspx>

Williams, B. K. and E. D. Brown. 2012. Adaptive Management: The U.S. Department of the Interior Applications Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, D.C.

Williamson, R. and T. A. Volk. 2009. A Summary of Existing Living Snow Fence Programs in North America. State University of New York, College of Environmental Science and Forestry. August 2009. Available online at: <http://www.esf.edu/willow/lrf/Reports/LSF%20Programs%20in%20North%20America.pdf>

Wyoming Department of Administration and Information, Economic Analysis Division. 2011. Population for Wyoming, Counties, Cities, and Towns: 2010 to 2030. State of Wyoming. October 2011. Available online at: <http://eadiv.state.wy.us/pop/wyc&sc30.pdf>

Wyoming Department of Administration and Information, Economic Analysis Division. 2014. Wyoming Cost of Living Index for the Fourth Quarter of 2013. State of Wyoming. April 8, 2014. Available online at: <http://eadiv.state.wy.us/wcli/NewsRelease-4Q13.pdf>

Wyoming Department of Environmental Quality (WDEQ). 2004. Silviculture Best Management Practices. Wyoming Nonpoint Source Management Plan. Available online at: <http://deq.state.wy.us/wqd/watershed/Program%20Documents/4.%20Non-Point%20Source%20Pollution%20Planning%20and%20Grants/7.%20Best%20Management%20Practices/Silviculture%2004.pdf>

Wyoming Department of Environmental Quality (WYDEQ). 1998. Coal Standard Operating Procedure No. 1.9. Land Quality Division (LQD), WYDEQ. Accessed June 2014. Available online at: [http://deq.state.wy.us/lqd/Resources/Division/Guidance%20and%20Info/SOPs/1998-0701\\_LQD\\_SOP-coal-procedures-public-notices-proof-of-notice-number-1.9.pdf](http://deq.state.wy.us/lqd/Resources/Division/Guidance%20and%20Info/SOPs/1998-0701_LQD_SOP-coal-procedures-public-notices-proof-of-notice-number-1.9.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2003. Guideline No. 6: Noncoal; Application for a “Permit to Mine” or an “Amendment”. Land Quality Division (LQD), WYDEQ. Accessed June 26, 2014. Available online at: [http://deq.state.wy.us/lqd/Resources/Division/Guidance%20and%20Info/Guidelines/2003-0101\\_LQD\\_Guidelines\\_Noncoal-application-for-a-permit-to-mine-Guide-6.pdf](http://deq.state.wy.us/lqd/Resources/Division/Guidance%20and%20Info/Guidelines/2003-0101_LQD_Guidelines_Noncoal-application-for-a-permit-to-mine-Guide-6.pdf)

Wyoming Department of Environmental Quality (WYDEQ). 2013. Livestock/Wildlife Best Management Practice Manual. Conservation Practices to Protect Surface and Ground Water. 2013 Update. Document #13-0038. WYDEQ, Water Quality Division, Nonpoint Source Program. Available online at: <http://deq.state.wy.us/wqd/watershed/Program%20Documents/4.%20Non-Point%20Source%20Pollution%20Planning%20and%20Grants/7.%20Best%20Management%20Practices/LivestockWildlife%2013.pdf>

Wyoming Department of Environmental Quality (WYDEQ). 2014a. About LQD. Land Quality Division (LQD), WYDEQ. Revised September 29, 2014. Accessed October 2014. Information available online at: <http://deq.state.wy.us/lqd/>

Wyoming Department of Environmental Quality (WYDEQ). 2014b. Concentrated Animal Feeding Operations (CAFOs). Accessed June 26, 2014. Information available online at: <http://deq.state.wy.us/wqd/CAFO.htm>

Wyoming Department of Environmental Quality (WYDEQ). 2014c. Guidelines and Standard Operating Procedures. Land Quality Division (LQD), WYDEQ. Revised June 12, 2014. Accessed June 26, 2014. Information available online at: <http://deq.state.wy.us/lqd/guidelines.asp>

Wyoming Department of Environmental Quality (WYDEQ). 2014d. WYDEQ website. Accessed July 2014. Information available online at: <http://deq.state.wy.us/>

Wyoming Department of Transportation (WYDOT). 2011. County Road Fund Manual: State and Local Programs. WYDOT Research Center, Cheyenne, Wyoming. Accessed July 2014. Available online at: <http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Management%20Services/County%20Road%20Fund%20Manual/County%20Road%20Fund%20Manual%20.pdf>

Wyoming Department of Transportation (WYDOT). 2014. WYDOT website. Accessed July 2014. Information available online at: <http://www.dot.state.wy.us/home.html>

Wyoming Game and Fish Commission. 2014. Chapter 46: Fishing Regulations. Accessed July 2014. Available online at: [http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS\\_CH46.pdf](http://wgfd.wyo.gov/web2011/imgs/QRDocs/REGULATIONS_CH46.pdf)

Wyoming Game and Fish Department (WGFD). 2010. Wyoming State Wildlife Action Plan (SWAP). WGFD, Cheyenne, Wyoming. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SWAP\\_2010\\_FULL\\_OCT0003090.pdf](http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SWAP_2010_FULL_OCT0003090.pdf)

Wyoming Game and Fish Department. 2013. Hunting Regulations. Accessed July 2014. Available online at: <http://wgfd.wyo.gov/web2011/hunting-1000179.aspx>

Wyoming Game and Fish Department (WGFD). 2014. Wyoming Fishing Regulations: 2014-2015. Accessed July 2014. Available online at: [http://wgfd.wyo.gov/web2011/Departments/Fishing/pdfs/WYFISHINGREGS\\_1415\\_BROCHURE0004975.pdf](http://wgfd.wyo.gov/web2011/Departments/Fishing/pdfs/WYFISHINGREGS_1415_BROCHURE0004975.pdf)

Wyoming Governor's Office. 2014. Wyoming Governor's Office website. Accessed July 2014. Information available online at: <http://governor.wy.gov/Pages/default.aspx>

Wyoming Homeland Security. 2011. Chapter 17- Wildland Fire. Wyoming Multi-Hazard Mitigation Plan. June 2011. Accessed September 2014. Available online at: [http://hls.wyo.gov/Library/mit\\_plan/17\\_Wildland\\_Fire.pdf](http://hls.wyo.gov/Library/mit_plan/17_Wildland_Fire.pdf)

Wyoming Housing Database Partnership. 2014. Campbell County. Information available online at: <http://www.wyomingcda.com/index.php/partners/C40>

Wyoming Infrastructure Authority. 2014. Wyoming Infrastructure Authority website. Accessed July 2014. Information available online at: <http://wyia.org/>

Wyoming Legislature Service Office. 2012. 2012 Budget Session, 61st Legislature, House Bills Index / Senate Files Index. Available online at: <http://legisweb.state.wy.us/2012/billindex/BillCrossRef.aspx?type=ALL>

Wyoming Office of State Lands and Investments. 2006. BMP Field Audits: Site Information and Ranking Criteria. Forestry Division BMP Ranking Form. Accessed September 2014. Available online at: [http://slf-web.state.wy.us/forestrydivision/BMP\\_Ranking\\_Form.pdf](http://slf-web.state.wy.us/forestrydivision/BMP_Ranking_Form.pdf)

Wyoming Oil and Gas Conservation Commission (WOGCC). 2014a. County Reports. Accessed July 2014. Information available online at: <http://wogcc.state.wy.us/>; County Reports at: <http://wogcc.state.wy.us/countyMenu.cfm?Oops=ID97756&Skip=%27Y%27&oops=ID97756>

Wyoming Oil and Gas Conservation Commission (WOGCC). 2014b. How to Put Together an APD for WOGCC. March 2014. Accessed July 2014. Information available online from: <http://wogcc.state.wy.us/>; APD Guidance at: <http://wogcc.state.wy.us/downloads/HOW2FileAPD.pdf>

Wyoming Oil and Gas Conservation Commission (WOGCC). 2014c. Rules/Statutes. Accessed July 2014. Information available online from: <http://wogcc.state.wy.us/>; Rules/Statutes at: <http://wogcc.state.wy.us/rules-statutes.cfm?Skip=%27Y%27>

Wyoming Oil and Gas Conservation Commission (WOGCC). 2014d. Well Summary. Accessed July 2014. Information available online from: <http://wogcc.state.wy.us/>; Well Summary by County at: <http://wogcc.state.wy.us/countyMenu.cfm?Oops=ID97756&Skip=%27Y%27&oops=ID97756>

Wyoming Oil and Gas Conservation Commission (WOGCC). 2014e. WOGCC website. Accessed July 2014. Online at: <http://wogcc.state.wy.us/>

Wyoming Pipeline Authority. 2014. Wyoming Pipeline Authority website. Accessed July 2014. Information available online at: <https://www.wyopipeline.com/>

Wyoming Public Service Commission. 2014. Wyoming Public Service Commission website. Accessed July 2014. Information available online at: <http://psc.state.wy.us/>

Wyoming State Forestry Division. 2006. Wyoming Forestry Best Management Practices, Water Quality Protection Guidelines. Office of State Lands and Investments. December 2006.

Wyoming State Forestry Division. 2009. Wyoming Statewide Forest Resource Assessment: Describing Conditions, Trends, Threats, and Priorities. Office of State Lands and Investments. September 2009. Available online at: <http://slf-web.state.wy.us/forestrydivision/StatewideAssessment.pdf>

Wyoming State Forestry Division. 2014. Wyoming Forestry Best Management Practices, Forest Stewardship Guidelines for Water Quality: 2013 Field Audit Report. Office of State Lands and Investments. February 2014.

Wyoming State Geological Survey. 2014. Wyoming's Oil and Gas Resources. Summary Report. February 2014. Available online at: <http://www.wsgs.uwyo.edu/Public-Info/OnlinePubs/docs/Oil-and-Gas-Summary.pdf>

Wyoming State Parks, Historic Sites and Trails. 2014a. Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2014-2019 Wyoming Department of State Parks and Cultural Resources. Accessed September 2014. Available online at: <http://wyoparks.state.wy.us/pdf/Planning/SCORPBook.pdf>

Wyoming State Parks, Historic Sites and Trails. 2014b. Wyoming State Parks, Historic Sites and Trails website. Accessed July 2014. Information available online at: <http://wyoparks.state.wy.us/>



Wyoming Statute (W.S.) 11. Title 11 - Agriculture, Livestock and Other Animals; Chapters 1-48. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles/Title11/Title11.htm>

Wyoming Statute (W.S.) 24-2-101. Title 24 - Highways; Chapter 2 - Department of Transportation; 24-2-101. Department and Commission Created; Qualifications; Appointment; Term; Removal; Compensation; Location of Offices; Power to Bring Civil Actions; Official Seal. Available online at: <http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles/Title24/T24CH2.htm>

Yarrow, G. 2009. Providing Habitat Needs for Wildlife through Forest and Agricultural Management. Extension Forestry & Natural Resources, Wildlife & Fisheries Biology - Environmental & Natural Resources - Forest Resources. Clemson Cooperative Extension, Clemson University. Accessed September 2014. Available online at: [http://www.clemson.edu/extension/natural\\_resources/wildlife/publications/fs24\\_providing\\_habitat\\_needs.html](http://www.clemson.edu/extension/natural_resources/wildlife/publications/fs24_providing_habitat_needs.html)

## Acronyms

CCNRLUP	Amended Campbell County Natural Resource and Land Use Plan
ACORE	American Council on Renewable Energy
ADA	Americans with Disabilities Act
ADMB	Animal Damage Management Board
APD	Application to Drill
APHIS	Animal and Plant Health Inspection Service
AQRVs	Air quality related values
ATV	all-terrain vehicle
AUMs	Animal Unit Months
AWEA	American Wind Energy Association
BA	Biological Assessment
bbls	oil barrels
BE	Biological Evaluation
BP	Before Present
BFO	Buffalo Field Office
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMPs	Best Management Practices
CAA	Clean Air Act
CAFO	Concentrated Animal Feeding Operations
CAP	the amount of pollutant that may be emitted
CAVR	Clean Air Visibility Rule
CBI	Community Builders, Inc.
CCAs	Candidate Conservation Agreements
CCAAs	Candidate Conservation Agreements with Assurances
CCCD	Campbell County Conservation District
CCDPZ	Campbell County Division of Zoning and Planning
CCEDC	Campbell County Economic Development Corporation
CCWPD	Campbell County Weed and Pest District
CDA	Concentrated Development Area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations

CH4	methane
CI	Compression ignition
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
CRP	Conservation Reserve Program
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
eGRID	Emissions and Generation Resource Integrated Database
EGUs	electric generating units
EIA	(US) Energy Information Administration
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESD	Ecological Site Description
ESP	electrostatic precipitators
ESRI	Environmental Systems Research Institute
FGD	flue-gas desulfurization
FHA	Federal Highway Administration
FLPMA	Federal Land Policy Management Act
FS	Forest Service
FSM	Forest Service Manual
GAO	Government Accounting Office
GHG	greenhouse gas
GRB	Green River Basin
gSSURGO	Gridded Soil Survey Geographic
HAP	hazardous air pollutant
HCP	Habitat Conservation Plan
IMPLAN	Impact Analysis for Planning
I-90	Interstate 90
JPAD	Jonah-Pinedale Anticline Development
LRMP	Land and Resource Management Plan
LDAR	leak detection and repair
LQD	Land Quality Division
MATS	Mercury and Air Toxics Standards
MACT	Maximum Available Control Technology
MBTA	Migratory Bird Treaty Act
Mcf	thousand cubic feet
MPB	mountain pine beetle
N <sub>2</sub> O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NEWEDC	Northeast Wyoming Economic Development Corporation
NHPA	National Historic Preservation Act
NFMA	National Forest Management Act
NGOs	non-governmental organizations



NH <sub>3</sub>	ammonia
NOAA	National Oceanic and Atmospheric Administration
NO	nitric oxide
NO <sub>2</sub>	nitrogen dioxide
NOX	nitrogen oxide
NPL	National Priorities List
NRCS	Natural Resource Conservation District
NRTA	National Recreation Trails Association
NSPS	New Source Performance Standards
NSR	New Source Review
NWSWG	Northeast Wyoming Sage-Grouse Working Group
OGCC	Wyoming Oil and Gas Conservation Commission
OHVs	off-highway vehicles
OSM	US Office of Surface Mining Reclamation and Enforcement
O&G	oil and gas
PL	Public Law
PLPW	Private Lands Public Wildlife Access Program
PM	particulate matter
PMB	Predator Management Board
PM <sub>2.5</sub>	Fine particulate matter
PM <sub>10</sub>	inhalable particulate matter
PRB	Power River Basin
PSD	Prevention of Significant Deterioration
RCI	Residential/Commercial/Industrial
RHV	Risk, Hazard, and Value
RIMS	Regional Input-output Modeling System
RMP	Resource Management Plan
RPA	Resources Planning Act
RS	Revised Statute
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCR	selective catalytic reduction
SEO	State Engineer's Office
SGCN	Species of Greatest Conservation Need
SHA	Safe Harbor Agreement
SHP	Strategic Habitat Plan
SIP	State Implementation Plan
SI-ICE	spark ignition internal combustion engine
SMCRA	Surface Mining Control and Reclamation Act
SMZ	Streamside Management Zone
SNCR	selective non-catalytic reduction
SOP	standard operating procedure
SO <sub>x</sub>	sulfur oxide
SO <sub>2</sub>	sulfur dioxide
SRMA	Special Resource Management Area
SRP	Special Recreation Permit
Stat.	Statute
SWAP	State Wildlife Action Plan
TBNG	Thunder Basin National Grassland
TCP	Traditional Cultural Property
Tech.	Technical



TMDL	Total Maximum Daily Loads
TRB	Transportation Research Board
TSP	total suspended particulate
UCRB	Upper Columbia River Basin
UGRB	Upper Green River Basin
mg/m <sup>3</sup>	micrograms per cubic meter of air
US	United States
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UW	University of Wyoming
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WBWG	Western Bat Working Group
WDA	Wyoming Department of Agriculture
WGFD	Wyoming Game and Fish Department
WJVSC	Wyoming Joint Ventures Steering Committee
WNDD	Wyoming Natural Diversity Database
WOGCC	Wyoming Oil and Gas Conservation Commission
WPBR	white pine blister rust
WS	Wildlife Services
W.S.	Wyoming Statute
WSA	Wilderness Study Area
WSFD	Wyoming State Forestry Division
WSEO	Wyoming State Engineers Office
WWCS	Wyoming Wetlands Conservation Strategy
WWDC	Wyoming Water Development Commission
WY	Wyoming
WYDEQ	Wyoming Department of Environmental Quality
WYDOT	Wyoming Department of Transportation
WYPDES	Wyoming Pollution Discharge Elimination System

## Scientific Names

Animal Diseases		
Parasitic Diseases		
Common Name of Disease	Caused by	Scientific name of causative pathogen
babesiosis (in humans)	Apicomplexa protozoans	<i>Babesia</i> spp., usually <i>B. microti</i>
babesiosis (in cattle and other ungulates)	Apicomplexa protozoans	<i>Babesia bigemina</i> and <i>B. bovis</i>
toxoplasmosis	Toxoplasma protozoans	<i>Toxoplasma gondii</i>
filariasis	canine heartworm	<i>Dirofilaria immitis</i>
Bacterial Diseases		
Common Name of Disease	Caused by	Scientific name of causative pathogen
bubonic plague (humans)	coccobacilli	<i>Yersinia pestis</i>
sylvatic plague (animals)	coccobacilli	<i>Yersinia pestis</i>
brucellosis	coccobacilli	<i>Brucella abortus</i>
tularemia	coccobacilli	<i>Francisella tularensis</i>
plague	coccobacilli	<i>Yersinia pestis</i>
Rocky Mountain spotted tick fever	coccobacilli	<i>Rickettsia rickettsii</i>
Lyme disease	spirochete	<i>Borrelia</i> spp.
tuberculosis	mycobacteria	<i>Mycobacterium tuberculosis</i>
Viral Disease		
Common Name of Disease	Caused by	Scientific name of causative pathogen
West Nile virus	virus	<i>Flavivirus</i> spp.
rabies	virus	<i>Lyssavirus</i>
Prion Diseases		
Common Name of Disease	Caused by	Name of causative pathogen
chronic wasting disease	transmissible spongiform encephalopathy	prions
Plant Diseases		
Fungal Diseases		
Common Name of Disease	Caused by	Scientific name of causative pathogen
white pine blister rust	Basidiomycota fungus	<i>Cronartium ribicola</i>
western gall rust	Basidiomycota fungus	<i>Peridermium harknessii</i>
Dutch elm disease	Ascomycota fungus	<i>Ophiostoma</i> spp.
chestnut blight	Ascomycota fungus	<i>Cryphonectria parasitica</i>

Mammals	
Common Name	Scientific Name
Abert's squirrel	<i>Sciurus aberti</i>
American badger	<i>Taxidea taxus</i>
American hog-nosed skunk	<i>Conepatus leuconotus</i>
American marten	<i>Martes americana</i>
beaver	<i>Castor canadensis</i>
black-footed ferret	<i>Mustela nigripes</i>
black-tailed jackrabbit	<i>Lepus californicus</i>
black-tailed prairie dog	<i>Cynomys ludovicianus</i>
burro	<i>Equus asinus</i>
cat (stray or feral)	<i>Felis catus</i>
cattle	<i>Bos taurus</i>
coyote	<i>Canis latrans</i>
deer mouse	<i>Peromyscus maniculatus</i>
desert bighorn sheep	<i>Ovis canadensis nelsoni</i>
desert cottontail	<i>Sylvilagus audubonii</i>
eastern cottontail	<i>Sylvilagus floridanus</i>
eastern fox squirrel	<i>Sciurus niger</i>
elk	<i>Cervus canadensis</i>
fringed myotis	<i>Myotis thysanodes</i>
gray wolf	<i>Canis lupus</i>
grizzly bear	<i>Ursus arctos</i>
ground squirrels	<i>Spermophilus</i> spp.
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>
hoary bat	<i>Lasiurus cinereus</i>
horse	<i>Equus ferus caballus</i>
jackrabbit	<i>Lepus</i> spp.
kangaroo rat	<i>Dipodomys ordii</i>
kit fox	<i>Vulpes macrotis</i>
long-eared myotis	<i>Myotis evotis</i>
mountain cottontail	<i>Sylvilagus nutallii</i>
mountain lion	<i>Puma concolor</i>
mule deer	<i>Odocoileus hemionus</i>
New Mexico meadow jumping mouse	<i>Zapus hudsonius luteus</i>
North American porcupine	<i>Erethizon dorsatum</i>
northern long-eared bat	<i>Myotis septentrionalis</i>
olive-backed pocket mouse	<i>Perognathus fasciatus</i>
porcupine	<i>Erethizon dorsatum</i>
prairie dogs	<i>Cynomys</i> spp.
pronghorn	<i>Antilocapra americana</i>
pygmy rabbit	<i>Brachylagus idahoensis</i>
pygmy shrew	<i>Sorex hoyi</i>
raccoon	<i>Procyon lotor</i>
red fox	<i>Vulpes vulpes</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
river otter	<i>Lontra canadensis</i>
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>
sheep	<i>Ovis aries</i>
spotted bat	<i>Euderma maculatum</i>
swift fox	<i>Vulpes velox</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>



water vole	<i>Microtus richardsoni</i>
white-tailed deer	<i>Odocoileus virginianus</i>
white-tailed prairie dog	<i>Cynomys leucurus</i>
Wyoming pocket gopher	<i>Thomomys clusius</i>
<b>Birds</b>	
Common Name	Scientific Name
American bittern	<i>Botaurus lentiginosus</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
Baird's sparrow	<i>Ammodramus bairdii</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
black swift	<i>Cypseloides niger</i>
black tern	<i>Chlidonias niger</i>
black-backed woodpecker	<i>Picoides arcticus</i>
boreal owl	<i>Aegolius funereus</i>
Brewer's sparrow	<i>Spizella breweri</i>
burrowing owl	<i>Athene cunicularia</i>
Cassin's sparrow	<i>Aimophila cassinii</i>
chestnut-collared longspur	<i>Calcarius ornatus</i>
chipping sparrow	<i>Spizella passerine</i>
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>
Eurasian collared dove	<i>Streptopelia decaocto</i>
European starling	<i>Sturnus vulgaris</i>
ferruginous hawk	<i>Buteo regalis</i>
flammulated owl	<i>Otus flammelous</i>
golden eagle	<i>Aquila chrysaetos</i>
grasshopper sparrow	<i>Ammodramus savannarum</i>
greater prairie-chicken	<i>Tympanuchus cupido</i>
greater sage-grouse	<i>Centrocercus urophasianus</i>
harlequin duck	<i>Histrionicus histrionicus</i>
horned lark	<i>Eremophila alpestris</i>
house sparrow	<i>Passer domesticus</i>
lark bunting	<i>Calamospiza melanocorys</i>
lark sparrow	<i>Chondestes grammacus</i>
Lewis's woodpecker	<i>Melanerpes lewisi</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
long-billed curlew	<i>Numenius americanus</i>
McCown's longspur	<i>Calcarius mccownii</i>
mountain bluebird	<i>Sialia currucoides</i>
mountain plover	<i>Charadrius montanus</i>
mourning dove	<i>Zenaida macroura</i>
northern flicker	<i>Colaptes auratus</i>
northern goshawk	<i>Accipiter gentilis</i>
northern harrier	<i>Circus cyaneus</i>
olive-sided flycatcher	<i>Contopus cooperi</i>
peregrine falcon	<i>Falco peregrinus</i>
prairie falcon	<i>Falco mexicanus</i>
purple martin	<i>Progne subis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
rock pigeon	<i>Columba livia</i>
sage sparrow	<i>Amphispiza belli</i>
sage thrasher	<i>Oreoscoptes montanus</i>
sage-grouse	<i>Centrocercus spp.</i>
sandhill crane	<i>Grus canadensis</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
sharp-tailed grouse	<i>Tympanuchus phasianellus</i>

short-eared owl	<i>Asio flammeus</i>
song sparrow	<i>Melospiza melodia</i>
Sprague's pipit	<i>Anthus spragueii</i>
Swainson's hawk	<i>Buteo swainsoni</i>
trumpeter swan	<i>Cygnus buccinator</i>
vesper sparrow	<i>Pooecetes gramineus</i>
western burrowing owl	<i>Athene cunicularia</i>
western meadowlark	<i>Sturnella neglecta</i>
white-faced ibis	<i>Plegadis chihi</i>
white-tailed ptarmigan	<i>Lagopus leucura</i>
yellow-billed cuckoo	<i>Coccyzus americanus</i>

### Reptiles

Common Name	Scientific Name
alligator	<i>Alligator mississippiensis</i>
Black Hills redbelly snake	<i>Storeria occipitomaculata pahasapae</i>
bull snake	<i>Pituophis catenifer sayi</i>
desert massasauga	<i>Sistrurus catenatus edwardsii</i>
greater short-horned lizard	<i>Phrynosoma hernandesi</i>
prairie rattlesnake	<i>Crotalus viridis</i>

### Amphibians

Common Name	Scientific Name
boreal toad	<i>Anaxyrus boreas boreas</i>
Columbia (or Bighorn Mountain) spotted frog	<i>Rana luteiventris</i>
northern leopard frog	<i>Lithobates (Rana) pipiens</i>
plains leopard frog	<i>Lithobates blairi</i>
wood frog	<i>Lithobates sylvaticus</i>

### Fish

Common Name	Scientific Name
black bullhead	<i>Ameiurus melas</i>
bluegill	<i>Lepomis macrochirus</i>
bluehead sucker	<i>Catostomus discobolus</i>
catfish	<i>Ictalurus punctatus</i>
channel catfish	<i>Ictalurus punctatus</i>
Colorado River cutthroat	<i>Oncorhynchus clarkii pleuriticus</i>
finescale dace	<i>Phoxinus neogaeus</i>
flannelmouth sucker	<i>Catostomus latipinnis</i>
flathead chub	<i>Platygobio gracilis</i>
green sunfish	<i>Lepomis cyanellus</i>
hornyhead chub	<i>Nocomis biguttatus</i>
lake chub	<i>Couesius plumbeus</i>
largemouth bass	<i>Micropterus salmoides</i>
mountain sucker	<i>Catostomus platyrhynchus</i>
northern redbelly dace	<i>Phoxinus eos</i>
pearl dace	<i>Margariscus margarita</i>
plains minnow	<i>Hybognathus placitus</i>
plains topminnow	<i>Fundulus sciadicus</i>
Rio Grande chub	<i>Gila pandora</i>
Rio Grande cutthroat	<i>Oncorhynchus clarkii virginalis</i>
Rio Grande sucker	<i>Catostomus plebeius</i>
rock bass	<i>Ambloplites rupestris</i>
roundtail chub	<i>Gila robusta</i>
sauger	<i>Sander canadensis</i>
shovelnose sturgeon	<i>Scaphirhynchus platorynchus</i>
small-mouth bass	<i>Micropterus dolomieu</i>
southern redbelly dace	<i>Phoxinus erythrogaster</i>

stonecat	<i>Noturus flavus</i>
sturgeon chub	<i>Macrhybopsis gelida</i>
walleye	<i>Sander vitreus</i>
Yellowstone cutthroat trout	<i>Oncorhynchus clarkia bouvieri</i>

#### Insects and Other Arthropods

Common Name	Scientific Name
Arapahoe snowfly	<i>Capnia arapahoe</i>
beet leafhopper	<i>Circulifer tenellus</i>
cattle fever tick	<i>Boophilus annulatus</i> and <i>B. microplus</i>
emerald ash borer	<i>Agrilus planipennis</i>
grasshoppers	<i>Caelifera</i> spp.
Great Basin silverspot	<i>Speyeria nokomis nokomis</i>
gypsy moth	<i>Lymantria dispar</i>
Hudsonian emerald	<i>Somatochlora hudsonica</i>
ips beetle	<i>Ips pini</i>
Mormon crickets	<i>Anabrus simplex</i>
mosquito	<i>Culicidae</i> spp.
mountain pine beetle	<i>Dendroctonus ponderosae</i>
Nokomis fritillary	<i>Speyeria nokomis</i>
Ottoe skipper	<i>Hesperia ottoe</i>
regal fritillary	<i>Speyeria idalia</i>
Susan's purse-making caddisfly	<i>Ochrotrichia susanae</i>
tick	<i>Ixodidae</i> or <i>Argasidae</i> spp.

