

2022 - 2026

**North Platte Valley Conservation District
Local Land Use & Natural Resource
Management Plan**



**North Platte Valley Conservation District
1441 East M Street, Suite B
Torrington, WY 82240
307.532.4880 ext 101
conservegoshen.com**

Table of Contents

Introductions	
Boundaries	2
Board of Supervisors	2
Conservation District Staff	2
Natural Resources Conservation Service	2
County Commissioners	2
Representatives	2
Senators	2
Executive Summary	3
Conservation District Background	4-5
Legislative Declarations	5-11
District Mission Statement	11
General County Information	12-15
Methodology	16
Policy Statements, Local Data, Objectives	
Water- Local Data	16
Policy	16
Objectives	17
Watershed Study	17-43
Soil- Local Data	44
Policy	44
Objectives	44
Historical Soil Survey	44-46
Range-Local Data	47
Policy	47
Objectives	47
Development-Local Data	47
Policy	48
Objectives	48
Community-Local Data	48
Policy	49
Objectives	49-50
Wildlife-Local Data	50
Policy	50-51
Objectives	52
Resolution of Adoption	53

North Platte Valley Conservation District boundaries lay within the green area of the inset map.

South Goshen Conservation District boundaries lay within the blue area of the inset map.

Lingle/Ft. Laramie Conservation District boundaries lay within the pink area of the inset map.



Board of Supervisors

Art Davis - Chair
David Cushman - Vice Chair
Chrissy Ochsner - Treasurer
Kaye McKee
Enoch Baumgardner

Conservation District Staff

Denise Lucero - District Manager
Vacant - District Tree Technician

Natural Resources Conservation Service

Ryan Clayton - District Conservationist
Jason Newhall – Rangeland Specialist
Jamie Menvey - Soil Conservationist
Shade Frank – Soil Conservation Technician
Terry Kimbrel – Time Systems General Clerk
Jerry Hattan - Irrigation/Water Management Specialist (Retired, Volunteer)

County Commissioners

John Ellis
Cody Cox
Justin Burkhart

Representatives

Vacant H.D. 2
Shirley Duncan H.D. 5
John Eklund H.D. 10

Senate

Cherie Steinmetz S.D. 3
Anthony Bouchard S.D. 6

Executive Summary

The Long Range and Natural Resource Management Plan (hereafter Plan) for the North Platte Valley Conservation District (NPVCD) is an updated five-year plan that serves as the basis for District policy, available for public inspection, and filed at the Goshen County Court House in the Clerk's Office, 2125 E A St, Torrington, WY 82240.

The primary intent of the Plan is to provide guidance and policy for soil and water conservation practices related to the District's mission. Secondly, it is to compel federal agencies to consider local strategies and coordinate with the Board as required by federal law, regulation, and policy. The District hopes this Plan will encourage comments and suggestions from agencies, private landowners, and industry.

NEPA requires all federal agencies to cooperate to the fullest extent possible with state and local government. The Board wants to assert their special expertise, especially as it relates to planning and participation, in federal policies on public lands. The District takes an active role in developing working relationships with the various federal agencies and seeks cooperating agency status on federal planning documents which impact the District.

The overall purpose of the revision is to update natural resource policy statements and amend outdated information in the previous Management Plan. The Board declares its interest in maintaining, protecting, and enhancing soil and water resources within the District, and intends to promote long-term conservation and enhancement of our natural resources while contributing to the economic stability of the District. Issues of concern connected to soil and water resources, such as soil health, water quality/quantity, wildlife, private property rights, and all facets of agriculture, are included where feasible and appropriate.

Key points, in no particular order of importance, described in the Plan include:

NPVCD recognizes the value of farming and ranching, and the historical importance it plays in the economy and culture of Goshen County, and desires a sustainable balance between economic, recreational, and conservation use of lands for economic growth and quality of life.

NPVCD strives to have properly functioning watersheds within the District and promotes wise and sustainable uses of waters for all needs including personal usage, agriculture, and recreation.

NPVCD requests to be part of all federal actions that include soil or water resources, or any change in land use requiring National Environmental Policy Act documentation.

NPVCD promotes the sustainability of healthy wildlife populations and their contributions to the economic stability, but that ecosystem rather than single-species management be implemented.

NPVCD promotes soil health which includes erosion control, and best management practices to control weed and pests, fertility enhancement, and ecosystem diversity.

NPVCD strives to achieve a sustainable balance between energy development, agriculture, and the environment. Given the effects that energy projects may have on area resources, it is essential that potential impacts are fully understood so that development may move forward, while adverse effects are limited or avoided.

NORTH PLATTE VALLEY CONSERVATION DISTRICT NATURAL RESOURCE LAND USE PLAN

North Platte Valley Conservation District's (NPVCD) Natural Resource Land Use Plan has been developed in partial fulfillment of the requirements of the Wyoming Department of Agriculture Base Funding Criteria as per "Wyoming Conservation District Law" (W.S. 11-16- 101 through 11-16-134).

NPVCD has long been respectful of the constitutional concept of private property rights. It is the intent of this Plan to be a guide for the citizens of NPVCD, and others, for identifying and respecting the customs, culture, economic viability, social stability and quality of life found in this unique area, and then applying those values to resource conservation, planning, growth, development, and such changes as may occur within NPVCD through time.

NPVCD Natural Resource Land Use Planning Process

Goshen County Land Use Plan was written and adopted by county commissioners December 15, 1977. The plan addressed the character, quality, and pattern of physical environments for activities of people and organizations throughout the county. Revisions thereafter included subdivision regulations (appendix A), flood damage prevention ordinance and 100 year flood plan (appendix B), regulations for permitting to construct, install or modify individual sewage disposal facilities (appendix C), wellhead protection ordinance (appendix D), and final revision in 1995 to protect the public health and environment of the county to address future development planning. The county land use plan was developed with collaboration of both public and committee input; addresses land use plan regulatory tool use which requires public education prior to individual actions; and is subject to review and periodic change as circumstances within the county change.

NPVCD continues to work with Goshen County Commissioners in matters pertaining to local issues.

Goals adopted by the NPVCD board include the following responsibilities:

- Protect land within the district against soil deterioration
- Rebuild damaged land
- Improve cropland, grassland, reception areas and wildlife habitat
- Reduce floodwater and sediment damage
- Stabilize critical blowout, runoff and sediment producing areas
- Develop water for agricultural, municipal, industrial and wildlife uses
- Improve water management, water distribution, water conservation, and water quality
- Encourage landowners and operators to become cooperators and develop conservation programs to protect and sustain natural resources
- Cooperate with local, state and federal agencies

NPVCD recognizes that it will continue to experience change driven by a variety of social, economic, and natural resource issues and concerns, resulting in programmatic evolution through time.

NPVCD particularly relies on the USDA-Natural Resources Conservation Service (NRCS) for technical assistance and other support.

NPVCD anticipates continuing membership in the Wyoming Association of Conservation Districts (WACD) and The National Association of Conservation Districts (NACD).

Introduction

A number of factors contributed to the rapid deterioration of western agricultural lands during the early 1930s. The application of poor farming procedures, misuse of range, and extreme lack of moisture were probably foremost in creating these adverse conditions.

Recognizing the need to stop further degradation of these valuable lands a bill establishing the Wyoming Soil Conservation Act was established 1941. This Act authorized the establishment of Soil Conservation Districts. These newly formed bodies were given the responsibility of natural resource conservation within their respective districts.

The North Platte Valley Conservation District (NPVCD) is one of 34 districts in Wyoming organized to provide leadership in the wise and sustained use of natural resources. The District has worked to conserve and enhance natural resources in Goshen County since 1953, writing long range plans utilizing community input every fifth year since inception.

Governmental Subdivision of the State

NPVCD is a local government and a governmental subdivision of the state as defined and established by the Wyoming Statutes at Title 11, Chapter 16, et seq., entitled – “Wyoming Conservation Districts Law.” The Board of Supervisors of NPVCD (5 members) are elected by the people of NPVCD at General Elections, by popular vote. The elected members represent both the rural and urban populations within NPVCD. The Supervisors are the only locally elected board charged specifically with the responsibility of representing local people on natural resource issues. A Conservation District Supervisor serves the community and district voluntarily and without pay. The NPVCD Board of Supervisors employs a District Director, and other personnel to implement the projects and programs of NPVCD and the County. NPVCD programs and administration is now supported by a voter approved mill levy, which generates revenue for projects and grants.

NPVCD is guided by the legislative declarations and policy of the Wyoming State Legislature with the following charge:

AS REPRINTED FROM: W.S. § 11-16-103 Legislative declarations and policy

It is hereby declared that the farm and grazing lands of Wyoming are among the basic assets of the state; that improper land use practices cause and contribute to serious erosion of these lands by wind and water; that among the consequences which would result from such conditions are the deterioration of soil and its fertility and the silting and sedimentation of stream channels, reservoirs, dams and ditches; that to conserve soil, and soil and water resources, and prevent and control soil erosion, it is necessary that land use practices contributing to soil erosion be discouraged and that appropriate soil conserving land use practices be adopted.

It is hereby declared to be the policy of the legislature to provide for the conservation of the soil, and soil and water resources of this state, and for the control and prevention of soil erosion and for flood prevention for the conservation, development, utilization, and disposal of water, and hereby to stabilize ranching and farming operations, to preserve natural resources, protect the tax base, control floods, prevent impairment of dams and reservoirs, preserve wildlife, protect public lands, and protect and promote the health, safety and general welfare of the people of this state.

The above, being the charge and direction of the Wyoming Legislature for all Conservation Districts within the State of Wyoming, NPVCD's responsibility to the cooperators of the District is measurable and accountable by the actions NPVCD takes to accomplish the direction given by the Wyoming Legislature.

The NPVCD Board of Supervisors, an elected body and a local government, is the local guide to the management of lands within the jurisdiction of NPVCD and is accountable to the citizens of the District.

Federal Involvement

This plan is intended to provide a positive guide for the people of NPVCD, and local, state, and federal agencies in coordinating their management activities. This should be done in a manner consistent with locally led planning efforts. The intent is to ensure that federal agency actions provide additional benefits to local citizenry. Coordination with a local government, such as NPVCD, can help achieve this important goal.

Statutes exist that outline roles of local government in federal agency planning activities. These statutes generally outline the need to coordinate land use planning activities with state agencies, boards, commissions and departments; and provide technical assistance, information and education to the state, counties, municipalities, regions, and political subdivisions of the state, relative to land use planning.

At the highest levels of our government this intent is evident and mandated by statute. In the Executive Order (13352) for Facilitation of Cooperative Conservation, August 26, 2004, guidance is given to multiple federal government agencies including the Department of the

Interior, Department of Agriculture, Department of Defense, and the Environmental Protection Agency, and states:

"... to ensure that... implementing laws relating to the environment and natural resources in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision making, in accordance with their respective agency missions, policies, and regulations."

"Cooperative conservation" in said order is defined as: *"actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both..."*

The order goes on to state that federal agencies must carry out environmental programs and projects in a manner which:

- "(i) facilitates cooperative conservation;*
- (ii) takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources;*
- (iii) properly accommodates local participation in Federal decision making;"*

Upon gaining Statehood, the State of Wyoming retained concurrent civil and criminal jurisdiction by the State of Wyoming on all lands ceded to the federal government (W.S. 36-10-103). To this end, local government works in coordination and cooperation with federal agencies.

It is the intent of NPVCD to ensure communication with federal and state agencies on proposed actions that affect resources that lie within jurisdictional boundaries of NPVCD. Where appropriate, the NPVCD Board will coordinate with federal and state agencies in planning and implementation of those actions. When formal communication is required, official notification and delivery of information and documents should be directed to the South Goshen Conservation District, 1441 East M Street, Suite B; Torrington, Wyoming 82240. Electronic correspondence should be sent through the website at <http://conservegoshen.com/>; or by e-mail to denise.lucero@wy.nacdnet.net.

Statutory Requirements for Local Government-to-Federal Interaction and Influence

1. The National Environmental Policy Act (NEPA)

NEPA applies to *"every major Federal action significantly affecting the quality of human environment"* (42 U.S.C. § 4332(2) (C)). The courts have interpreted this to mean that every time the federal government spends any amount of money for almost any action, NEPA compliance is required. There are several ways local governments can participate in the NEPA process, depending on the type of federal decision, the level of commitment of the local government, and the goal of the local government.

First, the local government can use its local land use or resource plan as part of the federal agency's "consistency review" process. Under this provision, if the federal agency, in the course of writing an EIS, receives a local land use or resource plan, NEPA commands the federal agency to *"discuss any inconsistency of a proposed action with any approved state or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the [environmental impact] statement should describe the extent to which the [federal] agency would reconcile its proposed action with the [local government] plan or law."* (40 C.F.R. §§ 1506.2, 1506.2(d)).

NEPA also requires that copies of comments by state or local governments must accompany the EIS or EA throughout the review process (421 U.S.C. §4332(c)).

Second, local governments can separately participate in the NEPA process as a "cooperating agency" (40 C.F.R. §1508.5). Pursuant to NEPA, an applicant for "cooperating agency status" must both (1) be a locally elected body such as a conservation district board of supervisors or a county commission; and (2) possess "special expertise." A local government's special expertise is defined as the authority granted to a local governing body by state statute.

Wyoming statutes specifically recognizes a conservation district's duty to:

"provide for the conservation of soil, and soil and water resources of this State, and for the control and prevention of soil erosion and for flood prevention or the conservation, development, utilization and disposal of water, and thereby stabilize ranching and farming operations, to preserve natural resources, protect the tax base, control floods, prevent impairment of dams and reservoirs, preserve wildlife, protect public lands, and protect and promote the health, safety and general welfare of the people of this state." W.S. 11-16-103(b).

Wyoming statutes go on to state that the powers and duties of conservation districts and supervisors include *"cooperate, including but not limited to representing the conservation district as a cooperating agency with special expertise as provided by the National Environmental Policy Act..."* and to:

"Develop and implement comprehensive resource use and management plans for range improvement and stabilization.....In developing plans under this paragraph, the supervisors of the district shall consider the customs and cultures of residents of the district as those customs and cultures relate to the land and resource, current and historical information and data related to the uses of the land and resource... The supervisors of a conservation district which has officially adopted a comprehensive plan pursuant to W.S. §11-16-122 (b)(xvi) may coordinate with federal agencies as provided in the Federal Land Policy and Management Act of 1976, the Forest Rangeland Renewable Resources Act of 1974, as amended by the National Forest

Management Act of 1976 and any other federal statute which provides for coordination with local governments and federal regulations adopted pursuant to this statute.” W.S. §11-16-122(b)(viii), (xvi) and (xxviii).

Third, the Wyoming Statutes state:

“When representing a conservation district as a cooperating agency in matters related to the National Environmental Policy Act and in federal land planning, implementation and management actions, supervisors of a conservation district shall be deemed to have special expertise on all subject matters for which they have statutory responsibility as provided in W.S. 11-16-122, including but not limited to all subject matters directly or indirectly related to stabilization of the agriculture industry, protection of natural resources including but not limited to data and information, conservation of soil and water resources, control and prevention of soil erosion, flood prevention of the conservation , development, utilization and disposal of water within the district.” W.S. § 11-16-135.