#### Mollusks

Common Name	Scientific Name
Cooper's Rocky Mountainsnail	<i>Oreohelix strigosa cooperi</i>
pygmy mountainsnail	<i>Oreohelix pygmaea</i>
Rocky Mountain capshell	<i>Acroloxus coloradensis</i>

#### Plants

Common Name	Scientific Name
Absaroka Range beardtongue	<i>Penstemon absarokensis</i>
alfalfa	<i>Medicago sativa</i>
American cranberrybush	<i>Viburnum opulus</i> var. <i>americanum</i>
antelope bitterbrush	<i>Purshia tridentata</i>
Arizona willow	<i>Salix arizonica</i>
aspen	<i>Populus</i> spp.
aspen (quaking)	<i>Populus tremuloides</i>
autumn willow	<i>Salix serissima</i>
Aztec milkvetch	<i>Astragalus proximus</i>
balsam poplar	<i>Populus balsamifera</i>
Baltic sphagnum	<i>Sphagnum balticum</i>
Barratt's willow	<i>Salix barrattiana</i>
Barr's milkvetch	<i>Astragalus barrii</i>
Bill's neoparrya	<i>Neoparrya lithophila</i>
black henbane	<i>Hyoscyamus niger</i>
Black Hills spruce	<i>Picea glauca</i> var. <i>densata</i>
bloodroot	<i>Sanguinaria canadensis</i>
blue grama	<i>Bouteloua gracilis</i>
blueberry willow	<i>Salix myrtillifolia</i>
box elder	<i>Acer negundo</i>
Brandegee's buckwheat	<i>Eriogonum brandegeei</i>
buffalobur	<i>Solanum rostratum</i>
bulbous bluegrass	<i>Poa bulbosa</i>
Canada thistle	<i>Cirsium arvense</i>
Cary's beardtongue	<i>Penstemon caryi</i>

Cathedral Bluff meadow-rue	<i>Thalictrum heliophilum</i>
Chamisso's cottongrass	<i>Eriophorum chamissonis</i>
clawless draba	<i>Draba exunguiculata</i>
club spikemoss	<i>Selaginella selaginoides</i>
Colorado tansyaster	<i>Machaeranthera coloradoensis</i>
common burdock	<i>Arctium minus</i>
common cocklebur	<i>Xanthium strumarium</i>
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
common twinpod	<i>Physaria didymocarpa</i> var. <i>lanata</i>
cottonwood	<i>Populus</i> spp.
currant	<i>Ribes</i> spp.
cushion bladderpod	<i>Physaria pulvinata</i>
cushion Townsend daisy	<i>Townsendia condensata</i> var. <i>anomala</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Degener's beardtongue	<i>Penstemon degeneri</i>
diffuse knapweed	<i>Centaurea diffusa</i>
dropleaf buckwheat	<i>Eriogonum exilifolium</i>
dwarf mistletoe	<i>Arceuthobium</i> spp.
dwarf raspberry	<i>Rubus arcticus</i> ssp. <i>acaulis</i>
dyers woad	<i>Isatis tinctoria</i>
eastern red cedar	<i>Juniperus virginiana</i>
elliptic spikerush	<i>Eleocharis elliptica</i>
English sundew	<i>Drosera anglica</i>
field bindweed	<i>Convolvulus arvensis</i>
foxtail sedge	<i>Carex alopecoidea</i>
Fremont's bladderpod	<i>Lesquerella fremontii</i>
gooseberry	<i>Ribes</i> spp.
Gray's draba	<i>Draba grayana</i>
green ash	<i>Fraxinus pennsylvanica</i>
Greenland primrose	<i>Primula egaliksensis</i>
groundcedar	<i>Lycopodium complanatum</i>
Hall's bulrush	<i>Schoenoplectus hallii</i>
Harrington's beardtongue	<i>Penstemon harringtonii</i>
hoary cress (whitetop)	<i>Cardaria draba</i> and <i>Cardaria pubescens</i>
houndstongue	<i>Cynoglossum officinale</i>
ice cold buttercup	<i>Ranunculus karelinii</i>
Indian ricegrass	<i>Achnatherum hymenoides</i>
Iowa moonwort	<i>Botrychium campestre</i>
Kotzebue's grass of Parnassus	<i>Parnassia kotzebuei</i>
Laramie columbine	<i>Aquilegia laramiensis</i>
largeflower goldenweed	<i>Pyrrhocoma carthamoides</i> var. <i>subsquarrosa</i>
largeflower triteleia	<i>Triteleia grandiflora</i>
leafy spurge	<i>Euphorbia esula</i>
leafy spurge	<i>Euphorbia esula</i>
lesser bladderwort	<i>Utricularia minor</i>
lesser panicled sedge	<i>Carex diandra</i>
lesser roundleaved orchid	<i>Platanthera orbiculata</i>
limber pine	<i>Pinus flexilis</i>
livid sedge	<i>Carex livida</i>
Lone Mesa snakeweed	<i>Gutierrezia elegans</i>
many-stemmed goldenweed	<i>Pyrrocoma integrifolia</i>
Missouri milkvetch	<i>Astragalus missouriensis</i> var. <i>humistratus</i>
mountain lady's slipper	<i>Cypripedium montanum</i>
mountain tansymustard	<i>Descurainia torulosa</i>
musk thistle	<i>Carduus nutans</i>

narrowleaf grapefern	<i>Botrychium lineare</i>
needle-and-thread	<i>Stipa comata</i>
ox-eye daisy	<i>Chrysanthemum leucanthemum</i>
Pagosa Springs bladderpod	<i>Lesquerella pruinosa</i>
park milkvetch	<i>Astragalus leptaleus</i>
peculiar moonwort	<i>Botrychium paradoxum</i>
perennial pepperweed (giant whitetop)	<i>Lepidium latifolium</i>
perennial sowthistle	<i>Sonchus arvensis</i>
plains cottonwood	<i>Populus deltoids</i>
plains rough fescue	<i>Festuca hallii</i>
plumeless thistle	<i>Carduus acanthoides</i>
ponderosa pine	<i>Pinus ponderosa</i>
Porter's false needlegrass	<i>Ptilagrostis porteri</i>
prairie dodder	<i>Cuscuta platensis</i>
prairie Junegrass	<i>Koeleria macrantha</i>
purple loosestrife	<i>Lythrum salicaria</i>
quackgrass	<i>Agropyron repens</i>
Ripley's milkvetch	<i>Astragalus ripleyi</i>
rock cinquefoil	<i>Potentilla rupincola</i>
Rocky Mountain alpineparsley	<i>Oreoxis humilis</i>
Rocky Mountain juniper	<i>Juniperus scopulorum</i>
Rocky Mountain monkeyflower	<i>Mimulus gemmiparus</i>
roundleaf orchid	<i>Amerorchis rotundifolia</i>
roundleaf sundew	<i>Drosera rotundifolia</i>
Russian knapweed	<i>Centaurea repens</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Rydberg's golden columbine	<i>Aquilegia chrysantha</i> var. <i>rydbergii</i>
sagebrush	<i>Artemisia</i> spp.
sageleaf willow	<i>Salix candida</i>
saltcedar	<i>Tamarix</i> spp.
Sandberg's bluegrass	<i>Poa secunda</i>
sandhill goosefoot	<i>Chenopodium cycloides</i>
scarlet gilia	<i>Ipomopsis aggregata</i> ssp. <i>weberi</i>
Scotch thistle	<i>Onopordum acanthium</i>
Selkirk's violet	<i>Viola selkirkii</i>
shadscale	<i>Atriplex confertifolia</i>
Shoshone carrot	<i>Shoshonea pulvinata</i>
Siberian sea thrift	<i>Armeria maritima</i> ssp. <i>sibirica</i>
simple bog sedge	<i>Kobresia simpliciuscula</i>
skeletonleaf bursage	<i>Franseria discolor</i>
slender cottongrass	<i>Eriophorum gracile</i>
Smith's draba	<i>Draba smithii</i>
smooth northern-rockcress	<i>Braya glabella</i>
sphagnum	<i>Sphagnum angustifolium</i>
spiny hop-sage	<i>Grayia spinosa</i>
spotted knapweed	<i>Cynoglossum officinale</i>
stonecrop gilia	<i>Aliciella sedifolia</i>
stream orchid	<i>Epipactis gigantean</i>
tranquil goldenweed	<i>Pyrrocoma clementis</i> var. <i>villosa</i>
trianglelobe moonwort	<i>Botrychium ascendens</i>
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>
violet milkvetch	<i>Astragalus iodopetalus</i>
Visher's buckwheat	<i>Eriogonum visherii</i>
Weber's draba	<i>Draba weberi</i>
west silver bladderpod	<i>Physaria scrotiformis</i>
western wheatgrass	<i>Pascopyrum smithii</i>

wheel milkweed	<i>Asclepias uncialis</i>
white adder's-mouth orchid	<i>Malaxis brachypoda</i>
white pine	<i>Pinus strobus</i>
whitebark pine	<i>Pinus albicaulis</i>
whitebristle cottongrass	<i>Eriophorum altaicum</i> var. <i>neogaeum</i>
winding mariposa lily	<i>Calochortus flexuosus</i>
winter-fat	<i>Krascheninnikovia lanata</i>
yellow lady's slipper	<i>Cypripedium parviflorum</i>
yellow toadflax	<i>Linaria vulgaris</i>
yellow widow orchid	<i>Liparis loeselii</i>

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## **Appendix A. Campbell County Goals, Objectives, and Policies**

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# General Land Use Planning

## Goal

The management of state and federal lands for multiple use based in sound science and current, accurate data, where the land's various resource values are managed to best meet the present and future needs of the citizens of Campbell County.

## Objectives

- *Efficient use of land and resources to meet the needs of local citizens and industries.*
- *A combination of balanced and diverse resource uses that takes into account the needs of future generations for renewable and non-renewable resources, including, but not limited to: recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values.*
- *Harmonious and coordinated use and management of natural 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.*
- *The prioritizing of any one use should only occur after the impacts of potentially managing for that single use to other multiple uses are fully quantified and lessened. The public will be fully informed of any land use management proposal and/or decision which affects traditional multiple use status of federal lands in the county.*

## Policies

- *Support cooperation, consultation, and coordination between the state of Wyoming, federal agencies to achieve the goals, objectives and policies outlined in the CCNRLUP and other other laws, ordinances and policies applicable in Campbell County.*
- *Work to ensure that state and federal statutes and regulations are followed in the administration of state and federal land.*
- *Work to ensure that federal and state agencies comply with federal and state regulations to enhance productivity on federal and state land through use of credible scientific data and science-based decision making on land and natural resources.*
- *Support conservation practices recommended by the Campbell County Conservation District (CCCD) that improve natural resources and economic returns.*
- *Support the responsible recreational use of state trust and federal lands. Where such lands are damaged, encourage state and federal land managers to work with the County and other local partners to encourage thoughtful use of state and federal lands and mitigate/remediate damaged land. In the event that state and federal lands cannot be adequately protected from damage, access to such lands should be constrained.*
- *Protect, preserve and respect private property rights. Assure state agency compliance with the provisions of W.S. § 9-5-303, W.S. § 9-5-304 and W.S. § 16-3-103(a)(i)(H).*

- *Review NEPA documents to ensure consistency and compatibility with county attributes and objectives.*
- *Protect and promote Campbell County interests through participation in state and federal land and resource planning processes.*
- *Actively participate in the planning and regulation of state and federal land and associated resources.*
- *Require credible, science-based decisions regarding the management and use of state and federal land. Apply credible scientific data within the decision making process regarding the management and use of state and federal land.*
- *State and federal agencies shall coordinate with local government to:*
  - *Establish effective government-to-government relationships with Campbell County;*
  - *Identify a county relations liaison to serve as the first point of contact with the Campbell County Board of Commissioners;*
  - *Implement federal land management programs and activities consistent with and respecting the county's rights, including coordination;*
  - *Work to reduce or remove legal or administrative program impediments that inhibit the agency's and the county's capacity to work directly and effectively with each other;*
  - *Consult with the county on matters that may affect the public's rights and interests;*
  - *Promptly notify Campbell County at the earliest opportunity of proposed policy, plans, projects or actions that may affect the public's rights or interests in order to provide Campbell County an opportunity for meaningful dialogue concerning potential implications and effects;*
  - *Develop, in consultation and collaboration with Campbell County, agreements and statements of relationships with the county that help clarify the county's rights and interests and set forth procedures and protocols for consultation, with points of contact;*
  - *Involve designated county representatives, including staff, consultants and technical representatives, including development of proposed policies, plans, projects, or actions, when appropriate;*
  - *Involve the county early in planning process in the preparation of in-depth socioeconomic information;*
  - *Fully consider recommendations by Campbell County to address county concerns on proposed decisions;*
  - *Inform Campbell County and other local governmental entities how its information and recommendations were considered in federal land management decisions, including explanations particularly in the event that county input was not adopted or incorporated;*
  - *Document the process and actions taken to consult with Campbell County, the results of those actions, and how decisions were communicated to the county. This consultation review and monitoring process shall involve Campbell County officials and representative;*

- *Participate in a “cooperator working group,” which would focus on implementation of planning decisions on public lands; and*
- *Conduct annual planning meetings for specific projects that include participation by livestock permittee, affected adjacent landowners, and other multiple use interests in affected area, as well as Campbell County representatives.*

## Lands and Realty

### Goal

Sustain environmentally, socially and economically efficient multiple-use federal lands by preserving existing uses while protecting valid rights associated with those lands. Support state trust land management consistent with state constitutional, statutory and regulatory requirements.

### Objectives

- *Avoidance and minimization of impacts to land resources during resource development.*
- *Legal application and use of eminent domain laws with government and those that use eminent domain respecting and adequately compensating private property owners.*
- *Promote federal land management which encourages siting of linear and other infrastructure projects on federal lands, where technically and economically feasible.*
- *Proper and legal application of split estate laws and regulations, based in first encouraging cooperation and furthering the interests of the various owners the in split estate context.*
- *Environmentally responsible resource use.*
- *Identification and disposal of isolated, difficult to manage, federal and state lands, where warranted.*
- *Appropriate and cost effective reclamation to achieve .*
- *Protection of property and valid rights associated with land ownership and state and federal leases and permits.*
- *Continued multiple-use of federal lands.*
- *Administration of state trust lands in a manner consistent with state constitutional, statutory and regulatory provisions.*
- *Improved health of the land through sustainable, cost effective management practices.*

### Policies

- *Actively participate in the planning, regulation, and monitoring of state and federal land resources in relation to surface and subsurface land use.*
- *Encourage the use of coordinated resource management planning on the development and change of use on state and federal land, where applicable.*

- *Work with local, state and federal agencies to achieve the desired goal of sustained multiple-use of federal land and resources.*
- *Implement best management practices utilizing appropriate and accepted conservation measures, reclamation standards, and/or mitigation techniques to ensure sustained multiple use.*
- *Make available immediate, interim and final reclamation options to use as needed to address specific projects and offer flexibility in order to address individual land resource needs.*
- *Seek to ensure that private property rights are protected in state and federal planning processes.*
- *Encourage coordination and cooperation between competing energy interests on same and adjacent lands to maximize development of available energy and mineral resources and minimize impacts on private landowners.*
- *Support state trust land exchanges that allow state grazing lessees to acquire isolated, inaccessible state trust land inholdings within their property holdings in exchange for larger, publicly accessible tracts that optimize returns to state trust land beneficiaries.*
- *Locate energy transmission infrastructure, such as oil and gas pipelines, data providers and high voltage electric transmission lines in existing utility corridors and on state and federal lands, where feasible.*
- *Obtain adequate bonding requirements to ensure complete removal and successful reclamation of state and federal agency permitted projects.*
- *Support bond release efforts by mining companies in order to more fully utilize use of private and public lands.*
- *Make available for disposal or exchange federally managed lands that are difficult to manage or exist in isolated tracts, as identified in agency land management plans.*
- *Ensure there is no net loss of private lands in Campbell County. Net loss shall be measured in acreage and fair market value.*
- *Utilize federal and state agency standards for reclamation practices.*
- *Initiate state or federal land exchanges or acquisitions only with willing private landowners without coercion or threat by state or federal agencies.*
- *Notify affected landowners and stakeholders of any proposed action affecting existing state or federal land uses.*
- *State and federal agencies shall:*
  - *consult, coordinate, and cooperate with Campbell County and affected stakeholders in any proposed state or federal land tenure adjustment;*
  - *consult, coordinate and cooperate with private and county stakeholders in actions affecting multiple-use of federal lands within Campbell County;*
  - *consult, coordinate, and cooperate with private property owners in any federal action affecting their private land resources;*

- *coordinate with local government and affected stakeholders to ensure the removal of facilities and reclamation of affected sites when energy and mineral resource development projects are finished;*
- *consult with local governments in Campbell County prior to any acquisition of private lands or interest in private lands in the county. Because state and federal acquisition of private lands could serve to negatively impact the tax base of Campbell County, any other state and/or federal acquisition of any ownership interests in private lands should be offset, to the maximum extent possible, with disposal of state and/or federal land and/or mineral holdings; and*
- *ensure that any state and/or federal land transaction involving lands within Campbell County is conducted in a manner that protects the private property rights of the landowner that is directly involved in the transaction and property rights of adjacent and/or affected landowners.*

## Natural, Biological and Cultural Resources

### Air Quality

#### *Goal*

Maintain air quality consistent with approved standards in Campbell County for the protection of the health of residents and in furtherance of responsible development.

#### *Objectives*

- *Air quality standards and regulations which do not prohibit reasonable economic activity within Campbell County.*
- *Air quality monitoring according to approved protocols and standards.*
- *Utilization of economically feasible and best available technologies in air quality management and monitoring.*

### Policies

- *Do not apply air quality controls to naturally occurring events, such as drought or wind events, which are beyond the scope of human ability to control.*
- *Make open and available to the public raw collected air quality monitoring data at all stages of collection, publication and processing.*
- *Utilize best available and economically viable technologies in development and implementation of air quality standards and regulations.*
- *Make open and available for public inspection methodology and result criteria for the evaluation of air quality monitoring data prior to collection of the data.*
- *State and federal agencies shall:*
  - *collaborate with relevant county agencies and stakeholders in the development of provisions or stipulations for proposed projects that may significantly impact air quality;*



- *collaborate with relevant county agencies and stakeholders in developing mitigation plans to reduce potential impacts to air quality from proposed projects;*
- *consult, coordinate, and collaborate with county agencies and stakeholders in dust suppression projects;*
- *collaborate with Campbell County on air quality modeling and quantitative data analysis for air quality and visibility standards affecting Campbell County industries and stakeholders;*
- *cooperate, coordinate, and consult with local governments and affected stakeholders to minimize emissions and reduce economic impacts related to air quality management where possible; and*
- *utilize credible scientific data, and economic cost benefits analysis when proposing and developing air quality standards and regulations.*

## Cultural/Historic/Paleontology Resources

### *Goal*

Make collaborative decision regarding identification, protection, and/or excavation of archaeological, historical, and paleontological resources.

### *Objectives*

- *Uncompromised economic viability of projects for the protection of archaeological, historical, and paleontological resources.*
- *The County supports the protection of private property rights in state and federal planning actions involving archaeological, historic, and paleontological sites.*
- *The confidentiality of identified archaeological, historical, and paleontological sites on private lands, unless landowner gives written permission for public dissemination.*

### *Policies*

- *Realize cultural and archaeological artifacts located on private lands are property of the land owner and uphold that property ownership in any state or federal planning action or decision.*
- *State and federal agencies shall recognize Campbell County as a consulting party as described in Section 106 of the National Historic Preservation Act and subsequent amendments. As a consulting party, Campbell County will request periodic review and comment on classification and management of significant cultural resources on federal lands in the county, and the impact of proposed land use actions on those sites.*

## Soils

### Goal

Maintenance and protection of soil quality and quantity for maximum vegetative production and clean air and water.

### Objectives

- *Conservation of soil resources on local, state, and federal lands in order to provide for the vegetative needs of the county.*
- *Improvement of quality of soil resources through the efficient management, development, and use of ecological site principles.*
- *Continued use of the soil resource on local, state, and federal lands as part of the county's custom and culture, and economic viability.*
- *Coordination, consultation, and cooperation with local, state and federal agencies in the modification or disturbance of the soil resource and efforts to mitigate or reclaim impacts to soils.*

### Policies

- *Coordinate with USDA NRCS and CCCD on land use development and disturbance activities.*
- *Use Ecological Site Descriptions developed by the USDA NRCS as a foundation for the inventory, evaluation, monitoring, and management of rangelands and forestlands.*
- *Use Campbell County Soil Survey for the orderly planning and development of the state and federal lands in Campbell County.*
- *Monitor soil use and resources on state and federal lands in cooperation with local agencies.*
- *Protect private rights and interests in the use of soil resources on state and federal land.*
- *Support the CCCD in their efforts to:*
  - *ensure that the watersheds in Campbell County are managed to reduce soil erosion and associated hazards;*
  - *cooperate, consult, and coordinate in studies, planning, and implementation activities related to soil resources by local, state, and federal agencies; and*
  - *enhance natural resource education by providing information to urban and rural communities and legitimate media sources.*
- *Support approved soil remediation efforts by local, state, and federal agencies.*
- *Support efforts of soil conservation by industry and agriculture interests.*
- *Apply credible scientific data in decisions regarding soil resource restrictions and development.*



- *Require oil, gas, and other industry developments affecting the soil resource on federal lands to coordinate, cooperate, and consult with CCCD and USDA NRCS.*
- *Review and comment on new and revised state and federal policies and decisions for applicability to soil resource issues in Campbell County.*
- *State and federal agencies shall consult, coordinate, and collaborate with affected stakeholders in projects potentially affecting soil resources of Campbell County.*

## Vegetation

### Goal

Sustain vegetation communities for food and cover for livestock, wildlife, and bird populations and protect the soil from erosion.

Reclamation plans for federal and state agencies shall consult with local, specialized agencies including, but not limited to, the Campbell County Weed and Pest Board, the Pedator Management Board, the Campbell County Conservation District and other city and county agencies with specialized expertise.

### Objectives

- *Conservation and cooperative management of vegetative communities on state and federal lands.*
- *Cooperation with local, state, and federal agencies regarding vegetation monitoring and assessment.*
- *Support of rehabilitation and restoration efforts for historic vegetative communities.*
- *Cooperative management of rangeland, forest land, and crop land vegetation treatments.*
- *Cooperation with local agencies conducting plant surveys to validate existing data and add new data.*
- *Support of locally driven efforts to identify, modify, and manage the vegetative resource for desired plant communities.*

### Policies

- *Provide adequate notice to Campbell County residents regarding any proposed state or federal action relating to the vegetative resource of Campbell County.*
- *Utilize multiple use management concepts in managing the vegetative resource on state and federal lands in Campbell County.*
- *State and federal agencies shall cooperatively manage vegetative resources on the state and federal lands with consideration of adjoining private lands.*
- *Use unbiased and scientifically accepted ecological site descriptions including state and transition models for vegetative management.*

## Visual

### Goal

The utilization of additional visual resource protection only upon determination that the visual resource has not already been compromised.

### Objectives

- *Continuation of existing land uses.*
- *Economic projects and activities not unduly restricted by visual resource protections.*
- *Communication sites recognized as important to the health, safety, and welfare of Campbell County citizens.*

## Policies

- *Evaluate economic viability of projects before implementation of visual resource protection requirements.*
- *Visual resource protection requirements should not unnecessarily or inappropriately intrude on existing land uses.*
- *Visual resource designations should not adversely affect private property rights or private land uses.*

## Water

### Goal

To maintain water resources of sufficient quality and quantity to support agriculture, industry, and citizen needs in the present and into the future.

### Objectives

- *Employment of the prior appropriation doctrine as adopted by the State of Wyoming.*
- *Water resource development that assures future growth and protection of Wyoming water rights within agreements with neighboring states.*
- *Management and conservation of water in a manner which benefits the county.*
- *Improvement of quality and quantity of usable water through the efficient management, development and use of water resources.*
- *Continued agricultural and industrial viability as part of the custom and culture and beneficial impacts on state and federal lands.*
- *Wetland and water supply issues resolved at the local level.*
- *Coordinated approach when establishing riparian management plans and use of Best Management Practices.*

## **Policies**

- *Monitor water policy, water law, water use, water development opportunities and changes in regulation.*
- *Use credible scientific data in decisions regarding water resource restrictions and development.*
- *Support the appropriation and utilization of water rights currently provided under Wyoming law for beneficial use as the most effective means for providing water resources for agricultural, municipal, industrial, and domestic purposes.*
- *Support the CCCD in its efforts to:*
  - *ensure that productive watersheds are maintained to reduce soil erosion;*
  - *support locally-led watershed planning;*
  - *support studies of flow and water quality on local watersheds;*
  - *review and provide comments to the Wyoming Department of Environmental Quality; and*
  - *promote public education by providing information to urban and rural communities and legitimate media sources.*
- *Support water conservation and precipitation gathering by industry, agriculture, and the public.*
- *Support government approved stream and lake remediation efforts by local and state agencies.*
- *Support recycling of water, use of appropriately treated reclaimed water, and use of alternative water sources to reduce use of potable water.*
- *Review new and revised state and federal policies and decisions for applicability to water issues in Campbell County and provide appropriate comments.*
- *State and federal agencies shall:*
  - *require oil, gas and other developments on federal and state trust lands to consult with a local group, i.e., the CCCD to develop monitoring protocols;*
  - *require water quality monitoring including sampling and data collection for industrial developments affecting waters of the state on state and federal lands;*
  - *disclose water flow, level, and quality data to the public;*
  - *use credible scientific data and accepted methods for acquisition of water flow, level, and quality data in hydrology studies and decision making;*
  - *consult, coordinate and collaborate with affected stakeholders in projects potentially affecting water quality and quantity.*
  - *incorporate watershed management in all land management plans.*
  - *notify owners of existing water rights of any attempt to negate and or acquire that water right and not coerce in any manner the existing owner to relinquish that right; and*

- *recognize valid water rights.*
- *Campbell County shall oppose the federal control or nationalization of Wyoming's water resources or rights.*
- *Support protection of private rights and interests in water development by the Wyoming State Engineers' Office on state and federal land.*
- *Protect private property rights during water development on state and federal lands.*
- *Water rights desired by the federal government must be obtained through the Wyoming State Engineer's Office under the laws of the State of Wyoming.*

## Weeds, Pests, and Invasive Species

### *Goal*

Prevention, eradication, control, and monitoring of noxious weeds, invasive species, and pests in order to protect the health, safety, economics, and welfare of the people of Campbell County.

### *Objectives*

- *Eradication of noxious weeds.*
- *Prevention of the introduction of undesirable invasive and noxious plant species.*
- *Management of the spread of undesirable invasive and noxious plant species.*
- *Prevention of the introduction of designated/declared pests.*
- *Control of mammals which have become designated/declared pests, as defined by the Wyoming Department of Agriculture.*
- *Prevention of the introduction of diseases, such as rabies, bubonic plague, tuberculosis, brucellosis, West Nile, tularemia, tick fever and other diseases carried by wild animals and insects.*
- *Control of insects which have become pests, as defined by the Wyoming Department of Agriculture.*
- *Protection of the environment and the aesthetic value of the natural scenery.*

### *Policies*

- *Require state and federal land management agencies to control prairie dogs on agency owned lands in order to prevent range degradation, reduction of available forage to lessees, and expansion of prairie dogs from state and federal lands to private lands*
- *Require an adequate buffer zone between prairie dog towns on State and Federal lands and private lands to ensure the health, safety and economic protection of neighboring private land owners*
- *Monitor prairie dog colonies for evidence of plague or other communicable diseases. If any evidence is noted, report it to the Wyoming Department of Public Health.*
- *Oppose any translocation and/or introduction of prairie dogs within Campbell County.*

- *Support the environmentally sound prevention and control of noxious weeds, invasive species, and pests into Campbell County.*
- *Facilitate and support cooperative efforts and programs involving private landowners and local, state, and federal land management agencies in the control of designated insect pests (e.g., mosquitoes, grasshoppers, Mormon crickets, etc.) on all lands in Campbell County, including consultation with Campbell County Weed and Pest, as an agency with special expertise.*
- *Oppose the introduction of weed, invasive and pest species into Campbell County absent a compelling public interest in such introduction and extensive coordination and consultation with local government entities, including Campbell County Weed and Pest, and private landowners prior to such introduction. Any introduction of weed, invasive and pest species shall be fully analyzed, with public health, safety, human welfare, private property and socio-economic impacts being fully disclosed, evaluated and mitigated prior to the introduction of such species.*
- *Ensure the implementation of appropriate and proven safeguards to range, human health, human safety and private property prior to the introduction of invasive species and noxious weeds, including effective range sanitation practices*
- *Encourage appropriate safeguards to the introduction of invasive species and noxious weeds, including effective range sanitation practices.*
- *Pursue grant opportunities and/or partnerships to aid in invasive weed or pest prevention and control.*
- *State and federal agencies shall:*
  - *control and manage plant, animal, and insect populations which pose a threat to human health and safety and the health and safety of domestic animals; including the active control or eradication of designated/declared weeds and pests on agency lands;*
  - *strictly adhere to all federal and state statutory and regulatory requirements before any species, specifically including noxious weed, pest or invasive species, is introduced or reintroduced into Campbell County; and*
  - *compensate and/or remediate damages to neighboring private land owners caused by the introduction of identified pests onto state or federal lands in Campbell County and the expansion of the introduced pest beyond those public lands and required buffers.*

## Threatened, Endangered, and Special Status Species

### *Goal*

Population recovery plans for listed and special status wildlife and plant species utilizing cooperative management with regulatory agencies incorporating input from local and directly-affected stakeholders.



## **Objectives**

- *State and federal agency notification and coordination with Campbell County as part of the review/evaluation, listing, and management of listed and special status species, and critical habitat for listed species.*
- *Participation by local authorities and affected stakeholders in the listing and management of threatened and endangered species.*
- *The use of the best available scientific and commercial scientific data to make decisions on the listing and management of threatened and endangered species.*
- *Protection of private property rights and interests to the maximum extent possible.*
- *Opposition by Campbell County of the reintroduction of listed and special status species that will cause economic loss.*

## **Policies**

- *Fully evaluate and document the local economic and social impacts of proposed critical habitat designations with an Environmental Impact Statement before the designation of critical habitat.*
- *Obtain express written permission of the property owner before conducting an inventory of a threatened or endangered species on private property.*
- *Data or inventory collected for a proposed threatened or endangered species listing obtained without the express written permission of an affected property owner may not be used to validate the proposed listing.*
- *Exclude areas implicated with substantial negative economic and/or social impacts from proposed critical habitat designations, species introductions, and reintroduction areas.*
- *Allow existing property uses to continue under any critical habitat designation to the maximum extent practical.*
- *Support efforts to improve habitat and management practices in order to prevent the listing of a species.*
- *Encourage consideration of agreements with state and federal agencies to mitigate impacts to threatened and endangered species (e.g., candidate conservation agreements).*
- *Encourage incentives and assistance for protection of threatened and endangered species on private land.*
- *Support the recovery planning efforts for sensitive, threatened, and endangered species that are consistent with this Plan.*
- *Differentiate between special status species and those formally listed pursuant to the Endangered Species Act in federal land planning efforts because special status species do not require the same levels of protection.*

- *Consider conservation plans, initiatives or agreements to address threats to species and their habitats before listing a species.*
- *State and federal agencies shall:*
  - *Allocate adequate financial and personnel resources to predator management;*
  - *utilize non-biased, objective data substantiated by credible scientific peer-reviewed methods in the collection, manipulation, and interpretation of data to be utilized in threatened and endangered species listings;*
  - *communicate, coordinate, and cooperate with Campbell County in the review/evaluation, listing, and management of threatened and endangered species, including the designation of critical habitat for listed species within Campbell County; and*
  - *abide by recovery objectives in any threatened and endangered species listing and shall promptly remove the listing once those objectives have been met.*
- *Campbell County shall be actively engaged before the listing of threatened or endangered species that potentially affect Campbell County citizens, industries, or economy.*

## Predators

### **Goal**

Citizens and businesses free from personal injury and property loss due to predator attacks, wildlife populations sufficient for hunting and recreation opportunities, and a balanced predator/prey population based on credible scientific data.

### **Objectives**

- *Maintenance of all currently recognized and approved methods of predator control, including but not limited to: trapping, artificial calling methods, chemical control, hunting and wildlife habitat improvement.*
- *Monitoring of predator-related activities affecting Campbell County by state and federal agencies.*
- *Participation in decisions made by state and federal agencies in order for Campbell County's economic interests to be represented and protected.*
- *Maintenance of an animal damage control plan, including, but not limited to public or private bounties for the protection of livestock and crops on private land bordering state and federal land.*
- *Coordination of predator control actions and regulations by state and federal agencies with those of Campbell County.*

- Employment of sound science and peer reviewed primary literature in predator management decisions.

## Policies

- State and federal agencies shall:
  - Allocate financial and personnel resources to reduce predation on domestic livestock and wildlife;
  - consult, coordinate, and cooperate with local governments, including local Predator Boards, and affected stakeholders in decision making regarding predator management at the local level;
  - recognize state and county designated predators and cooperate in control and management actions; and
  - monitor and collect data regarding the impact on prey species populations when predator species receive special protection through any act or designation by any state or federal agency. State and federal wildlife management agencies shall keep predator populations within acceptable limits to protect human populations and domestic animals from disease spread by predators.
- Appoint one (1) agricultural representative to any team-based, decision-making process that state and/or federal agencies undertake pertaining to predator control.
- State and federal agencies shall, in consultation with local weed and pest officials and predator management agencies:
  - keep predator populations within acceptable limits to protect agriculture carrying capacity and wildlife populations; and
  - monitor and collect data regarding the impact on prey species populations when predator species receive special protection through any act or designation by any state or federal agency.
- Examine and evaluate impacts to prey species in any state or federal action which provides special protections to any predator species.
- Protection of predator species shall not be to the detriment and reduction of prey species.
- State and federal agencies shall keep predator populations within acceptable limits to protect human populations and domestic animals from disease spread by predators.
- Recognize the right of private property owners to protect their property and livestock from predation through state and federally approved control methods.
- Include any and all recognized methods in predator control and based on science based and peer reviewed data, economics, and logistics of use.
- Oppose single species management on state and federal lands. (refer to wildlife section)
- Keep mapping data current and validated by source and credible scientific data collection methods. (refer to wildlife section)



- *Keep raptor nesting and population maps current and distinguish between active and inactive nests. (refer to wildlife section)*
- *Collect credible scientific data regarding effects of increasing raptor populations on prey species.(refer to wildlife section)*
- *Substantiate raptor protection from human activity by credible scientific data that warrants protection and provides proof that raptors cannot co-exist with human activity. (refer to wildlife section)*

## Wildlife

### Goal

To achieve and maintain sustainable wildlife populations of game and non-game species for hunting, recreation, tourism, economic development, and ecosystem balance through management and conservation based on credible scientific data.

### Objectives

- *Cooperative efforts and collaborative agreements between citizens, county, local, state, and federal governments; wildlife management agencies; and industry stakeholders.*
- *Predator control based on economics, logistics, and Credible Scientific Data.*
- *Improved health and disease management of wildlife and prevention of transmission of wildlife diseases to domestic livestock and human populations.*
- *Local participation in wildlife management decisions involving harvest and conservation strategies.*
- *Adequate open space capable of supporting diverse wildlife populations.*
- *Local participation in federal designation of wildlife management and habitat areas.*

### Policies

- *Hunting and fishing opportunities shall remain available in Campbell County.*
- *Base wildlife habitat conservation, development, and management decisions on credible scientific data.*
- *Keep mapping data current and validated by source and credible scientific data collection methods.*
- *State and federal agencies shall:*
  - *allocate sufficient resources to protect, restore, and reclaim game-damaged agricultural resources, pursuant to state law and regulation; and*
  - *implement cooperative partnerships with affected stakeholders to address energy development and wildlife conflicts.*
- *Predator control shall be a component of wildlife management.*

- *State and federal agencies shall allocate necessary finances, personnel, and laboratory resources to wildlife disease containment and eradication; and use all available means to reduce and eliminate the transmission of wildlife disease to domestic livestock and human populations.*
- *Appoint one (1) local wildlife/animal interest representative to any state or federal agency team-based decision making process pertaining to wildlife resources.*
- *State and federal agencies shall seek public input in setting licensing, harvesting, and population management numbers for wildlife.*
- *Federal land management planning decisions be implemented to support recommended licensing/harvesting numbers as articulated by the Wyoming Game & Fish Commission.*
- *State and federal land management decisions shall not reduce currently existing access for hunting and fishing opportunities.*
- *Recognize and uphold private property rights in negotiations and/or acquisition of private lands for public access to state and federal lands for hunting and fishing opportunities.*
- *Support land exchanges in acquiring access to state and federal lands for hunting and fishing opportunities.*
- *Wildlife shall be managed to population objectives based in the land's carrying capacity in balance with other land uses.*
- *State and federal agencies shall:*
  - *consult, coordinate, and cooperate with local governments and affected stakeholders in the establishment of any wildlife management area or habitat conservation area; and*
  - *address and mitigate negative impacts to wildlife using locally based solutions and cooperative efforts with affected stakeholders.*
- *State and federal agencies shall be encouraged to provide financial and material support for private landowners in resource enhancement to provide enhanced habitat for wildlife.*
- *Keep raptor nesting and population maps current and distinguish between active and inactive nests.*
- *Collect credible scientific data regarding effects of increasing raptor populations on prey species.*
- *Substantiate raptor protection from human activity by credible scientific data that warrants protection and provides proof that raptors cannot co-exist with human activity.*
- *Oppose single species management on state and federal lands.*

## Economics and Resource Uses

### Economics

#### *Goal*

Strengthen and expand Campbell County's economic base while preserving and building upon the social conditions in the county.

#### *Objectives*

- *Coordination, consultation, and cooperation with state and federal agencies to support and sustain existing economic activities, including energy and mining; agriculture and recreation.*
- *Support for future economic activities on state and federal land that are compatible with other existing or future uses and county goals.*
- *Encouragement for economic diversification in the county that will provide sustainable economic opportunities for residents.*
- *Assurance that activities on state and federal lands are properly mitigated to minimize or eliminate any negative social or economic effects.*

#### *Policies*

- *State and federal agencies shall notify, at the earliest point, Campbell County of any proposed action, change of existing activities, newly permitted activities or changes in regulations that may affect the economic base of the county.*
- *State and federal agencies shall include Campbell County in the review of any proposed developments and in any decision making processes.*
- *State and federal agencies shall collaborate and consult with county agencies and the public to determine the full scope of potential social and economic effects of activities occurring on public lands and Campbell County should be notified of such discussions.*
- *State and federal agencies shall:*
  - *entertain opportunities for economic development based on project merits and a comprehensive evaluation of the impacts to local or regional economic conditions;*
  - *perform a socioeconomic impact analysis for each land management activity or decision related to state and federal properties; these analyses shall be conducted by experts familiar with the area's unique history, culture, economy and resources.*
- *Include in socioeconomic impact analyses a description of existing social, demographic, and economic conditions; the analytical methodologies; and the impacts to a comprehensive set of topics, including, but not limited to: population, employment, income levels, industry activity, housing, community services, utility services, schools, fiscal impacts to the county and local jurisdictions, public revenues, public expenditures, transportation, social conditions, and quality of life.*

- *Address in socioeconomic impact analyses the impacts of all phases of development or other activities, including construction and long-term operations, and all impacts of changes in regulations or other long-term planning strategies.*
- *Make socioeconomic impact analyses developed by state and federal agencies publicly available to all county officials, residents, or other citizens.*
- *State and federal agencies shall:*
  - *collaborate with county agencies to develop a meaningful and relevant mitigation plan to address any direct or indirect negative social or economic effects resulting from activities on public lands;*
  - *enforce the economic mitigations set forth in approved mitigation plans.*
- *Revise and modify socioeconomic mitigation plans over time in response to actual, on the ground conditions. Monitoring socioeconomic impacts and adapting the response to those impacts will be needed in order to properly mitigate certain actions.*
- *Campbell County reserves the right to appeal or seek other courses of action when the economic effects of management activities on state and federal land are not fully evaluated, considered, monitored or mitigated as part of any land management decision.*

## Timber

### Goal

A sustained timber resource managed for optimum utilization, economic return, and environmental benefit while supporting multiple uses by Campbell County citizens.

### Objectives

- *Diverse age classes and species in timbered areas.*
- *Reduction of insect & disease damage.*
- *Prevention of build-up of excessive fuel loads.*
- *Improvement of wildlife habitat.*
- *Improvement of fire suppression and defensible space.*
- *Utilization of timbered areas for local economic and social benefit.*

## **Policies**

- *Support private, state, and federal land managers in proper management of harvestable timber areas through best forest management practices, including, but not limited to: timber harvest, thinning, select cutting and clear cut, fire management, and managed grazing practices for the prevention of catastrophic wildfires, insect infestations, and disease outbreaks.*
- *State and federal agencies shall manage for sustaining multiple uses in timbered areas (e.g. timber harvest, livestock grazing, mining, oil & gas production, and recreation).*
- *Support timber harvest of insect and disease damaged timber stands to improve forest health and prevent catastrophic wild fires and future infestations.*
- *State and federal agencies shall coordinate efforts with all landowners and local governments in treating timber stands for insect and disease outbreaks.*
- *Support the ability of its citizens to derive economic and social benefits from timbered areas, including the use of timber products from state and federal lands for private, personal use.*
- *State and federal agencies shall recognize and encourage commercial timber harvest in Campbell County to promote forest health and economic development.*
- *Encourage use of living snow fences and shelter belts.*
- *Promote the use of appropriate species in urban and rural forestry planning.*

## **Livestock and Grazing**

### **Goal**

An allowance for continued livestock grazing on private, state, and federal lands and the maintenance of current and/or historic animal unit month (AUM) levels, while sustaining and improving grazing land production, rangeland health and wildlife habitat.

### **Objectives**

- *Healthy grazing lands and wildlife habitat.*
- *Reduction of soil erosion.*
- *Diversification of native plant populations.*
- *Maintenance of a strong and viable livestock production industry.*
- *Continued livestock grazing on state and federal land.*
- *Grazing potential, distribution and flexibility in the grazing season on state and federal land.*
- *Management and control of noxious weeds, invasive species and pests.*

## **Policies**

- *Use relevant scientific data and rangeland monitoring data to support any modification of AUM's on state and federal lands.*
- *Make immediately available access for permittees/lessees to any data collected on their grazing permit/lease, including field notes.*
- *Consult and consider the input of permittees/lessees on any proposed changes of use to permits/leases.*
- *State and federal agencies shall consult and coordinate with permittees/lessees on any proposed grazing rest prescriptions due to wildfires or prescribed burns. Any AUM reductions shall be temporary and based on scientific data and monitoring and rangeland health standards and guidelines.*
- *State and federal agencies shall not permit the relinquishment, transfer, or retirement of livestock grazing AUMs in favor of conservation, wildlife, or other uses.*
- *State and federal agencies shall:*
  - *recognize, venerate, and actively promote and protect all property rights associated with grazing permits/grazing leases, including but not limited to water rights and rights-of-ways (ROWS) on state and federal lands,*
  - *protect the rights of privacy and shall not release personal and private information of permittees/lessees, such as phone numbers, home address, contact information or financial data to members of the public or media unless expressly approved in writing by the permittees/lessees. This policy shall not prohibit exchanges of data between state and federal agencies and local emergency service providers.*
- *Issue grazing permit/lease renewals and grant extensions to permittees/lessees if state and federal agencies are unable to process such renewals before the expiration of such permit/lease.*
- *State and federal agencies shall not impede the control of noxious weeds and pests in order to maintain the long term economic productivity of the rangeland for livestock and wildlife grazing.*

## **Mineral Resources**

### **Goal**

Continued exploration, development, and production of valuable mineral resources while maintaining and enhancing the environment.

### **Objectives**

- *Timely and successful reclamation practices in accordance with state law.*
- *Mineral resource development with minimized land use impacts.*

- *Positive, coordinated, and cooperative working relationships with stakeholders involved in mineral resource development.*
- *Timely access to state and federal mineral resources with reasonable stipulations based on credible scientific data and economic sustainability.*
- *Identification, prioritization, periodic review, updating, and mapping of mineral development locations in order to mitigate conflict with rural development, roads, and infrastructure.*
- *Conflict resolution and mitigation of split estate and eminent domain issues while protecting and preserving private property rights and other valid existing rights.*
- *Active participation with state and federal agency decisions regarding mineral development within Campbell County.*
- *Plan for short and long term sustained development of mineral resources to maximize economic return and minimize impacts.*
- *Reasonable state and federal environmental regulations that do not deter or delay the production of mineral resources.*
- *Protection, preservation, and respect of surface and mineral private property rights in relation to mineral resource development.*
- *Timely mineral resource projections to aid in local, state, and federal land use planning.*
- *The employment of credible scientific, engineering, and economic data in decisions regarding mineral resource development.*
- *Support for and implementation of new technologies to develop new energy resources.*
- *Active participation with state and federal agencies regarding existing, pending and future mineral development actions and proposals.*

## **Policies**

- *Except for Congressional withdrawals, federally managed lands shall remain open and available for mineral resource exploration, development and production, unless administrative withdrawal or other action is necessary to protect the national security and withdrawal procedures are fully followed.*
- *State and federal agencies shall:*
  - *coordinate, cooperate, and consult with local governments and potentially affected stakeholders, including private landowners, on proposed and pending federal actions regarding mineral development;*
  - *meet with local governments on at least an annual basis to discuss existing, pending and future mineral development actions and proposals;*
  - *consider all available and relative economic data to determine and document economic impacts to the mineral industry, to county and local governments, and to county residents from any proposed land management and/or natural resource planning decisions; and*



- *coordinate and tier to Environmental Assessments and Environmental Impact Statements required for projects in order to avoid duplication of EA's and EIS's and costly, unnecessary delays to projects.*
- *Campbell County shall actively participate as a cooperating agency in federal planning actions to ensure Campbell County remains a top producer of mineral resources.*
- *State and federal agencies shall:*
  - *recognize and venerate private property rights in mineral resource development;*
  - *recognize and venerate the right of private property owners to determine standards and practices on their private land; and*
  - *coordinate, cooperate and consult with local governments, private property owners, private lessees and permittees, and mineral resource development companies in developing and implementing reclamation standards and requirements.*
- *Provide adequate bonding requirements to ensure removal and successful reclamation of abandoned energy and mineral resource projects.*
- *Provide for immediate, interim, and final reclamation as conditions and development warrant with reclamation practices and standards that are appropriate to industries' specific needs.*
- *State and federal agencies shall:*
  - *have efficient, stream-lined permitting processes in order to timely process and approve plans of development;*
  - *not limit or infringe upon the ability of private mineral owners to access, extract and transport their mineral resource, including in areas determined set aside for no mineral leasing on federal lands, if that determination takes place after leasing has already occurred or adequate compensation shall be provided;*
  - *provide clearly defined mapping and data to warrant any kind of cultural, paleo, plant or wildlife inventory on private lands;*
  - *recognize that cultural artifacts on private lands are owned by the private land owner, shall recognize the right of the property owner to deny a cultural resource survey being conducted on privately owned lands, and shall not deny a mineral extraction permit or application due to the refusal of a property owner to allow a cultural survey; and*
  - *honor industry and company developed agreements and processes to mitigate and address competing mineral resource development.*
- *Oppose the imposition of barriers to mineral resource production and development.*
- *Base wildlife buffers, occupancy stipulations, and restrictions on peer reviewed and approved credible scientific data and share in writing with any affected private property owner upon request.*
- *Make available voluntary, compensatory, mitigation measures, both on and off-site, to mineral resource development companies conducting activities within wildlife buffers, occupancy stipulations, and restrictions.*



- *Do not make public wildlife, plant, paleo and cultural information gathered on private property in conjunction with mineral resource development. It shall be available to the private property owner.*
- *Resolve conflicts between competing mineral resource industries in an effort to maximize production and sustained economic returns.*
- *Base federal climate change policies on peer reviewed and credible scientific data.*
- *Make available opportunities for year-round gravel crushing and screening operations where materials are needed and where it is economically feasible to extract them.*
- *Make available new gravel pit excavation possibilities on state and federal lands.*

## Energy

### Goal

The development, enhancement, production, and transportation of all available energy resources and technologies in Campbell County.

### Objectives

- *Electrical power generation using low-sulfur Powder River Basin coal, oil and gas, and renewable energy resources.*
- *Use of land and resources to accommodate new growth and foster economic development.*
- *Diversification of the county's economic base through the development and demonstration of renewable energy and clean coal technologies such as fuel enhancement, coal-to-fuels, coal to value added products and advanced combustion.*
- *Improvement of rail, pipeline, and electrical transmission facilities to transport energy to markets throughout the region and the United States.*
- *Public utility facility corridors planned, designed and located in a coordinated manner.*
- *Mitigation of eminent domain and split estate issues.*
- *Protection of private property rights.*

### Policies

- *Encourage and support energy development projects that will ensure an affordable and reliable supply of electricity, utilizing all methods of feasible energy production.*
- *Promote the investment and permitting of a regional transmission grid to efficiently facilitate the transfer of resources out-of-state.*
- *Locate energy transmission infrastructure, such as oil and gas pipelines and high voltage electric transmission lines in existing utility corridors and on state and federal lands, where feasible.*



- *Use streamlined permitting processes to enable the placement of energy transmission infrastructure on state and federal lands rather than impacting private property owners.*
- *Encourage and assist carbon capture and sequestration projects and development of pipelines to transfer carbon dioxide to markets.*
- *Encourage the delineation and management of oil and gas fields, and associated residual oil zones, that are amenable to tertiary recovery efforts.*
- *Encourage the delineation of carbon dioxide, water and oil and gas pipeline infrastructure to facilitate tertiary recovery efforts in Campbell County.*
- *Encourage coordination and cooperation between competing energy interests on same and adjacent lands to maximize development of available energy resources.*
- ***Campbell County shall:***
  - *meet at least annually with state and federal agencies, including but not limited to: Bureau of Land Management, U.S. Forest Service, and the Wyoming State Planning Office regarding potential and proposed energy development and infrastructure projects that may impact Campbell County citizens, industries, and economy; and*
  - *be a cooperating agency, in preplanning implementation, Environmental Assessments, and Environmental Impact Statements for energy development and infrastructure projects.*
- *Campbell County authorities and affected stakeholders shall receive ample notice and mapping for potential eminent domain, energy development, and infrastructure projects that may affect citizens and industries.*
- ***Private property owners shall:***
  - *receive ample notice, maps, and relevant information concerning potential eminent domain actions against them in the placement of energy development and infrastructure project; and*
  - *receive full compensation for eminent domain acquisitions pursuant to state and federal law.*

## Renewable Energy

### Objectives

- *Economically viable renewable energy sources.*
- *Utilization of sustainable technologies.*
- *Removal and reclamation of abandoned renewable energy projects.*

## **Policies**

- *Operate renewable energy projects under comparable state and federal regulations and guidelines as existing energy production methods.*
- *Encourage the development of renewable energy resources and cogeneration where commercially viable.*
- *Obtain full bonding to ensure removal and reclamation of abandoned renewable energy projects.*
- *Campbell County shall be a cooperating agency in proposed renewable energy projects.*

## **Electricity**

### **Objectives**

- *Electrical power generation using low-sulfur Powder River Basin Coal, oil, gas, and renewable energy resources.*

## **Policies**

- *Adopt and encourage clean coal technologies for use in existing and proposed coal-fired power plants.*
- *Determine economic sustainability and cost to consumers in permitting power plants using any or all available sources of energy.*

## **Rail Transportation**

### **Objectives**

- *Adequate railway capacity to ensure transportation of Campbell County energy resources to markets.*
- *Safe and cost effective shipping of energy resources.*

## **Policies**

- *Place new railway corridors within existing transportation corridors where feasible and with respect to private property rights.*
- *Support railroad track expansions to ensure adequate rail capacity in the Powder River Basin for safe and efficient transportation of energy resources and other goods.*
- *Support access to Gulf and Pacific Coast port facilities for export of Campbell County energy resources.*
- *State and federal agencies shall cooperate and collaborate with local governments and affected stakeholders in planning and locating new railway corridors.*

## Transmission

### Objectives

- *Transmission infrastructure located in planned utility corridors.*

### Policies

- *Develop a memorandum of understanding establishing a cooperating agency relationship between the Wyoming Infrastructure Authority and Campbell County for transmission planning.*
- *Notify affected stakeholders and provided them with all relevant information in proposed transmission infrastructure.*
- *State and federal agencies and affected stakeholders shall coordinate and collaborate with the Wyoming Infrastructure Authority in pre- planning utility corridors and transmission infrastructure.*
- *The Board of County Commissioners shall encourage transmission facilities to be located in a manner that is safe, environmentally sensitive, and minimize negative aesthetic impacts to existing residents of Campbell County.*

## Outdoor Recreation

### Goal

Sustain and enhance outdoor recreation opportunities on state and federal lands.

### Objectives

- *Coordination, consultation and cooperation with state and federal agencies to protect and expand outdoor recreation opportunities on federal or state lands.*
- *Support and promotion of use of negotiated agreements to provide outdoor recreation opportunities.*
- *Protection of resources used in outdoor recreation activities.*
- *Encouragement of responsible outdoor recreation use.*
- *Pursuance and promotion of land and water management activities and policies that enhance outdoor recreational opportunities.*

## **Policies**

- *Coordinate with state and federal land management agencies and seek local citizen input on land management planning decisions for outdoor recreation.*
- *Support and promote state and federal planning efforts for outdoor recreation which best reflects the culture/custom of Campbell County.*
- *Support existing access and opportunities for outdoor recreation, including hunting and fishing.*
- *Support the closing of state and federal lands that become damaged by irresponsible outdoor recreation use and re-opening once the damage has been mitigated and the damage rehabilitated.*
- *Assist state and federal land management agencies in the prosecution of outdoor recreation users who willfully damage resources and facilities and those operating in any illegal manner.*
- *Recognize and uphold private property rights in negotiations and acquisition of public access to state and federal lands.*
- *Support land swaps in acquiring access to state and federal lands for outdoor recreation use.*
- *Oppose any net increase in state and federal lands and agencies shall provide data verifying this in any proposed acquisition of private lands.*
- *Oppose state and federal acquisition of private lands which would decrease the tax revenue stream for local governments and economic production capabilities of its citizens.*
- *Carefully consider, and oppose if warranted, perpetual conservation easements that prohibit, preclude, or impair the ability of future generations to utilize land resources for future needs.*
- *State and federal agencies shall:*
  - *cooperate, consult, and coordinate with local governments, private landowners and lease holders potentially impacted by a special recreation area designation;*
  - *work with Campbell County to educate outdoor recreation users on multiple use mandates and promote respect and cooperation between recreation users;*
  - *provide and maintain signage identifying agency lands available to the public for outdoor recreation and identifying private lands with no trespassing/private property signs in the Thunder Basin National Grassland and other intermingled private/state/federal lands;*
  - *seek to avoid and minimize resource user conflicts and impacts;*
  - *coordinate, consult, and cooperate with local government agencies and private landowners who are negatively impacted by outdoor recreation conflicts and damage to resources by recreation users;*
  - *recognize the intermingling of private lands within agency lands and coordinate and cooperate with private landowners in planning decisions and oversight of outdoor recreation; and*

- *make updated and current maps available to the public clearly identifying agency lands available for public outdoor recreation.*
- *State and federal land management decisions shall:*
  - *comply with recommended licensing/harvesting numbers as articulated by the Wyoming Game & Fish Commission,*
  - *not favor one recreation use to the detriment of others,*
  - *promote recreation that benefits the larger general public not special interest(s), and*
  - *reflect the needs of local recreational business in Campbell County.*

## Transportation and ROWs

### ***Goal***

Development of new, efficient transportation methods and rights-of-ways, and preservation of active transportation methods and rights-of-ways across private, state and federal lands.

### ***Objectives***

- *Preservation of active rights-of-way and routes across state and federal land in pursuit of mining, ranching, farming, logging, recreational activities, motorized vehicle use, and all other historic uses.*
- *Preservation and development of highways and transportation systems, railroads, utility corridors, and other forms of rights-of-way and routes to best serve Campbell County and its citizens.*
- *Enhancement of economic development with efficient transportation methods, routes, and rights-of-way.*
- *Mitigation of eminent domain issues in development of transportation rights-of-way.*
- *Local involvement in roadless designations by the USFWS.*
- *Reasonable access for all property owners to their property.*

### ***Policies***

- *Utilize mitigation and reclamation policies for “utility” or “infrastructure” rights-of-ways and routes.*
- *Oppose road closures, obliterations, re-construction, retirement, or any other term used where there may be possible R.S. 2477 (see agency mandates) rights-of-way across federal lands.*
- *State and federal agencies shall utilize public input meetings and collaborative decision making with Campbell County agencies and stakeholders in developing new transportation routes.*

- *Support the nomination of a County representative to be a member of the National Association of Counties (NACO) Public Lands Steering Committee and Transportation Steering Committee.*
- *Notify within a reasonable time period all potentially affected land holders regarding proposed new transportation routes, re-routing or closure of transportation routes affecting their property by entity proposing such routes.*
- *State, federal, and local agencies shall:*
  - *maintain, and provide to the public, updated mapping and visual data regarding proposed and existing transportation rights of ways; and*
  - *incorporate Campbell County's current transportation plan into their transportation planning process.*
- *State, federal and private transportation projects sited on state and federal lands where such lands are available.*
- *Streamline the permitting processes on state and federal lands in order to facilitate location of state, federal, and private transportation projects on such lands.*
- *Do not encumber or restrict private property rights or privileges with access to or across state or federal lands.*

## **Appendix B. Resource Specific Data**

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## Air Quality

### Federal and Wyoming Air Quality Standards

Federal ambient air quality standards and Wyoming air quality standards are presented in Table B-1.

**Table B-1. Federal and State ambient air quality standards.**

Pollutant	Averaging Time	Wyoming Standards	National Standards	Exceedance criteria
Ozone	8-hour	75 ppb	75 ppb	3-year average of annual 4 <sup>th</sup> highest daily max
Carbon monoxide	1-hour	35 ppm	35 ppm	No more than 1 exceedance per year
Carbon monoxide	8-hour	9 ppm	9 ppm	No more than 1 exceedance per year
Nitrogen dioxide	1-hour	100 ppb	100 ppb	98 <sup>th</sup> percentile averaged over 3 years
Nitrogen dioxide	Annual	53 ppb	53 ppb	Annual mean
Sulfur dioxide	1-hour	75 ppb	75 ppb	99 <sup>th</sup> percentile averaged over 3 years
Sulfur dioxide	3-hour	0.5 ppm	0.5 ppm	No more than 1 exceedance per year
PM <sub>2.5</sub>	24-hour	35 µg/m <sup>3</sup>	35 µg/m <sup>3</sup>	98 <sup>th</sup> percentile averaged over 3 years
PM <sub>2.5</sub>	Annual	15 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	Annual mean averaged over 3 years
PM <sub>10</sub>	24-hour	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	No more than 1 exceedance per year on average over 3 years
PM <sub>10</sub>	Annual	50 µg/m <sup>3</sup>	--	Annual mean averaged over 3 years

Sources: USEPA 2012c, WYDEQ 2012

## Air Quality Data

### Ozone

Ozone data was available from three sites in Campbell County and eight sites in counties adjacent to Campbell County. An area is considered in attainment of the 8-hour ozone NAAQS if the fourth highest daily maximum 8-hour ozone averaged over three consecutive years (i.e., the ozone Design Value) is 75 ppb or less at all monitoring sites. Table B-2 shows that the fourth highest 8-hour ozone have been less than 75 ppb at all three monitoring sites in Campbell County. The highest fourth highest daily minimum 8-hour ozone concentration at the sites in counties adjacent to Campbell County is 77 ppb in 2012 at the Devils Tower monitoring site in Crook County (Table B-3). However, the 2010-2012 three-year average fourth highest 8-hour ozone at this site is 64 ppb that is below the ozone NAAQS so there are no violations of the NAAQS. Note that many of the ozone monitors in Campbell and adjacent counties are new and only have one year of data (2013).

In December 2014, the EPA proposed to revise the NAAQS ozone standard to a range of 65 to 70 ppb. Based on 2011-2013 ozone Design Value data at the South Campbell County and Thunder Basin monitoring sites in Campbell County if EPA selects an ozone threshold in the lowest part of the expected 65-70 ppb range, Campbell County could be violating the ozone NAAQS.