These statutes clearly define the local government’s “special expertise” required to be a cooperating agency pursuant to NEPA.

2. Federal Land Policy and Management Act (FLPMA)

FLPMA, which governs the Bureau of Land Management (BLM), provides detailed requirements for “coordination” and “consistency” with local land use plans. With regard to the requirements for “coordination”, FLPMA states (43 U.S.C. § 1712):

“To the extent consistent with laws governing the administration of the public lands, coordinate the inventory, planning and management activities for such lands with the land use planning and management programs of other federal departments and agencies of the State and local governments within which the lands are located...considering the policies of approved State and tribal land resource management programs.”

Such coordination is to be achieved by:

To the extent practical, the BLM must stay apprised of local land use plans (43 U.S.C. § 1712(c)(9)).

- The BLM must assure that local land use plans germane to the development of BLM land use plans are given consideration.
- To the extent practical, the BLM must assist in resolving inconsistencies between local and BLM land use plans.
- The BLM must provide for the meaningful involvement of local governments in the development of BLM land use programs, regulations, and decisions that may impact non-federal lands.

Additionally, FLPMA requires BLM land use plans to be consistent with local land use plans, provided that achieving consistency does not result in a violation of federal law. FLPMA states:

“Land use plans of the Secretary [of the Interior, BLM] under this section shall be consistent with State and local plans to the maximum extent he finds consistent with federal law and the purposes of this Act.” (43 U.S.C. § 1712(c)(9)).

In other words, FLPMA requires both “coordination” and “consistency review.” Coordination should include both regularly scheduled meetings between the various local governments and BLM managers as well as inviting local BLM staff to local government meetings (Bureau of Land Management, 2012). FLPMA’s consistency review requirement states that if a BLM land use plan is inconsistent with a local land use plan, the BLM owes an explanation of how achieving consistency would result in a violation of federal law.

Finally, FLMPA requires that the BLM also provide for a Governor’s consistency review as part of the land use planning process (43 C.F.R. § 1610.3-2€).

3. The National Forest Management Act (NFMA)

NFMA, which governs the U.S. Forest Service (USFS), requires the agency to “coordinate.” The NFMA requires:

“[T]he Secretary of Agriculture shall develop, maintain, and, as appropriate, revise land and resource management plans for units of the National Forest System, coordinated with the land and resource management planning processes of State and local governments and other Federal agencies (16 U.S.C. § 1604(a)).

The fact that the USFS is directed to “coordinate” with local governments implies, by its plain meaning, that the USFS must engage in a process that involves more than simply “considering” the plans and policies of local governments; it must attempt to achieve compatibility between USFS plans and local land use plans.

4. Governor’s Consistency Review Process

State Governors are entitled to a separate consistency review of BLM and land use plans, revisions, and amendments. Title 43 C.F.R § 1610.3-2 provides an opportunity for the Governor to review all proposed plans to identify any inconsistencies with State or local plans. If the Governor’s comments result in changes to the plan, the public should be re-engaged in the process.

Multiple Use

NPVCD, and its citizens, recognize that federal law outlines a multiple use management paradigm of federally managed lands. The Federal Land Policy and Management Act states in objective 7, *“that management be on the basis of multiple use and sustained yield unless otherwise specified by law;”* and in objective 12 the BLM is mandated to manage public lands *“in a manner which recognizes the Nation’s need for domestic sources of minerals, food, timber and fiber.”*

The National Forest Management Act of 1976, Part 1600 states

“(3) to serve the national interest, the renewable resource program must be based on a comprehensive assessment of present and anticipated uses, demand for, and supply of renewable resources from the Nation's public and private forests and rangelands, through analysis of environmental and economic impacts, coordination of multiple use and sustained yield opportunities as provided in the Multiple-Use Sustained-Yield Act of 1960 and public participation in the development of the program.”

The Multiple Use Sustained Yield Act (16 U.S.C. 528-531) states, *“It is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.”*

“Goal 2, Provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems. Recognize the interdependence between the BLM and local communities. Consider natural and social systems across landownership boundaries, including land use patterns and open space.”

NPVCD has long supported multiple use, not only for federally managed lands, but also for State lands. Sustaining multiple uses includes preservation of historic and traditional economic uses on federally and State managed lands within and affecting NPVCD.

NPVCD has no natural forests managed by BLM within its borders.

The District’s Mission Statement

North Platte Valley Conservation District endorses a healthy agricultural community and proliferate tax base, and strives to promote practices that encourage healthy soils, water quality and quantity, tree planting, and enhancement of wildlife habitat. The District will work with conservation partners to protect individual landowner rights, while providing leadership in long-term nurturing of the land.

General Description (2019 Census)

Torrington, WY is the county seat and is located within NPVCD boundaries. Population in 2019 was 6,675. Between 2018 and 2019 the population of Torrington, WY declined from 6,717 to 6,675, a -0.625% decrease.

Median household income grew from \$44,493 to \$51,818, a 16.5% increase. Employed Population totaled 2,960 and had a 1-year decline of 1.33%. Males in the State of Wyoming have an average income 1.48 times higher than the average income of females. The income inequality in Wyoming (measured using the Gini index) is 0.449, which is lower than that the national average.

Resident's considered Persons of Poverty totaled 13.0%. Persons without health insurance totaled 11.7%. (The total of residents determined in Torrington, WY to live below the poverty line totaled 788, a number that is higher than the national average of 12.3%. The largest demographic living in poverty are Females under 5, followed by Females 18 – 24, and then Females 55 - 64. The Census Bureau uses a set of [money income thresholds](#) that vary by family size and composition to determine who classifies as impoverished. If a family's total income is less than the family's threshold than that family and every individual in it will be considered to be living in poverty).

High school graduates or citizen's with higher education totaled 91.2%. The largest university located in NPVCD is [Eastern Wyoming College](#) (224 degrees awarded in 2019).

The largest industries in Torrington, WY are Health Care & Social Assistance (491 people), Educational Services (370 people), and Accommodation & Food Services (254 people).

The highest paying industries are Transportation & Warehousing (\$58,068), Transportation & Warehousing, & Utilities (\$54,125), and Utilities (\$53,500).

Median property values totaled \$150,100, with 2,765 units of housing counted. Homeownership rate totaled 65%.

Most citizens drove to work alone, with average commute time of 11 minutes. Average car ownership totaled 2 cars per household.

Median age was 39.5. Native-born citizens, with a median age of 40, were generally younger than foreign-born citizens, with a median age of 41.

The 5 largest ethnic groups included: White (Non-Hispanic) (82.8%), White (Hispanic) (9.33%), Other (Hispanic) (4.13%), American Indian & Alaska Native (Non-Hispanic) (1.11%), and Asian (Non-Hispanic) (0.869%). 0% of the households in Torrington, WY speak a non-English language at home as their primary language. 99% of the residents in Torrington, WY are U.S. citizens. Torrington, WY also has a large population of military personnel who served in Vietnam, 1.96 times greater than any other conflict.

General Information – NPVCD (Suitewater)

NPVCD is one of three districts located in Goshen County. NPVCD encompasses 434,055 total acres (678 square miles). Of those acres, irrigated lands total 99,312 acres and non-irrigated lands total 334,743 acres.

The percentages of lands in NPVCD are as follows:

Bureau of Land Management: 1.5% (6,353 acres), Bureau of Reclamation: 0.0% (132 acres), Local Government: 0.4% (1,620 acres), Private owned lands: 93.1% (404,021 acres), State owned lands: 4.6% (19,758 acres), State (State Parks & Hist Sites): 0.0% (15 acres), State (University of Wyoming): 0.3% (1,396 acres), State (Wyoming Game & Fish): 0.0% (151 acres).

Elevation within NPVCD boundaries range between a Minimum of 4,024 feet and a Maximum of 5,053 feet, with a Mean Average totaling 4,448 feet.

The mean annual air temperature ranges from 45.5° to 48° F. The frost-free season ranges from 127 to 155 days. Precipitation ranges from 12.5 to 15 inches. About half of the precipitation occurs during the frost-free season.

Soils originate predominantly from sand and clay outwash or “pediments” transported by prevailing winds and surface runoff from the escarpments. The properties of the soil at any given place result from the integrated effects of five major factors of soil formation: parent material, climate, plant and animal life, relief, and time. (Adams 1902, Rapp et al. 1957).

Goshen County History

In the early 1820s to early 1840's, people traversing the Oregon, Mormon, California, and Texas Trails brought many pioneers through the North Platte River Valley. The government promoted settlement in the new lands by passing homesteading acts, which promised “free” land for an investment of five years of living on and improving the land. By the early 1900's, homesteading and reclamation projects of the North Platte brought an increase in population to the area. However, drought and years of depressed economy sent most packing back to their origins. Those that stayed eked a living while battling wind and minimal water issues. Others that found their way to the Valley came in the way of farm labor, mostly to thin and weed sugar beets. Ancestries reported in Goshen County show a major percentage of the population as German descent, with Mexican, English, Irish, Scottish, Swedish, and Norwegian/Scandinavian present. Goshen County grew quickly in the 1920's and survived the depression years of the 1930's because its economy was stabilized by agriculture, and lacked the boom-bust industries of mining, oil, and gas that affected so much of the state.



Goshen County offers wide-open spaces, lower populations, and fertile landscapes on which to build prospering enterprises.

Major crops grown in Goshen County include alfalfa, corn for grain and livestock feed, wheat, sugar beets, and dry edible beans. Goshen County ranks first in the State for agricultural importance to its economy. The County ranks first for corn and cattle production, second in wheat, all hay, and dry bean production. Goshen County continues to produce more cattle annually than any other Wyoming county. Goshen County 2017 Agriculture Census information can be found at:

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Wyoming/cp56015.pdf

Total farms in Goshen County numbered 842, with land in farms totaling 1,256,099 acres. Market value of products sold in 2017 totaled \$201,878,000. Share of sales by type were Crop or Livestock and/or livestock products. Land use practices included No-Till, Reduced Till, Intensive Till and Cover Crop. Crops for Forage (hay/haylage) totaled 76,596 acres. Corn for Grain totaled 29,885 in acres. Wheat for Grain totaled 13,640 acres. Dry Edible Beans totaled 8,862 acres. Corn for silage or greenchop totaled 3,084 acres. Livestock Inventory acres included: Broilers and other meat type chickens (236 acres) Cattle and Calves(124,186 acres), Goats (518 acres), Hogs and pigs (237 acres), horses and ponies (1,787 acres), Layers, (1,857 acres), Pullets (35 acres), Sheep and Lambs (1,328 acres). And Turkeys (48 acres).

The City of Torrington, located in NPVCD, is the County Seat, and houses businesses supporting agriculture in the county. Torrington Livestock Market, LLC, is the largest livestock market in the state. There are three fertilizer distributors, Westco,(which purchased Jirdon AgriChemicals in 2005); Panhandle Coop; and Simplot Growers Solutions which reside within NPVCD boundaries. Kelly Bean Company, established in 1927 in Scottsbluff, Nebraska, has matured into one of the largest markets of dry edible beans in the world, and houses a receiving station in Torrington.



The County has two major highways, US 26, which runs east and west through the county, and US 85, which runs north and south. Other smaller municipalities within Goshen County are Fort Laramie, Lingle, Yoder and LaGrange.

Hawk Springs, Huntley, Veteran, and Jay Em are small, unincorporated communities in the county.

Enthusiasts enjoy all sorts of outdoor recreational opportunities that include fishing, hunting, camping, hiking, and boating. The draw of Goshen County is its agrarian lifestyle; opportunities to own and be stewards of the land. The allure of Goshen County is the heritage of the people; raising families on land passed from generation to generation, learning the value of hard work, and appreciating a simpler lifestyle. The appeal of Goshen County is majestic views and abundant, diverse wildlife. The reality of Goshen County is productive soil, clean water, and fresh air. The conservation districts strive to maintain the many attributes of Goshen County through vigilance against those that do not have the county's best interests in mind. The commitment of the districts is to educate about preserving the soil, protecting the water, and safeguarding wildlife habitats while maintaining the heritage and history of Goshen County.

Most of Goshen County is in the Middle North Platte-Scotts Bluff Watershed, with Lower Laramie and Horse Watersheds stretching into parts of the county. The North Platte River flows through the valley as the major tributary, which runs through Colorado, Wyoming, and Nebraska. The Laramie River, Rawhide Creek, Horse Creek, Deer Creek, Cherry Creek, Katzer Drain, and Bear Creek are smaller tributaries that dump into the North Platte River. Larger bodies of water for irrigation and recreation include Hawk Springs Reservoir and Springer Lake. Pathfinder Irrigation and the Gering-Ft. Laramie are two major irrigation canals that flow through the county. Watershed dams constructed to control flooding include Arnold Drain, London Flats-Bovee, Angell Draw, Spring Canyon, Case Bier, and Pine Ridge.

Goshen County boasts many historical trails including the Oregon Trail, Mormon Trail, California Trail, and the Texas Cattle Drive Trail.

Black and white photograph of the Oregon Trail Marker #12 in Goshen County, Wyoming. Located next to Cold Springs Information Sign south of Torrington, Wyoming and approx. 1.6 miles south of the 85-26 intersection. The view is east looking at the front of the marker from the turnout.



NPVCD Mission

Methodology and Public Process

The District has an ongoing interest in understanding and documenting the local key resource issues. Statistical information was gathered from many sources and datasets including 2016 census information, public meetings and workshops, and outreach through media sources. This publication was released for a 45-day public comment period from October 8, 2021 to November 19, 2021. Unfortunately, no comments were submitted.

Policy Statements, Local Data, Analysis, and Mitigation

In order to develop broad issue-based policies, this Plan recognizes priority issues of concern within the following resource area categories. Current specific policies of the District are provided as follows, recognizing that significant programmatic overlap occurs. For example, education is a necessary component of all priority issues to varying degrees.

- 1. Water**
- 2. Soil**
- 3. Range**
- 4. Development**
- 5. Community Service**
- 6. Wildlife**

WATER: LOCAL SUPPORT DATA

Protection of water resources (water quality, quantity, and demands) was identified as the most important issue to constituents within NPVCD in a survey conducted in 2021. Concerns include agricultural sustainability and local economy affected by drought, demands of downstream water users, and effects of flood and pivot irrigation concerning ground water recharge and sediment movement.

Without water, there is no life. In the interest of protecting, preserving, and sustaining our water supply, the Board gives serious consideration to this resource.

Policy: Water

#1: The District opposes the use, sale, or lease by the State, of any Wyoming basin water to out of state entities. Any sale, or lease, of water out of basin, will be mitigated by storage, before the transaction is approved. Further, the District does not support trans-basin diversions.

#2: The District opposes interstate water transfers as they have adverse impacts on Wyoming water rights, existing commitments to maintain flows in the North Platte River system, and adverse impacts to future water development in Wyoming.