**Table B-2. Fourth highest observed daily maximum 8-hour ozone (ppb) at sites in Campbell County.**

Year	South Campbell County	Gillette	Thunder Basin
2004	61		65
2005	63		63
2006	65		72
2007	72		72
2008	64		66
2009	60		62
2010	61		63
2011	62		61
2012	69	65	71
2013	61		61

**Table B-3. Fourth highest observed daily maximum 8-hour ozone (ppb) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Converse	Crook	Natrona	Powder River	Sheridan	Weston
Year	Tallgrass Mob Energy #2	Devil's Tower	Casper	BROADUS	WARMS	Newcastle WARMS station
2004						
2005						
2006						
2007						
2008		62				
2009		61				
2010		58		56		
2011		57	61	54		
2012		77	62	56		
2013	42	67	65	56	58	67

### *Carbon Monoxide*

The air quality standards for carbon monoxide (CO) are 35 ppb for 1-hour CO and 9 ppb for 8-hour CO. These thresholds should not be exceeded more than once per year. No CO observations were available in Campbell County, but we would not expect there to be any violations of the CO NAAQS. The largest source of CO emissions is typically gasoline vehicles that have been getting cleaner so that even the largest urban areas rarely exceed the CO standard.

### *Nitrogen Dioxide*

Nitrogen Dioxide (NO<sub>2</sub>) has both 1-hour and annual standards. Both the state and federal 1-hour standards require that the three year average of the daily maximum 1-hour NO<sub>2</sub> at the 98<sup>th</sup> percentile does not exceed 100 ppb. Table B-4a lists the 98<sup>th</sup> percentile daily maximum 1-hour NO<sub>2</sub> at the 6 monitoring sites in Campbell County. The only site in Campbell County that the 98<sup>th</sup> percentile 1-hour NO<sub>2</sub> concentration exceeded 100 ppb for an individual year was at Belle Ayr in 2005 with a 116.5 ppb value. However, when looking at the average over three years including this value the 2004-2006 1-hour NO<sub>2</sub> is 75 ppb so does not violate the 1-hour NO<sub>2</sub>

NAAQS. When looking at the most recent three-years (2012-2013) of data the 1-hour NO<sub>2</sub> Design Values in Campbell County are 35 ppb or less, which is well below the 100ppb NAAQS. The 98<sup>th</sup> percentile of the daily maximum 1-hour NO<sub>2</sub> concentrations at monitoring sites in counties adjacent to Campbell County are always below 45 ppb so also don't threaten the 100 ppb 1-hour NO<sub>2</sub> NAAQS (Table B-4b).

**Table B-4a. Daily Maximum 1-hour NO<sub>2</sub> at the Annual 98th Percentile (ppb) at monitoring sites in Campbell County.**

Year	Belle Ayr BA-4	South Campbell County	Gillette	Hilight-Reno Junction Gas Plant	Thunder Basin	Tracy Ranch
2004	70	32			12	32
2005	116.9	33			12	
2006	38.9	30			12	
2007		36			11	
2008		33			11	
2009	24	29			11	
2010	34	32			11	
2011	36	33.4			11.3	
2012	34.3	31.9	32.2	46	11.2	
2013	35.1	31.6		52	8.5	

**Table B-4b. Daily Maximum 1-hour NO<sub>2</sub> at the Annual 98<sup>th</sup> Percentile (ppb) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Converse			Natrona		Powder River
	Tallgrass Energy Partners	Converse County - Mobile #2	ANTELOPE SITE 3	Casper Gaseous	Sinclair, Casper	BROADUS
Year						
2004			28			
2005			33.5			
2006			41			
2007						
2008						
2009			30			
2010			33			
2011					42.2	24
2012		31.5			27.3	15
2013	35.8	22.8		34	35.9	10
						9

Table B-5a lists the annual mean observed NO<sub>2</sub> concentrations at monitoring sites in Campbell, and Table B-5b for adjacent counties. All observed annual mean NO<sub>2</sub> concentrations are well below the 53 ppb annual standard at all sites over the past 10 years.

**Table B-5a. Annual mean NO<sub>2</sub> (ppb) at sites in Campbell County.**

Year	Belle Ayr BA-4	South Campbell County	Gillette	Hilight-Reno Junction Gas Plant	Thunder Basin	Tracy Ranch
2004	4.99	4.44			2.14	2.84
2005	6.42	4.14			1.95	
2006	7.64	3.08			1.84	
2007		4.13			1.81	
2008		3.07			1.73	
2009	4.84	2.63			1.68	
2010	6.67	3.32			1.77	
2011	5.65	2.70			1.99	
2012	7.61	3.01	4.83	8.46	1.84	
2013	6.94	2.86		9.18	1.47	

**Table B-5b. Annual mean NO<sub>2</sub> (ppb) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Converse			Natrona		Powder River	
	Year	Tallgrass Energy	Mobile #2	ANTELOPE SITE 3	Casper Gaseous	Sinclair, Casper	BROADUS
2004				1.57			
2005				2.98			
2006				2.69			
2007							
2008							
2009				1.43			
2010				2.53			3.38
2011					6.99	5.52	
2012			3.95		5.37	1.01	
2013	4.45	2.99		2.70	5.66	0.92	

### Sulfur Dioxide

The standard for 1-hour sulfur dioxide (SO<sub>2</sub>) is 75 ppb when taking a 3-year average of the annual daily maximum at the 99<sup>th</sup> percentile. The only SO<sub>2</sub> monitor in Campbell County is at WYODAK Site 4, which has consistently remained below this NAAQS threshold for the past 10 years. Table B-6a lists the annual daily maximum 1-hour SO<sub>2</sub> at the 99<sup>th</sup> percentile and the 3-year averages (i.e., 1-hour SO<sub>2</sub> Design Value) at the WYODAK Site 4 monitor.

**Table B-6a. Daily Maximum 1-hour SO<sub>2</sub> for each year at WYODAK Site 4 in Campbell County (ppb).**

Year	Annual daily max at 99 <sup>th</sup> percentile [ppb]	3-year average of the 99 <sup>th</sup> percentiles [ppb]
2004	56	
2005	57	57
2006	59.3	59
2007	61	63
2008	69	63
2009	60	60
2010	52	50
2011	37	43
2012	39	38
2013	37	

99<sup>th</sup> percentile SO<sub>2</sub> concentrations are even lower at the two monitoring sites in counties adjacent to Campbell County, so do not come close to the 1-hour SO<sub>2</sub> standard (Table B-6b).

**Table B-6b. Daily Maximum 1-hour SO<sub>2</sub> for each year (ppb) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Natrona		Weston	
	Location	Sinclair, Casper	Wyoming Refining	Weston
Year	Annual daily max at 99th percent.[ppb]	3-year average of the 99th percent. [ppb]	Annual daily max at 99th percent. [ppb]	3-year average of the 99th percent. [ppb]
2004				
2005			27.5	
2006			24	25
2007			22	23
2008			24	24
2009			25	22
2010			18	17
2011	31.7		9	16
2012	28.9	33	20	12
2013	38.3		6	

The standard for 3-hour SO<sub>2</sub> is to not exceed 0.5 ppm (500 ppb) more than once per year. Table B-7a lists the highest and second highest 3-hour SO<sub>2</sub> from the WYODAK Site 4 monitor in Campbell County. The highest second high 3-hour SO<sub>2</sub> concentration at the WYODAK site in any year is 60.3 ppb in 2008 that is well below the 500 ppb standard. No exceedances have been measured in the past 10 years and it appears SO<sub>2</sub> air quality is improving in more recent years. Again 3-hour SO<sub>2</sub> concentrations in neighboring counties are even lower with no concentrations even approaching the standard (Table B-7b).

**Table B-7a. Highest observed 3-hour SO<sub>2</sub> at WYODAK Site 4 in Campbell County (ppb).**

Year	Highest SO <sub>2</sub> [ppb]	Second Highest [ppb]
2004	38.6	37.6
2005	48.0	46.3
2006	56.0	50.2
2007	55.6	48.3
2008	126.6	60.3
2009	46.0	43.6
2010	51.3	46.3
2011	41.6	40.0
2012	38.0	34.3
2013	32.6	31.3

**Table B-7b. 1<sup>st</sup> and 2<sup>nd</sup> highest observed 3-hour SO<sub>2</sub> concentration (ppb) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County Location	Natrona Sinclair, Casper		Weston Wyoming Refining	
	Year	Highest SO <sub>2</sub> [ppb]	Second Highest [ppb]	Highest SO <sub>2</sub> [ppb]
2004				22.3
2005				21
2006				20.3
2007				23.3
2008				71.3
2009				26.3
2010				124.6
2011	22.1	21.7	9	8.3
2012	26.9	25.4	16.3	16.3
2013	30.8	30.4	27.6	4.6

### PM<sub>2.5</sub>

The 24-hour PM<sub>2.5</sub> standard requires that the 3-year average of 24-hour PM<sub>2.5</sub> at the 98<sup>th</sup> percentile be 35 µg/m<sup>3</sup> or less. The six PM<sub>2.5</sub> monitors in Campbell County are located near mines and at the Gillette College Tech Center. The observed 24-hour PM<sub>2.5</sub> concentrations at the 98<sup>th</sup> percentile for each of the past 10 years are listed in Table B-8a. All values are below 35 µg/m<sup>3</sup>; therefore, their 3 year averages always met the 24-hour PM<sub>2.5</sub> standard. The highest most recent (2011-2013) 24-hour PM<sub>2.5</sub> Design Value in Campbell County 19.4 µg/m<sup>3</sup> at Belle Ayr BA 4 monitor that is 56% of the 35 µg/m<sup>3</sup> standard.

Table B-8b lists the 98<sup>th</sup> percentile 24-hour PM<sub>2.5</sub> concentrations during the last 10 years at the 8 monitoring sites in counties adjacent to Campbell County. All values are below the 24-hour PM<sub>2.5</sub> NAAQS; thus there are no violations as the 3-year average would be below the NAAQS.



**Table B-8a. 24-hour PM<sub>2.5</sub> at the 98<sup>th</sup> percentile for each year (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Year	Gillette	Black Thunder Mine 26-2	Black Thunder Mine 36-2	Belle Ayr BA-4	Buckskin Mine North	Buckskin Mine North 2
2004		16.7		10.9	11.9	
2005		18.5		9.5	12.2	
2006		28.2		15.8	11.8	
2007		19		14.8	13.6	
2008		10.7	17.3	14.5	18.3	11.8
2009			9.8	11.6		11.5
2010			12.3	16.5		10
2011	9		13.9	20.4		15.5
2012	15.2*		15.8	24.4*		17.9
2013			13.6	13.5		13.7

\*Events excluded

**Table B-8b. 24-hour PM<sub>2.5</sub> at the 98<sup>th</sup> percentile (µg/m<sup>3</sup>) at monitoring sites in counties adjacent to Campbell County.**

Surr. County	Converse		Natrona	Powder River	Sheridan			
	Mobile #2	ANTEL OPE SITE 3			400 EAST LOUCKS STREET	Police Sta. SLAM	Highland Park Site	Meadowlark SLAM Monitor
Year								
2004		8.8			31.3	38.9		
2005		7.3			22.6	32.5	15.8	
2006		12.3				24.4	13	
2007		10.4				24.4	15.8	
2008		9.2				17.4	14	
2009		7	8.2			19.7	9.7	
2010		6.1	12.3	13.5		27	13.8	
2011		10.9	12.7	17.4		23	14.5	
2012	9.3	23.3	15.5	24.3		18.8	10.3	19.3
2013	8.2	8	12.5	14.3		16.7		14.4

The footnote in Table B-8a identifies that some monitoring data was excluded because they were *Exceptional Events*. The *Exceptional Events* policy allows the exclusion of data in calculating Design Values and attainment status due to unusual events such as wildfires and natural windblown dust. July 4, 2012 was deemed an Exceptional Event at Gillette and Belle Ayr, which allowed their highest observations of the year to be excluded. Had they not been excluded, the 24-hour PM<sub>2.5</sub> at the 98<sup>th</sup> percentile at Belle Ayr would have been 55 µg/m<sup>3</sup>, which would have exceeded the threshold; nevertheless, the three year average would still be below the standard and kept the monitor in attainment of the 24-hour PM<sub>2.5</sub> NAAQS.

The annual mean PM<sub>2.5</sub> standard became more stringent on December 14, 2012, when the EPA lowered the primary annual PM<sub>2.5</sub> standard from 15 to 12 µg/m<sup>3</sup>. Regardless of the change, all Campbell County sites in the past ten years complied with the more stringent standard, as listed

in Table B-9a. Monitoring sites in counties adjacent to Campbell County also have annual PM<sub>2.5</sub> values that are below the NAAQS (Table B-9b).

**Table B-9a. Annual mean PM<sub>2.5</sub> (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Year	Gillette	Black Thunder Mine 26-2	Black Thunder Mine 36-2	Belle Ayr BA-4	Buckskin Mine North	Buckskin Mine North 2
2004		5.69		4.67	5.47	
2005		6.41		4.69	5.16	
2006		7.25		5.57	5.2	
2007		7.01		5.8	4.78	
2008		5.16	5.29	5.85	5.03	5.10
2009			4.23	5.09		5.67
2010			5.14	6.8		5.26
2011	4.46		3.13	6.01		5.18
2012	2.90*		4.83	7.98*		5.77
2013			3.74	6.79		4.89

\* Events excluded

**Table B-9b. Annual mean PM<sub>2.5</sub> (µg/m<sup>3</sup>) at monitoring sites in counties adjacent to Campbell County.**

Surr. County	Converse		Natrona	Powder River	Sheridan			
	Mobile #2	ANTEL OPE SITE 3			400 EAST LOUCKS STREET	Police Sta. SLAM	Highland Park Monitor	Meadowlark SLAM site
Year								
2004		3.31			8.78	9.92		
2005		3.18			7.43	9.48	6.04	
2006		3.82				9.74	5.64	
2007		4.03				9.54	6.29	
2008		3.50				8.05	5.32	
2009		3.55	4.47			8.51	4.91	
2010		2.86	4.56	5.24		8.79	5.53	
2011		3.88	4.55	6.30		8.35	5.52	
2012	3.61	5.39	5.43	8.87		8.20	4.36	7.11
2013	3.27	2.82	4.29	5.06		7.13		5.03

### PM<sub>10</sub>

PM<sub>10</sub> monitors have been set up at 55 locations across Campbell County. Most are located near mines to ensure that dust and other particulates raised from mining activities do not impose a health risk to the miners and other areas downwind. The 24-hour PM<sub>10</sub> standard of 150 µg/m<sup>3</sup> should not be exceeded more than once per year on average over 3 years (i.e., there should not be 4 or more exceedances over a 3-year period). Table B-10a lists the second highest annual 24-hour PM<sub>10</sub> for each site in Campbell County over the last 10 years. Values in red highlight monitors with at least 2 exceedances during the year; sites in blue represent the second highest 24-hour PM<sub>10</sub> after one or more events were excluded.

Only two sites reported at least 2 exceedances in a calendar year after excluding one or more events – Black Thunder Mine 36-2 in 2004 and Rochelle R0-1 (North Antelope Rochelle Mine) in 2011. The former site had 2 exceedances in 2004 but no exceedances in either 2005 or 2006, putting it in compliance with the 24-hour PM<sub>10</sub> standard.

At Rochelle, the four highest 24-hour PM<sub>10</sub> concentrations in 2011 and 2012 (excluding exceptional events) are as follows:

- August 7, 2012 (250  $\mu\text{g}/\text{m}^3$ )
- August 23, 2011 (217  $\mu\text{g}/\text{m}^3$ )
- September 22, 2011 (154  $\mu\text{g}/\text{m}^3$ )
- August 27, 2012 (150  $\mu\text{g}/\text{m}^3$ )

The fourth highest concentration was dangerously close to putting the region out of compliance with the state and federal ambient air standards. Fortunately, there were no exceedances in either of the surrounding years (2010 or 2013). This site should require additional attention to ensure that it can continue to comply with the current air quality standards in the future.

Table B-10b lists the highest second high 24-hour PM<sub>10</sub> concentrations over the last 10 years at monitoring sites in counties adjacent to Campbell County. None of the values exceed the 150  $\mu\text{g}/\text{m}^3$  standard.

The second standard for PM<sub>10</sub> is the annual mean PM<sub>10</sub>. EPA rescinded the annual mean PM<sub>10</sub> standard in 2006, but the State of Wyoming continues to enforce a 50  $\mu\text{g}/\text{m}^3$  limit, which should not be exceeded when averaged over three consecutive years. Table B-11a lists the annual means at Campbell County monitoring sites (after excluding exceptional events); concentrations over 50  $\mu\text{g}/\text{m}^3$  are shaded in red.

The annual mean PM<sub>10</sub> concentration exceeded 50  $\mu\text{g}/\text{m}^3$  at three sites in Campbell County – Rochelle R01 in 2012, North Antelope – NA5 (North Antelope Rochelle Mine) in 2009, and Black Thunder Mine 36-2 in 2006. All three sites are located in the southeast corner of the County. When averaged over 3 years, all complied with the state standard. Note that the 55  $\mu\text{g}/\text{m}^3$  annual mean at Rochelle in 2012 will still be weighted in the 2012-2014 3-year average, so care must be taken to ensure that Rochelle's annual mean PM<sub>10</sub> remains low this year.

Table B-11b displays the annual PM<sub>10</sub> concentrations over the last 10 years at monitoring sites in counties next to Campbell County. All values are below the 50  $\mu\text{g}/\text{m}^3$  annual state standard.

PM<sub>10</sub> is the only pollutant that comes close to exceeding the national or Wyoming state ambient air quality standards in Campbell County. But based on air quality observations over the last 10 years there are no violations of any national or state standards.

**Table B-10a. Second Highest 24-hour PM<sub>10</sub> for each year (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
84	SC-1. 39,000 distance from mining activity, 6670" from LNCM								69	99	60
86	SC-3 Southeast of mine								94	122	108
87	SC-2 East of School Creek Mine								121	140	118
99	WRIGHT JR-SENIOR HIGH SCHOOL-220 Wright Blvd	27	47	48	55	51	31	26	39	54	45
303	Coal Creek Site 3									44	53
SOUTH CAMPBELL COUNTY											
456	APPROX 15 MILES SSW OF GILLETTE WY (SEE APPLE BUTTE QUAD MAP)	26	35	113	41	32	36	34	40	55	36
800	Gillette College Tech Center Mobile Trailer								21	76	
802	BELLE AYR BA-1	33	34	39	36	30	25	29	31	44	26
808	EAGLE BUTTE EB-3	64	85	93	125	83	56	59	70	96	60
826	RAWHIDE HILLTOP SITE	39	70	72	101	91	72	74	68	89	82
841	COAL CREEK CCM 7-1					37	21	21	27	28	23
857	WYODAK SITE 4	92	88	69	121	103	72	75	58	70	
869	ROCHELLE R0-1	100	99	108	126	127	107	121	154	150	128
870	NO ANTELOPE NA-5	83	127	119	144	136	84				
874	NO ROCHELLE SITE E	94	150	95	142	134					
875	JACOBS RANCH SITE 3	67	83	89	103	106	61	65	60	85	58
877	BLACK THUNDER BTM 26-2	77	83	90	92	29					
883	Cordero Rojo SITE W	38	52	106	70	71	77	80	51		
884	TRITON COAL BUCKSKIN MINE GILLETTE, WY	47	57	58	72	60	57	58	59	82	49
885	Cordero CRC-E10A	63	56	88	94	63	73	60	74	78	64
886	CABALLO C-8A/B	55	72	100	90	84	70	80	94	87	74
889	CORDERO HV-3/PM-3	38	42	68	90	48	42	37	19		
890	COAL CREEK CCM 26-1,2,3			51	35	34	21	30	28	37	
891	BTM-36-2 (BLACK THUNDER MINE)	435	116	124	119	98	73	92	82	83	64
892	BELLE AYR BA-4,5N,5S	46	53	61	53	39	40	41	58	49	37
893	BELLE AYR BA-3					50	23	22	31	46	33
894	JACOBS RANCH SITE 4	52	47	65	49	48	33	36	35	20	

**Table B-10a. Second Highest 24-hour PM<sub>10</sub> for each year (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
895	RAWHIDE NORTH SITE	42	58	75	71	65	69	59	68	95	62
896	DRY FORK COAL CO	24	27	44	40	16					
897	Dry Fork Mine Site 4									40	21
899	TRITON COAL GILLETTE, WYO	53	68	84	107	81					
900	AMAX EAGLE BUTTE MINE EB-5 OLD RURAL	33	48	46	39	18					
901	KERR-MCGEE CLOVIS POINT MINE GILLETTE WY	62	69	71	100	83	91	115	105	114	
906	EAGLE BUTTE EB-2 REL'D	61	53	60	64	67	49	28			
907	Black Thunder Mine Site 12 Met Teom	116	101	96	116	91	71	89	75	120	62
908	CABALLO C-9	69	62	64	69	83	60	59	68	67	55
910	NORTH ANTELOPE/ROCHELLE COAL GILLETTE WY	88	97	103	96						
915	BLACK THUNDER MINE GILLETTE WY	105	109	138							
916	NORTH ROCHELLE MINE 'J' SITE	82	117	94	123	94					
917	JACOBS RANCH SITE 5 RELOCATED	108	103	96	143	80					
1002	Gillette - 1000 West 8th	32	39	52	62	55	53	44	43	45	26
1003	Cordero Rojo CRM-W11 Hilight Road								50	61	47
1009	Cordero Rojo CRM-S11								44	63	40
1877	Black Thunder Mine BTM-25					35	32	25	32	39	34
1879	Dry Fork Site DF-2					27	26	28	36	49	39
1896	Dry Fork Site DF-3					28	23	24	31	14	
1899	Buckskin Mine North Site					82	81	71	94	96	51
1900	NARM NA-7					68	56	58	74	82	57
1906	EAGLE BUTTE EB-31							37	45	47	34
1915	Black Thunder Mine Site BTM-9, Gillette, WY					84	49	44	59	63	66
1917	Jacob Ranch Mine Site 5, Gillette, WY					93	90	135	80	121	79

**Table B-10a. Second Highest 24-hour PM<sub>10</sub> for each year (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2900	Amax Eagle Butte Mine Eb-5 Rural					41	22	28	26	44	35
2901	Eagle Butte-Rawhide School Monitor										56
5555	WYDK-M 3,044 meters NE of intersection of Wyodak Mine Access Rd & Garner Lake Rd									66	95
6666	1,008 meters North of I-90 & 361 West of American Ranch Rd									80	130

Events excluded.

**Table B-10b. Second Highest 24-hour PM<sub>10</sub> for each year (µg/m<sup>3</sup>) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Site ID	Location	Year										
			2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Converse	88	NA-8 North Antelope Rochelle							73	104	124	101	74
Converse	801	Converse County - Mobile #2									15	39	
Converse	819	ANTELOPE SITE 3						30	30	26	39	65	38
Converse	830	RELOCATED GLENROCK COAL SITE #823	33	55									
Converse	850	ANTELOPE SITE 5	65	114	117	105	108	67	72	103	115	66	
Converse	851	ANTELOPE COAL COMPANY SITE #6	91	68	111	105	87	86	69	100	88	69	
Converse	881	ANTELOPE SITE 4	38	40	96	76	93	61	55	53	82	75	
Natrona	1	Casper SLAMS site	35	35	68	37	38	31	17	45	38	36	
Powder River	1	BROADUS							78	120	110	89	
Sheridan	1	400 EAST LOUCKS STREET	61	64									
Sheridan	2	Sheridan - Police Sta. SLAM Site	75	104	78	62	83	92	61	57	73	52	
Sheridan	3	Highland Park Monitor			27	34	18	32	27	24	35	20	
Sheridan	99	ADJACENT ARVADA ELEM. SCHOOL	36	52	51	23							
Sheridan	1003	Sheridan - Meadowlark SLAM site									22	17	

**Table B-11a. Annual mean PM<sub>10</sub> (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
84	SC-1. 39,000 distance from mining activity, 6670" from LNCM							18.1	23.0	18.6	
86	SC-3 Southeast of mine							23.0	30.3	23.6	
87	SC-2 East of School Creek Mine							22.1	31.2	24.0	
99	WRIGHT JR-SENIOR HIGH SCHOOL-220 Wright Blvd	16.7	16.3	13.7	20.5	17.0	11.7	12.5	10.5	18.3	15.5
303	Coal Creek Site 3									21.6	16.8
	SOUTH CAMPBELL										
456	COUNTY APPROX 15 MILES SSW OF GILLETTE WY	10.0	12.3	14.7	13.0	10.2	12.0	11.7	11.5	16.0	11.8
800	Gillette College Tech Center Mobile Trailer								10.5	19.2	
802	BELLE AYR BA-1	12.3	10.7	11.9	11.8	9.5	8.2	10.2	10.4	10.1	8.2
808	EAGLE BUTTE EB-3	18.8	18.6	22.8	25.8	20.5	16.4	20.0	19.4	25.4	17.2
826	RAWHIDE HILLTOP SITE	17.2	20.7	25.4	26.7	25.0	21.0	19.8	20.1	25.2	18.2
841	COAL CREEK CCM 7-1					15.4	9.0	9.9	11.2	10.7	9.1
857	WYODAK SITE 4	18.3	18.9	16.7	24.2	20.8	17.6	16.4	14.8	18.5	
869	ROCHELLE R0-1	27.0	28.4	30.6	35.0	33.9	30.1	31.9	40.8	55.1	35.9
870	NO ANTELOPE NA-5	25.9	28.4	30.1	36.3	37.9	50.7				
874	NO ROCHELLE SITE E	29.2	30.6	28.9	32.0	30.9					
875	JACOBS RANCH SITE 3	25.4	28.2	32.8	32.4	28.4	23.0	19.9	21.6	27.7	20.5
877	BLACK THUNDER BTM 26-2	20.8	23.7	28.6	24.7	18.6					
883	Cordero Rojo SITE W	14.7	16.9	22.0	22.3	21.4	19.5	20.9	13.8		
884	TRITON COAL BUCKSKIN MINE GILLETTE, WY	14.5	15.8	17.4	19.5	17.0	14.7	15.4	14.9	19.3	14.9
885	Cordero CRC-E10A	21.8	22.4	28.7	29.2	26.7	22.0	22.7	23.8	31.6	22.9
886	CABALLO C-8A/B	18.6	21.0	25.1	26.9	23.1	20.8	20.6	19.9	24.2	17.4
889	CORDERO HV-3/PM-3	13.7	14.6	19.1	21.9	18.2	14.4	13.9	8.9		
890	COAL CREEK CCM 26-1,2,3			11.0	13.7	11.2	8.7	10.4	11.1	11.9	

**Table B-11a. Annual mean PM<sub>10</sub> (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
891	BTM-36-2 (BLACK THUNDER MINE)	32.1	32.5	34.2	33.2	30.6	20.9	21.4	20.1	27.3	21.8
892	BELLE AYR BA-4,5N,5S	16.1	15.7	16.6	19.5	15.2	15.0	16.0	20.9	17.8	13.1
893	BELLE AYR BA-3					13.3	8.0	8.9	10.0	10.1	8.6
894	JACOBS RANCH SITE 4	17.5	18.9	20.2	18.0	15.1	12.3	12.8	11.8	10.7	
895	RAWHIDE NORTH SITE	17.2	19.9	24.7	26.3	22.7	19.5	18.7	19.3	24.8	17.7
896	DRY FORK COAL CO	10.6	10.1	14.4	13.7	6.7					
897	Dry Fork Mine Site 4									13.5	8.1
899	TRITON COAL GILLETTE, WYO	16.3	16.5	21.3	24.2	22.4					
900	AMAX EAGLE BUTTE MINE EB-5 OLD RURAL KERR-MCGEE CLOVIS	11.4	9.9	13.5	12.6	11.7					
901	POINT MINE GILLETTE WY	16.1	16.5	19.8	28.6	17.8	20.6	23.2	24.7	23.9	
906	EAGLE BUTTE EB-2 REL'D	18.9	16.1	18.1	18.4	17.0	14.7	11.4			
907	Black Thunder Mine Site 12 Met Teom	27.6	28.4	29.6	30.2	28.2	19.8	21.5	20.8	31.8	19.1
908	CABALLO C-9 NORTH	16.0	16.8	21.0	23.1	21.3	16.9	17.3	17.0	20.6	15.7
910	ANTELOPE/ROCHELLE COAL GILLETTE WY	23.6	26.7	27.6	27.7						
915	BLACK THUNDER MINE GILLETTE WY	25.5	31.6	52.4							
916	NORTH ROCHELLE MINE 'T' SITE	23.9	26.4	27.0	28.5	27.2					
917	JACOBS RANCH SITE 5 RELOCATED	21.1	24.6	28.4	32.1	16.8					
1002	Gillette - 1000 West 8 <sup>th</sup> Cordero Rojo CRM-W11	15.1	15.4	18.3	23.7	18.3	22.1	17.8	16.2	17.8	14.0
1003	Hilight Road									18.0	20.7
1009	Cordero Rojo CRM-S11								17.5	19.1	15.1
1877	Black Thunder Mine BTM-25					13.6	11.3	11.9	10.8	13.0	12.5
1879	Dry Fork Site DF-2					13.3	10.7	13.2	12.2	14.3	14.7
1896	Dry Fork Site DF-3					11.7	8.4	9.7	9.6	5.6	

**Table B-11a. Annual mean PM<sub>10</sub> (µg/m<sup>3</sup>) at monitoring sites in Campbell County.**

Site ID	Location	Year									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1899	Buckskin Mine North Site					27.4	20.9	21.2	22.7	25.8	17.0
1900	NARM NA-7					19.7	16.8	17.2	17.5	25.7	18.9
1906	EAGLE BUTTE EB-31							16.6	11.7	11.7	11.2
1915	Black Thunder Mine Site BTM-9, Gillette, WY					21.3	15.0	14.8	16.5	21.4	19.4
1917	Jacob Ranch Mine Site 5, Gillette, WY					29.5	20.5	22.9	20.4	26.9	21.7
2900	Amax Eagle Butte Mine Eb-5 Rural					14.0	8.7	11.4	9.5	12.2	10.0
2901	Eagle Butte-Rawhide School Monitor										14.5
5555	WYDK-M 3,044 meters NE of intersection of Wyodak Mine Access Rd & Garner Lake Rd									22.4	16.1
6666	1,008 meters North of I-90 & 361 West of American Ranch Rd									26.8	18.6

Events excluded.

**Table B-11b. Annual mean PM<sub>10</sub> (µg/m<sup>3</sup>) at monitoring sites in counties adjacent to Campbell County.**

Surrounding County	Site ID	Location	Year									
			2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Converse	88	NA-8 North Antelope Rochelle						23.6	25.2	23.4	31.9	23.4
Converse	801	Converse County - Mobile #2								10.1	10.1	
Converse	819	ANTELOPE SITE 3					16.2	11.2	10.2	10.9	17.3	14.3
Converse	830	RELOCATED GLENROCK COAL SITE #823	12.7	21.9								
Converse	850	ANTELOPE SITE 5	25.8	30.2	31.9	38.4	31.9	25.9	26.3	26.9	34.1	25.2
Converse	851	ANTELOPE COAL COMPANY SITE #6	30.0	28.2	32.6	37.6	34.1	34.4	29.6	32.2	38.5	31.5
Converse	881	ANTELOPE SITE 4	16.8	17.6	22.1	25.3	23.9	18.7	17.9	17.2	24.5	19.8
Natrona	1	Casper SLAMS site	16.5	16.3	20.8	18.1	17.2	16.6	16.5	14.5	17.4	15.5
Powder River	1	BROADUS							21.1	31.4	34.2	24.1
Sheridan	1	400 EAST LOUCKS STREET	23.7	24.6								
Sheridan	2	Sheridan - Police Sta. SLAM Site	32.1	35.2	33.9	35.2	22.9	21.6	21.4	19.3	22.1	16.6
Sheridan	3	Highland Park Monitor		15.8	15.0	19.1	15.1	13.6	13.1	13.2	11.8	
Sheridan	99	ADJACENT ARVADA ELEM. SCHOOL	14.1	16.0	15.2	12.9						
Sheridan	1003	Sheridan - Meadowlark SLAM site								15.0	10.1	

## Vegetation

**Sagebrush Shrublands.** Distribution of sagebrush shrublands varies based on the sagebrush species and subspecies, but ranges from basins and valley bottoms, to undulating terraces and foothills, to steep slopes and mountainous areas. Soils associated with sagebrush shrublands are xeric soil types and vary in texture and depths.

Sagebrush stands can be dense, patchy or sparse dominated by a single species or subspecies of sagebrush or consist of a mosaic of multiple species of sagebrush. Often the mosaic stands are intermixed with other shrubs, such as rabbitbrush, antelope bitterbrush, greasewood, shadscale, winter-fat, and spiny hop-sage (Paige and Ritter 1999). Typically, sagebrush communities contain three to four vegetation layers: 1) a shrub layer, 12-40 inches tall, 2) forbs and caespitose grasses, 8-24 inches, 3) low-growing grasses and forbs less than 4-8 inches tall, and 4) a biological soil crust (Miller and Eddleman 2000). Sagebrush shrublands are associated with other plant communities including aspen, mountain shrubs, salt desert shrubs and open conifers (Wyoming Interagency Vegetation Community 2002).

In Campbell County, Wyoming big sagebrush communities are found below 6,000 feet and mountain big sagebrush communities above 7,000 feet. The transition from 6,000 to 7,000 feet these two communities grow together and are difficult to separate. Additionally, black sagebrush is located on shallow to very shallow rock soils and grows in association with Wyoming and big sagebrush between 5,000 and 7,000 feet. Basin sagebrush is associated with deep to deep soils in drainage bottoms and stream terraces and are mostly components of other shrub communities. Silver sagebrush is abundant in the sandy soils at lower elevations on shrub sand dunes.

**Prairie Grasslands.** Campbell County prairie grasslands are classified as mixed-grass prairie with common plant species including needle-and-thread, western wheatgrass, blue grama, Sandberg's bluegrass, prairie Junegrass, upland sedges, and Indian ricegrass (Knight 1994). Prairie grasslands generally occur on deep, well developed soils. Frequent and occasionally intense natural disturbances, such as drought, fire and grazing characterize prairie grasslands (Nicholoff 2003). This level of disturbance results in a predominance of perennial grasses, sedges, and herbaceous forbs that have their buds at or just below the soil surface minimizing their susceptibility to damage (Knight 1994). Regular disturbances create areas of vegetation in various stages of recovery resulting in a mosaic habitat diversity. Along with the disturbance, availability of water through snow drifts is another factor influencing the local composition of prairie plants.

Historically, Campbell County prairie grasslands were incorporated into cattle and sheep ranches which are still held in private ownership today. This allows for large tracts of grasslands to persist relatively intact.

**Riparian.** Riparian areas are distinct green corridors demarcating streams from uplands. They are vital zones of ecological processes that connect landscapes and they support diverse plant and animal communities (Gregory et al. 1991). These areas buffer water loss from uplands, filter chemical and organic wastes, trap sediment, build and maintain stream banks reducing soil erosion, and moderate stream temperatures. The diversity in plant species makes these areas



valuable to wildlife through high quality forage, nesting habitats and corridors for wildlife movement. Riparian areas are used for agriculture, recreation, travel, water development and housing.

## Weeds, Pests, and Invasive Species

### Wyoming State Designated Noxious Weeds W.S. 11-5-102 (a)(xi).

Common Name	Scientific Name
field bindweed	<i>Convolvulus arvensis</i> L.
Canada thistle	<i>Cirsium arvense</i> L.
leafy spurge	<i>Euphorbia esula</i> L.
perennial sowthistle	<i>Sonchus arvensis</i> L.
quackgrass	<i>Agropyron repens</i> (L.) Beauv.
hoary cress (whitetop)	<i>Cardaria draba</i> and <i>Cardaria pubescens</i> (L.) Descv.
perennial pepperweed (giant whitetop)	<i>Lepidium latifolium</i> L.
ox-eye daisy	<i>Chrysanthemum leucanthemum</i> L.
skeletonleaf bursage	<i>Franseria discolor</i> Nutt.
Russian knapweed	<i>Centaurea repens</i> L.
yellow toadflax	<i>Linaria vulgaris</i> L.
Dalmatian toadflax	<i>Linaria dalmatica</i> (L.) Mill.
Scotch thistle	<i>Onopordum acanthium</i> L.
musk thistle	<i>Carduus nutans</i> L.
common burdock	<i>Arctium minus</i> (Hill) Bernh.
plumeless thistle	<i>Carduus acanthoides</i> L.
dyers woad	<i>Isatis tinctoria</i> L.
houndstongue	<i>Cynoglossum officinale</i> L.
spotted knapweed	<i>Cynoglossum officinale</i> L.
diffuse knapweed	<i>Centaurea diffusa</i> Lam.
purple loosestrife	<i>Lythrum salicaria</i> L.
saltcedar	<i>Tamarix</i> spp.
common St. Johnswort	<i>Hypericum perforatum</i>
common tansy	<i>Tanacetum vulgare</i>
Russian olive	<i>Elaeagnus angustifolia</i>
<b>Total Species</b>	<b>25 species</b>

### Wyoming State Designated Pests W.S. 11-5-102 (a)(xii)

Common Name	Scientific Name
grasshopper	<i>Caelifera</i> spp.
Mormon cricket	<i>Anabrus simplex</i>
prairie dog	<i>Cynomys</i> spp.
ground squirrel	<i>Spermophilus</i> spp.
mountain pine beetle	<i>Dendroctonus ponderosae</i>
beet leafhopper	<i>Circulifer tenellus</i>
<b>Total Species</b>	<b>6 species</b>



### **Campbell County Identified Noxious Weeds and Pests.**

Common Name	Scientific Name
buffalobur	<i>Solanum rostratum</i> Dun.
black henbane	<i>Hyoscyamus niger</i>
common cocklebur	<i>Xanthium strumarium</i>
mosquito	<i>Culicidae</i> spp.
<b>Total Species</b>	<b>4 species</b>

One of the most common noxious weeds in Campbell County is leafy spurge. Campbell County has been implementing a special control program for over 25 years that has contained most major infestations to the northwest corner of the county. Leafy spurge is a very hardy weed that is difficult to remove after an infestation takes place, therefore early detection and control is imperative. Leafy spurge is a perennial species that reproduces from seeds and creeping roots. The seed pods on the plant will pop and shoot the seeds up to 20 feet from the parent plant.

Bulbous bluegrass is not officially designated a noxious weed but it is an invasive species that has been spreading in Campbell County (Jarmusz 2014). It is replacing desirable grasses. Controlling the plant is proving difficult but testing is currently being conducted on different methods of eradication.

### **Threatened, Endangered, and Special Status Species**

The USFWS lists three ESA-protected or candidate species in Campbell County (USFWS 2014a, 2014c). No critical habitat for federally-listed species is designated in Campbell County. The three species include:

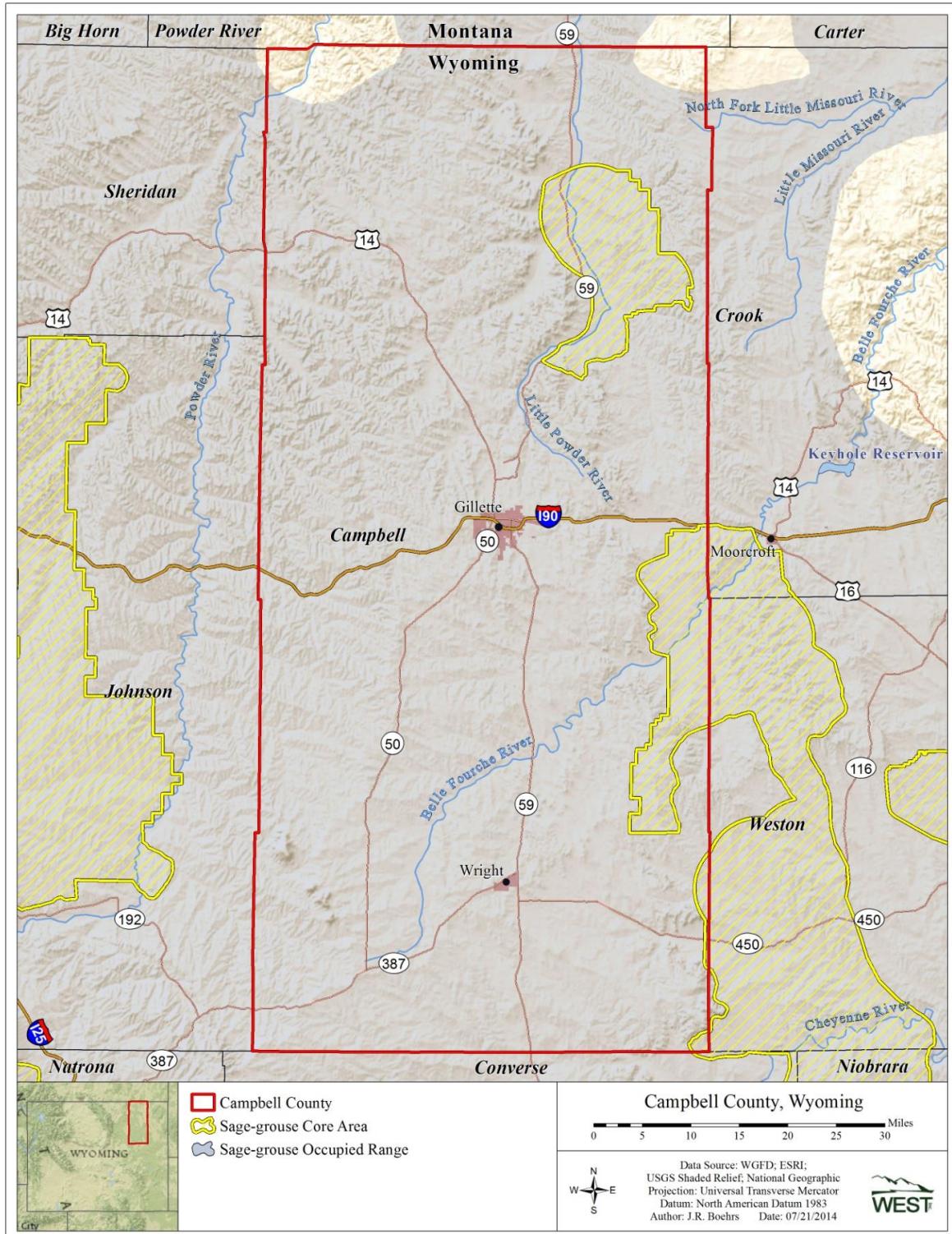
- Ute's ladies'-tresses orchid (*Spiranthes diluvialis*), Threatened
- Northern long-eared bat (*Myotis septentrionalis*), Threatened
- Greater sage-grouse (*Centrocercus urophasianus*), Candidate

Ute's ladies'-tresses orchid is a plant associated with open riverine and wetland areas. It generally is found in grassy wetlands and swales associated with small rivers and streams where soils remain moist through much of the growing season (Fertig and Heidel 2007, Heidel et al. 2008). The orchid is a perennial plant that is dependent upon an association with fungus living in the soil. The orchid may not flower or put up leaves every year, as it is capable of persisting underground in association with the fungus. Ute's ladies'-tresses orchid is not known to exist in Campbell County, but a known population exists in northwestern Converse County (Fertig and Heidel 2007, Heidel et al. 2008).

Northern long-eared bat was listed as a threatened species in April 2015 (Federal Register Vol. 80 No. 63 April 2, 2015). The northeastern corner of Wyoming is included in the known distributional range of the northern long-eared bat (USFWS 2014f, 2014g). The bat may roost as individuals or in colonies during summer in crevices, hollows, under the bark of live or dead trees, in structures, or in caves and mines (USFWS 2014f, 2014g). In winter, the northern long-eared bat hibernates in caves and mines (USFWS 2014f, 2014g). There are breeding records for northern long-eared bat in the northeastern corner of Wyoming (Orabona et al. 2012).



Greater sage-grouse is currently a candidate species for listing under the ESA. Conservation of greater sage-grouse is a priority since populations have been in decline. Sage-grouse occur throughout Campbell County. The Northeast Wyoming Sage-Grouse Working Group (NWSWG) was established in 2004 and is one of eight sage-grouse working groups in Wyoming that work to conserve sage-grouse at the local level with the input and participation of local people. The goal of the working groups is to improve sage-grouse population numbers and habitat so that federal listing is not needed. The NWSWG recommends conservation actions and supports partnerships and research on sage-grouse conservation issues (NWSWG 2006). As part of state efforts to conserve the bird and prevent the need for federal listing, the Governor of Wyoming issued an Executive Order (Order 2011-5 [Mead 2011]) in 2011 that delineated Core Population Areas for sage-grouse (Figure B-1) and stipulated that new development and land uses in those Core Population Areas should not cause declines in sage-grouse populations.



**Figure B-1. Map of greater sage-grouse Core Population Areas and overall distribution within Campbell County.**

Regional conservation groups such as the NWSWG were formed with the goal of preventing the need for federal listing of species and provide conservation guidance to conserve species of concern such as sage-grouse. Conservation actions suggested by the NWSWG, and following the Governor of Wyoming issued Executive Order regarding conservation of sage-grouse are designed to improve sage-grouse numbers and prevent listing while preserving existing land uses and property rights as much as possible. Campbell County should cooperate with and encourage resident participation in conservation groups such as the NWSWG so that sensitive species are conserved before populations decline to the point that they require listing and regulations affecting land use become more restrictive.

The Buffalo Field Office also is charged with implementing the BLM Greater Sage-Grouse Planning Strategy. Planning efforts on BLM-managed lands across the range of the greater sage-grouse are directed to consider all appropriate and applicable conservation measures for greater sage-grouse in Resource Management Plans (RMPs). The Buffalo Field Office is in the process of revising their RMP in 2014 (see BLM 2013, 2014c).

The USFS Rocky Mountain Region (Region 2) has prepared a Greater Sage-grouse Record of Decision (ROD) for Northwest Colorado and Wyoming (USFS 2015) with LRMP amendments. The conservation measures presented in the ROD and LRMP amendments protect the greater sage-grouse and its habitat. The management direction in the LRMP amendments is accomplished through land use allocations that limit or eliminate new surface disturbance and a suite of other management actions. The cumulative effect of these measures is to conserve, enhance, and restore greater sage-grouse habitat across the remaining range of the species in the Rocky Mountain region.

Gray wolves in the northern Rocky Mountains were delisted everywhere except Wyoming in 2009 (74 FR 15123, April 2, 2009), and the delisting was extended to Wyoming in 2012 (77 FR 55530, September 10, 2012). Wolves are currently considered to be trophy game or predatory animals in Wyoming and are managed by WGFD, though USFWS continues to monitor wolf numbers (USFWS 2014e). Between 2002 and 2013, the northern Rocky Mountain wolf population exceeded recovery goals, and delisting did not jeopardize the population (USFWS 2014e). No wolf packs exist in Campbell County, but individual wolves may range far from known pack territories. In 2011, a single wolf killed a ewe on private property (USFWS 2011c). If wolves become more prevalent in Campbell County, predation on livestock and wildlife could cause economic harm to family-owned businesses such as livestock farmers and game outfitters. Campbell County is concerned about regulatory restrictions on control of listed predators, such as gray wolves prior to 2012.

In the case of listed predators such as the gray wolf, the recovery plan included provisions for removing problem animals that preyed on livestock (USFWS 1987). USFWS funds for recovery efforts are limited, and funds generally are allocated based on species priority, regional workloads, and partnership opportunities that maximize use of funds or bring in additional funds or resources (US Government Accountability Office [GAO] 2005). Campbell County should investigate opportunities to cooperate with federal and state agencies on predator management.

## BLM Buffalo Field Office Sensitive Species List

Common Name	Scientific Name
northern leopard frog	<i>Rana pipiens</i>
Columbia spotted frog	<i>Rana luteiventris</i>
Yellowstone cutthroat trout	<i>Oncorhynchus clarkia bouvieri</i>
greater sage-grouse	<i>Centrocercus urophasianus</i>
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>
Baird's sparrow	<i>Ammodramus bairdii</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
Brewer's sparrow	<i>Spizella breweri</i>
ferruginous hawk	<i>Buteo regalis</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
long-billed curlew	<i>Numenius americanus</i>
mountain plover	<i>Charadrius montanus</i>
northern goshawk	<i>Accipiter gentilis</i>
peregrine falcon	<i>Falco peregrinus</i>
sage sparrow	<i>Amphispiza belli</i>
sage thrasher	<i>Oreoscoptes montanus</i>
trumpeter swan	<i>Cygnus buccinator</i>
western burrowing owl	<i>Athene cunicularia</i>
white-faced ibis	<i>Plegadis chihi</i>
yellow-billed cuckoo	<i>Coccyzus americanus</i>
black-tailed prairie dog	<i>Cynomys ludovicianus</i>
fringed myotis	<i>Myotis thysanodes</i>
long-eared myotis	<i>Myotis evotis</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
swift fox	<i>Vulpes velox</i>
<b>No. Species</b>	<b>25</b>

Source: BLM 2014e

## U.S. Forest Service Region 2 Regional Forester Designated Sensitive Species

Common Name	Scientific Name	Occurrence in Campbell County*
<b>MAMMALS</b>		
gray wolf	<i>Canis lupus</i>	historic
American hog-nosed skunk	<i>Conepatus leuconotus</i>	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	
white-tailed prairie dog	<i>Cynomys leucurus</i>	x
black-tailed prairie dog	<i>Cynomys ludovicianus</i>	x
spotted bat	<i>Euderma maculatum</i>	
hoary bat	<i>Lasiorurus cinereus</i>	
river otter	<i>Lontra canadensis</i>	
American marten	<i>Martes americana</i>	
water vole	<i>Microtus richardsoni</i>	
fringed myotis	<i>Myotis thysanodes</i>	x
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>	
desert bighorn sheep	<i>Ovis canadensis nelsoni</i>	
pygmy shrew	<i>Sorex hoyi</i>	
Wyoming pocket gopher	<i>Thomomys clusius</i>	
kit fox	<i>Vulpes macrotis</i>	
swift fox	<i>Vulpes velox</i>	
New Mexico meadow jumping mouse	<i>Zapus hudsonius luteus</i>	



## U.S. Forest Service Region 2 Regional Forester Designated Sensitive Species

Common Name	Scientific Name	Occurrence in Campbell County*
<b>BIRDS</b>		
American bittern	<i>Botaurus lentiginosus</i>	X
American peregrine falcon	<i>Falco peregrinus anatum</i>	
bald eagle	<i>Haliaeetus leucocephalus</i>	X
black swift	<i>Cypseloides niger</i>	
black tern	<i>Chlidonias niger</i>	X
black-backed woodpecker	<i>Picoides arcticus</i>	X
boreal owl	<i>Aegolius funereus</i>	
Brewer's sparrow	<i>Spizella breweri</i>	X
burrowing owl	<i>Athene cunicularia</i>	X
Cassin's sparrow	<i>Aimophila cassini</i>	
chestnut-collared longspur	<i>Calcarius ornatus</i>	X
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>	
ferruginous hawk	<i>Buteo regalis</i>	X
flammulated owl	<i>Otus flammeolus</i>	
grasshopper sparrow	<i>Ammodramus savannarum</i>	X
greater prairie-chicken	<i>Tympanuchus cupido</i>	
greater sage-grouse	<i>Centrocercus urophasianus</i>	X
harlequin duck	<i>Histrionicus histrionicus</i>	
Lewis's woodpecker	<i>Melanerpes lewis</i>	X
loggerhead shrike	<i>Lanius ludovicianus</i>	X
long-billed curlew	<i>Numenius americanus</i>	X
McCown's longspur	<i>Calcarius mccownii</i>	X
mountain plover	<i>Charadrius montanus</i>	X
northern goshawk	<i>Accipiter gentilis</i>	X
northern harrier	<i>Circus cyaneus</i>	X
olive-sided flycatcher	<i>Contopus cooperi</i>	
purple martin	<i>Progne subis</i>	
sage sparrow	<i>Amphispiza belli</i>	X
short-eared owl	<i>Asio flammeus</i>	X
trumpeter swan	<i>Cygnus buccinator</i>	
white-tailed ptarmigan	<i>Lagopus leucura</i>	
yellow-billed cuckoo	<i>Coccyzus americanus</i>	X
<b>AMPHIBIANS</b>		
boreal toad	<i>Anaxyrus boreas boreas</i>	X
plains leopard frog	<i>Lithobates blairi</i>	
Columbia spotted frog pop. 4 (Bighorn Mountain spotted frog)	<i>Rana luteiventris</i>	X
northern leopard frog	<i>Lithobates pipiens</i>	X
wood frog	<i>Lithobates sylvaticus</i>	X
<b>REPTILES</b>		
desert massasauga	<i>Sistrurus catenatus edwardsii</i>	
Black Hills redbelly snake	<i>Storeria occipitomaculata pahasapae</i>	
<b>FISHES</b>		
bluehead sucker	<i>Catostomus discobolus</i>	X
Colorado River cutthroat	<i>Oncorhynchus clarkii pleuriticus</i>	X
finescale dace	<i>Phoxinus neogaeus</i>	X
flannelmouth sucker	<i>Catostomus latipinnis</i>	X
flathead chub	<i>Platygobio gracilis</i>	X
hornyhead chub	<i>Nocomis biguttatus</i>	X
lake chub	<i>Couesius plumbeus</i>	
mountain sucker	<i>Catostomus platyrhynchus</i>	
northern redbelly dace	<i>Phoxinus eos</i>	

## U.S. Forest Service Region 2 Regional Forester Designated Sensitive Species

Common Name	Scientific Name	Occurrence in Campbell County*
pearl dace	<i>Margariscus margarita</i>	X
plains minnow	<i>Hybognathus placitus</i>	X
plains topminnow	<i>Fundulus sciadicus</i>	X
Rio Grande chub	<i>Gila pandora</i>	
Rio Grande cutthroat	<i>Oncorhynchus clarkii virginalis</i>	
Rio Grande sucker	<i>Catostomus plebeius</i>	
roundtail chub	<i>Gila robusta</i>	X
southern redbelly dace	<i>Phoxinus erythrogaster</i>	
sturgeon chub	<i>Macrhybopsis gelida</i>	X
Yellowstone cutthroat	<i>Oncorhynchus clarkii bouvieri</i>	X
<b>INSECTS</b>		
Arapahoe snowfly	<i>Capnia arapahoe</i>	
Ottoe skipper	<i>Hesperia ottoe</i>	
Susan's purse-making caddisfly	<i>Ochrotrichia susanae</i>	
Hudsonian emerald	<i>Somatochlora hudsonica</i>	
regal fritillary	<i>Speyeria idalia</i>	
Nokomis fritillary or Great Basin silverspot	<i>Speyeria nokomis nokomis</i>	
<b>MOLLUSKS</b>		
Rocky Mountain capshell	<i>Acroloxus coloradensis</i>	
pygmy mountainsnail	<i>Oreohelix pygmaea</i>	X
Cooper's Rocky Mountainsnail	<i>Oreohelix strigosa cooperi</i>	X
<b>NON-VASCULAR PLANTS</b>		
sphagnum	<i>Sphagnum angustifolium</i>	
Baltic sphagnum	<i>Sphagnum balticum</i>	
<b>FERNS &amp; ALLIES</b>		
trianglelobe moonwort	<i>Botrychium ascendens</i>	
Iowa moonwort	<i>Botrychium campestre</i>	
narrowleaf grapefern	<i>Botrychium lineare</i>	
peculiar moonwort	<i>Botrychium paradoxum</i>	
groundcedar	<i>Lycopodium complanatum</i>	
club spikemoss	<i>Selaginella selaginoides</i>	
<b>GYMNOSPERMS</b>		
whitebark pine	<i>Pinus albicaulis</i>	
<b>ANGIOSPERMS - MONOCOTS</b>		
roundleaf orchid	<i>Amerorchis rotundifolia</i>	
winding mariposa lily	<i>Calochortus flexuosus</i>	
foxtail sedge	<i>Carex alopecoidea</i>	
lesser panicled sedge	<i>Carex diandra</i>	
livid sedge	<i>Carex livida</i>	
mountain lady's slipper	<i>Cypripedium montanum</i>	
yellow lady's slipper	<i>Cypripedium parviflorum</i>	
elliptic spikerush	<i>Eleocharis elliptica</i>	
stream orchid	<i>Epipactis gigantean</i>	
whitebristle cottongrass	<i>Eriophorum altaicum var. neogaeum</i>	
Chamisso's cottongrass	<i>Eriophorum chamissonis</i>	
slender cottongrass	<i>Eriophorum gracile</i>	
plains rough fescue	<i>Festuca hallii</i>	
simple bog sedge	<i>Kobresia simpliciuscula</i>	
yellow widelip orchid	<i>Liparis loeselii</i>	
white adder's-mouth orchid	<i>Malaxis brachypoda</i>	
lesser roundleaved orchid	<i>Platanthera orbiculata</i>	
Porter's false needlegrass	<i>Ptilagrostis porteri</i>	



## U.S. Forest Service Region 2 Regional Forester Designated Sensitive Species

Common Name	Scientific Name	Occurrence in Campbell County*
Hall's bulrush	<i>Schoenoplectus hallii</i>	
largeflower triteleia	<i>Triteleia grandiflora</i>	
<b>ANGIOSPERMS - DICOTS</b>		
stonecrop gilia	<i>Aliciella sedifolia</i>	
Rydberg's golden columbine	<i>Aquilegia chrysanthia</i> var. <i>rydbergii</i>	
Laramie columbine	<i>Aquilegia laramiensis</i>	
Siberian sea thrift	<i>Armeria maritima</i> ssp. <i>sibirica</i>	
wheel milkweed	<i>Asclepias uncialis</i>	
Barr's milkvetch	<i>Astragalus barrii</i>	
violet milkvetch	<i>Astragalus iodopetalus</i>	
park milkvetch	<i>Astragalus leptaleus</i>	
Missouri milkvetch	<i>Astragalus missouriensis</i> var. <i>humistratus</i>	
Aztec milkvetch	<i>Astragalus proximus</i>	
Ripley's milkvetch	<i>Astragalus ripleyi</i>	
smooth northern-rockcress	<i>Braya glabella</i>	
sandhill goosefoot	<i>Chenopodium cycloides</i>	
prairie dodder	<i>Cuscuta platensis</i>	
mountain tansymustard	<i>Descurainia torulosa</i>	
clawless draba	<i>Draba exunguiculata</i>	
Gray's draba	<i>Draba grayana</i>	
Smith's draba	<i>Draba smithii</i>	
Weber's draba	<i>Draba weberi</i>	
English sundew	<i>Drosera anglica</i>	
roundleaf sundew	<i>Drosera rotundifolia</i>	
Brandegee's buckwheat	<i>Eriogonum brandegeei</i>	
dropleaf buckwheat	<i>Eriogonum exilifolium</i>	
Visher's buckwheat	<i>Eriogonum visheri</i>	
Lone Mesa snakeweed	<i>Gutierrezia elegans</i>	
scarlet gilia	<i>Ipomopsis aggregata</i> ssp. <i>weberi</i>	
Fremont's bladderpod	<i>Lesquerella fremontii</i>	
Pagosa Springs bladderpod	<i>Lesquerella pruinosa</i>	
Colorado tansyaster	<i>Machaeranthera coloradoensis</i>	
Rocky Mountain monkeyflower	<i>Mimulus gemmiparus</i>	
Bill's neoparrya	<i>Neoparrya lithophila</i>	
Rocky Mountain alpineparsley	<i>Oreoxis humilis</i>	
Kotzebue's grass of Parnassus	<i>Parnassia kotzebuei</i>	
Absaroka Range beardtongue	<i>Penstemon absarokensis</i>	
Cary's beardtongue	<i>Penstemon caryi</i>	
Degener's beardtongue	<i>Penstemon degeneri</i>	
Harrington's beardtongue	<i>Penstemon harringtonii</i>	
common twinpod	<i>Physaria didymocarpa</i> var. <i>lanata</i>	
cushion bladderpod	<i>Physaria pulvinata</i>	
west silver bladderpod	<i>Physaria scrotiliformis</i>	
rock cinquefoil	<i>Potentilla rupincola</i>	
Greenland primrose	<i>Primula egaliksensis</i>	
largeflower goldenweed	<i>Pyrrocoma carthamoides</i> var. <i>subsquarrosa</i>	
tranquil goldenweed	<i>Pyrrocoma clementis</i> var. <i>villosa</i>	
many-stemmed goldenweed	<i>Pyrrocoma integrifolia</i>	
ice cold buttercup	<i>Ranunculus karelinii</i>	
dwarf raspberry	<i>Rubus arcticus</i> ssp. <i>acaulis</i>	
Arizona willow	<i>Salix arizonica</i>	
Barratt's willow	<i>Salix barrattiana</i>	

## U.S. Forest Service Region 2 Regional Forester Designated Sensitive Species

Common Name	Scientific Name	Occurrence in Campbell County*
sageleaf willow	<i>Salix candida</i>	
blueberry willow	<i>Salix myrtillifolia</i>	
autumn willow	<i>Salix serissima</i>	
bloodroot	<i>Sanguinaria canadensis</i>	
Shoshone carrot	<i>Shoshonea pulvinata</i>	
Cathedral Bluff meadow-rue	<i>Thalictrum heliophilum</i>	
cushion Townsend daisy	<i>Townsendia condensata</i> var. <i>anomala</i>	
lesser bladderwort	<i>Utricularia minor</i>	
American cranberrybush	<i>Viburnum opulus</i> var. <i>americanum</i>	
Selkirk's violet	<i>Viola selkirkii</i>	

\* Occurrence based on Orabona et al. (2012) for mammals, birds, amphibians, reptiles, fishes, and mollusks; vascular plants occurrence based on Heidel (2012).