#3: The District advocates protecting of existing water rights and water uses within the District for long-term conservation and enhancement of our natural resources which will contribute to the economic stability of the District and its residents.

#4: The District encourages and facilitates development of water storage facilities to meet Wyoming water needs.

#5: The District supports efforts to ensure Wyoming Water Law, as it exists, is adhered to in all cases. Further, the District wants to ensure historic and customary beneficial uses under Wyoming State Law take precedence over any, and all, in-stream flow use designations.

#6: The District supports water quality monitoring as a part of all energy and right-of-way development projects to ensure groundwater and surface water quality is not degraded.

#7: The District supports Wyoming State Water Law and the State's right to administer all water. Further, the District is opposed to any federal government action which adversely affects state's rights where water law is concerned.

#8: The District supports private rights in the administration of riparian or wetland areas.

#9: The District supports a fair monetary compensation for agriculture water right takings for any environmental or wildlife purposes.

#10: Any new demands for water needed under the Platte River Cooperative Agreement in the habitat area in central Nebraska would need to come from non-traditional sources, such as cloud seeding, to protect the current water use system in the district and a policy established after public input for low water years.

Objectives: Water

Strive to maintain and improve the quality and quantity of the District's waters through education, technical assistance, Best Management Practices, and coordination, and increase the efficient use of water through the same processes.

Participate in watershed studies and plans to maintain and/or improve the ecological health and quality of water within all watersheds in the District.

In conjunction with local, state and federal planning partners, develop strategies to maintain and improve watershed conditions that address availability of water for critical needs, including municipal uses and agriculture, while attaining stream bank stability, habitat, and riparian health.

Public information regarding two (2) watershed studies (Niobrara-Lower North Platte Rivers Watershed Management Plan April- 2019) and (Horse Creek Watershed Management Plan December 2019) are available at <http://wwdc.state.wy.us>

Watershed Evaluation in NPVCD

In 2014, the Niobrara Conservation District (NCD), in cooperation with the other sponsoring conservations districts—Platte County Resource District (PCRD), Lingle-Ft. Laramie Conservation District (LFLCD), and the North Platte Valley Conservation District (NPVCD)—requested that the Wyoming Water Development Commission (WWDC) conduct a comprehensive study of the Niobrara–Lower North Platte Rivers Watershed. The local sponsors requested that the Level I watershed study evaluate the current watershed condition and function, river and creek geomorphic classification, irrigation system efficiency, groundwater resources, water and flood storage, and wetland and riparian areas, and identify water development opportunities on irrigated lands, rangelands, wetlands, and streams. In 2017, the WWDC approved funding for the watershed study and then contracted with RESPEC to provide professional services for the Niobrara–Lower North Platte Rivers Watershed Study.

This Level I study provided important information that the NCD, LFLCD, and NPVCD (the study's local sponsors) and neighboring conservation districts and the WWDC (the study's sponsor) could use in developing water resources and implementing conservation practices that address water- and land-resource concerns within the study area. This watershed study includes in-depth descriptions about needed water development projects that could provide economic, ecological, and social benefits to the state of Wyoming and its citizens.

What Is a Watershed Study?

A watershed is defined in the Merriam-Webster Dictionary as "a region or area bounded peripherally by

a divide and draining ultimately to a particular watercourse or body of water” [Merriam-Webster, 2013]. The Operating Criteria of the Wyoming Water Development Program [WWDC, 2018] describes Level I study’s as preliminary analyses and compares development alternatives. A Level I study is also used for master plans, watershed improvement studies, and other water-planning studies.

Specifically, the Operating Criteria of the Wyoming Water Development Program, [WWDC, 2018a] describes watershed studies as:

These studies provide a detailed evaluation of an individual watershed. The studies may identify water development and system rehabilitation projects as well as address erosion control, flood control or other non-water development related environmental issues. Watershed improvement studies are an integral part of the Small Water Project Program, which has its own specific criteria. The studies may identify projects that may be eligible for the New Development, Rehabilitation, or Dam and Reservoir Programs.

Today, conservation by watershed is an old concept with new horizons. Watersheds have long been recognized in the western United States for their significant natural resources and the interrelationships found contained in land areas connected by stream systems. These relationships were recognized by John Wesley Powell from his early expeditions of the west and resulted in proposed conservation, low density open grazing, irrigation systems and state boundaries based on watershed areas. The conservation concept developed over time to coalesce in the early 1930’s with the formation of special districts whose boundaries were often based on watersheds. At that time the relationship between stream systems and landscape function was recognized. This relationship was broadened to embrace watershed condition and quality and its response to human influences. This further provided some understanding of the historic land use effect on watershed condition and how management and restoration needs to be based on local landscape characteristics. Today, these relationships are embraced by the Wyoming Water Development Commission and Office through a watershed study program. On behalf of a local community sponsor, a

watershed study can provide a comprehensive evaluation, analysis and description of the resources associated with a watershed and the watershed’s water development opportunities. It is best stated that information related to the physical sciences is incorporated into a biological system. There are three prominent issues that are important considerations in a watershed information review and study. The first is surface water storage. Surface water storage is often of significant interest to a watershed community in order to address seasonal and/or annual shortages of water supply, augment late season stream flow to benefit riparian habitat and wildlife, address flood impacts, enhance recreation opportunities, improve water quality and stream channel stability. Second is the evaluation of irrigation infrastructure and development of information necessary to guide its rehabilitation. Of interest to local water users are ways to improve water delivery and on-farm irrigation efficiencies often timed to address annual or seasonal shortages of water supply or irrigation water delivery issues. Third is the enhancement of upland water resources and distribution for livestock and wildlife that allows grazing management adjustments for range resource improvement. Benefits to the watershed, through plant community invigoration, reduction of erosion and stream channel stabilization, can be achieved from water development projects being strategically implemented over the watershed. Other issues and opportunities such as making beneficial use of produced water and removal of highwater demand invasive species can also be important. A watershed study, providing management and rehabilitation plans for water storage, irrigation systems and upland water development, can help empower a community to proactively enhance their watershed. Conservation by watershed can be an effective

holistic approach to embracing the natural resource challenges and opportunities facing a community. A watershed study can provide the information to meet those challenges.

Surface Water- Watershed Study

Hydrography

The Niobrara–Lower North Platte Rivers Watershed is in the eastern portion of the Guernsey to State Line Subbasin of the Platte River Basin and in the southeastern portion of the Northeast River Subbasin in eastern Wyoming. Approximately 1,945 stream miles are located within the watershed with 215 miles of streams classified as perennial, 1,380 miles are categorized as intermittent, and another 350 miles are classified as canals and ditches. The Niobrara River and its tributaries (Bergreen Creek, Duck Creek, North Branch Silver Springs Creek, North Duck Creek, Quinn Creek, Silver Springs Creek, and Van Tassell Creek) and the North Platte River and its tributaries (Aego Creek, Cold Springs Branch, Crystal Creek, Dry Rawhide Creek, JM Creek, Laramie River, Molly Fork, Muskrat Creek, Negro Baby Creek, Pine Ridge Creek, Rawhide Creek, Red Cloud Creek, Red Cloud Slough, and Sixmile Creek) are important streams within the watershed. Other tributary streams within the watershed include Box Elder Creek and Cherry Creek, which are intermittent, stream flows that do not reach the North Platte River. The headwaters of Sheep Creek are located within the study area; however, the creek stream does not flow into the North Platte River in Wyoming but enters the river downstream in Nebraska.

In July 2011, a flood-related Federal Disaster Declaration was declared when severe storms, flooding, and landslides occurred in 15 counties, including Goshen County, from May 18, 2011, to July 8, 2011 [Federal Emergency Management Agency, 2011]. In May 2016, flooding on the Laramie River and the North Platte River was triggered by snowmelt runoff and heavy rains and caused damage near Fort Laramie and the surrounding areas in Goshen and Platte Counties. In June 2016, strong thunderstorms hit the city of Torrington and the surrounding area, depositing an estimated 3 to 5 inches of rainfall that caused damage to streets, roads, and basements.

Goshen County has a well-documented flood history and in 2007, Goshen County approved their Local Hazard Mitigation Plan, which expired in 2012 [Goshen County, 2006; Federal Emergency Management Agency, 2015b]. Following widespread flooding in 2011 within Wyoming, the emergency management agencies with the state of Wyoming and Goshen County coordinated with the Federal Emergency Management Agency (FEMA) Region VIII Office in assessing flood risk and mitigating flood impacts statewide and Wyoming's Multi-Hazard Mitigation Plan received a comprehensive update in 2014. On March 2, 2015, the state of Wyoming, Goshen County, and FEMA held a meeting in Torrington to identify areas of concern and priorities of communities within the watershed and determine areas for further flood risk assessment [FEMA, 2015]. Information on flood-risk and mitigation priorities from communities was gathered to identify previous flooding events, local flooding hazards, and flood mitigation risks during the meeting. In 2017, Goshen County adopted the State of Wyoming's Region 7 Hazard Mitigation Plan to augment the county's emergency planning efforts.

Geomorphology

The watershed's geomorphology can be described as rolling plains, buttes, escarpments, and tablelands dissected by canyons, gullies, channels, and valleys draining to the Niobrara River in the north and the North Platte River in the south. Elevations within the watershed gradually decrease from west to east. Structural features of the watershed include the Hartville Uplift on the west boundary of the watershed and the Goshen Hole Lowlands in the southwest area of the watershed. Surficial geology within the

watershed includes residuum, alluvium, and eolian units while Quaternary and Tertiary bedrock geologic deposits underlie almost the entire watershed.

The objectives of the geomorphic task were to classify stream systems within the watershed using the Rosgen Stream Classification System and to assess the channel structure, morphology, and stability of streams where appropriate. This classification can aid in understanding channel forms and identifying suitable measures for improving stream segments. This initial Rosgen classification consists of a broad geomorphic characterization that is based on the available data including soils, climate, basin and valley shape, and the plan, profile, and pattern of a river or creek channel.

The project team's classification incorporates aerial imagery, geospatial data, digital terrain models, and available studies to determine channel sinuosity, channel slope, and corresponding Rosgen stream channel type. There are approximately 1,945 stream miles in the study area with 215 miles classified as perennial streams; 1,380 miles categorized as intermittent streams; and another 350 miles classified as canals and ditches. The Rosgen classification that was completed focused on the Niobrara River and the North Platte River and their major tributaries because of the availability of information, existence of problem areas, and likelihood for improvements projects on those stream segments.

Channel Structure and Stream Stability

The channels in the watershed generally appear stable and functioning. However, some segments on the Niobrara River and the North Platte River have channels that have changed or perhaps are changing. Recent periods of drought and low flows followed by increased precipitation, high flows, and flooding events likely contributed to these changing conditions. Some river segments that were visited during the inventory had reaches that are adjusting to disturbances from natural and/or man-made events which mainly included high flows associated with floods. Field visits conducted on participating landowners' properties involved evaluating some unstable channels that indicated streambank erosion, sediment deposition, and lateral instability. A few of those reaches also appeared to be entrenched and lacked adequate vegetative cover to resist erosion during runoff or high flow events.

Channel morphologies and hydrologic regimes of the Platte River and its tributaries, the South Platte and North Platte Rivers in Colorado, Wyoming, and Nebraska have undergone major changes since 1860, when the water resources of the Platte Basin began to be developed for agricultural, municipal, and industrial uses [Eschner et al., 1983]. Reservoir storage and river flows are managed to provide water for irrigation water delivery, hydroelectric power production, municipal and industrial water supply, flood control, outdoor recreation, and fish and wildlife preservation in Wyoming and Nebraska [US Bureau of Reclamation, 2018]. The dominant characteristic of the North Platte River is its flow-regulated conditions controlled by seven impoundments; Seminoe, Kortes, Pathfinder, Alcova, Gray Reef, Glendo, and Guernsey Reservoirs [WDEQ, 2007]. The impoundments and diversions greatly influence the ecological structure and function of the North Platte River [WDEQ, 2007].

Groundwater

Groundwater in the watershed is important for livestock/wildlife water, private domestic wells, municipal water, and stream flow. Groundwater availability within the watershed is variable because of the diverse aquifer characteristics and hydrogeological properties in the study area. Site-specific groundwater investigations were not conducted; hydrogeologic investigations and possibly modeling should be included in the planning for any proposed groundwater development project. A summary of groundwater resources can be found in the recently completed Platte River Basin Water Plan Update Groundwater Study, Level I (2009–2013) [Taucher et al., 2013] and Lusk Area Groundwater Level 1 Study

[Hinckley et al., 2009] provide a more thorough treatment on the topic. Contained in Taucher et al. [2013] are maps with groundwater potentiometric surface elevations and contours for selected aquifers within the Platte River Basin.

Aquifers

An aquifer is geologic unit that is permeable and saturated enough to yield sufficient quantities of water. Several aquifers or hydrostratigraphic units occur throughout the watershed. Quaternary and Tertiary aquifers are grouped into the High Plains Regional Aquifer System, which is a significant aquifer not only throughout southeastern Wyoming but also the central United States. Within the watershed, this Aquifer System consists of several lithostratigraphic units including: Quaternary Alluvial and Terrace aquifers, the Ogallala aquifer, Arikaree aquifer, and the White River aquifer (including the Brule aquifers and confining units and locally in the Goshen Hole area the Chadron aquifer).

The Quaternary Alluvial aquifer principally occurs within the North Platte River Valley. The aquifer consists of permeable sand and gravel deposits along with interbedded silts and clay. As noted by Rapp et al. [1957], alluvial thickness in Goshen County varies considerably from 0 to 200 feet or more. Because alluvial aquifers are confined to stream valleys, they are limited in aerial extent, often unconfined, and are in hydraulic connection with water in adjacent streams and rivers [Taucher et al., 2013]. Two studies in Goshen County, including pump test data [Weston Engineering, 1998] indicate that the North Platte River alluvial aquifer is in “minimal hydraulic connection with underlying bedrock hydrogeologic units” [Taucher et al., 2013]. The North Platte River alluvial aquifer supplies water to stock, domestic, and irrigation wells, as well as provides municipal water in Torrington and Fort Laramie [Taucher et al., 2013]. Rapp et al. [1957] also estimated that amount of groundwater flow within the alluvial aquifer at the Wyoming–Nebraska state line to range from 6,500 to 7,000 acre-feet per year. Along with the alluvial aquifer mapped by the Wyoming State Geological Survey (WSGS), other unconsolidated quaternary deposits, particularly terrace and loess deposits, form local aquifers. In Goshen County, terrace deposits are up to 210 feet thick [Rapp et al., 1957]. These units are primarily recharged through irrigation practices, including loss from unlined irrigation canals and ditches; water levels fluctuate in response to seasonal application of water for irrigation and well yields typically fluctuate based on amount of recharge [Taucher et al., 2013]. Groundwater flow in the quaternary terrace-deposit aquifers generally follows surface topography, though near Torrington groundwater flow direction in the Quaternary is influenced by bedrock topography [Rapp et al., 1957]. Note that loess deposits are generally unsaturated in the watershed but serve as a soil type with enhanced filtration [Rapp et al., 1957].

The Ogallala Formation is exposed only in small scattered outcrops within the watershed. The Ogallala Aquifer is a heterogeneous fluvial deposit consisting of gravel, sand, silt, clay, and minor volcanic ash [Taucher et al., 2013]. Because of the heterogeneity of the deposit, wells drilled into the aquifer may have fair to very low well yields [Taucher et al., 2013].

The Miocene-age Arikaree Aquifer is present at the surface over nearly the entire northern half of the watershed and across much of the extent of the High Plains Aquifer System throughout the Midwest [Taucher et al., 2013]. The Arikaree consists of 0 to 1,000 feet of interbedded volcanic sandstone and siltstone [Rapp et al., 1957]. The Arikaree Aquifer is a low permeability aquifer though larger yields are seen where fractures have added secondary permeability [Rapp et al., 1957]. In Niobrara County, the Arikaree Aquifer is a major source of water and supplies water to stock and domestic wells as well as municipal water supplies at Lusk and Manville [Whitcomb, 1965; Hinckley et al., 2009].

The White River Group consists of the upper Brule Formation and lower Chadron Formation. In general, the White River Group forms a confining unit below the High Plains Aquifer System; however, locally such as in the Goshen Hole, permeable sandstone and conglomerate beds may form small local aquifers, particularly where in hydraulic connection with overlying Tertiary aquifers. In Goshen County, Rapp et al. [1957] describe the Brule Formation as 0–420 feet thick, and the Chadron Formation is 0–245 feet thick. The Brule Formation is primarily siltstone, and the Chadron Formation an upper siltstone and a lower fluvial deposit [Crist, 1975]. Wells in the White River often have low yields, except where secondary fracture permeability increases yield [Taucher et al., 2013].

Paleozoic units outcrop at the Hartville Uplift and along the northwestern edge of the watershed. The Hartville Formation or Hartville Aquifer is a confined aquifer except where it outcrops. The Hartville Aquifer consists of limestone and dolomite with sandstone beds at the top and base of the formation. Most study area wells in the Hartville Aquifer are located near the Rawhide Buttes and are completed in the upper Converse Sandstone [Hinckley et al., 2009]. The Hartville Aquifer is underlain by the Mississippian age Guernsey Aquifer [Rapp et al., 1957] as having an upper cherty limestone and lower dolomitic and dolomitic siltstone unit. These Paleozoic aquifers are penetrated by relatively few wells in the watershed and do not represent widespread use as depth increases and water quality decreases away from the outcrop area.

Groundwater Levels and Flow Direction

Depending on the location in the watershed, groundwater can be found at varying depths; areas near streams and alluvial valleys have shallower groundwater with depths from 5 feet or more. Other locations in the watershed have deeper aquifers with depths several hundred feet below the ground surface. Groundwater flow is driven by gravity and hydraulic head. Within the watershed, groundwater generally flows from areas of higher elevation on the western side of the watershed eastward to areas of lower elevation at the state line. Particularly in Quaternary alluvial aquifers, groundwater flow is toward streams or in the direction of streamflow [Taucher et al., 2013]. Potentiometric surface or water level maps for select aquifers are contained within Crist [1975] and Taucher et al. [2013].

In the central and east-central portions of the watershed, several wells are completed in confined aquifers and have artesian conditions [Rapp et al., 1957]. Water-level monitoring indicates seasonal fluctuations in the water table driven primarily by irrigation. On average, the water table rises 5 feet during the irrigation season because of seepage from canals and irrigation; in areas where canals are higher above the water table changes can be as much as 25 feet [Rapp et al., 1957]. However, long-term trends seem to indicate a small, consistent decline in water levels across the region [Hinckley et al., 2009]. Declines have occurred in the Prairie Center area; and near Lusk, the Arikaree Aquifer has experienced water level declines up to 30 feet between 1960 through 2008 [Hinckley et al., 2009].

Within Niobrara County, the State Engineer's Office (SEO) actively monitors water levels at three wells. Respectively. In northern Goshen County, the SEO actively monitors water levels at seven wells. Since monitoring began, there have been water level declines in most of the monitoring wells except in the Niobrara No. 2 well and the Sandstone #1 well.

Groundwater System Flux

Changes in the volume of water in an aquifer system are related to the flux of water into and out of the aquifer. Within southeastern Wyoming, recharge to groundwater aquifers occurs via precipitation infiltration, losses or seepage along streams and unlined canals, or from application of irrigation waters. In irrigated areas recharge is from a combination of these mechanisms, though in non-irrigated areas

recharge is dominated by direct precipitation. Groundwater discharge occurs in several ways including spring flow, seepage into streams (gaining streams) as baseflow, leakage between hydrostratigraphic units, evapotranspiration, and well withdrawal.

Recharge

Precipitation that infiltrates and percolates downward enters an aquifer as recharge. While recharge is difficult to accurately quantify, recharge is estimated based on precipitation and percolation percentages for soil/vegetation combinations. Recharge is most notable at bedrock aquifer and alluvial aquifer outcrops that border mountain ranges and uplifts as well as recharge to alluvial aquifers along losing stream channel segments. The estimated net annual aquifer recharge rate in the watershed is 1–5 inches per year (in/year) across most of the watershed, though recharge rates are lower, approximately 0.25–0.75 in/year, along the North Platte River and other stream channels [Taucher et al., 2013].

Aquifer recharge was also estimated as a percentage of net annual precipitation (which varies from 11–15 in/year); recharge percentage varies from 1.5 to 5 percent along the North Platte River and major drainages and increases to 5.1–10 percent across most the rest of the watershed, though small areas have higher recharge percentages at 10–20 percent [Taucher et al., 2013]. Within the shallow aquifers of the watershed, though, recharge is heavily influenced by agricultural practices. Surficial aquifers such as the Quaternary Alluvial Aquifer receive significant recharge from unlined canal and ditch seepage as well as some recharge from infiltration of irrigation water over fields [Taucher et al., 2013].

Springs and Natural Groundwater Discharge

Where the water table of an aquifer is above the land surface elevation, springs may form. Nearly 110 springs have been identified within the study area. Springs occur where permeable material overlies low permeability material, particularly at the contact between the Brule and Arikaree formations. Most springs are located in the Wildcat Hills, Rawhide Buttes, and Goshen Hole Rim areas of the watershed as well as near the North Platte River near Torrington. Notable springs within the study area include Bowen, Habig, Moore, Muskrat, Reynolds, Silver, Wolf, and Woodworth springs. According to Rapp et al. [1957], area springs are all gravity fed and are not under artesian pressure.

Base Flow Contribution

Within the study area, groundwater discharge is dominated by discharge to streams as baseflow, primarily the result of irrigation recharge to alluvial aquifers which feeds local streams. Rapp et al. [1957] describe that “prior to irrigation no perennial streams flow into the North Platte River between Torrington and the State Line; at present three perennial drains (the Cherry Creek, Katzer, and Arnold drains) contribute to the flow of the river.” The North Platte River is generally a gaining stream during the summer, though is a losing stream during the winter [Parks, 1991]. Analysis of groundwater baseflow along the North Platte River from 2¼ miles downstream of Whalen Dam to ¼ mile upstream of the state line indicate that much of the North Platte River is a gaining stream with baseflow contributions from groundwater varying from 76,320 to 179,000 acre-feet per year [Crist, 1975; Rapp et al., 1957].

Based on potentiometric contours, Crist [1975] described Rawhide Creek as “a gaining stream in the upper reach and a losing stream in the lower reach near the North Platte.” Horse Creek has flows entirely derived from groundwater baseflow [Rapp et al., 1957]. On the Niobrara River, groundwater and springs supplied by the Arikaree Aquifer contribute a significant portion of baseflow to the river [Whitcomb, 1965]. In 2016, the WSGS published a statewide groundwater recharge study that included

estimates of the baseflow component of groundwater [Taboga and Stafford, 2016]. This investigation incorporated data for climate, evapotranspiration, land cover, streamflow, and hydrogeology. The baseflow contribution to streamflow varies from 0 to 5 centimeters per year (cm/year) (1 to 2 in/year) within the watershed, though aquifers across most of the watershed contribute less than 1 cm/year (less than 0.4 in/year) to baseflow.

Wells and Groundwater Usage

Groundwater information and water well databases were obtained from the SEO. Permitted water well information, including locations, yields, and depths, was collected and compiled in the study's GIS geodatabase. The watershed contains approximately 5,426 permitted wells. Wells occur throughout the watershed, though are more densely concentrated near Torrington, the North Platte River, and Lusk. Generally, water consumption peaks during the summer because of increased irrigation.

There are 2,311 domestic wells, approximately 36 municipal wells, 15 industrial wells, and 713 irrigation wells. There are 1,773 stock wells. The remaining 578 wells are permitted for other uses. Irrigated lands are supplied from 713 irrigation wells, including 380 irrigation wells in the North Platte River Valley, 52 irrigation wells within the Prairie Center Groundwater Control Area, 190 irrigation wells in Niobrara County, and another 91 irrigation wells in other portions of Goshen and Platte Counties. Well depths are typically less than 500 feet with domestic and stock wells typically yielding 3 to 80 gallons per minute (gpm) and high capacity wells typically yielding 700 to 1,200 gpm with some wells producing 2,000 to 4,000 gpm. Groundwater is pumped from the alluvial aquifer and used to supplement irrigation from surface water between the two major canals, though "north of the Interstate Canal and east of Rawhide Creek, groundwater is the principal source of irrigation water" [Crist, 1975].

There are 1,773 stock wells distributed throughout the watershed. Depths range from 0 to 850 feet deep but are typically shallower than 400 feet. Approximately 2,311 domestic wells are located in the watershed and are primarily concentrated within the North Platte River Valley between Fort Laramie and Torrington and with similar depths of 50–500 feet. In the Lusk area, stock and domestic wells typically penetrate less than 50 feet of water while higher capacity irrigation wells penetrate more than 200 feet.

There have been 36 municipal wells completed within the watershed. The Wyoming Water Development Commission's (WWDC's) 2016 Public Water System Survey Report lists five towns, one water and sewer district, and one city that provide potable water within the study area including the towns of Fort Laramie, Lingle, Lusk, Manville, Yoder, South Torrington Water and Sewer District, and the city of Torrington. According to the WWDC's Platte River Basin Plan 2016 Update, the total annual diversions in 2013 for the Fort Laramie, Lingle, and Torrington municipal water systems were 18.77, 83.42, and 583.02 million of gallons, respectively. At Lusk, municipal wells are up to 180 feet deep completed within the Arikaree Aquifer.

There are 198 monitoring wells within the watershed, and most are located in the Torrington area because nitrates were discovered in the mid-1980s in Torrington's municipal wells [Baker and Associates, 1994]. In 1994, Torrington began monitoring groundwater quality in their wellhead protection area [City of Torrington, 1997; Eddy-Miller and Gerhard, 1999]. Fifteen industrial wells are located within the study area; the primary uses include ethanol, concrete, and sugar production.

Geology- Watershed Study

Topography

The Niobrara–Lower North Platte Rivers Watershed covers parts of the Central High Plains and Mixed Sandy and Silty Tableland and Badlands of the Western Great Plains Range and Irrigated Region. This land area has a varied topography with steep slopes along the higher parts of buttes, tablelands that range from nearly level to moderately sloping, and steeper areas that are situated on the sides of ridges and canyons. The escarpments and steep-walled valleys of the Hat Creek Breaks and 77 Hills bound the study area on the north with the gently sloping tableland to the south. Areas of the Badlands have eroded walls, escarpments, and tablelands with nearly level to very steep slopes that are dissected by multiple streams, gullies, buttes, and canyons. The southern portion of the watershed includes the North Platte Valley and part of the Goshen Hole Rim, which is a shallow basin with level to gently rolling topography, surrounded by escarpments and canyons to the south of the North Platte River.

On the Niobrara River, elevations range from 4,685 feet above mean sea level (amsl) at the Wyoming–Nebraska state line to approximately 6,075 feet amsl at Lone Tree Hill, which is south of Manville. Elevations range from 4,025 feet amsl at the Wyoming–Nebraska state line on the North Platte River to approximately 6,135 feet amsl at Wildcat Hill and 6,052 feet above msl at Rawhide Buttes, which are southwest of Lusk. Elevation ranges gradually increase from east to west. Throughout the watershed slopes are low at angles less than 5 degrees, though slopes are notably steeper and more rugged near the Hartville Uplift and along the Goshen Rim escarpment that rings the Goshen Hole Lowlands. No significant landslide deposits have been mapped within the watershed, though site geotechnical surveys are recommended for significant structures on or immediately adjacent to steep slopes.

Surficial Geologic Units

Surficial geologic units influence the watershed by providing the parent material for the soil formations and plant communities; surficial deposits also impact stream morphology. The study area's surface geology consists of residuum mixed with alluvium, eolian, slopewash, grus, and/or bedrock outcrops; eolian mixed with scattered deposits of residuum, alluvium, and slopewash; and alluvium with scattered deposits of terrace, slopewash, eolian, residuum, and grus. The residuum and eolian are distributed throughout the watershed. Alluvium and terrace deposits occur along the rivers as well as smaller creeks and drainages. Fan deposits are concentrated along the western side of the watershed near the Wildcat Hills and the Haystack Range. Additional surficial units include benches, mesa, terrace, slopewash, colluvium, and bedrock.

Bedrock

Geology

The bedrock geologic units that underlie the watershed study area predominantly consist of Tertiary sedimentary units. Quaternary and Tertiary deposits cover over 95 percent of the watershed. The most expansive unit is mapped as undifferentiated Lower Miocene and Upper Oligocene rocks (Tmo) which covers approximately 57 percent of the watershed; the Tmo may include portions of the White River Group (including the Brule and Chadron Formations), Arikaree Formation, and other unnamed beds [Rapp et al., 1957]. These units are comprised of soft sandstone and interbedded claystone, siltstone, and thin limestones. Quaternary age dune sand and loess deposits make up approximately 10 percent of the watershed and overlay Tertiary units along the North Platte River as well as the southernmost tip of the watershed; these shifting silts and sands are some of the most notable eolian deposits in the US. Alluvial deposits cover approximately 8 percent of the watershed,

concentrated along the North Platte River and Rawhide Creek; in places, these units can be up to 200 feet thick [Libra et al., 1981].

Paleozoic and Cretaceous rocks have very limited surface exposure, accounting for less than three percent of the watershed and occurring right along the western edge of the watershed as part of the Hartville Uplift. Precambrian rocks are exposed in windows where the Tertiary sediments have been eroded at the edges of the Hartville Uplift along the westernmost edge of the watershed and account for less than 1 percent of the bedrock. There are no significant deposits of expansive or swelling clays in the watershed.