## Timber

### Streamside Management Zones

In Wyoming, some of the most important BMPs are those that deal with Streamside Management Zones, or SMZs. SMZs refer to the stream, lake, or other body of water and an adjacent area of varying width where management practices that might affect wildlife habitat or water quality, fish or other aquatic resources need to be modified. The SMZ encompasses a strip at least 50 feet wide on each side of a body of water.

### Wyoming Forestry and Silviculture BMP Field Audits

Field audits of Forestry and Silviculture BMPs have been conducted regularly since the year 2000 (Wyoming State Forestry Division 2014). Although no audits have been conducted in Campbell County, findings are applicable. The audits are conducted by an interdisciplinary team comprised of professionals in natural resource fields from government and private sectors. The most recent audit was in 2013. The nearest audit site to Campbell County, Huseby, is located on private land. The sale followed BMP guidelines except for the width of the SMZs. In the 2011 audit, the closest site to Campbell County was the Garden Creek Timber Sale located on State land in Natrona County. This was a re-audit from 2007. A major concern was the amount of thistle and other noxious weeds that would be established following the burning of the slash piles. While the thistle did take over those small sites, it is decreasing over time and is converting back to native grasses and shrubs. The form used in the field for the audits can be found at Wyoming Office of State Lands and Investments (2006).

### Insect and Disease Management

Wyoming is facing unprecedented forest health issues. The results of the lack of age class diversity and overall susceptibility to insect attack are being observed throughout the state, including Campbell County. Entomologists have stated it is an anomaly for all major bark beetles to be at epidemic levels at the same time. In some areas mortality of mature trees can be 100%. Limber pine stands are experiencing significant mortality from a combination of mountain pine beetle and white pine blister rust. In many areas, older forests are being converted to young forests on a large scale due to pine beetle epidemics. The result will be a new



generation of even-aged stands at the landscape scale. Ultimately, the cycle will repeat. There needs to be an increased focus on density management in young stands in the future. Management will be needed to keep remaining older stands resilient and to accelerate the growth of younger stands. (Wyoming State Forestry Division 2009).

Mountain Pine Beetle and Ips Beetle. Mountain pine beetle and Ips beetle are native to the forests of western North America, inhabiting ponderosa and limber pine trees, among others. Outbreaks encompass the Black Hills, Shoshone, Big Horn, Medicine Bow and Bridger Teton National Forests. The beetles are endemic to the forests in Campbell County as well. These insects have normally played an important role in the life of a forest and been an important part of the ecosystem long before human settlement. The beetles attack old or weakened trees and speed the development of a younger forest. They deposit their larvae beneath the bark of a tree to feed on its nutrient rich sapwood. Trees which are too old or sickly to repel them are killed by the larvae feeding on the phloem, girdling the tree, and by “blue stain” a distinctive fungus carried by adult beetles, that grows in the sapwood shutting down the flow of water to the needles. This leaves room for new trees to grow and is an essential function of the forest, bringing about diversity in age classes of trees. Fires and beetles helped ensure that age class diversity was maintained. Historically, beetle populations were kept in check by long, cold winters, which kill off the beetles. These conditions are becoming less frequent, so more beetles are surviving through winter. In addition to less die off, reproduction rates have increased. Beetles are ectotherms, meaning they rely on heat from their environment to fuel their physiological processes, so the higher the temperature, the better they are at reproducing.

Wyoming State Forestry, USFS, BLM and private landowners have been taking action to address bark beetle infestations by focusing on increasing the pace and scale of active forest management across Wyoming. Pine beetle activity is being actively suppressed by forest management in the western Black Hills in Crook and Weston Counties where less than 1,000 newly affected acres were detected in 2013. The outbreak has not been as severe in Campbell County as in other areas, but the potential exists for it to worsen.

Emerald Ash Borer. The emerald ash borer is a green beetle native to Asia and Eastern Russia. Outside its native region, the emerald ash borer is an invasive species, and emerald ash borer infestation is highly destructive to ash trees in its introduced range. The emerald ash borer has killed millions of trees across the U.S. which has caused regulatory agencies to enforce quarantines. The losses have been in the tens of millions of dollars (Emerald Ash Borer Info 2014). Michigan was the site of the first North America discovery in 2002, likely arriving via wooden packing materials in shipments from Asia. Imported packing crates now have to be treated. The invasion soon spread to the other Great Lakes states, Canadian provinces and the states adjacent to those. In the fall of 2013, it was found for the first time in the western US in Boulder, Colorado (Chilton 2013). The insect could feasibly spread to Campbell County municipalities with ash trees.

Trees suffering the early stages of an emerald ash borer infection have been successfully treated with injections in their trunks or in the soil using systemic pesticides. The injected pesticides travel throughout the tree, just under the bark where the emerald ash borer likes to feed. Injections cost \$250 per tree per year. Once the emerald ash borer is in the area it is necessary to

keep treating the trees yearly. Injections leave holes in the trunk, damaging the bark and increasing a tree's chances of becoming infected with other diseases. Ash trees with other health problems or growing in undesirable locations, such as under power lines, shouldn't be considered candidates for preservation. Another option is to not treat the ash and plant another tree species to replace it. Firewood and wood chips from ash trees could bring emerald ash borer. Consideration should also be given to trees cut down locally. If it is diseased wood, it should be kept under plastic for a year before processing.

White Pine Blister Rust. White pine blister rust (WPBR), an introduced pathogen, is affecting the distribution and health of ecologically important limber pine stands. It continues to spread in Wyoming (Kearns et al. 2014). WPBR was introduced to North America from Europe in shipments of infected pine seedlings in the early 1900's (Geils et al. 2010). WPBR requires two host species to complete its lifecycle. The hosts are: 1) Pines and 2) Ribes (a genus of about 150 species of currants). Pine can only be infected by basidiospores produced on currant plants. The fungus grows into the wood of pines, causing cankers (areas of dead bark). The fungus continues to develop on the bark, eventually forming blisters, which break open after a three or more year incubation period, and release spores that are disseminated by wind and infect Ribes plants. Cankers will kill a tree if they grow into the trunk. If branches contain cankers about four inches from the trunk, the tree will eventually die. Seedlings die within 2-4 years of infection because the infection entry point is needles and there is not much distance from the needles to the main stem. Once the infection hits the main stem it is lethal. In older trees, it may take up to 30 years for the infection to kill the entire tree. Top-killing can occur, which reduces cone production and takes the tree out of the reproductive population.

Limber pine stands statewide are being killed by WPBR, especially in the southern Bighorn Mountain range in northern Natrona County. This is the oldest infection in Wyoming, having killed 50% of the limber pine since the 1960's. In addition, the stress caused by WPBR makes limber pine more susceptible to attack from the mountain pine beetle, as the trees lack the energy reserves to thwart attacks. This has been made worse by the current drought, causing increased mortality. If WPBR follows its established patterns, it would be feasible to estimate that 75% of the native limber pine in Wyoming would die as a result of this pathogen. This is a significant concern as limber pine often grows on sites that are too harsh for other plants, and there may be no surrogate for them on these sites (Schoettle et al. 2014). Limber pine stands in Campbell County are at risk of this mortality.

Many management approaches are available to combat WPBR, but none are satisfactory. Treatment of the disease has not been effective, as there are no fungicides available for prevention or treatment of WPBR. A form of control practiced in some areas is to remove ribes plants from any nearby pines. Because the infection moves from currant plants, to pines, and back again, it cannot continue to exist without its alternate host. Removal of currants is rarely successful in practice, as they readily re-grow from small pieces of root left in the soil, and the seeds are widely spread in birds' droppings. (Forestpathology.org 2009). The USFS conducted intensive Ribes eradication efforts in Idaho in the 1940s and 1950s, sending work crews through white pine stands to dig up or pull Ribes plants and it proved unsuccessful.

Pruning is very expensive and only feasible in high commercial value trees. Bark blisters found on branches over 10-15 cm from the bole may be pruned off, which will stop the spread of the disease to the rest of the tree. Pruning infected branches can prevent infections near the stem from growing into it, where they are likely to girdle and kill the tree. If the branch dies before the fungus reaches the next larger branch or stem, the fungus is terminated. If it colonizes the stem, especially when it is small, the tree is terminated. If the main trunk is affected control is not possible and the tree will die.

Current efforts are focusing on developing genetically resistant strains of the 5-needle pines. The development of blister-rust-resistant pines, the possible increase in natural resistance to the disease, the planting of 5-needle pines in low blister rust hazard zones, and pruning of blister rust cankers in certain high quality 5-needle pine stands can help achieve a balance of conifer species in the forest.

**Western Gall Rust.** Western gall rust is a fast spreading pine-to-pine rust with no alternate host that causes galls on branches or stems. It is a threat to ponderosa pine in Campbell County (Means 2014). Pustules full of spores form in bark cracks on galls and rupture during moist weather and release spores that disperse in the wind. Most infections occur on the current year's shoots or needles. It affects trees of all ages, causing growth loss, branch death and deformity. Mortality is most common in seedlings and saplings because galls can quickly girdle the small stem. Branch galls typically only live a few years until the branch and the gall die. Mortality may result when many galls occur throughout the crown. Mass infection tends to occur in wave years when conditions are favorable, about every 5-15 years. Vigorous trees are more prone to infection during this time because they have a larger proportion of susceptible foliage (USFS 2003).

Management is complicated because of the lag time between infection and evidence of symptoms. Complete sanitation, destroy and regenerate to start over, is difficult. Other options are to remove all trees with stem infections and select leave trees that are disease-free or only have branch galls or stem cankers high in the crown; prune infected branches to reduce inoculum levels even though this provides little benefit to the tree because branches with galls usually die anyway; prepare for disease losses by regenerating stands at increased stocking levels to compensate for future rust-caused mortality; and plant non-host species that are adapted to the site. Trees with stem cankers can be hazardous in recreation areas and should be removed.

## Fire Management

Increased fire activity during a warmer/drier period could negatively impact water quality as larger, hotter fires affect vegetative cover and soils. It is practical to prevent the build-up of excessive fuel loads to reduce the potential for catastrophic conflagrations. The long-held belief that beetle infestations and resulting dead kill lead to more devastating forest fires is currently being challenged. Although there is some disagreement, studies imply that beetle kill may actually limit the effect and reach of fires by reducing small fuels (Shoemaker 2010).

In 2013, the BLM Buffalo Field Office approved a thinning project in northern Campbell County in ponderosa pine stands near ranch homes and developments in a high fire occurrence area. The objective of thinning and pine burning in this area is to improve the ponderosa stands' resistance



to large, stand replacing fires which have become a common occurrence in the vicinity during the last decade. Six large fires occurred between 2001 and 2012. Treatments should moderate future fire behavior and increase safety for firefighters and local residents, as well as improve the stand's resistance to drought and bark beetle outbreaks (BLM 2013a). It is Campbell County's Policy to continue to support efforts like this and to invest in/promote projects to reduce fire risk.

The USFS FSM 5100 – Fire Management, specifies the USFS objective to identify, develop, and maintain fuel profiles consistent with historic fire regimes characteristic of sustainable ecosystems and/or consistent with land uses. Sustainable ecosystem's fuel treatment shall be consistent with historic fire regimes and natural variability in fuel profiles characteristic of that vegetation. Fuel treatment shall consider cost-efficient protection of agency lands with consideration for cooperative opportunities and sensitivity to social/political concerns on neighboring ownerships.

As more homes in forested lands are built next to public lands (wildland/urban interface), it becomes increasingly important to protect these structures from wildfires. Campbell County will work with communities to ensure adequate protection from wildfires. This includes but is not limited to ensuring that private property owners clear defensible spaces around their structures.

### **Timber Management for Wildlife Habitat**

Proper timber management can create favorable habitat by altering characteristics that influence wildlife such as edge habitats, habitat diversity, interspersion, and plant succession. Proper arrangement of food, water and cover can also determine the use and value of wildlife habitat. It is Campbell County's policy to improve wildlife habitat through forest management.

Forest management to improve wildlife habitat includes timber harvest that provides travel corridors, thinning, and prescribed fire. Timber harvest sometimes fragments forest wildlife habitat into isolated stands. For wildlife to use these areas, a travel corridor may be required through open areas to forested stands. Travel corridors should be established by leaving a strip of forest at least 100 feet wide between open areas (Yarrow 2009). Thinning a closed stand allows sunlight to reach the forest floor, increasing the production of understory forage and browse. The growth of understory legumes and herbaceous plants can also be stimulated by a properly conducted and timed prescribed fire that accelerates the germination of seeds stored in the litter. Studies have shown that prescribed burning increases the nutrient content and palatability of many plants valuable for wildlife and sets back succession to create and maintain cover.

### **Tree Species for Living Snow Fences and Shelterbelts**

Several trees may be considered when deciding what species to plant. Ponderosa Pine (*Pinus ponderosa*) trees are native to Campbell County, are fairly drought tolerant, and grow well in most soils but do best in a well-drained soil. The Black Hills Spruce (*Picea glauca* var:*densata*) is also endemic to Wyoming, has lower moisture needs than other spruces, and provides excellent wind protection (City of Gillette 2005). The Eastern Red Cedar (*Juniperus virginiana*) is excellent for windbreaks and cover for wildlife. It thrives with little or no attention, and is tolerant of adverse conditions. Its appearance may not be desirable for some landscapes and it spreads aggressively, which may make Rocky Mountain Juniper (*Juniperus scopulorum*) a better option.

## Urban Forestry

Drought-tolerant trees are built for survival in drier, less hospitable climates. However, selecting the best trees to plant in urban areas encompasses other criteria as well. Management plans to sustain or enhance healthy urban tree cover will be most successful incorporating local tree data and relevant local, social, and ecological factors and costs, including community desires relative to canopy cover and associated ecosystem services.

Like rural forests, urban forests are subject to pests, disease, invasive plants, wildfire, drought, air pollution; and severe weather; but in urban forests these events are more likely to cause damage to people and property. The insects and diseases that affect urban forests cause or have the potential to cause significant damage. Endemic pests such as mountain pine beetle have caused severe damage to urban forests (Ellig 2008). Invasive species, such as the gypsy moth, emerald ash borer, and the fungi that cause Dutch elm disease and chestnut blight, have caused catastrophic tree mortality that has virtually eliminated dominant tree species in some places (Dozier 2000, Liebhold et al. 1995). Invasive plants can degrade or modify urban forests in part by removing and replacing native plants and altering ecosystem structure. Wildfires can cause substantial damage to urban forests and dramatically alter the urban landscape, especially in the wildland-urban interface (Spyratos et al. 2007).

Lack of urban forest management can lead to the loss of tree health and canopy cover, prompting a change in species composition, thereby reducing the quality of the environment and the ecosystem services derived from it. These potential changes could increase environmental management and human health costs, as well as decrease the quality of life for residents.

Management efforts can be directed to reduce these threats and sustain important resources. Long-term planning and management can reduce the risks associated with various urban forest threats and ensure ecosystem services that will continue to improve urban environmental quality and enhance human quality of life and well-being. The City of Gillette has a City Arborist and their Forestry Division cares for over 8,000 trees and shrubs in the city. Local and regional landowners, communities, and agencies can plan for sustainable growth while conserving the beauty and benefits of Campbell County's urban forests.

## Livestock and Grazing

Livestock grazing is an important agricultural industry in the State of Wyoming, and Campbell County is ranked 6th in the state for all cattle and for breeding sheep with a livestock inventory value of 107.7 million dollars in 2013 (Community Builders, Inc. [CBI] 2013). Between 2004 and 2013, the livestock inventory of Campbell County has increased by more than 20 million dollars (CBI 2013). Cattle numbers across Wyoming have varied from between 1 million and 1.5 million since the early 1950's. Sheep numbers declined considerably during this time period, dropping from 2 million to 275,000 (J. Nagagna, WSGA, personal communication, June 23, 2014). Campbell County contained 79,670 cattle and calves in 2012. Only 27,597 sheep and lambs were present in Campbell County in 2012 (USDA 2012). The higher proportion of cattle compared to sheep in Campbell County is consistent with the overall trend in Wyoming.

Grazing and livestock related activities make up 2.1 percent of the total employment of Campbell County (CBI 2013). While other industries are responsible for a greater percentage of total employment, grazing and livestock production provide many benefits to the citizens, wildlife and health of Campbell County's landscape. Proven methods of livestock grazing continue to maintain the health and productivity of grazing lands and provide improved wildlife habitat, healthy watersheds and soil erosion control.

## **Appendix C. Regulatory Framework**

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## Regulatory Framework

### Air Resources

#### *Federal*

Congress enacted the 1970 Clean Air Act (CAA; 42 USC 7401-7671q Clean Air Act) and its Amendments of 1977 and 1990 to protect public health and welfare from different types of air pollution caused by a diverse array of pollution sources. The CAA has several sections or titles that affect emission sources and air quality within Campbell County. The CAA recognizes that air pollutants do not recognize political boundaries so federal rules that affect sources outside of Campbell County may also improve air quality conditions within the county. EPA is charged with implementing the CAA following the instructions from Congress provided within the CAA and its amendments. The CAA defines six criteria air pollutants (CAPs; NO<sub>2</sub>, SO<sub>2</sub>, ozone, suspected particulate [TSP, PM<sub>10</sub>, PM<sub>2.5</sub>] and lead) for which National Ambient Air Quality Standards (NAAQS) are defined under Title I<sup>9</sup> of the CAA. If measured air quality in a region fails to achieve the NAAQS for one of the CAP pollutants, EPA designates the area as a nonattainment area (NAA) and States are required to develop a State Implementation Plan (SIP) with emission control measures and demonstrate that the region will achieve the NAAQS by a specific date. Air quality in Campbell County does not violate any NAAQS. Title I of the CAA also includes the New Source Review (NSR) and Prevention of Significant Deterioration (PSD) program that requires new or modified sources with emissions above specific thresholds to use Best Available Control Technology (BACT) and demonstrate they will not result in exceedances of any NAAQS or cause deterioration in air quality above specific thresholds. The CAA Amendments has defined 156 National Parks and Wilderness Areas as PSD Class I areas that are offered special more stringent air quality and air quality related value (AQRVs; e.g., visibility and deposition) protection. Campbell County has no Class I areas and is classified as PSD Class II area. Title I of the CAA also has provisions for controlling hazardous air pollutants (HAPs) in order to reduce exposure to air toxins.

Title II<sup>10</sup> of the CAA is designed to control emissions from on-road and non-road mobile sources. EPA has implemented numerous rules to control emissions from on-road light and heavy duty vehicles as well as non-road sources. These national rules affect mobile source emissions in Campbell County. Title III<sup>11</sup> of the CAA provides general provisions. Title IV<sup>12</sup> of the CAA is designed to reduce acid rain by controlling SO<sub>2</sub> and NO<sub>x</sub> emissions from large point sources. Title IV has implemented a national cap and trade program for these two pollutants with several electrical generating units in Campbell County affected by this program. Title V<sup>13</sup> and VI<sup>14</sup> of the CAA are in regards to permitting and stratospheric ozone protections.

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<sup>9</sup> 42 USC 7401-7515

<sup>10</sup> 42 USC 7521-7590

<sup>11</sup> 42 USC 7601-7627

<sup>12</sup> 42 USC 7651-7651o

<sup>13</sup> 42 USC 7661-7661f.

<sup>14</sup> 42 USC 7671-7671q

Over the years the federal government (EPA) has implemented standards and actions to improve air quality across the entire country as part of the implementation of the CAA. These standards have included mobile sources as well as large stationary point sources. Federal standards include: the Tier 2 Vehicle Standards, the heavy-duty gasoline and diesel highway vehicle standards, the non-road spark-ignition engines and recreational engine standards, and the large non-road diesel engine rule. The federal government has also implemented regional control strategies for major stationary sources focusing on the eastern U.S. and may extend the program to the western U.S. The following is a list of federal regulatory actions that would likely lead to emission reductions in the Campbell County (see EPA website for more details [USEPA 2014f]):

- Tier 2 Motor Vehicle Standards (USEPA 2014j)
- Heavy-duty Gasoline and Diesel Highway Vehicle Standards (USEPA 2014e)
- Non-Road Spark-ignition Engines and Recreational Engines Standards (USEPA 2014d, 2014i)
- Large Non-Road Diesel Engine Rule (USEPA 2014g)
- Mercury and Air Toxics Standards (MATS; USEPA 2012b)
- VOC MACT (USEPA 2012d)
- Federal Reformulated Gasoline (USEPA 2013b)
- Federal Non-Road Spark-Ignition Engines and Equipment (USEPA 2008a)
- Locomotive Engines and Marine Compression-Ignition Engines Final Rule (USEPA 2008b)
- CAA Title IV - Acid Rain Program
- Low-Sulfur Fuels (USEPA 2012a)
- Clean Air Visibility Rule (CAVR; USEPA 2005)
- Clean Power Rule (USEPA 2014b)
- Oil and Gas New Source Performance Standards (NSPS; August 16, 2012; USEPA 2012f)

The Wyoming Bureau of Land Management (BLM) Buffalo Field Office (BFO), whose planning areas include Johnson, Campbell and Sheridan Counties, is required to disclose the air quality and AQMV impacts due to oil and gas and mining developments on Federal lands under the National Environmental Policy Act (NEPA). The BLM BFO has prepared a Resource Management Plan (RMP; BLM 2013, 2014c) that discussed potential development in the BFO planning area that could affect emissions and air quality in Campbell County. The BLM BFO keeps a list of NEPA documents on their website (BLM 2014b).

The USFS Rocky Mountain Region (Region 2) Air Group developed a ranking system which identified visibility and aquatics, terrestrial, and depositional information as the highest concerns and priorities for monitoring in Thunder Basin National Grasslands (USFS 2001). USFS has projected future emissions sources to include a major coal bed methane development projects

within the Powder River Basin, along with increases in gas processing and power generating facilities in northeastern Wyoming (USFS 2001). Furthermore, USFS FSM 2500 – Watershed and Air Management Rocky Mountain Region (Region 2) will be adhered to where applicable (USFS 1992b).

### ***State***

The WYDEQ has issued rules for reducing emissions in Wyoming that would affect sources in Campbell County. These state regulations have focused on reducing emissions from oil and gas sources in Wyoming. The WYDEQ oil and gas permitting guidance (WYDEQ 1997; revised September 2013) has identified different levels of controls for different areas of the state with the ozone nonattainment area in southwest Wyoming having the highest control requirements. These areas are shown in Figure C-1 and in terms of most to least stringent control are as follows:

- JPAD/NPL – Jonah Pinedale Anticline Development and Normalized Pressure Lance area;
- UGRB – Upper Green River Basin area;
- CDA – Concentrated Development Area; and
- Statewide – regulations for the entire State of Wyoming.

## PERMIT SITES AND REGULATION AREAS

### Air quality regulation zones

- Jonah and Pinedale Development Area
- Concentrated Development Area
- Upper Green River Basin
- Statewide

### Permit types

- Gas well permit
- CBM permit
- Oil well permit

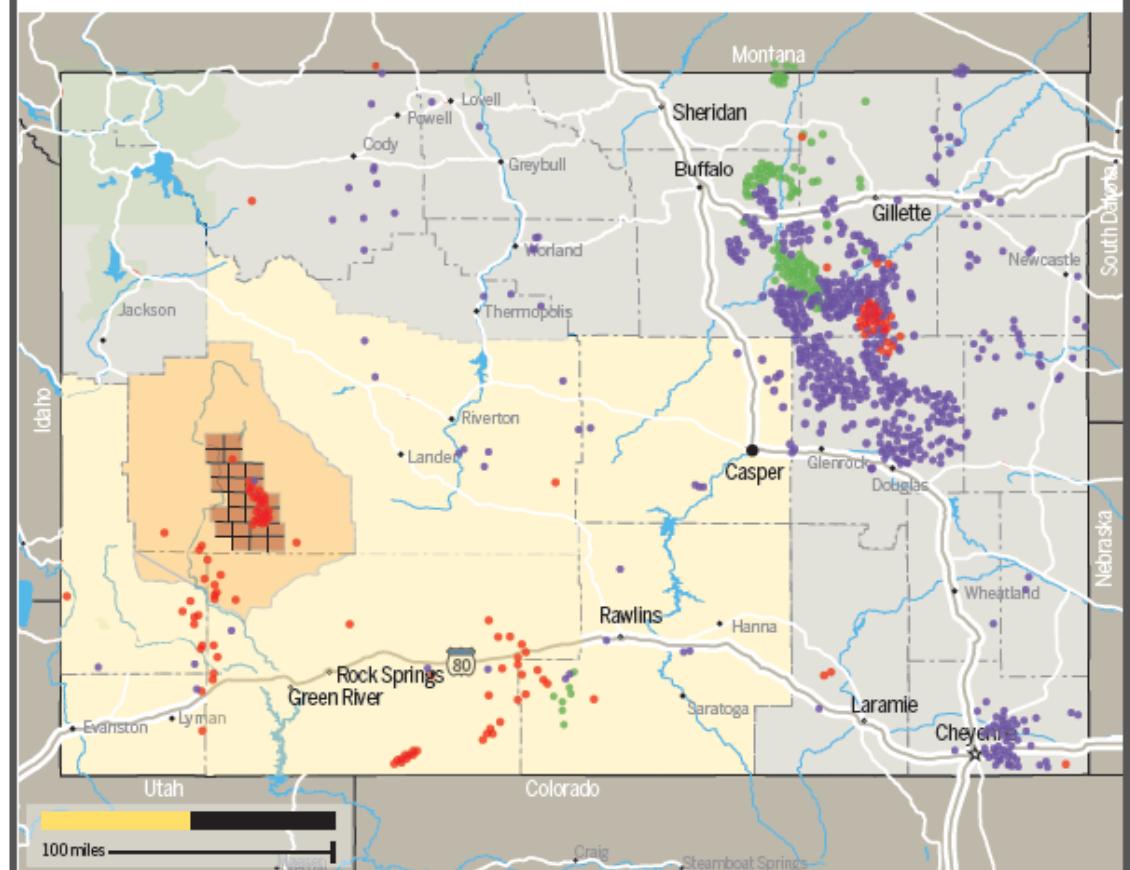


Figure C-1. Locations of the JPAD/NPL, UGRB and CDA areas in Wyoming.

Oil and gas development in Campbell County would be subjected to the statewide oil and gas regulations. Table C-1 below summarizes Wyoming state rulemakings with the statewide regulations affecting oil and gas sources in Campbell County.