The area has a complex structural history extending back 2.1 billion years [Sims et al., 1996]. The primary structural features of the watershed include the Hartville Uplift along the western edge of the watershed and the Goshen Hole Lowlands (which is part of the Denver-Julesburg Basin) in the southwest corner of the watershed. Within the Denver-Julesburg basin, there are up to 12,000 feet of sedimentary rocks [Libra et al, 1981]. The Hartville Uplift is a Laramide-age anticline consisting of a deformed Precambrian core. Within the watershed, there are three long faults that trend north-northeast or north-east. These faults are part of the structural arch between the Laramie Range and the Black Hills. The westernmost fault is the Hartville Fault, a high angle reverse thrust fault; while the Hartville Uplift represents over 8,000 feet of structural uplift, topographic relief across the area is relatively low. The other two principal faults form the Whalen-Wheatland Fault System.

Climate

The topography of the watershed results in a semiarid climate with typical annual precipitation rates ranging from 13 to 15 in/year in the central portion of the watershed and lee side of the Wildcat Hills, while the northern portion and higher elevations of the watershed receives 16 to 18 in of annual precipitation. Maximum precipitation occurs as rain during the spring and summer months, with high-intensity thunderstorms occurring in late summer. Precipitation during the winter generally accumulates as snowfall with likely freezing temperatures from October through April. Data from the Parameter-Elevation Regressions on Independent Slopes Model (PRISM) were used to display the average annual precipitation in and surrounding the watershed.

The watershed has an average growing season of 112 days at the Lusk (483960) meteorological station to a growing season of 129 days at the Torrington (484126) meteorological station. Eight historic and current National Weather Service Cooperative Observer Network (COOP) stations are located within the study area, with varying periods of data records. Climatic data were obtained for five meteorological stations that are chosen because of their period of record, available data, and location, which are accessible through Water Resources Data System (WRDS) (<http://www.wrds.uwyo.edu/sco/data/datamap.html>).

BIOLOGICAL SYSTEMS

Fish and Wildlife

Wyoming's waters and landscapes support over 800 species of wildlife with 120 species of mammals, 426 species of birds, 12 species of amphibians, 27 species of reptiles, 78 species of fish, several thousand species of invertebrates, and over 13,100 species of plants [Wyoming Game and Fish Department, 2010]. The Wyoming Game and Fish Department (WGFD) provides a system of control, propagation, management and protection, and regulation of all wildlife in Wyoming. The WGFD monitors and maintains big game, small game, nongame, and fish populations through studies, surveys, and habitat analysis. The WGFD has developed geodata that shows big game areas, ranges, and routes. Additionally,

the WGFD has developed geodata that shows crucial stream corridors, blue ribbon streams, key nongame areas, and habitat priority areas within the state of Wyoming.

Fisheries

Fish habitats within the study area include perennial and intermittent streams, springs, lakes, and ponds that support fish through at least a portion of the year with aquatic habitat quality that varies by location, landforms, and vegetation [Bureau of Land Management, 2007]. A total of ten fish species are considered native to the watershed based on observed and documented species from the Wyoming Natural Diversity Database (WYNDD). Several species of Dace, Minnow, Shiner, and Darter fish are present within the study area. The Lower North Platte River is locally important to sport fishery in the Torrington area, specifically rainbow trout [WGFD, 2010].

There are no streams within the study area classified by the WGFD as a Blue or Red Ribbon stream. Habitat priority areas within the watershed contain only one terrestrial Crucial Habitat and one aquatic Enhancement Priority Area. Aquatic Crucial Habitats include the Niobrara River, Lower North Platte River, Rawhide Watershed, and Rawhide Creek. Riparian areas are the only Terrestrial Crucial areas, while the Lower North Platte River is also listed as an Enhancement Area.

Wildlife Habitat, Game, and Sensitive Species (Plant and Animal)

Wildlife is abundant and diverse with fish species, big game, nongame mammals, as well as reptiles and amphibians, furbearers, and birds are known to occur within the study area [WYNDD, 2018]. Big game species, including antelope, mule deer, white-tailed deer, and elk, are known to occur within the study area. Raptors in the area include, but are not limited to, golden and bald eagles; ferruginous and Swainson's hawks; American kestrel; and peregrine falcon [WYNDD, 2018].

Wildlife Habitat and Migration Corridors

The Lower North Platte River and a western portion of the study area are identified as a Key Nongame Wildlife Area (KNWA) by the WGFD because of the existence of more than 115 bat roosts in the area, as well as several Species of Greatest Conservation Need (SGCN) mammals. The SGCN lists 11 bird and 15 mammal species that occur in the Guernsey KNWA. The WGFD has developed geodata that shows hunt areas, herd units, seasonal range, crucial ranges, parturition areas, and migration routes and barriers for antelope, elk, mountain lion, mule deer, and white-tailed deer [WGFD, 2015]. Approximately 65,485 acres of the study area has been classified as crucial range for antelope and mule deer.

Non-sensitive and Sensitive Species

The WYNDD records and maintains a list of species in Wyoming that are thought to be rare or sensitive. Data obtained from the WYNDD list 131 fish and wildlife species that are documented within the study area. Fish, birds, amphibians and reptiles, snails and mollusks, and mammals are listed from WYNDD. Out of the 131 species within the study area, 115 are listed as sensitive species. In addition, 28 species of plants are listed on WYNDD's native species list, while 5 are labeled as sensitive. A list of native plant species can be viewed in the study located at http://library.wrds.uwyo.edu/wwdcrept/Niobrara/Niobrara_Lower_North_Platte_Watershed-Level_I_Management_Plan-Final_Report-2019.html

Sage Grouse

The greater sage-grouse are known to occur within the study area; however, no core areas are situated within the watershed. Additional information about Wyoming's sage-grouse management including mitigation, de minimus activities, core area maps and data, and the Density Disturbance Calculation Tool (DDCT) can be found at <https://wgfd.wyo.gov/Habitat/Sage-Grouse-Management>

Land Cover

The 2011 National Land Cover Database (NLCD) classifications summarize the characteristics of the land surface and include but are not limited to shrub/scrub, grassland/herbaceous, deciduous or evergreen forest, developed urban, crops, wetlands, water, and barren ground. The NLCD is distributed by the Multi-Resolution Land Characteristics Consortium (MRLC) and serves as the definitive Landsat-based, 30-meter resolution, land-cover database with a 16-category classification that is applied across the US [Homer et al., 2012]. The 2011 NLCD was obtained and used in determining the predominant surface cover types that exist within the watershed.

An analysis of the 2011 NLCD data indicates that approximately 870,005 acres (67.2 percent) of land cover within the study area is composed of grassland/herbaceous. Another 216,474 acres (16.7 percent) of the watershed are classified as cultivated crops, and 130,833 acres (10.1 percent) as shrub/scrub cover. The remaining areas consist of developed/open space, pasture and hay, woody wetlands, emergent wetlands, evergreen forest, and other small classes. Barren land (which includes rock, sand, and clay occurring on bedrock, scarps, sand dunes, strip mines, and gravel pits) covers approximately 7,319 acres (0.6 percent) of the study area. Approximately 1,371 acres of water cover 0.1 percent of the study area. In summary, approximately 77 percent of the watershed's land cover consists of grass and shrub lands, which are typically used for livestock grazing. The remaining 23 percent of the study area consists of cropland, pasture and hay, woody wetlands, evergreen forest, and water based on the 2011 NLCD.

Riparian Areas

Riparian areas are the most productive wildlife habitat type in Wyoming, supporting more wildlife diversity than any other habitat [Bureau of Land Management, 2007]. In addition to providing wildlife habitats and forage, shade and water for livestock, riparian areas also provide functions such as improving water quality, sustaining base flows, and lessening the impacts of floods. The LANDFIRE existing vegetation type (EVT) data were analyzed for the study area, and the dominant riparian/wetland EVTs within this area are Herbaceous Wetlands (0.4 percent), Western Great Plains Floodplain Systems (0.37 percent), and Recently Burned Herbaceous Wetlands (less than 0.01 percent). All EVT areas cover approximately 0.77 percent of the watershed and are primarily located along the Niobrara River, Rawhide Creek, Lower North Platte River, and Box Elder Creek. The WGFD have identified the riparian regions as Crucial and Enhanced Habitat areas. Riparian and wetland habitat areas support the high SGCN species diversity, including native fish, amphibian, and reptile species. The Lower North Platte River was selected as an Enhanced Habitat area for the potential of sport fishery and its habitat for native nongame fish species. Niobrara and Rawhide Creek were identified as crucial habitats for their unique prairie fish assemblage for Wyoming and the Rawhide Watershed was selected because of its high diversity of SGCN species and for representing the highest amphibian and reptile diversity in the Casper region.

Wetlands

A wetland is an area that is periodically inundated or saturated by surface or groundwater on an annual or seasonal basis, displays hydric soils, and typically supports or is capable of supporting hydrophytic vegetation [Black, 1997]. Wetlands can enhance watershed function by accumulating rainfall or runoff

and storing that water in diverse quantities and periods within the wetland's vegetation and soils. The National Wetlands Inventory (NWI) was established by the US Fish and Wildlife Service (USFWS) to map existing wetlands based on vegetative, hydrologic, and soil features using aerial imagery and field verification. The NWI geospatial wetland data was obtained and mapped to identify approximately 8,775 acres of all wetland types, which cover approximately 1.04 percent of the study area and occur throughout the area, or 13,409 acres. Riverine wetlands directly associated with the Lower North Platte River account for approximately 5,142 acres (38 percent) of the wetlands within the study area.

In 2009, The Nature Conservancy (TNC) in cooperation with the WGFD and USFWS delineated and prioritized wetland complexes throughout Wyoming [Copeland et al., 2010; Wyoming Joint Ventures Steering Committee, 2010]. The Wyoming Joint Ventures Steering Committee [2010] identified nine wetland complexes to focus project implementation; however, the Goshen Hole Wetland Complex (GHWC) was the only complex located within the study area. The GHWC contains approximately 9,669 acres of wetlands with high waterfowl and waterbirds production, migration stopover, and winter habitat [Tibbets et al., 2016]. The complex is in a low-lying basin, known as Goshen Hole, within the low North Platte River floodplain, predominately composed of Freshwater Emergent wetlands which include irrigated hayfields, wet meadows, and emergent vegetation zones around rivers and ponds.

Vegetation and Plant Communities

Existing vegetative cover in the watershed was evaluated by using data obtained through the LANDFIRE program [USGS, 2010]. LANDFIRE vegetation maps are mostly derived from the NatureServe ecological classifications. Other data are derived from the NLCD, National Vegetation Classification Standard (NVCS) Alliances, and LANDFIRE specific types. The LANDFIRE data includes many relevant attributes such as EVT, existing vegetation height (EVH), and existing vegetation cover (EVC).

The LANDFIRE existing vegetation data specify 14 different vegetation classes and 57 different vegetation types within the study area. The dominant EVTs include Western Great Plains Shortgrass Prairie (34.8 percent), Introduced Upland Vegetation-Annual Grassland (13.8 percent), Northwestern Great Plains Mixed Grass Prairie (12.2 percent), NASS-Close Grown Crop (9.1 percent), and Western Great Plains Sand Prairie (8.7 percent) all cover a total of 43.8 percent of the watershed. The remaining 21.4 percent of the watershed consisted of 52 different vegetation types.

Most of the study area has grassland vegetation, which primarily occur at lower elevations on rolling plains or foothills. Most grassland communities have been influenced by grazing, fire or fire suppression, and Invasive, Nonnative Plant Species (INPS). Within the watershed, livestock grazing is one of the major income-producing industries. Mixed-grass vegetation is predominately used for livestock and wildlife grazing. Vegetative communities within the study area vary because of the differing topography, geology, soils, climate, fire history, and surface management. In addition to many grass species, 23 native flowering plants identified by the WYNDD that occur in the watershed.

ANTHROPOGENIC SYSTEMS

Agricultural Water Use

Water is primarily used by agricultural producers to irrigate crop and hay lands for grain and forage production including alfalfa, corn, dry edible beans, pasture grasses, sugar beets, potatoes, and wheat crops within the watershed. Irrigation development along the North Platte River and tributaries had an early history beginning in the 1840s near Fort Laramie [McKinley, 1938]. Today, irrigation within the watershed is supplied by surface and groundwater sources providing water to more than 108,000 acres

in the North Platte Valley, Goshen Hole, and near Prairie Center, Lusk, Manville, and Van Tassell.

Agricultural producers also provide drinking water for livestock including beef cows and calves, sheep and lambs, hogs and pigs, and horses. Agricultural lands and producers also provide drinking water and aquatic habitat for resident and migratory wildlife including big game and small mammals, reptiles and amphibians, furbearers, raptors, waterfowl, upland game birds, nongame birds, and native and nonnative fishes throughout the study area. Currently, there are more than 1,750 permitted stock wells and 220 stock reservoirs providing water for livestock within the watershed.

Irrigated Lands

Irrigated lands within the watershed mainly consist of center pivot systems and gated-pipe flood-irrigated corn and alfalfa crop fields which are managed to produce grain and hay for livestock forage. These irrigated lands are mostly located on alluvium-derived soils found on the valleys along the North Platte River and Niobrara River. Irrigated lands are also located on tablelands from northeast of Lusk to south of Prairie Center and east of Jay Em, which are supplied by wells drilled into the Arikaree Formation.

Irrigated lands polygons from WWDC's Platte River Basin Plan Update and the Northeast Basin Plan Update studies were overlaid onto the NAIP aerial imagery to determine irrigated acreages within the study area. These irrigated layers were updated using 2015 NAIP imagery for the study and incorporated in to the project geodatabase. Detailed field mapping of irrigated lands was not part of the scope of this Level I study.

In 2006, approximately 108,135 acres of irrigated land were identified within the study area, which comprised 8.4 percent of the study area. In 2012, that amount dropped to approximately 98,055 irrigated acres, indicating an estimated 9.3 percent reduction from 2006. The reduction in irrigated acres in 2012 was a result of diminished runoff period and low streamflows caused by below-average precipitation and snowpack within the Platte Basin during the 2012 water year [SEO, 2012]. In 2015, approximately 105,895 irrigated acres were identified in the study area, which comprised 8.2 percent of the watershed.

The location of irrigated lands within the study area have been categorized by county and HUC 10 watershed. Of the 105,895 total irrigated acres, the majority (83.7 percent) are located within Goshen County and the remaining 16.3 percent are located within Niobrara County. By HUC 10 watershed, the largest portion (38.7 percent) is located within the North Platte River-Cold Springs Branch Watershed, which encompasses the area just east of Lingle along the North Platte Valley to the state line. The next largest amount of irrigated lands is situated in the Cherry Creek-Cherry Creek Drain Watershed (17.0 percent) within the Goshen Hole and in the Cottonwood Draw-North Platte River Watershed (14.0 percent) along the area just east of Guernsey along the North Platte Valley to Lingle.

Irrigation Conveyances

A total of 18 irrigation canals and ditches carry 3 cfs or more of fully adjudicated water rights from existing points of diversion (POD) within the watershed. These canals and ditches total approximately 191.5 miles of conveyance. However, this total does not include the numerous laterals, ditches, and drains that are operated as part of five irrigation districts and six ditch companies within the study area. Almost all these conveyances carrying more than 3 cfs are in the North Platte River-Cold Springs Branch and Cherry Creek-Cherry Creek Drain watersheds along the North Platte Valley from just west of the

Whalen Diversion, which is located on the North Platte River approximately 6½ miles west-northwest of the town of Fort Laramie to the state line.

North Platte Project

The North Platte Project in Wyoming and Nebraska consists of Pathfinder Dam and Reservoir; Guernsey Dam, Reservoir and Powerplant; Whalen Dam; Northport, Fort Laramie, and Interstate Canals; and four off stream inland reservoirs on the Interstate Canal along with 1,602 miles of canals and laterals; and, 352 miles of open drains, and 194 miles of electric transmission lines [Autobee, 1996; USBR, 2018]. The North Platte project extends 111 miles along the North Platte Valley from Guernsey, Wyoming to Bridgeport, Nebraska and provides irrigation water to about 226,000 acres within four irrigation districts and 109,000 acres within 8 water-user associations [Autobee, 1996; USBR, 2018]. Since 1909, irrigation water has been diverted at Whalen Dam on the North Platte River into the Fort Laramie Canal on the south side of the river and into the Interstate Canal on the north side of Whalen Dam. The Fort Laramie Canal was completed in 1924 with a capacity of 1,500 cfs and delivers water for 129 miles to an area south of Gering, Nebraska. The Interstate Canal was completed in 1915 with a capacity of 2,100 cfs and delivers water for 95 miles to Lake Alice and Lake Minatare (i.e., Inland Lakes) northeast of Scottsbluff, Nebraska.

Irrigation Districts

The WWDC's 2017 Irrigation System Survey Report lists thirteen entities including four irrigation districts, seven ditch companies, and two water-user associations operating within the study area. The four irrigation districts deliver water to over 59,320 irrigated acres and more than 500 water users. The ditch companies provide water to another 9,160 irrigated acres and 55 water users while the water-user associations deliver water to approximately 13,480 acres and 97 water users within the watershed. The four irrigation districts within the watershed include: the Goshen Irrigation District (GID), Hill Irrigation District, Pratte-Ferris Irrigation District, and the Torrington Irrigation District. Irrigation water for approximately 15,000 acres to the Hill Irrigation District and the Lingle Water Users Association is delivered under USBR contracts via the Interstate Canal which is operated by the Pathfinder Irrigation District headquartered in Mitchell, Nebraska. In addition to the irrigation districts, there are two water-user associations; the Goshen Hole Water Users Association and the Lingle Water Users Association along with seven companies including; Burbank Ditch, Goshen Mutual Reservoir & Ditch Company, Lucerne Canal & Power Company, New Grattan Ditch Company, New North Platte Irrigation & Ditch Company, Rock Ranch Ditch Company, and Wright & Murphy Ditch Company, which deliver water to irrigated acres within the watershed. Detailed information about those systems were unavailable.

Goshen Irrigation District

The GID was formed in 1926 following the construction of the North Platte Project by the USBR and assumed responsibilities for the Fort Laramie Canal, which is also known as the Gering-Fort Laramie Canal [Autobee, 1996; Anderson Consulting Engineers, Inc., 2008]. The Fort Laramie Canal begins at Whalen Dam and provides irrigation water for 52,484 acres predominantly located south of the North Platte River and north of the Fort Laramie Canal in Wyoming. The canal also delivers irrigation water to 54,850 acres of land in Nebraska.

The GID's source of irrigation water is the North Platte River direct flows and stored water in Pathfinder and Guernsey Reservoirs. The GID's primary conveyances include 86 main canal miles, two tunnels, many siphons, two lateral canals, pipelines, and numerous spillways/ wasteway structures [Anderson Consulting Engineers, Inc., 2008]. As part of the GID's 2008 Master Plan, a review of facilities indicated that the GID had implemented 75 of the 106 improvements identified in the previous studies [Anderson

Consulting Engineers, Inc., 2008]. The project also included proposed improvements database, structure inventory and assessment, seepage loss determinations, GID geospatial database, conceptual design and costs, and plan improvements economic estimates. Since 2008, the GID has received Level III funding from the WWDC to implement many projects that include but are not limited to the following improvements:

- Automate three canal spillway gates
- Automate 11 control sites for regulating flows
- Convert 16 miles of ditches in 29 pipe segments
- Rehabilitate the Check Structure 45.1, Main Canal Lateral 45.1 and Tunnel No. 1.
- Convert the Table Mountain Lateral and Springer Main ditches to pipelines
- Rehabilitate tile pipeline laterals, 6.7 and 45.1, with poly vinyl chloride (PVC) pipe.

Hill Irrigation District

The Hill Irrigation District delivers water from the North Platte River via the Interstate Canal to approximately 3,800 irrigated acres situated north and east of Torrington. The Hill Irrigation District began operating around 1900 and their system includes a headgate and weir for diverting and measuring water from the Interstate Canal; approximately 5 miles of main canal; and numerous field turnouts and crossings [Lidstone & Anderson, Inc., 1997]. The GID can divert between 54.4 cfs and 108.8 cfs at the headgate on the Interstate Canal, depending on availability of surplus flow with many irrigators supplementing their water supplies through irrigation wells [Lidstone & Anderson, Inc., 1997]. As part of the GID's Level II Project, an inventory of existing structures was completed; a rehabilitation plan for recommended improvements was developed; and conceptual designs and potential costs were estimated.

Pratte-Ferris Irrigation District

The Pratte-Ferris Irrigation District (formerly Ferris Irrigation District) was formed in 1989 [Kennedy Engineering, 1990]. The Ferris Canal (Ferris No. 1 Ditch) diverts at a diversion dam on the North Platte River just upstream of US Highway 85 near Torrington and delivers water to the District which is located southeast of the city of Torrington to the state line south of the Ferris Canal and north of the North Platte River [Kennedy Engineering, 1990]. The Ferris Canal (Ferris No. 1 Ditch) has a territorial water right priority of May 22, 1886 which allows the diversion of 22.01 cfs for irrigation of 1,655 acres [Kennedy Engineering, 1990]. In 1989, the Pratte-Ferris Irrigation District's diversion dam and a portion of the main canal from the diversion dam to US Highway 85 were identified as needing reconstructed, which led to the construction in 1992 of a new diversion dam, the rehabilitation of the canal from the diversion dam to US Highway 85, and the reconstruction of the second wasteway and the main measuring flume located near Highway 26 [Eastern Wyoming Engineering and Surveying Professionals, 1989; Kennedy Engineering, 1990]. These improvements optimized the Pratte-Ferris Irrigation District's use of this early season water [Kennedy Engineering, 1990].

Torrington Irrigation District

The Torrington Irrigation District delivers water from the North Platte River via the Torrington Ditch to approximately 2,400 irrigated acres that are situated west of the city of Torrington. The Torrington Irrigation District began operating as the Torrington Ditch Company around 1890 and their system includes a diversion dam and 25 miles of conveyances [WWDC, 2017]. The Torrington Irrigation District can divert 34.88 cfs from the North Platte River and Rawhide Creek and stored water in the Glendo Reservoir [Trihydro, 2006; WWDC, 2017].

Pathfinder Irrigation District

The Pathfinder Irrigation District was formed in 1926 in Nebraska after the construction of the North Platte Project by the USBR and has assumed responsibilities for the Interstate Canal, which delivers water from the Whalen Diversion Dam on the North Platte River via the Interstate Canal to approximately 68,886 acres in both Wyoming and Nebraska [Autobee, 1996; Pathfinder Irrigation District, 2017; USBR, 2018]. The Pathfinder Irrigation District operates and maintains approximately 98 miles of the Interstate Canal (54 miles in Wyoming and 44 in Nebraska), 82 miles of secondary canals, and 600 miles of open laterals and buried pipelines as part of the USBR North Platte Project's Interstate Division [Pathfinder Irrigation District, 2017]. The Interstate Canal flows east on the north side of the river for 54 miles to the state line and then continues to flow east into Nebraska for 44 miles and enters Lake Alice and Lake Minatare Reservoirs (i.e. Inland Lakes) northeast of Scottsbluff, Nebraska [Pathfinder Irrigation District, 2017]. The USBR's Interstate Division by contract provides irrigation water for approximately 15,000 acres to the Hill Irrigation District and the Lingle Water Users in Wyoming [Pathfinder Irrigation District, 2017].

In 2004, the USGS, in cooperation with the North Platte Natural Resources District, used continuous resistivity profiling techniques to map near-surface lithologies of the Interstate and Tri-State Canals in western Nebraska and eastern Wyoming. This study provided information needed for a groundwater flow model and improved the general understanding of groundwater recharge [Ball, et al., 2006]. Test holes were drilled at multiple locations in both canals to verify the results of the resistivity surveys, to compare the effectiveness of the two techniques, and to develop an interpretive scale that was used to estimate the relative canal leakage potential [Ball et al., 2006]. Ball et al. [2006] applied the interpretive scale to the vertically averaged resistivity and classified areas of the canals as having either high, moderate, or low canal leakage potential as shown in Figure 3.45. The Interstate Canal intersects multiple outcrops of the Brule Formation, and typically is bordered by dry rangeland to the north and irrigated cropland to the south [Ball et al., 2006]. A wide range of canal leakage potential values was observed along the Interstate Canal; however, the highest canal leakage potential in the canal was found west of the state line in Wyoming.

Domestic, Municipal and Industrial Water Use

Potable Water Systems

The domestic, municipal, and industrial (DMI) water systems use groundwater to supply their water users, communities, and customers. The watershed contains 2,362 permitted DMI wells including 2,311 domestic wells, 15 industrial wells, and 36 municipal wells. The WWDC's 2016 Public Water System Survey Report lists five towns, one water and sewer district, and one city that provide potable water within the study area including the towns of Fort Laramie, Lingle, Lusk, and Manville, South Torrington Water & Sewer District, and the city of Torrington. The municipalities of Fort Laramie, Lingle, Lusk, Manville, and Torrington have groundwater wells with depths ranging 70–1,100 feet deep. According to the WWDC's Platte River Basin Plan 2016 Update, the total annual diversions in 2013 for the Fort Laramie, Lingle, and Torrington municipal water systems were 18.77, 83.42, and 583.02 million of gallons, respectively.

In 2010, Goshen County, the City of Torrington, Scotts Bluff County, and City of Scottsbluff entered into an agreement with the USBR through the federal Rural Water Supply Program to conduct an Appraisal Investigation for the Platte Alliance Water Supply (PAWS) [USBR, 2014]. The Goshen County Commission is the sponsor of the project, which is examining the concept of replacing existing municipal and rural

water source supply wells with a regional (interstate) surface water treatment plant and delivery transmission system [WWDC, 2017]. The source of water would be the North Platte River via available and existing storage, consolidation of key correlative municipal/domestic groundwater rights, and other potential tributary or water right purchase opportunities that may be identified [WWDC, 2017]. The study area is comprised of an interstate stretch of the North Platte River Valley and environs extending from Guernsey Reservoir in Wyoming to Bridgeport, Nebraska [WWDC, 2017]. More information is available at the PAWS website (<http://www.plattealliancewatersupply.com/>).

Water Storage

Water-storage development within the watershed has been affected by institutional constraints related to the 2001 Modified Decree and/or the Platte River Recovery and Implementation Program (PRRIP), which limits the opportunity to create new reservoir projects or increase existing storage reservoirs through enlargement. Water users identified problems with existing reservoirs that limit the potential to store water in these facilities. Field visits and initial assessments were conducted on ponds, stock reservoirs, and irrigation reservoirs that were identified by participants. Reservoirs with a permitted capacity of 500 acre-feet or greater within the watershed were also mapped and described along with summarizing previously proposed reservoirs within the watershed.

Large Reservoirs

There are approximately 238 permitted reservoirs/ponds within the watershed. Most of these reservoirs/ponds are considered reservoirs because they have an embankment dam and are constructed on a drainage. These reservoirs/ponds range in total capacity from 0.03 acre-feet to 2,207 acre-feet with a mean capacity of 78.4 acre-feet and median capacity of 6.6 acre-feet. Approximately 150, or two-thirds, of these reservoirs have a capacity of greater than one acre-foot and cumulatively store 11,780 acre-feet.

Existing reservoirs with a permitted capacity of 500 acre-feet or greater within the watershed were mapped and described as part of the study. Six reservoirs with a capacity of 500 acre-feet or greater exist within the study area and include the following facilities: Detention Reservoir Pine Ridge–1, Detention Reservoir Case Bier–1, Arnold Reservoir, Glomill Reservoir, A-3 Reservoir, and Katzer No. 2 Reservoir.

Detention Reservoir Case Bier - 1

The Detention Reservoir Case Bier – 1 is a functional flood control dam and reservoir located on Case Bier Draw (Sand Draw or Spring Canyon), which is a tributary to the North Platte River. The reservoir is located approximately 2½ miles northwest of Fort Laramie in the SE¼ of SE¼ of Section 4 of Township 26 North, Range 64 West in Goshen County. The reservoir was permitted in 1958 (Permit No. P6422.0R) with a capacity of 1,458.9 acre-feet.

Arnold Reservoir and Enlargement

The Arnold Reservoir is a functional flood control dam and reservoir located on Arnold Drain, which is a tributary to the North Platte River. The reservoir is located approximately 1½ miles northeast of Torrington in the NE¼ of SW¼ of Section 1 of Township 26 North, Range 61 West in Goshen County. The reservoir was permitted in 1934 (CR CR05/092) with a capacity of 770.0 acre-feet, and the enlargement was permitted in 1963 (CR05/002) with a capacity of 364.5 acre-feet for a total capacity of 1,134.5 acre-feet.

Glomill Reservoir and Enlargement

The Glomill Reservoir is a functional, off-channel irrigation dam and reservoir that is located adjacent to Box Elder Creek. The reservoir is located approximately 13 miles west of Yoder in the NW¼ of SW¼ of Section 10 of Township 22 North, Range 64 West in Goshen County. The reservoir was permitted in 1910 (CR CR39/554) with a capacity of 810.0 acre-feet, and the enlargement was permitted in 1975 (CR CR08/391) with a capacity of 486.4 acre-feet for a total capacity of 1,296.4 acre-feet.

A-3 Reservoir

The A-3 Reservoir is a functional flood control dam and reservoir located on Angel Draw, which is a tributary to the North Platte River. The reservoir is located approximately 5 miles south of Lingle in the SW¼ of NE¼ of Section 7 of Township 24 North, Range 62 West in Goshen County. The reservoir was permitted in 1968 (CR CR06/003) with a capacity of 762.0 acre-feet.

Katzer No. 2 Reservoir

The Katzer No. 2 Reservoir is a functional off-channel irrigation and stock dam and reservoir located on adjacent to the Spring Lateral and Katzer Main Drain, which is a tributary to the North Platte River. The reservoir is located approximately 9 miles southeast of Torrington in the NE¼ of SE¼ of Section 16 of Township 23 North, Range 60 West in Goshen County. The reservoir was permitted in 1904 (CR CC20/178) with a capacity of 520.0 acre-feet.