**Table C-1. Summary of the Wyoming Department of Environmental Quality (WYDEQ)'s rules for reducing emissions.**

Source Category	Wyoming DEQ Oil and Gas Regulations by Source Category
Drill Rigs	Wyoming has no separate state restrictions for temporary CI or SI-ICE
Workover Rigs	Non-road Mobile Tier Standards take precedence  Wyoming has an Interim Policy for the UGRB Ozone Non-Attainment area allowing operators to voluntarily permit temporary drill rig engines w/ BACT control in return for future emission credits

**Table C-1. Summary of the Wyoming Department of Environmental Quality (WYDEQ)'s rules for reducing emissions.**

Source Category	Wyoming DEQ Oil and Gas Regulations by Source Category
Well Completions	<p><b>C6 S2 O&amp;G Permitting Guidance</b></p> <p>Wyoming has 4 area categories; 1) Concentrated Development Areas (CDA), 2) Upper Green River Basin (UGRB) 3) Jonah and Pinedale Anticline Development Area and Normally Pressured Lance (JPAD/NPL) &amp; 4) Statewide refers to all facilities not located in CDA, UGRB or JPAD/NPL</p> <p>Green completions are required in the JPAD/NPL area and CDA's in Wyoming as of July, 2014.</p>
Compression	None
Pneumatic Controllers	<p><b>C6 S2 O&amp;G Permitting Guidance</b> Install low or no-bleed at all new facilities. Upon modification of facilities, new pneumatic controllers must be low/no-bleed and within 60 days of modification, existing controllers must be replaced with no/low-bleed. (well site facilities only - not gas plants)</p>
Condensate & Crude Oil Tanks	<p><b>C6 S2 O&amp;G Permitting Guidance</b></p> <p>Wyoming has 4 area categories; 1) Concentrated Development Areas (CDA), 2) Upper Green River Basin (UGRB), 3) Jonah and Pinedale Anticline Development Area and</p> <p>Normally Pressured Lance (JPAD/NPL) &amp; 4) Statewide refers to all facilities not located in CDA, UGRB or JPAD/NPL</p> <p><b>JPAD/NPL</b> - 98% control of all new/modified tank emissions upon startup/modification</p> <p><b>CDA</b> PAD Facilities- 98% control upon startup/modification</p> <p>Single Well Facilities - 98% control of all new/modified tank emissions <math>\geq 8</math> tpy VOC within 60 days of startup/modification</p> <p><b>Statewide</b> 98% control of all new/modified tank emissions <math>\geq 10</math> tpy VOC within 60 days of startup/modification</p> <p><b>UGRB</b> PAD Facilities- 98% control upon startup/modification</p> <p>Single Well Facilities - 98% control of all new/modified tank emissions <math>\geq 4</math> tpy VOC within 60 days of startup/modification</p>
Gas Processing Plants	Wyoming has adopted NSPS Subpart KKK on LDAR

**Table C-1. Summary of the Wyoming Department of Environmental Quality (WYDEQ)'s rules for reducing emissions.**

Source Category	Wyoming DEQ Oil and Gas Regulations by Source Category
Glycol Dehydrators	<p><b>C6 S2 O&amp;G Permitting Guidance</b> Wyoming has 4 area categories; 1) Concentrated Development Areas (CDA), 2) Upper Green River Basin (UGRB) 3) Jonah and Pinedale Anticline Development Area and</p> <p>Normally Pressured Lance (JPAD/NPL) &amp; 4) Statewide refers to all facilities not located in CDA, UGRB or JPAD/NPL</p> <p><b>JPAD/NPL</b> 98% control of all new/modified dehydrator VOC/HAP emissions at start up</p> <p><b>CDA &amp; Statewide</b></p> <p>PAD Facilities - 98% control upon startup/modification</p> <p>SINGLE Well Facilities - 98% control within 60 days of startup/modification for VOC emissions <math>\geq 6</math> OR 98% control within 30 days of startup/modification for VOC emissions <math>\geq 8</math> tpy</p> <p><b>UGRB</b></p> <p>PAD Facilities - 98% control upon startup/modification</p> <p>SINGLE Well Facilities - 98% control within 60 days of startup/modification for VOC emissions <math>\geq 4</math> tpy</p>
Minor Source Permitting	Emissions from minor sources must be approved through permitting applied through the <b>WAQSR Chapter 6 Section 2(a)(i) O&amp;G Permitting Guidance</b> . For VOC emissions $\geq 8$ tpy from sources other than tanks, dehydrators, pneumatic controllers and pumps, water tanks, BACT is considered on case-by-case basis.
Point Source Permitting Threshold	Wyoming has no de minimus permitting threshold outside of their <b>C6 S2(k)</b> exemptions, thus all sources not waived by the Administrator are permitted and undergo BACT analysis
Pneumatic Pump	<p><b>C6 S2 O&amp;G Permitting Guidance</b> Wyoming has 4 area categories; 1) Concentrated Development Areas (CDA), 2) Upper Green River Basin (UGRB) 3) Jonah and Pinedale Anticline Development Area and</p> <p>Normally Pressured Lance (JPAD/NPL) &amp; 4) Statewide refers to all facilities not located in CDA, UGRB or JPAD/NPL</p> <p><b>JPAD/NPL</b> - 98% control of all new/modified pneumatic pump VOC/HAP emissions at startup/modification or the pump discharge streams shall be routed into a closed loop system at startup/modification</p> <p><b>CDA &amp; Statewide</b></p> <p>PAD Facilities - pneumatic pumps shall be controlled by at least 98% or the pump discharge streams shall be routed into a closed loop system at startup/modification</p> <p>SINGLE Well Facilities - 98% control within 60 days of startup/modification for sites with combustion units installed OR solar, electric or air-driven pumps for sites without combustion units installed</p> <p><b>UGRB</b></p> <p>98% control of all new/modified facilities at startup/modification or the pump discharge streams shall be routed into a closed loop system at startup/modification.</p>



## ***Local***

In general, Campbell County relies on the federal and Wyoming DEQ rules and regulations for controlling air pollutants so has minimal local rules related to air quality. However, air pollution control is accounted for in their planning and local control on air quality regulations and control measures is important to the County.

For example, the Campbell County 2013 Comprehensive Plan (CCDPZ 2013) includes elements for reducing dust from infrastructure development projects. In addition, specific resolutions may be passed to address certain topics that may affect emissions and air quality in Campbell County. Another example of local control is that due to the wildfire danger this year, Campbell County passed a resolution restricting open burning (Hall 2014) to reduce the chance of starting a wildfire.

## **Cultural Resources**

### ***Federal***

#### **National Historic Preservation Act (NHPA)**

Section 106 of the NHPA (Section 106) applies to federally licensed and federally funded undertakings (federal undertakings), and states that federal agencies must take into account the effects of these undertakings on historic properties (cultural resources eligible for listing on the National Register of Historic Places). The generalized implementing regulations for the NHPA are contained in 36 CFR Part 800. The regulatory authority for Section 106 will be the designated federal lead agency for the undertaking, and specific implementation of regulations and policy will vary among the different agencies.

Several federal agencies have developed resource management plans that broadly guide their planning and management of cultural resources under Section 106:

- *Bureau of Land Management, Buffalo Field Office Resource Management Plan:* [https://www.blm.gov/epl-frontoffice/projects/lup/36597/43459/46536/BFO\\_DRMP\\_Chapter\\_4.pdf](https://www.blm.gov/epl-frontoffice/projects/lup/36597/43459/46536/BFO_DRMP_Chapter_4.pdf) (Pp. 1,140-1,180).
- *U.S. Forest Service, Douglas District Office Land and Resource Management Plan:* [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5163437.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5163437.pdf)

Additionally, several federal agencies have developed programmatic agreements and/or protocols with the Wyoming State Historic Preservation office. These PAs and protocols guide the implementation of Section 106 by these agencies in the State of Wyoming for specific federal undertakings:

- *Programmatic Agreement Among the Bureau of Land Management, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM will Meet its Responsibilities Under the National Historic Preservation Act: State Protocol Between the Bureau of Land Management, Wyoming State Director and the Wyoming State Historic Preservation Officer*[amended April 25, 2014] (<http://wyoshpo.state.wy.us/Section106/Protocol.aspx>)

- *Programmatic Agreement Among the U.S.D.A. Forest Service, Wyoming Forests, Wyoming State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Compliance with the National Historic Preservation Act on the National Forests and Grasslands of Wyoming* [amended January 7, 2014] ([http://wyoshpo.state.wy.us/pdf/USFS\\_SHPO\\_PA.pdf](http://wyoshpo.state.wy.us/pdf/USFS_SHPO_PA.pdf) [currently the 2008 version])
- *Protocol/Guideline Between the Wyoming State Historic Preservation Office and the Department of Environmental Quality/Land Quality Division Applicable to Non-Coal Projects, Private Surface/Private Minerals* [October 11, 2007] <http://wyoshpo.state.wy.us/pdf/LQD-NonCoalProtocol.pdf>
- *State Level Agreement Between the Natural Resources Conservation Service and The Wyoming State Historic Preservation Office* ([SHPO](#) 2008)

#### Archaeological Resources Protection Act (ARPA)

ARPA pertains primarily to the issuing of permits to conduct archaeological excavation on federal lands and to remove archaeological material from these lands. The regulations also stipulate conditions for curation of archaeological materials collected from public lands. They establish penalties (fines and jail time) for those who illegally collect, sell, or otherwise traffic archaeological materials from federal lands. The implementing regulations for ARPA are contained in 43 CFR Part 7.

#### Native American Graves Protection and Repatriation Act (NAGPRA)

This legislation applies to Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony. It establishes a process for the return of these objects to lineal descendants and culturally affiliated groups. It also establishes provisions for the unexpected discovery of Native American human remains. NAGPRA applies to federal undertakings. If human remains of any sort are discovered, the county coroner and the lead federal agency should be contacted immediately and all work in the vicinity should stop. The implementing regulations for NAGPRA are contained in 43 CFR Part 10.

#### Paleontological Resources Preservation Act

This act establishes regulations and penalties relating to the collection of paleontological resources from federal lands. Collection of vertebrate fossils or large amounts invertebrate or plant fossils is illegal without a permit. It is also illegal to collect invertebrate or plant fossils with mechanized equipment or in such a way that causes significant damage to the land. Regulations have been developed by the Departments of Interior and Agriculture for specific agencies under each of these departments.

#### **State**

The State of Wyoming has a limited number of statutes and regulations regarding specific requirements and protections of cultural resources, and that are specifically directed at historic and prehistoric resource issues. These state statutes and regulations include:

- Mining activities on non-federal lands (i.e., private/fee or state lands) which are regulated under the Wyoming Department of Environmental Quality – Land Quality Division;

- Wind energy development activities which are regulated under the Wyoming Department of Environmental Quality – Industrial Siting Division; and
- Wind energy development activities on state lands that are regulated under the Wyoming Office of State Lands and Investment.

State regulation regarding cultural resources can be obtained from the specific state agency under which a specific activity is governed.

In addition, there are no state statutes or regulations protecting paleontological resources. Most state policies depend on federal policies and regulations to provide primary regulatory guidance on all cultural, historic and paleontological resources.

## **Soils**

### ***Federal***

- The Clean Water Act (CWA) provides a regulatory framework for soil resource management and protection on all forested lands. It requires each state to identify and implement best management practices to reduce nonpoint source pollution on all lands.
- Laws relating to the USFS that provide for soil resource management/protection:
  - Organic Administration Act of 1897
  - Multiple-Use Sustained Yield Act of 1960
  - Forest and Rangeland Renewable Resources Planning Act of 1974
  - National Forest Management Act of 1976
- BLM Buffalo Field Office Resource Management Plan (BLM 2013, 2014c)
- Section 501(b) of the Surface Mining Control and Reclamation Act of 1977, Part 823. These regulations pertain to highly reproductive soils that have been historically used as cropland and specify revegetation requirements and special techniques for handling prime-farmland soils to ensure that the reconstructed soils are returned to a productivity level to that of surrounding unmined prime farmlands.

### ***State***

- Wyoming Conservation Districts Law Title 11 (W.S. 11-16-101 et. seq.) addresses soil conserving land use practices.
- Best Management Practices generally related to other regulations or resources:

### ***Local***

- Campbell County Comprehensive Plan(CCDPZ 2013)
- Zoning Regulations
- Subdivision Regulations

## Vegetation

### *Federal*

- The following BLM guidelines, as they pertain to integrated vegetation management, can be accessed online (see BLM 2011).
  - BLM Land-Use Planning Handbook - H-1601-1 (BLM 2005b)
  - Federal Land Policy & Management Act of 1976 (FLPMA)
  - Renewable Resource Improvement & Treatment Guidelines & Procedures - H-1740-1 (BLM 1987)
  - Integrated Vegetation Management Handbook H-1740-2 (BLM 2008)
  - Monitoring Manual for Grassland, Shrubland & Savanna Ecosystems (BLM 2005c)
  - Sampling Vegetation Attributes (Cooperative Extension Service et al. 1996)
  - Inventory & Monitoring of Wildlife Habitat Assessing Big Sagebrush at Multiple Scales (Cooperrider et al. 1986 , Homer et al. 2009, BLM 2012)
  - Measuring and Monitoring Plant Populations - BLM Tech. Reference 1730-1 (BLM 1998)
  - Interpreting Indicators of Rangeland Health assessment technique - BLM Tech. Reference 1734-6 (BLM et al. 2005)
  - Multi-scale Big Sagebrush Assessment Technique - BLM Tech. Note 417 (BLM 2005a)
  - BLM Programmatic Environmental Impact Statement Final Vegetation Treatments Using Herbicides in 13 Western States (BLM 2009a)
- USFS FSM 2000 – Range Management Rocky Mountain Region (Region 2) (2005)
- USFS FSM 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management Rocky Mountain Region (Region 2) (2005)
- USFS FSH 2209.13 – Grazing Permit Administration Handbook (1992a)

### *State*

- WDFG Northeast Wyoming Sage-Grouse Conservation Plan (2006)

### *Local*

- Campbell County (CCDPZ 2014)

## Visual

### *Federal*

- BLM – Visual Resource Management (VRM) system (BLM 2014f). The VRM system provides a method to identify and evaluate scenic values to determine the appropriate levels of management by the BLM. It also provides methodology to analyze potential impacts to visual resources and apply visual design techniques so that surface-disturbing activities under the jurisdiction of the BLM better harmonize with their surroundings. Other federal agencies often utilize the VRM system for evaluation of visual effects of projects under their agencies' jurisdiction.
- USFS – Scenery Management System (USFS 1995), with Visual Quality and Scenic Integrity Objectives. The USFS uses the objectives as a way to analyze the degree and acceptability of alteration associated with a proposed USFS-jurisdictional management activity, in terms of visual contrast with surrounding natural landscape.
- BLM Buffalo Field Office – Resource Management Plan (RMP; BLM 1985) and Draft Resource Management Plan Amendment (under review; BLM 2014d). The 1985 Buffalo RMP and subsequent amendments designates most of Campbell County as Class IV, which allows major modification to the existing landscape. The Draft RMP Amendment for the Buffalo Resource Area includes several alternative visual management plans under consideration by the BLM. All of the alternatives would continue to designate most of Campbell County as Class IV. Varying amounts of Class III (allowing moderate change) and Class II (managing for low change) designations are under consideration; these are generally associated with areas west of the Little Powder River in northeastern Campbell County, the Pumpkin Buttes, along I-90, and the Fortification Creek Elk Area/Wilderness Study Area. Two alternatives under consideration would designate small areas of Class I (managing for no or very little change to the characteristic landscape) in the vicinity of the Fortification Creek Elk Area/Wilderness Study Area.
- USFS Thunder Basin National Grassland Land and Resource Management Plan (LRMP; (USFS 2014c). The Thunder Basin National Grassland LRMP has guidelines to manage activities within the National Grassland to be consistent with the scenic integrity objectives that have been adopted by the Thunder Basin Management unit.

### *State*

- Wyoming Department of Transportation (WYDOT): Wyoming Scenic Byways and Backways Program (WYDOT 2009). The purpose of the program is to promote and enhance tourism and the appreciation of the state's heritage along with the preservation, protection and enhancement of the state's scenic, historic and cultural resources. There are currently no designated scenic byways or backways in Campbell County; however, nominations are regularly reviewed by WYDOT so it is possible that a highway segment in the county may be designated as scenic in the future.



## ***Local***

- Zoning Regulations (CCDPZ 2011). The Campbell County Zoning Regulations address visual management throughout the regulations, including in the Wind Generation Overlay District, Master Sign Plan, Gateway Standards, Telecommunications Facilities, and residential and commercial development standards.
- Subdivision Regulations (CCDPZ 2010). The Campbell County Subdivision Regulations address visual resources through the design standards set forth in Section 12.

## **Water**

### ***Federal***

#### Clean Water Act 1972

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The CWA is enforced by the USACE and the USEPA.

#### US Army Corps of Engineers (USACE)

The USACE has regulatory authority under the CWA and the Rivers and Harbors Act. The purpose of these laws is to restore and maintain the chemical, physical, and biological integrity of waters of the United States. Section 404 of the Clean Water Act authorizes the Corps to regulate the discharge of dredged or fill material into waters. Contact information for the Wyoming - U.S. Army Corps of Engineers is provided at USACE (2014).

#### Environmental Protection Agency (EPA)

EPA provides compliance assistance on a sector-by-sector basis in order to efficiently reach facilities with similar operations, processes or practices. Most business sectors are affected by a number of major environmental statutes and regulations. Contact information for the EPA - Region 8 is provided at USEPA (2014c).

#### US Geological Survey (USGS; non-regulatory)

The USGS provides hydrologic information and technical evaluations to appraise the quantity, quality, and movement of the Nation's surface water and ground-water resources. In Wyoming, the USGS is the principal federal agency for the collection of water-resources data. In cooperation with state and local agencies, the USGS operates and maintains statewide networks of surface water and groundwater monitoring sites (USGS 2014c).

#### Interstate Compacts

Additional water regulations are maintained under interstate agreements. Interstate compacts controlling the development and use of water in Campbell County are the Belle Fourche River Compact of 1943 and the Yellowstone River Compact of 1950.

## **State**

Wyoming has two primary regulatory bodies overseeing the state's water resources: Wyoming State Engineers Office (WSEO) and WYDEQ.

### Wyoming State Engineers Office (WSEO)

The Surface Water and Engineering Division is responsible for reviewing applications to put surface water of the state to a beneficial use. Permits are issued for 1) transporting water through a ditch or pipeline; 2) storage in reservoirs; 3) storage in smaller (under 20 acre-feet in capacity and a dam height less than 20 feet) reservoirs for stock water, wildlife, wetlands, and fish propagation; 4) enlargements to existing ditch or storage facilities; and 5) instream flow purposes. The Groundwater Division is responsible for issuing appropriations for all groundwater uses including stock and domestic wells.

### Wyoming Department of Environmental Quality (WYDEQ)

WYDEQ is responsible for monitoring, permitting, inspection, enforcement, and restoration/remediation activities related to ground and surface water. WYDEQ is responsible for enforcing state and federal environmental laws, including but not limited to: CWA, National Pollutant Discharge Elimination System (NPDES), Resource Conservation and Recovery Act, and Federal Surface Mining Reclamation and Control Act.

### ***Local***

#### Campbell County Conservation District (CCCD)

Conservation Districts are political subdivisions of the state of Wyoming. Each District is governed by a board of locally elected supervisors. The CCCD is responsible for providing leadership for the conservation of natural resources within Campbell County. The function of the CCCD is to coordinate technical, educational and financial resources to the meet the needs of the local land user.

### **Weeds, Pests, and Invasive Species**

#### ***Federal***

Executive Order 13112, “Invasive Species”, directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

#### ***State***

The Wyoming State Legislature enacted the Wyoming Weed and Pest Control Act in 1973 (W.S. 11-5-101 et seq.). This act established each Wyoming county as a Weed and Pest Control District.

The Wyoming Board of Agriculture, in conjunction with the Wyoming Weed and Pest Council, determine “Designated Noxious Weeds” (W.S. 11-5-102(a)(xi)) and “Designated Pests” (W.S. 11-5-102 (a)(xii)). These listings provide statewide legal authority to regulate and manage these species.

## Threatened, Endangered, and Special Status Species

### *Federal*

#### Endangered Species Act

The federal ESA (16 United States Code [USC] 1531-1544) provides protection for species of wildlife, fish, and plants that are designated as “endangered species” or “threatened species.” Section 3 (16 USC 1532) defines “species” as a species, subspecies, or distinct population segment of vertebrates. Section 4 (16 USC 1533) provides for the listing of species as “endangered” or “threatened” through a rulemaking process. The two principal provisions of the ESA that accord regulatory protection to listed species are Sections 7 and 9 (16 USC 1536 and 1538). The ESA divides authority for enforcing these provisions between the Secretaries of the Interior and Commerce, placing terrestrial and freshwater species under the jurisdiction of USFWS and most marine and anadromous fish species under the jurisdiction of the National Marine Fisheries Service. In Campbell County, only USFWS would be involved when addressing issues of compliance with Sections 7 and 9 of the ESA.

Section 9 and an implementing regulation (50 Code of Federal Regulations [CFR] 17.31) prohibit “take” of endangered or threatened wildlife species by any person, public or private. “Take” is defined in ESA Section 3 as follows: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in such conduct.” USFWS has defined “harm” by regulation (50 CFR 17.4) to be any act that “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.”

Section 7 applies to federal agency actions, including the federal permitting, authorizing, or funding of actions by non-federal persons. It requires each federal agency to insure that its actions are “not likely to jeopardize the continued existence” of any listed species. It also imposes a second standard on any federal agency actions that may affect listed species’ “critical habitat” which USFWS designates by Section 4 rulemaking. Section 7 requires that the federal agency must insure as well that those actions are “not likely...to result in destruction or adverse modification of” critical habitat. It establishes a procedure for federal agencies to consult with the USFWS to determine whether their actions will or will not result in jeopardy or cause adverse modification.

Because some projects could result in “take” of a threatened or endangered species, and thus be subject to the ESA’s sanctions, Congress amended the ESA in 1982 to provide two mechanisms for authorizing “incidental take,” defined in section 10(a)(1)(B), as take resulting from an otherwise lawful activity. If the incidental take would occur as a result of a federal agency action, Section 7 authorizes the USFWS to issue to the agency an incidental take statement during the consultation process. The incidental take statement permits a prescribed amount of take of listed species caused by the action if the agency adopts reasonable and prudent measures that are recommended by USFWS to reduce the impact of the authorized takes. For any private activity that has no federal nexus – i.e., requires no federal authorization or funding – USFWS, under Section 10, may issue to the landowner or proponent of the activity an incidental take permit also authorizing a prescribed amount of take of listed species. To issue the permit, USFWS must find that the proponent has prepared, and is capable of implementing, a conservation plan (often



called a habitat conservation plan) for the affected species that will “to the maximum extent practicable, minimize and mitigate the impacts” of the authorized takes.

The USFWS publishes information about listing and reintroduction proposals in the Federal Register. To ensure that the public is aware of listing proposals, the USFWS also publishes press releases in area newspapers, and notifies government personnel at the federal, state, county, and municipal level, as well as local organizations. After publishing in the Federal Register, there is a 60-day public comment period, and a public hearing, if requested, must be held within 45 days of publication in the Federal Register. Campbell County can participate in the decision-making process by disseminating information about federal listing decisions to residents, and coordinating communication about additional species information and concerns to the USFWS during the comment period.

The 60-day public comment period for federal listing and reintroduction proposals is the opportunity for interested citizens and stake holders to provide comments or additional information regarding that proposal. Statements may also be submitted at public hearings, if held. Campbell County may gather pertinent information about species occurrence and potential impacts to industries, businesses, land use, and the local economy that could occur due to listing decisions. This pertinent information should be submitted to the USFWS during the public comment period for any listing decisions that affect residents and businesses in Campbell County. Campbell County should work with the USFWS to ensure that County-specific concerns and preferences are communicated and considered during the decision-making process. The USFWS is compelled by law to base listing decisions on the best available scientific and commercial (trade) data. As part of the listing decision process, the USFWS engages peer-reviewers and species experts to review the scientific accuracy of the listing decision (Nicholopoulos 1999).

The USFWS delisting process follows a process similar to listing – when available data indicate that recovery objectives have been met, a delisting proposal is published in the Federal Register, and the USFWS uses information and opinions from species experts, state wildlife agencies, and the public to make a decision about whether the species should be delisted (USFWS 2004). Campbell County can help with the delisting process by cooperating with state, federal, and other wildlife experts to collect information about plant and wildlife populations and their habitats.

Designation of critical habitat affects only federal agency actions or actions for which federal funding or permits are obtained. If an economic analysis indicates that critical habitat designation will cause substantial economic impact that outweighs benefits to the listed species, that area may be excluded from critical habitat, unless exclusion of that area could lead to extinction of the listed species (USFWS 2013c). Development projects may also be exempted from critical habitat restrictions via decision by a federal Cabinet-level committee, but this option has been used only three times since it was created in 1978 (USFWS 2013c). Designation of critical habitat does not require that state or private landowners consult with the USFWS for state or private actions, as long as there are no federal funding, permits, or other federal approvals (i.e., “federal nexus”) involved in the state or private action (USFWS 2011a, 2013b). Development and other actions on federal lands, and land use actions on non-federal lands that involve a federal nexus are required by federal law to consult with the USFWS to ensure that listed species

will not be impacted by the action (USFWS 2011a). The USFWS and other federal and state agency personnel cannot conduct activities on private lands without permission.

Species reintroductions usually are labor-intensive and expensive, and the USFWS works with land owners to ensure that habitat will be conserved so that reintroductions are as successful as possible. Lands with economic or social values that are incompatible with sensitive species reintroductions would be unlikely to be good candidate areas for reintroduction, and Campbell County should work with regional, state, and federal partners to identify such areas.

Candidate Conservation Agreements (CCAs), Candidate Conservation Agreements with Assurances (CCAA), Safe Harbor Agreements (SHA), and the Partners for Fish and Wildlife Program are voluntary programs developed by the USFWS to encourage species conservation on private or non-federal lands. Conservation banking is another system that facilitates species and habitat conservation - credits are created when property is protected and managed for the benefit of a species of interest, and parties can purchase credits to off-set impacts due to development or other actions (USFWS 2012). If a development or other land use activity is likely to result in take of a listed species, a Habitat Conservation Plan (HCP) can be prepared that describes how risk will be reduced or minimized, and is required as part of an incidental take permit, but can also be prepared for candidate species (USFWS 2011b).

An important part of species recovery is providing or improving, and then protecting, habitat where population numbers can increase. The USFWS recognizes that cooperation with private landowners is essential for protecting and recovering listed species since about half of currently listed species have at least 80% of their habitat on private lands (USFWS 2009a). The voluntary USFWS programs (CCAs, CCAAs, SHAs, participation in the Partners for Fish and Wildlife Program, conservation banking, and HCPs) are intended to make it worthwhile for private and non-federal landowners to conserve habitat for listed species by providing monetary incentives and assurances. Such incentives include assurances that land use activities can be conducted even if they result in incidental take of listed species, options to sell mitigation credits, and funds to offset costs incurred from conservation actions (USFWS 2005). Campbell County should coordinate with the USFWS and WGFD to make information about federal and state wildlife conservation programs and incentives available to Campbell County residents.

Residents, businesses, and industries in Campbell County can participate in voluntary conservation programs at the federal, state, or local level. Information about participation in these programs and progress toward species conservation should be communicated with the USFWS during the public comment period in the case of a listing decision. Campbell County should coordinate with residents and communicate with the USFWS to ensure that County-specific concerns and preferences are considered during the decision-making process.

#### Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), (16 USC 703-711), administered by the USFWS, makes it unlawful to pursue, hunt, take, capture, kill, attempt to take, capture or kill or possess, etc. any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and Russia (the countries of the former Soviet Union). Nesting birds and nest contents are afforded protection when eggs or chicks are

present in the nest pursuant to the MBTA. Unlike the federal ESA and the Bald and Golden Eagle Protection Act (BGEPA), no permits are available to authorize take of birds subject to the MBTA. Most bird species that are resident or migratory in Campbell County are protected by the MBTA. The only bird species not protected by the MBTA are game species managed by the WGFD and non-native invasive species such as rock pigeon, European starling, house sparrow, and Eurasian collared dove.

#### Bureau of Land Management

The Buffalo Field Office has a list of sensitive species that may occur on BLM lands in their jurisdiction, including Campbell County (BLM 2014e). Species with BLM special status are listed on available sensitive species lists (BLM 2014e). These species may or may not receive any regulatory protection on BLM lands as part of a sensitive species designation.

BLM management actions are meant to maintain and enhance numbers of sensitive species, as well as their habitats. Development and other land use actions on BLM lands may be subject to surveys for plants and wildlife and impact reduction measures such as timing and date restrictions, disturbance buffers around biological resource features, restrictions on use or speed of vehicles, and other practices intended to protect sensitive species and their habitats. Post-action monitoring also may be required.

#### U.S. Forest Service

USFS managed lands are part of the Thunder Basin National Grassland (TBNG). TBNG is part of the USFS Rocky Mountain Region (Region 2), and the Regional Forester designates a list of sensitive species for the Region (USFS 2001). For actions on USFS managed lands, the USFS may require preparation of a Biological Evaluation (BE) that describes sensitive species that may be present and potential impacts to those species, with the goal of preventing impacts to sensitive species populations that may contribute to the need for federal listing.

### **Predators**

#### *Federal*

- Animal Damage Control Act (7 USC 426-426cAnimal Damage Control ).
- Environmental Assessment for Predator Damage Management in Eastern Wyoming (USDA APHIS 1998).
- USDA APHIS Wildlife Services. Contact Information: Rod Krischke, Wyoming Wildlife Services State Director, 6731 W. Coal Rd., P.O. Box 59, Casper, WY 82602 Phone: (307) 261-5336 FAX: (307) 261-5996 Toll-Free Number: 1-866-4USDAWS E-mail: [rodney.f.krischke@aphis.usda.gov](mailto:rodney.f.krischke@aphis.usda.gov) Web site: [www.aphis.usda.gov/wildlife\\_damage](http://www.aphis.usda.gov/wildlife_damage).
- USFS Thunder Basin National Grassland Land and Resource Management Plan (USFS 2002b).
- USFS Black Hills National Forest 1997 Land and Resource Management Plan Phase II Amendment (USFS 2005).
- USDI BLM Buffalo Resource Management Plan (BLM 2013, 2014c).

## ***State***

- Wyoming Legislative Statutes (W.S.): Title 11 - Agriculture Livestock and Other Animals; Title 23 - Game and Fish.
- Wyoming Livestock Board 1934 Wyott Drive, Cheyenne, WY 82002 Phone: 307-777-7515.
- Wyoming Animal Damage Management Board, 2219 Carey Avenue, Cheyenne, WY 82002-0100. Phone: (307)-777-6781.
- WGFD damage control wardens. Phone: 1-800-842-1934.
- Wyoming Department of Agriculture (WDA), 2219 Carey Avenue, Cheyenne, WY 82002-0100 Phone: (307)-777-3121. Hotline to voice a complaint or concern: 1-800-413-0114.
- Wyoming Wildlife Services State (WS), P.O. Box 59, Casper, WY 82602 Phone: (307)-261-5336.

## ***Local***

- Campbell County Predator Management District, 5201 Tarry Street, Gillette, WY 82718. Phone: (308)-686-7003.