Previously Proposed Water-Storage Development

Since 1933, there are ten previous studies on potential reservoir development that were completed within the watershed; the Wyoming Water Development Office (WWDO) has compiled a list of proposed reservoirs from these studies. Currently, no WWDC Dam and Reservoir planning projects are within the study area.

Upland Water Storage

Approximately 3,211 stock/domestic wells, 177 stock reservoirs/ponds, and 38 springs are permitted within the watershed. Existing livestock and wildlife water sources within the watershed are mapped and described along with inventorying existing water sources and potential water developments on properties of participating landowners within the study area. Study participants' properties covered approximately 29,094 acres (2.3 percent) of the study area. Mapping was not completed for most private lands in the watershed because many landowners did not participate in the study. The mapping is not a complete account of all viable water sources but serves as a starting point for estimating livestock and wildlife water needs within the watershed. The Wyoming SEO's e-Permit online database was queried for water-rights data and then was overlain on NAIP aerial imagery to determine whether these reservoirs/ponds were functional, ephemeral or intermittent, or nonfunctional regarding their status of beneficial uses. The reservoirs/ponds that contained water and showed no breaches of the dam or spillway were determined to be viable water sources and designated functional. Other facilities that were observed to be dry and not breached were designated as ephemeral/intermittent but viable water sources. The reservoirs/ponds that showed evidence of dam and/or spillway breaches were determined to be nonviable and designated as nonfunctional. During field visits with participating landowners, these reservoirs/ponds were also discussed and inventoried and any necessary improvements were identified. To illustrate the viable and nonviable reservoir evaluation mapping, Figure 3.67 displays an example of a breached, nonviable, nonfunctional reservoir, and Figure 3.68 shows a functioning, viable reservoir.

Springs, tanks/troughs, storage tanks, and wells were evaluated regarding their viability as sources of livestock/wildlife water within the watershed. These facilities were mapped then verified by field inventory and discussions with participating landowners about their condition and function. Wells were

considered nonviable when they no longer provided the necessary amount of water for current use or could not pump any water at all. Wells that were located on properties where the owner did not participate in the study were designated as unevaluated wells.

Existing Livestock/Wildlife Water Sources

Dependable water supplies are essential in providing adequate amounts of suitable-quality water for livestock and wildlife. Many upland water sources currently exist within the watershed, and many rangeland improvements and grazing projects have developed existing water sources such as wells, springs, and perennial streams. These projects often included storage tanks, ponds, reservoirs, windmills, pumping plants, and spring developments with pipelines carrying livestock/wildlife water to water tanks.

There are approximately 1,773 permitted stock wells and another 1,438 domestic wells that have combined domestic and stock watering uses within the watershed. Of the 238 reservoirs/ponds within the watershed, 115 (48 percent) reservoirs/ponds were determined to be functional and viable, 102 (43 percent) reservoirs/ponds were ephemeral/intermittent and viable, and 13 reservoirs/ponds were nonfunctional and nonviable. Approximately 177 of these 238 facilities are permitted for stock use although the other 61 are viable sources of livestock/wildlife water. Additionally, 38 permitted springs are located within the study area.

As explained previously, existing wells, tanks/roughs, windmills, pumps, and spring developments were evaluated only on properties of participating landowners within the study area. No evaluation of these facilities was completed on non-participating landowners' properties. The results of this evaluation for existing wells, tanks, and springs on participant's properties indicated that 99 wells, 114 tanks, and 9 springs are viable livestock/wildlife water sources within the watershed. Twenty nonviable wells and one nonviable spring were inventoried. The mapping also indicated the existence of 24 stock reservoirs/ponds and 10 springs located on participating landowners' properties. Of these 24 facilities, 14 facilities were rated functional and viable and 10 facilities were designated as ephemeral/intermittent and viable. These sources do not include any streams or nonviable reservoirs/ponds.

Areas Needing Additional Water Development

The watershed has a considerable amount of water development for livestock and wildlife. Many wells and tanks are located throughout the study area. However, reservoirs and ponds are less abundant mainly because of the lack of perennial streams within the watershed. Well development for livestock/wildlife water depends on the availability of groundwater within the watershed. Because of the diverse aquifers and hydrogeology in the study area, well depths can vary from 0 to 850 feet deep but are typically shallower than 400 feet. In the North Platte Valley, stock wells typically have depths of 50 to 250 feet while stock wells near Lusk typically are less than 50 feet deep. During field visits and inventory, many wells that were drilled many decades earlier were still functioning as viable water sources. Landowners commonly indicated that the wells were 30–80 years old and still provided adequate quantities and quality for livestock and wildlife. Twenty wells were identified as nonfunctional and proposed for rehabilitation as part of this Level I study.

Land

The study area covers approximately 2,022 square miles, or 1,294,160 acres. The watershed is primarily located within the central and northern portion of Goshen County and the southern part of Niobrara

County with a small area situated in the southeastern portion of Platte County. The city of Torrington and the towns of Fort Laramie, Lingle, Lusk, Manville, and Van Tassell are located within the watershed. Approximately 70.3 percent of the watershed is located in Goshen County, with 24.0 percent in Niobrara County, and 5.7 percent in Platte County. The watershed also covers portions of five conservation districts with approximately 35.6 percent located in the LFLCD, 30.5 percent in the NPVCD, 24.0 percent in the NCD, 5.7 percent in the Platte County Resources District (PCRD), and 4.2 percent within the South Goshen Conservation District (SGCD).

Land Use

Agriculture is the principal industry and land use within the study area. Other major industries include oil-and-gas development, manufacturing, healthcare, government, and education. Grazing is the predominant land use in the watershed. Other land uses (such as irrigated pasture and hay forage, oil-and-gas production, wind energy generation, wildlife habitat, and recreation) are also often components of the agricultural operations within the watershed. Livestock use is primarily cattle along with sheep, horses, bison, and goats. Because of the importance of the livestock grazing and ranching within the watershed, rangelands provide the foundation for this land use. Commonly, ranching operations will manage their livestock, pasture and hay, wildlife, and water resources in combination with recreational hunting uses.

Transportation and energy corridors are concentrated in the watershed along US Highway 26 from Guernsey to the state line, US Highway 85 from Torrington to Lusk, and US Highway 18 from Manville through Lusk and to the Wyoming–Nebraska border. The Colorado and North Wyoming Railroad extends from Manville to the State of Nebraska, parallel to US Highway 85 and the Burlington Northern is located along US Highway 18 across the southern portion of the watershed. Power and energy development within the watershed includes wind power complexes with several power transmission lines located throughout the study area. In 2014, the USGS mapped 294 industrial wind turbine locations on two wind farms within the study area. These maps of the power lines that traverse the study area are general estimates of the locations and alignment.

Several energy pipelines are also located within the study area; however, information about current pipeline locations and operations should be obtained by accessing the US Department of Transportation’s (DOT) National Pipeline Mapping System (NPMS) Pipeline Information Management and Mapping Application (PIMMA). PIMMA is a web-based mapping application that can be accessed on the DOT’s website (<https://www.npms.phmsa.dot.gov/>). Access to NPMS data is limited by user type, so private or governmental entities have several restrictions in place for data viewing or downloading. Information and maps from PIMMA must be treated as DOT proprietary information, but only NPMS staff have the right to redistribute maps or information from the NPMS [USDOT, 2015]. The Wyoming Pipeline Authority (WPA) also has a database for the state, which is available by contacting the WPA by telephone (307.237.5009) or visiting <https://www.wyopipeline.com/web-based-interactive-map>

Because of the restrictions regarding pipeline data, pipeline locations were not included in map figures within the final report; although publicly available data are included in the study’s GIS data.

Land Ownership

Land ownership within the watershed is predominantly private at 1,837 square miles, or 90.9 percent of the watershed. Of the private land, approximately 1,433 square miles (78.0 percent) consist of range and forest grazing land. More than 151 square miles (8.2 percent) of the private lands are irrigated and represents 99 percent of all the irrigated lands within the watershed.

Because significant portions of the grazing and irrigated lands within the study area are private lands, the management of grazing animals, the development of watering facilities, and the operation and maintenance of irrigation infrastructure facilities are the responsibilities of individual landowners and lessees. The capital necessary for developing and operating these facilities on private land often involves additional revenue input from other land-use activities such as oil-and-gas production, mineral extraction, wind energy generation, hunting/recreational opportunities, and small acreage development. While private landowners typically control the land surface, there are some private lands where the mineral estate is owned by the federal government and administered by the Bureau of Land Management (BLM).

The state of Wyoming owns 149 square miles (7.4 percent) of the watershed, and 30.5 square miles (1.51 percent) are federal lands under management of the BLM, USBR, NPS, and the US Department of Defense. Nearly 138 square miles of state land consists of range and forest grazing land, while federal agencies manage approximately 29 square miles for grazing. Neither the state nor the federal agencies control a significant amount of irrigated land, at a combined total of less than 4 square miles.

Grazing on state lands is essential to livestock operations within the study area. Although, the landowners' use of state grazing lands differs between operations, most landowners use some state land grazing as part of their operations. The land ownership pattern of predominantly private lands interspersed with state and federal lands affects livestock management because of the variability of forage conditions and availability of dependable watering sources.

Because of the scale of the land management spatial data, the total estimated areas and corresponding percentages have been rounded up to the nearest square mile. In addition to the land ownership and management, the BLM's surface management data and county parcel data from Goshen, Niobrara, and Platte Counties were collected and included in the study's GIS.

Land Management and Upland Water Resources

Approximately 1,600 square miles of rangelands and forestlands are located within the watershed and cover more than 79 percent of the study area. Rangeland acres were approximated by using the hay and pasture, shrub/scrub, and grassland herbaceous vegetative cover types; the forestland acres were approximated by using the deciduous, evergreen, and mixed forest vegetative cover types from the NLCD.

Approximately 1,583 square miles of grass and shrub lands comprise the rangelands located in the watershed. Approximately 1,420 (89.7 percent) of the 1,583 square miles of rangelands are privately owned. Almost 136 (approximately 8.6 percent) are owned by the state of Wyoming; 26 square miles (1.6 percent) of the 1,583 square miles of rangelands are managed by the BLM. The remaining 1.4 square miles (less than 0.1 percent) of rangelands are managed by other agencies, including the USBR and Department of Defense.

In addition to the rangelands in the watershed, forestlands cover approximately 17 square miles in the watershed. Private land encompasses approximately 14 square miles (81.5 percent) of the forestlands within the study area. The BLM manages roughly 1.7 square miles (10.1 percent), and the state of Wyoming owns 1.4 square miles (8.3 percent) of forestlands within the watershed. Less than 0.1 percent of the watershed, forestlands are owned by the USBR and US Department of Defense.

Private Lands

Private land encompasses approximately 1,420 square miles (89.7 percent) of the rangelands and

approximately 14 square miles (81.5 percent) of the forestlands within the study area. Grazing practices on private lands are established by the landowner and/or manager and often with technical assistance from the local Natural Resources Conservation Service (NRCS) Field Office or a range consultant. Management practices and improvements on private lands are implemented and owned by the landowner or manager. Landowners and managers who voluntarily participate in Farm Bill programs may be required to follow NRCS standards and specifications or an approved grazing plan included in a conservation plan that was developed for the enrolled property or applicable Farm Bill program. Private grazing lands are often managed for multiple uses, including mining, oil-and-gas production, wildlife habitat, and recreation. Public land-management policies directly affect the management of the private grazing lands because public leases and federal allotments are integral components of a typical private grazing operation within the study area.

State of Wyoming Lands

State land encompasses approximately 136 square miles (8.6 percent) of the rangelands and approximately 1.4 square miles (8.3 percent) of the forestlands within the study area. Most of the state lands within the watershed are leased to private landowners for grazing. These leases are issued by the Wyoming State Board of Land Commissioners (SBLC) and administered by the Wyoming Office of State Lands and Investments (OSLI). State grazing and agricultural leases allow lessees to construct lease-related improvements on state land, subject to board approval. Grazing management and the operation of installed improvements on state grazing leases are usually implemented by the lessee. After transferring a state grazing lease, the new lessee reimburses the previous lessee for improvements.

Federal Grazing Allotments

An allotment generally consists of federal rangelands and forestlands but could also include private and/or state parcels. BLM grazing allotments encompass approximately 224,874 acres of federal, state, and private rangelands and forestlands within the watershed. These BLM allotments are typically managed under an Allotment Management Plan (AMP) or a Coordinated Resource Management Plan (CRMP). An AMP or CRMP usually involves collaborative resource planning between the agency and permittees to create a livestock grazing management plan specifying the land areas, animal units, grazing schedule, and needed improvements in order to achieve multiple use resource management objectives and grazing land health standards.

Cultural Resources

The Wyoming State Historic Preservation Office (SHPO) maintains a database of inventoried historic sites within the state. The SHPO makes a spatial data file available that generalizes the cultural resource inventory to the section level. This level of locating archaeological data protects the sites from unauthorized disturbance. The attributes recorded for each section include the site count, inventory acres, report numbers, and eligible site number. Sections within the study area have been determined to be eligible for inclusion in the National Register of Historic Places. The National Register of Historic Places, our nation's official list of cultural and historic sites, is administered by the National Park Service and managed within the Wyoming SHPO. Twenty-Seven historical monuments and markers sites are listed on the National Registry of Historic Places and located within the study area. The most prominent historic sites are the Fort Laramie National Historic Site, the Oregon Trail, and the Cheyenne-Deadwood Stage Road. The Oregon, California, and Mormon Trails traverse through the watershed along the North Platte Valley.

Watershed Function

Identifying improvement opportunities for hydrologic and watershed function—including water quantity, yield, and use—are an essential element of the Level I watershed study. Hydrologically, a watershed has three fundamental functions [Black, 1997]:

1. Collecting water from rainfall, snowmelt, and storage that becomes runoff
2. Storing various amounts and durations
3. Discharging water as runoff.

Watershed characteristics (e.g., geologic structure, soils, landform, topography, vegetation, and climate) influence the capture or collection of precipitation, infiltration and storage of surface water and groundwater, and runoff or discharge of water.

Implementing BMPs and conservation practices can affect water quantity through improved plant communities, vegetative diversity, and ecological site health achieved from water development.

Creating reliable water sources in areas without such allows grazing systems to establish and changes in grazing distribution. The hydrological responses to grazing are strongly contingent on the vegetative community composition with communities that provide greater cover and obstruction to overland flow, such as midgrass-dominated communities that have greater hydrological function (including infiltration rate) than shortgrass-dominated communities [Wood and Blackburn, 1981; Thurow, 1991; NRCS, 2011].

Poor water distribution has been the primary cause of poor livestock distribution [Holechek, 1997]. Livestock distribution and grazing behavior can be modified by adjusting the location of supplemental feed and water, implementing patch burns, and herding in addition to fencing [Williams, 1954; Ganskopp, 2001; Fuhlendorf and Engle, 2004; Bailey, 2005]. The NRCS [2011] reviewed many studies and found that water distribution, steep slopes, and high elevations clearly influenced the livestock distribution. Sufficient evidence existed to recommend that the NRCS increase the role of herding and supplement placement along with water development and fences for managing livestock distribution [NRCS, 2011].