## ***Wildlife***

### ***Federal***

#### **Bald and Golden Eagle Protection Act**

The purpose of the BGEPA (16 USC 668–668c, as amended), administered by the USFWS, is to protect bald eagles and golden eagles, their nests, eggs, and parts (BGEPA 1940). The BGEPA states that “no person shall take, possess, sell, purchase, barter, offer for sale, purchase or barter, transport, export, or import any bald or golden eagle alive or dead, or any part, nest or egg without a valid permit to do so”. The BGEPA also prohibits the “take” of bald and golden eagles unless pursuant to regulations. Take is defined by the BGEPA as an action “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” Under the BGEPA, “disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle; 2) a decrease in productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. However, on September 11, 2009 (Federal Register, 50 Code of Federal Regulations [CFR] 13 and 22), the USFWS set in place rules establishing two new permit types: 1) individual permits that can be authorized in limited instances of disturbance and in certain situations where other forms of take may occur, such as human or eagle health and safety; and 2) programmatic permits that may authorize incidental take that occurs over a longer period of time or across a larger area (USFWS 2009d).

An applicant for a programmatic take permit will work with USFWS to develop “advanced conservation practices” to offset impacts to eagles. Considerations for issuing programmatic take permits include the health of the local and regional eagle populations, availability of suitable



nesting and foraging habitat for any displaced eagles, and whether the take and associated mitigation provides a net benefit to eagles.

Bald and golden eagles occur year-round in Campbell County.

USFS FSM 2600 – Wildlife, Fish and Sensitive Plant Habitat Management Rocky Mountain Region (Region 2) will be adhered to where applicable (2005).

## ***State***

### **Wyoming Game and Fish Department (WGFD)**

Statewide and area specific fishing regulations are developed by the Wyoming Game and Fish Commission. The *Wyoming Fishing Regulations 2014-2015* brochure includes detailed information about the applicable fishing regulations in effect in the state, including species information, daily creed and possession limits, seasons, bait and other topics. There are no area specific regulations in effect in Campbell County. The 2014-2015 fishing regulations can be found at WGFD (2014).

Hunting regulations are also developed by the Wyoming Game and Fish Commission and are revised periodically. These regulations include information on species specific seasons, maps and other rules, as well as regulations for a number of non-species specific hunting activities. The 2013 hunting regulations can be found at WYGFD (2013a).

Wyoming has regulations prohibiting unauthorized stocking of fish or fish eggs. Private citizens can only stock waters in Wyoming following a WGFD permitting system that includes review by the responsible regional fisheries supervisor (Wyoming Game and Fish Commission 2005).

### **Office of State Lands and Investments**

Chapter 13 of the Board of Land Commissioners' *Rules and Regulations* addresses the legal use of State Trust Lands for recreational purposes, including hunting and fishing. The public may access these properties "via public road, right of-way, or easement, via public waters, via adjacent state, local, or federal land if such land is open to public use, or via adjacent private land if permission to cross such land has been secured from the landowner." Violations of these *Rules and Regulations* will result in legal action on the part of the State. Chapter 13 can be accessed at State of Wyoming (2014a).

Chapter 14 of the *Rules and Regulations* provides authority and direction regarding the issuance of temporary use permits, including those for outfitters and guides, on State Trust Lands. Chapter 14 can be accessed at State of Wyoming (2014b).

## ***Economics***

### ***Federal***

#### **Presidential Executive Order 12898**

*Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low income Populations*, was issued by President Clinton in 1994. The purpose of the Executive Order was to focus attention on specific population groups as part of any federal

level environmental analysis. The Order directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The order directs each agency to develop a strategy for implementing environmental justice. The order is intended to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation (Executive Order 12898 ).

The document *Environmental Justice, Guidance under the National Environmental Policy Act*, developed by the CEQ, provides guidance on considering environmental justice during specific phases of the NEPA process, including scoping, development of alternatives, analysis and mitigation (CEQ 1997)

#### [U.S. Forest Service Manual- Economic and Social Evaluation \(Chapter 1970\) and U.S. Forest Service Economic and Social Analysis Handbook \(FSH 1909.17\)](#)

Together, the USFS Manual's Chapter 1970, *Economic and Social Evaluation* (USFS 2008), and the agency's *Economic and Social Analysis Handbook* (USFS [no date]) provide detailed guidance for incorporating economic and social data and evaluation into land use planning and decision-making. The manual sets forth the overall policies and objectives for evaluating economic efficiency and approaching economic impact analysis and social analysis, while the handbook delves into specific methodologies used for the analysis of each of those topics, as well as uses of analytical outcomes.

#### [Bureau of Land Management Land Use Planning Handbook \(H-1601-1\), Appendix D](#)

The BLM's *Land Use Planning Handbook* (BLM 2005) provides guidance to BLM employees for implementing the BLM land use planning requirements of the Federal Land Policy and Management Act of 1976. Appendix D of the Handbook, *Social Science Considerations in Land Use Planning Decisions*, "provides guidance on integrating social science information into the planning process"; that may include economic, political, cultural and social data. The Appendix addresses data sources, data collection and management, environmental justice, analytic guidelines, public involvement and other related topics.

#### [State of Wyoming](#)

##### [Office of State Lands and Investments](#)

Chapter 14 of the Board of Land Commissioners' *Rules and Regulations* (State of Wyoming 2014b) provides authority and direction regarding the issuance of temporary use permits, including those for construction activities, roadways, water wells and other uses, on State Trust Lands.

##### [Wyoming Department of Environmental Quality, Industrial Siting Division](#)

The Industrial Siting Division assesses socioeconomic and environmental impacts for companies planning major industrial developments before they begin the construction permit process. Facilities that may be required to obtain a permit from the Industrial Siting Council include, but are not limited to, power plants, transmission lines, wind farms, landfills, waste incinerators, radioactive waste facilities and other large-scale building projects. Chapter 1 of the Industrial Siting Council's Rules and Regulations outlines the required information to be submitted as part

of the permit application, including information on facility workforce and wages; an inventory of existing social and economic conditions in the project area (population, employment, housing, transportation, public facilities and services); a study of the social and economic impacts of the proposed facility, including land use changes; and an analysis of consistency with state, regional and local land use plans.

The Industrial Siting Council's Rules and Regulations documents can be accessed through the Division's website at <http://deq.wyoming.gov/isd/> or directly through the Wyoming Secretary of State's website at <http://soswy.state.wy.us/Rules/default.aspx>.

### ***Local***

#### **Campbell County Comprehensive Plan**

Chapter Four of the *2013 Campbell County Comprehensive Plan* is focused on Economic Development within Campbell County (CCDPZ 2013). That Plan includes the County's overall philosophy towards economic development, along with an evaluation of the County's economic strengths and weaknesses. Campbell County's stated economic development goals and objectives include the following:

- Support the activities of the CCEDC and the Northeast Wyoming Economic Development Council (NEWEDC), including the implementation of CCEDC's *Five Year Strategic Plan* (CCEDC [no date]) and NEWEDC's *Comprehensive Economic Development Strategy*<sup>15</sup>;
- Increase diversification of the local economy and promote economic growth in new employment sectors;
- Support core industries that are the economic backbone of Campbell County, including the coal industry and other existing industries;
- Maintain a business-friendly environment for new and existing economic endeavors;
- Continue emphasizing initiatives that improve the quality of life for Campbell County residents, including visual appearance of developments and quality of design.

The Comprehensive Plan provides guidance regarding the County's future development and can provide a wealth of input into land use decision making. From an economic standpoint, the Comprehensive Plan reiterates and confirms the County's stance towards encouraging further mineral extraction and energy development, along with the desire to develop new industries, in concert with maintaining or improving the quality of life for residents. This County perspective will be important to state and federal agencies faced with making short and long-term decisions that will impact the local economy and the lives of Campbell County citizens.

#### **Campbell County Economic Development Corporation (CCEDC)**

CCEDC's *Five Year Strategic Plan for Economic Development in Campbell County (2010 – 2015)* was developed to "establish direction for Campbell County's short, medium and long-term economic development". While the plan is not specifically a regulatory document, Campbell

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<sup>15</sup> Referenced in CCDPZ 2013

County and its Board of Campbell County Commissioners have adopted it as part of the economic development goals outlined in the County's Comprehensive Plan. The goals of the CCEDC's plan mirror many of those found in the Comprehensive Plan, including the encouragement of economic diversity, support for existing industries and desire for social improvements. As part of the plan, the CCEDC has developed a long list of specific actions to further those goals.

### Campbell County Zoning Regulations

While Campbell County's zoning regulations do not apply to state and federal properties and would not be applicable to any development or activities occurring on those lands, the regulations would apply to any project related construction of facilities or use of properties outside of state or federal property boundaries. Therefore, state and federal agencies should consider the comprehensive requirements of any project occurring on public lands, including the need for, location of and types of associated facilities that may be developed on private properties throughout the County. Zoning regulations protect the allowable uses of private property, as well as property values; adherence to those regulations will maintain an organized pattern of development in the County that is consistent with County policies and goals. Familiarity with County zoning regulations may be useful when developing certain mitigation strategies to minimize socioeconomic impacts.

## **Timber**

### ***Federal***

#### Best Management Practices

National Best Management Practices for Water Quality Management on National Forest System Lands will be adhered to where applicable (USFS 2012).

USFS FSM 2400 - Timber Management Rocky Mountain Region (Region 2) will be adhered to where applicable (USFS 2001).

#### Public Law 108-7

This law granted the BLM and the USFS 10-year authority to enter into stewardship contracts or agreements to achieve agency land management objectives and meet community needs. This represented an extension of the Forest Service's authority, expands authority to BLM, continues collaboration with state and local communities and tribes, and removes the requirement for project-level monitoring and "non-commercial" restrictions. The USFS now has four 10-year stewardship contracts across the region to remove dead trees to restore forests and increase their resiliency. Additionally, the USFS has awarded several short-term stewardship contracts aimed at improving forest health and adding to local economies.

#### Wyoming Wildland Urban Interface Hazard Assessment

Currently, this is the principle wildland fire response plan for the state. It is produced by a joint venture of the Wyoming State Forestry Division, USFS, BLM, National Park Service (NPS), and other interested parties, with the BLM hosting the data (Wyoming Homeland Security 2011). This is a geographic information system (GIS)-based mapping mission, a fire-hazard mapping program. The assessment maps fire hazard incorporating population density against slope, aspect, and fuels. With the mapping analysis evaluating areas of varying wildfire vulnerability,



the final output will result in a Risk, Hazard, and Value (RHV) map displaying areas of concern (red zones) for wildland fires.

#### Mini Fire Mobilization 2010 Plan (Mini-Mobe)

This document outlines areas of cooperation and coordination with respect to fire prevention, readiness, detection, fuels management, suppression, information sharing, communications, and reimbursement for shared resources. The 'Mini-Mobe' was produced through a joint venture of the BLM; NPS, Intermountain Region; Bureau of Indian Affairs, Rocky Mountain Region (BIA); Fish and Wildlife Service, Mountain Prairie Region; USDA, Forest Service Rocky Mountain and Intermountain Regions; and the Wyoming State Board of Land Commissioners, Office of State Lands and Investments, Wyoming State Forestry Division. The overarching purpose of the Mini-Mobe is to document agreement and commitment to fire management assistance and cooperation between federal, state and local agencies entering into the agreement.

### **State**

#### Best Management Practices

WYDEQ and WSDF Forestry BMPs will be adhered to where applicable. Timber shall be managed according to State of Wyoming and Federal Forestry Best Management Practices (BMP's). Silviculture (the growing and cultivation of trees to meet management objectives) BMPs address timber harvest and road building in order to control nonpoint source pollution of water. Surface water from forested watersheds is often used as a source of domestic public water supply. Subsurface water flow is important as it recharges the water table and is greatly impacted by timber harvesting. Implementation of BMPs has proven to be an effective way to minimize water quality degradation by controlling non-point source water pollution. These practices have the benefit of protecting other natural resources as well. Besides providing water to municipalities, watersheds are important because they: collect, store and filter rain and moderate snow melt; recharge groundwater aquifers; provide habitat for fish and wildlife; connect uplands headwaters with riparian and wetland areas; and provide clear, clean water to streams and lakes for recreation. Compliance with Wyoming's silviculture BMPs is critical to protecting water quality during forest management activities. The ongoing pine beetle epidemics are likely to produce significant increases in water yield from many forested watersheds due to major reduction in live trees on the landscape. However, the resulting increased fuel loading and the potential for large, intense wildfires in the future poses a significant risk to water quality (Wyoming State Forestry Division 2006).

#### Governor's Task Force on Forests

Campbell County recognizes that the well-being of Wyoming's forests requires a coordinated approach to management and will therefore consider the findings of the Governor's Task Force on Forests. Cognizant of the need to better understand the impacts that have resulted from the beetle epidemic and to identify collaborative solutions to some of the problems caused by those impacts, Wyoming Governor Matt Mead formed the Task Force on Forests in 2013. This effort will develop recommendations pertaining to all forests located within Wyoming, working with federal, state, and private landowners. The Task Force will develop near and long term strategies, recommendations and measurable actions that the state (working with federal partners and private interests) can implement (UW 2013).

### Living Snow Fences

The Wyoming State Forestry Division (WSFD) administers and contributes funds to the Living Snow Fence Program, a cooperative effort between WYDOT, WSFD, local conservation districts, and private landowners to implement windbreak plantings for the purpose of snow catchment along state highways.

### *Local*

#### Campbell County Comprehensive Plan

Introducing commercial timber harvest will meet the Plan's goal of increasing diversification of the local economy by supporting the development of Campbell County's resources.

#### Community Forestry

Growing trees in Wyoming communities is difficult and requires commitment, expertise, and funding. This makes community forestry a high priority. Many communities lack expertise or funding and depend on the Wyoming State Forestry Division for assistance. There are areas around the towns of Gillette and Wright designated as high priority for community forestry (Figure C-2). Funding for tree management at the local level continues to increase. As local governments gain a better understanding of the benefits of community trees they allocate more staff and funding to care for their community forests. The community forestry grant program requires a local cash match which in turn has been a catalyst for local governments to create budget line items for community forestry management.



Figure C-2. High priority areas for community forestry in Campbell County, Wyoming.

## Arbor Day Foundation Tree City USA

The Arbor Day Foundation recognizes communities that achieve Tree City USA status. Gillette has been a Tree City USA town for 22 years, and Wright for 19 years. The benefits of this program include creating a foundation for tree care and expanding an innovative community tree program or project. Grants are available through this program.

## **Livestock and Grazing**

### ***Federal***

#### Best Management Practices

National Best Management Practices (BMPs) for grazing will be adhered to where applicable and when reasonable. The Environmental Protection Agency has developed BMPs for grazing operations in pasture and rangeland settings. These BMPs include managing methane production, managing nonpoint source pollution, managing animal feeding operation pollution, controlled grazing and manure management (USEPA 2012).

#### Taylor Grazing Act of 1934

This federal law provides the framework for federal oversight of grazing on public lands. The passage of the act eventually led to the formation of the Bureau of Land Management. Permits are granted under the law for federal grazing leases. A fee is associated with the lease and a limit is placed on the duration of the lease. Leases may be renewed (Holechek et al. 2004). Grazing leases on federal land in Campbell County fall under the purview of this law.

#### Public Rangelands Improvement Act of 1978

This federal law seeks to improve the conditions of the nation's rangelands through national rangeland inventories, federal management policies, and funding for rangeland improvement projects. This law amended the Wild Free Roaming Horses and Burros Act to reduce cost in the administration of the act and to improve methods of dealing with excessive numbers of wild horses or burros on rangelands. The law also amended the Federal Land Policy and Management Act to require district advisory councils for the Secretary of the Interior. This law impacts the Bureau of Land Management and the United States Forest Service (Public Rangelands Improvement Act of 1978).

### ***State***

#### Best Management Practices

Best Management Practices (BMPs) for livestock grazing will be adhered to where applicable. The Wyoming Department of Environmental Quality Livestock/Wildlife Best Management Practice Manual from 2013 can be used as a resource for BMP information and to determine which BMPs are eligible for funding under the Section 319 grant program. BMPs in the manual have been developed to prevent, reduce, or eliminate pollution to Wyoming's water resources (WYDEQ 2013). The manual contains both general and specific information pertaining to BMPs. BMPs found in the manual relate to water sources and shading, range and pasture planting, manure management, fencing, access roads, riparian buffers and many others (WYDEQ 2013).

### Wyoming Statutes Title 11 – Agriculture, Livestock and Other Animals

A series of chapters comprise the Wyoming State Statutes pertaining to grazing and livestock. The statutes include guidance related to many livestock and grazing related issues including control of predatory animals, weed and pest control, protection of livestock, livestock districts, and many others.

### Wyoming Pollution Discharge Elimination System Program

Appropriate Wyoming Pollution Discharge Elimination System (WYPDES) permits will be secured where applicable. The Clean Water Act requires permits be secured for any point-source discharge of a pollutant in Wyoming into a Water of the United States. These permits specify the limitations and conditions of the discharge. Concentrated Animal Feeding Operations (CAFO) is an operation with more than 1,000 animal units confined on site for more than 45 days during the year. An animal unit is defined as an animal equivalent of 1,000 pounds live weight, and equates to 1,000 head of beef cattle, 700 dairy cows, 2,500 swine weighing more than 55 pounds, 125,000 broiler chickens or 82,000 laying hens or pullets. An operation may be classified as a CAFO if the operation negatively impacts the Waters of the State (WYDEQ 2014b). Permits for CAFOs can be secured by contacting the WYDEQ. Multiple regulatory programs are associated with the permitting process resulting in the need for applicants to secure a permit from each program. Contacts for permitting vary by region. Online resources exist that provide information on the permitting process and links to permit personnel (WYDEQ 2014b).

### *Local*

#### Campbell County Comprehensive Plan

The Plan is blueprint for how Campbell County should physically develop between 2013 and 2033 (CCDPZ 2013). The Plan identifies many issues of concern that are associated with grazing and the livestock industry including reduced private property rights and impacts of future development to agriculture. The Plan asserts that Campbell County will work to balance regulations that serve to guide future land use and development with private property rights. The Plan contends that Campbell County will work to promote the continuation of ranching and agriculture in Campbell County including the review of County subdivision regulations to make sure that ranch lands and open spaces are retained (CCDPZ 2013).

#### Campbell County Zoning Regulations

Campbell County zoning regulations are designed to allow individuals to easily determine what regulations pertain to a given parcel of land in Campbell County. The Agriculture Zoning District (A-L) in Campbell County allows for crop production, livestock production, commercial agricultural uses, and other similar land uses. Special regulations pertain to specific individual land uses (CCDPZ 2010).

#### Subdivision Regulations

One of the goals of the Campbell County Comprehensive Plan is to promote the continuation of ranching and the maintenance of open space. Specific subdivision regulations can be found in the Campbell County Subdivision Regulations (CCDPZ 2010).

## Mineral Resources

### *Federal*

#### Bureau of Land Management

The National Environmental Policy Act of 1969 (NEPA) called for federal, state, and local governments to cooperate with the goal of achieving productive harmony between humans and their environment. Federal agencies may allow other governments and agencies to cooperate in the production of environmental impact statements. The Department of Interior requires that every Interior agency offers cooperating agendum status to eligible partners for all environmental impact statements and for environmental assessments as well. The BLM's position on Cooperating Agencies may be accessed at BLM (2013d).

The primary mineral resources that are extracted in Campbell County are coal, crude oil, and natural gas. The majority of these mineral resources occur on lands managed by the federal government, primarily the BLM. In some cases, the BLM manages both the surface and the subsurface minerals and in other cases, the BLM manages only the subsurface minerals. Lands in this later condition are termed "split estate." More information about how the surface and subsurface estates became separated and how the BLM manages split estate can be accessed at BLM (2006).

Split estate ownership has at times been a contentious issue in the recent coalbed natural gas development. While approximately twelve per cent (12%) of the surface is owned by the federal government, over seventy percent (70%) of the minerals under the surface are federally owned. The BLM approves the leasing and development of these federal minerals through a lengthy permitting and regulatory process. Through the Record of Decision and Resource Management Plan Amendments for the Powder River Basin Oil & Gas RMP Amendment (BLM 2003b), the BLM gained regulatory authority on the private surface land over federal minerals through the following language "In order to meet the consistency requirements of FLPMA [Federal Land Policy Management Act], the same standards used for environmental protection of federal surface are also applied to the federal mineral portion of split estate lands. The impacts to surface resources and surface uses from BLM-authorized mineral development must be considered not only on BLM administered public lands but also on split-estate lands." Since Wyoming law makes the mineral estate the dominant estate, private surface owners find themselves faced with allowing federal actions such as wildlife and cultural studies on their private lands, or face the possible threat of condemnation by companies. However, the BLM is required to work with both the surface owner and the proposed mineral developer to reduce impacts on private lands.

A description of how the BLM manages split estate lands, with additional links to specific rules and regulations can be accessed at BLM (2009b).

A description of how the BLM manages split estate lands in Wyoming can be accessed at BLM (2012).

All mining and oil and gas projects involving BLM surface or split estate lands will be subject to review under NEPA. Smaller projects may be approved through an EA; larger projects will be



approved through an EIS. Campbell County can comment on an EA and can have a more active role as a Cooperating Agency when an EIS is prepared.

USFS FSM 2800 – Mineral and Geology Rocky Mountain Region (Region 2) wil be adhered to where applicable (1997).

### ***State***

#### **Wyoming Department of Environmental Quality-Land Quality Division (LQD)**

All mining in Wyoming is permitted by the Land Quality Division (LQD) with over sight by the US Office of Surface Mining Reclamation and Enforcement (OSM) for surface coal mines. The LQD website can be accessed at WYDEQ (2014a).

Guidelines and Standard Operating Procedures for information required in applications to mine can be accessed at WYDEQ (2014c).

Guideline 6 “Organization and Topic Guideline for an Application for a “Permit to Mine” or an “Amendment” for non-coal operations specifies that the permit application be placed in the office of the County Clerk for the County in which their operation is located for public review. In addition, public notification of the pending permit action must be published in a newspaper of general circulation in the area. This guideline specifies that proof of notification be sent to all surface property owners in the permit area, all adjacent surface owners, and all surface owners with  $\frac{1}{2}$  mile of the proposed mine site (WYDEQ 2003).

Standard Operating Procedure (SOP) No. 1.9 specifies that every application for a new coal mine permit or for an amendment, renewal, transfer, or major revision of an existing permit that is sent to public notice must file a copy of their application with the County Clerk for the County in which their operation is located. The applicant must have published in a newspaper of general circulation notice of that filing in the County Clerk’s office. In addition to the applicant’s filing requirements, the LQD will send separate notification to the Board of Campbell County Commissioners and Planners. This SOP can be accessed at WYDEQ (1998).

#### **Wyoming Oil and Gas Conservation Commission (WOGCC)**

The WOGCC issues state-wide rules and regulations to govern the development of oil and gas in Wyoming. Current WOGCC rules and regulations can be accessed through the references below or through the *Rules/Statutes* page on the WOGCC’s website (WOGCC 2014c). These rules and regulations apply to the drilling and mining of private, state, and federally owned minerals. The intent of WOGCC rules and regulations are to prevent waste and to conserve mineral resources, as well as to protect human health and the environment. This is accomplished through designating extraction methods which are designed to avoid soil or water contamination at drilling or producing locations. The WOGCC website contains numerous links to various, voluminous data sets and permitting guidelines. In general, applicants who wish to develop oil and/or natural gas in Wyoming must submit an Application to Drill (APD) to the WOGCC. Guidance to the information requirements to complete an APD can be accessed at WOGCC (2014b).

Separate WOGCC forms must be included in each APPD that document agreements with surface owner(s). If the proposed project is on BLM lands, including split estate lands, the applicant must also submit a separate APPD to the BLM, using BLM forms.

A wealth of information is available on the WOGCC website (WOGCC 2014e). In order to stay abreast of current oil and gas activity, or to review past activity, frequent visits to this website would be prudent.

Specific information by county can be accessed at WOGCC (2014a).

## **Outdoor Recreation**

### ***Federal***

#### **Land and Water Conservation Fund Act of 1965**

The Land and Water Conservation Fund provides certain monies and matching grants to federal, state and local agencies for a number of purposes, including the development of public outdoor recreation areas and the general protection of natural resources. In part, funds can be used for the acquisition of land and water resources, as well as for creating easements on land or water. Recreation planning activities can be funded under the Act. The State of Wyoming must meet certain requirements in order to acquire Fund monies, including the development of a statewide comprehensive outdoor recreation plan (SCORP); Wyoming's plan is discussed under the discussion of state level regulations for recreation.

Information about the Act can be found in a number of places, including FedLaw (2014).

#### **Bureau of Land Management Land Use Planning Handbook (H-1601-1), Appendix C**

The BLM's *Land Use Planning Handbook* provides guidance to BLM employees for implementing the BLM land use planning requirements of the FLPMA (BLM 2005). Appendix C of the Handbook, *Program-Specific and Resource-Specific Decision Guidance*, includes guidance on recreation and visitor services and comprehensive trails and travel management. Identification of SRMAs and Extensive Recreation Management Areas (ERMAs) are discussed, along with recreation management, marketing, monitoring and administration. The boundaries and development of travel management areas and off-highway vehicle management areas are addressed.

The entire BLM Land Use Planning Handbook, including Appendix C, can be found at BLM (2005).

#### **Bureau of Land Management Recreation Strategy 2014-2019**

The BLM's Recreation Strategy: Connecting with Communities was developed by the Recreation and Visitor Services Program. The purpose of the Strategy is to "align the resources of the BLM's Recreation & Visitor Services Program with the desired outcomes of local communities, businesses, and other service providers (as consistent with federal law and policy) to deliver as many benefits as possible to the recreating public." The Strategy emphasizes customer service, collaborative planning with local jurisdictions and promotes social and economic benefits to local communities. It addresses communication and outreach goals.

The Recreation Strategy can be found at BLM (2014a).

USFS FSM 2300 – Recreation, Wilderness, and Related Resource Management Rocky Mountain Region (Region 2) will be adhered to where applicable (1994a).

### ***State***

#### **Wyoming Game and Fish Department**

Statewide and area specific fishing regulations are developed by the Wyoming Game and Fish Commission. The *Wyoming Fishing Regulations 2014-2015* brochure includes detailed information about the applicable fishing regulations in effect in the state, including species information, daily creed and possession limits, seasons, bait and other topics (WGFD 2014). There are no area specific regulations in effect in Campbell County. The 2014-2015 fishing regulations can be found at Wyoming Game and Fish Commission (2014).

Hunting regulations are developed by the Wyoming Game and Fish Commission and are revised periodically. These regulations include information on species specific seasons, maps and other rules, as well as regulations for a number of non-species specific hunting activities. The 2013 hunting regulations can be found at WGFD (2013).

#### **Office of State Lands and Investments**

Chapter 13 of the Board of Land Commissioners' *Rules and Regulations* addresses the legal use of State Trust Lands for recreational purposes, including hunting and fishing. The public may access these properties "via public road, right of-way, or easement, via public waters, via adjacent state, local, or federal land if such land is open to public use, or via adjacent private land if permission to cross such land has been secured from the landowner." Violations of these *Rules and Regulations* will result in legal action on the part of the state. Chapter 13 can be accessed at State of Wyoming (2014a).

Chapter 14 of the *Rules and Regulations* provides authority and direction regarding the issuance of temporary use permits, including those for outfitters and guides, on State Trust Lands. Chapter 14 can be accessed at State of Wyoming (2014b).

#### **Wyoming Department of State Parks and Cultural Resources**

The Department's *Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2014-2019* "serves as a guide for local, state and federal agencies in the development and provision of future outdoor recreation opportunities" (Wyoming State Parks, Historic Sites and Trails 2014a). One of the main purposes of the Plan is to "guide the recreation industry in Wyoming, while protecting and enhancing Wyoming's natural resources." It was developed as a Plan that would identify and begin to address outdoor recreational needs on a statewide level, which would in turn provide guidance for local level actions. Authority for the SCORP comes from the Land and Water Conservation Fund (LWCF) Act of 1965 , whose purpose is to assist in developing outdoor recreation resources, in part by providing funds to individual states to use in various ways. Since 1966, Campbell County has received over \$1.36 million of LWCF monies. The Plan includes a number of goals and objectives regarding land use management in relation to recreational use, facility needs and funding concerns and opportunities.



The *SCORP* can be found at Wyoming State Parks, Historic Sites and Trails (2014a).

### ***Local***

#### **Campbell County Comprehensive Plan**

The 2013 *Campbell County Comprehensive Plan* does not identify or discuss any specific goals or objectives for recreational activities or opportunities in the County. However, the discussion of the Plan's Vision Statement includes recreation as an important factor in the development of the County. The Plan acknowledges that recreational opportunities "contribute to a strong sense of community and place." The Comprehensive Plan can be found at CCPDZ (2013).

### **Transportation and Rights-of-Ways (ROWS)**

#### ***Federal***

- National
  - Federal Highway Administration Transportation Research Board (TRB): TRB Committee ADA40, Transportation Needs of National Parks and Public Lands (ADA40).
    - ADA40 TRB Page & Information Resource Center (TRB 2014a)
    - Transportation Research Board (TRB 2014b)
  - U.S. Department of Transportation Federal Highway Administration (Federal Highway Administration 2014)
  - US DOI BLM (BLM 2014b)
  - NACO (2014)
- Federal Agencies (local) (i.e., Specific BLM RMP, National Park Service Park Planning)
  - U.S. DOI BLM Wyoming (BLM 2014c)
- USFS FSM 7700 - Transportation System Rocky Mountain Region (Region 2) will be adhered to where applicable (1994b).

#### ***State***

- WYDOT
  - General WYDOT (2014)
  - *WYDOT County Road Fund Manual: State and Local Programs* (WYDOT 2011)
- Wyoming State Parks, Historic Sites and Trails (2014b)
- Wyoming Department of Environmental Quality (WYDEQ 2014d)

### ***Local***

- *Campbell County 2013 Comprehensive Plan* (CCDPZ 2013)
- *Campbell County Zoning and Land Use Regulations*, May 2011 (CCDPZ 2011).



# Campbell County State and Federal Land Use Policy

## COLLABORATIVE EFFORT BY:



Environmental  
& Statistical  
Consultants



Clark Mining Services, LLC