Soil vegetative cover is widely recognized as a critical factor in maintaining soil-surface hydrologic condition and reducing soil erosion [Gifford, 1985; NRCS, 2011]. Regardless of the grazing system, stocking rates reduce soil-surface vegetative cover below a site-specific threshold, increase detachment and mobilization of soil particles because of raindrop impact, decrease soil organic matter and soil aggregate stability, and increase soil-surface crusting, which reduces soil-surface porosity. Therefore, infiltration decreases while soil erosion and sediment-transport increases [Blackburn, 1984]. Sufficient vegetative cover, critical soil cover, or residual biomass must remain during and after grazing to protect soil-surface condition (e.g., porosity, aggregate stability, and organic matter) and hydrologic properties (e.g., infiltration); however, these site-specific vegetation cover requirements vary depending on cover type (e.g., vegetation, litter, or rock), soil type, rainfall intensities, and water quality goals [Gifford, 1985]. The erosive energy of water and long-term reduction of organic matter adversely affect many soil properties through the increase of bulk density, disruption of biotic crusts, reduced aggregate stability, and organic matter content, which collectively reduce infiltration and increase sediment runoff [NRCS, 2011]. These efforts can increase water infiltration or percolation, stimulate spring flows, and increase flow volume and duration.

Ecological Enhancement

An ecological enhancement is any activity that improves an ecosystem, such as stabilizing erosive soils; increasing soil quality; planting or maintaining native grasses, shrubs, or trees; removing and controlling

invasive species; and improving or maintaining riparian/wetland areas. The potential benefits achieved from project activities and implementations that influence the condition of those ecological sites and characteristics are also just as complex and varied. Conjunctive to soil function is plant community diversity, health and productivity, subsequent forage diversity, production, and wildlife habitat. Benefits that are accrued to water quality are significant because improvements to the chemical, physical, and biological constituents of a waterbody produce local site enhancements and enhancements that are transferred downstream. Wetland restoration provides benefits to water quality and quantity. Watersheds function by providing diverse sites and pathways along which vital chemical reactions occur and by furnishing habitat for the flora and fauna that constitute the biological elements of ecosystems [Black, 1997].

Plant and Animal Habitat

Locations of conservation practices and rangeland infrastructure can have a large, indirect impact on overall vegetation change with the spatial design of infrastructure, including fence locations, watering points, and feeders that are used to modify patterns of animal movement and forage utilization; the livestock behavior, template of topography, and plant communities to which livestock respond are also considered [Laca, 2009; NRCS, 2011]. Using rangelands for sustainable livestock production has the potential to ensure that the wildlife habitat will continue into the future [NRCS, 2011]. Wildlife responses to conservation practices are usually species- and even species-habitat specific, which means that each species may respond differently to any specific practice and a single species may respond differently to the same practice in different vegetation associations or conditions [NRCS, 2011].

Free-standing water is a resource that influences distribution and abundance of many wildlife species in arid regions of the US; and water developments have been used since the 1940s to improve wildlife habitat [Simpson et al., 2011]. Simpson et al. [2011] evaluated available literature for evidence of the effects of water sources on wildlife populations. Positive effects of water developments on wildlife have been documented, and species that were previously thought not to use free-standing water developments do so when it is available [Simpson et al., 2011]. Researchers also studied the effects of wildlife water developments in southwestern Arizona and found that water developments were used by a diverse array of wildlife, including mule deer, game birds, and several nongame species [Rosenstock et al., 2004].

Stream Corridors and Riparian/Wetland Areas

Reducing the impact to riparian plant communities by developing upland water resources can result in stream corridor benefits. Riparian plant diversity and regeneration of preferred woody species can help restore local water tables, trap sediments, increase wildlife habitat and migration corridors, and stabilize streambanks. Aquatic population benefits can also accrue, and recreation potential can be realized.

Livestock distribution practices (such as water developments, supplement placement, and herding) are effective means of managing the timing of grazing in riparian areas [NRCS, 2011]. The grazing season also determines effects on riparian-vegetation communities, particularly woody plants, and can be managed to conserve riparian habitats [NRCS, 2011]. Riparian-grazing-management has been demonstrated to maintain or enhance key riparian-vegetation attributes (i.e., species composition, root mass and root density, cover, and biomass). Stream-channel and riparian soil stability have also been enhanced and support ecosystem services, such as flood and pollutant attenuation and high-quality riparian habitat [NRCS, 2011]. Peer-reviewed literature generally supports the effectiveness of water

developments, supplement placement, and herding for reducing riparian vegetation use, or time spent in riparian areas [NRCS, 2011].

Societal Value

Natural resource stewardship not only has economic value in terms of forage, livestock, and wildlife production relationships but also can have noneconomic value placed on those conservation practices by society. Those values can even influence the perception of those who implement conservation practices and can be as much of an influence in the decision process to implement conservation as economic value. A BMP or conservation practice can possibly provide an ecological service to accrue more value to society in general than to a landowner. Ecosystem services are things or experiences that are produced by the natural systems on which humans place value [NRCS, 2011].

Noneconomic values can and should be considered in determining watershed-enhancement programs, particularly when considering public investment in conservation. NRCS [2011] found little to no research exists that shows the direct noneconomic effects of BMPs and conservation practices on individuals, households, or social systems but acknowledged that producers likely realize psychological benefits from conservation because stewardship typically ranks high among the management goals of livestock producers [Huntsinger and Fortmann, 1990; Sayre, 2004]. Moreover, producers who strongly believe in a responsibility to society are more likely to engage in environmentally sound management practices, such as invasive weed control and riparian protection [Kreuter et al., 2005].

In 2012, in cooperation with the Wyoming Stock Growers Association (WSGA), University of Wyoming, and University of California-Davis, researchers with the USDA's ARS Rangeland Resources Research Unit in Cheyenne, who were investigating the effects of rangeland management decision-making, asked WSGA producer members about their goals, ranching operations, and management practices via a mail survey. A total of 307 ranchers responded to the survey [Kachergis et al., 2013; Meador, 2013]. Livestock and forage production were the top management goals; ecosystem characteristics that support these goals (e.g., soil health and water quality) were secondary [Kachergis et al., 2013; Meador, 2013].

Along with social values and ecological enhancements, open spaces have long been held in high value in Wyoming and other western states. From the perspectives of ranching, tourism, recreation, or real-estate industries, open space is significant. Open spaces are critical for upland and riparian connectivity, wildlife migrations and habitat, cultural resource preservation, and recreational opportunity.

See address provided below for FULL COPY of Final Report Niobrara-Lower North Platte Rivers
Watershed Study Level 1 Watershed Management Plan

http://library.wrds.uwyo.edu/wwdcrept/Niobrara/Niobrara_Lower_North_Platte_Watershed-Level_I_Management_Plan-Final_Report-2019.html

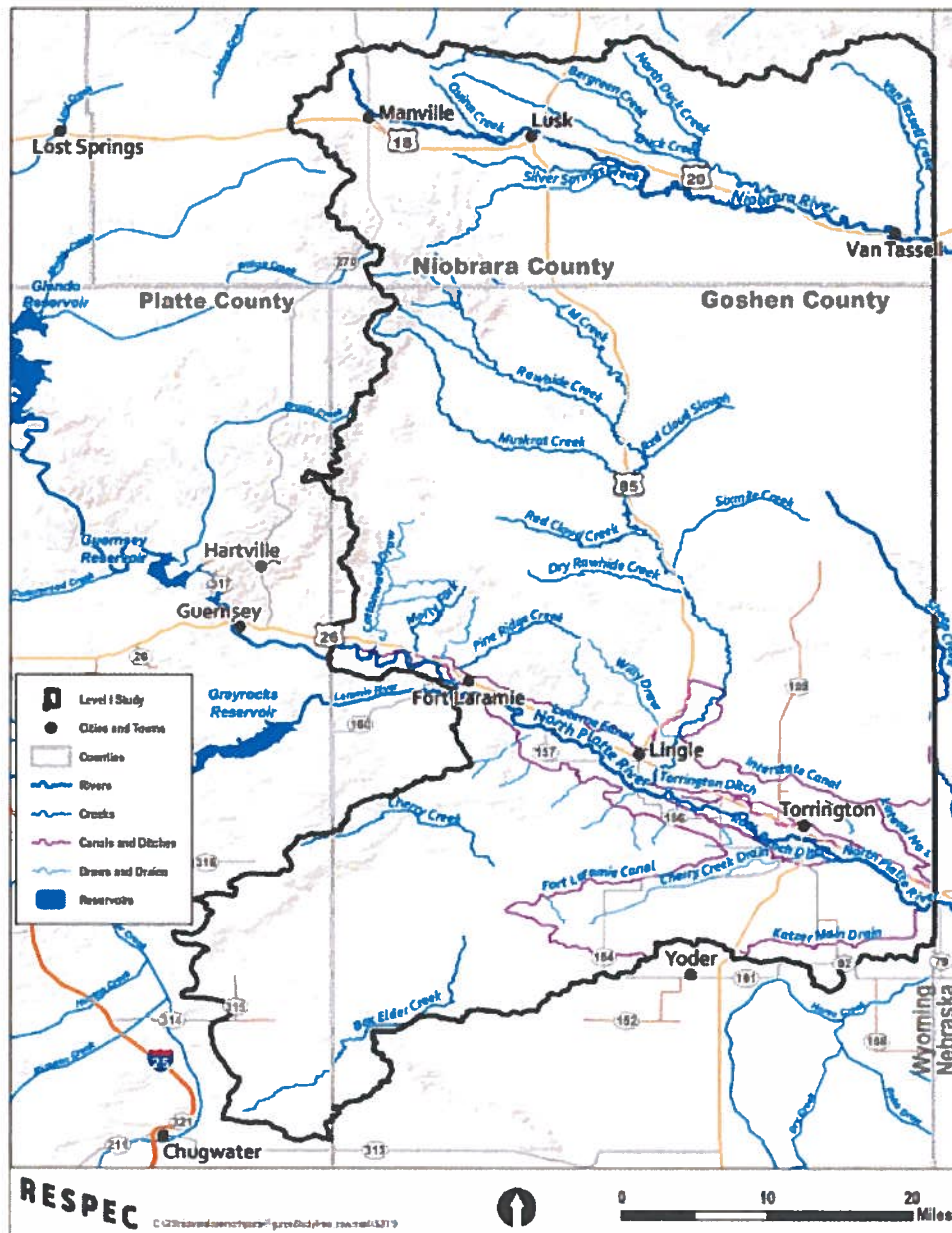


Figure 1.1. Niobrara-Lower North Platte Rivers Level I Watershed Study Area.

SOIL: LOCAL SUPPORT DATA

Agriculture is the foundational building block of Goshen County. The value of the Wyoming agricultural sector for 2014 was about 50 billion dollars. Wyoming ranks eleventh in the nation for total land in farms and ranches (USDA 2015). Goshen County ranked first in Wyoming for agriculture production and first in Wyoming for all cattle which clearly makes it an important contributor to Wyoming's agricultural economics.

Policy: Soil

#1: Agricultural land and subsequent operations are primarily responsible for the economic stability of the District. Therefore, the Board promotes to retain farming and ranching as the preferred land uses in Goshen County.

#2: The District encourages promotion of best management practices of all lands.

#3: The District encourages innovative farming/grazing practices that promote improved soil health.

#4: The District supports the uniform use of ecological site descriptions developed by NRCS as the foundation for the inventory, evaluation, setting of monitoring objectives, and management of rangelands.

Full soil report

Objectives: Soil

Promote public awareness and understanding of local agriculture, and successful conservation measures currently employed by local farmers and ranchers who are good stewards of the land.

Facilitate efforts to participate in natural resource management planning in order to provide for the economic stability and to protect local customs and cultures. Protect prime and statewide important lands in agricultural production.

Support traditional multiple land uses as a means to maintain continuity in the local economy, and assure the sustainability of existing agricultural, recreational, and industrial interests while maintaining or improving the present environmental quality of life.

Provide cost-share funding for on-the-ground natural resource conservation Best Management Practice (BMP) projects.

Support the increase or stabilization of soil organic matter (no net loss through wind or water erosion).

Historical Soil Survey Results

Historical soil surveys, performed within parameters of Goshen County, Wyoming, occurred in 1953 and 1981.

The first soil survey, dated 1953, was prepared as part of a program of the Department of the Interior for Development of the Missouri River Basin. The report is referred to as **Geological Survey Circular 238**, titled **GROUND-WATER CONDITIONS IN THE SOIL AND MOISTURE CONSERVATION DEMONSTRATION AREA NEAR TORRINGTON, GOSHEN COUNTY, WYOMING** (By F. N. Visser and H. M. Babcock). The study also included **A Section On The Chemical Quality Of The Ground Water** (by W. H. Durum and R. A. Krieger).

EXCERPTS OF STUDY

Geologic Setting

The area setting is in a deeply dissected section of the northern part of the High Plains and is underlain by the Brule and Chadron formations of Oligocene age. These Tertiary rocks, which are structurally high in this area, were largely eroded away during Pleistocene time by the North Platte River and by other through-flowing streams. Southwest of the North Platte River in the central part of Goshen County, Wyo., this erosion has formed a vast lowland, which has an extent of several hundred square miles and which is called Goshen Hole. Subsequent to this downcutting, Cherry Creek began to aggrade and deposited coarse sand and gravel. Later, as the carrying power of the stream decreased, finer-grained materials were deposited. Ultimately, the flow of the creek decreased to such an extent that it lacked sufficient power or volume to carry away the slope wash from the sides of the main valley. The present floor of the valley was developed at the same time as the second terrace above the North Platte River; at that time, the river was about 50 feet above its present level. The flow of water in the Cherry Creek valley was so small before the inception of irrigation that the topographers who mapped the area did not show even an intermittent stream in the valley. Subsequently, owing to surface- and ground-water runoff caused by irrigation, Cherry Creek has entrenched itself as much as 35 feet below the adjacent valley floor.

Geologic Formations

Tertiary system Chadron formation. The Chadron formation is typically a green, brown, buff, or red impervious clay containing a few channel sandstones, especially at the top of the formation. In most places the clay grades upward into the siltstone of the overlying Brule formation. Although the formations are similar in appearance in the contact zone, core samples of the Chadron formation were identified by their tendency to check when drying. The Chadron formation underlies the entire area, but only the more resistant channel sandstones are exposed. These sandstones crop out in the central and western parts and in the eastern part. The channel sandstones of the Chadron formation generally yield water to wells in sufficient quantity and of a suitable quality for domestic and stock use.

Brule Formation. In its typical development, the Brule formation is a pale-buff or flesh-colored sandy limy siltstone of compact texture and massive structure. In the formation are numerous vertical to nearly vertical fractures that range in width from a feather edge to several feet. The Brule is a weak, brittle formation; when placed in compression this material would tend to succumb to induced tension rather than induced shear. The weight of the overlying formations, which have since been removed by erosion, was sufficient to cause vertical fracturing when regional warping reduced the lateral support. In most of the core holes drilled into the Brule formation the drilling water, which was pumped at a rate of 20 gpm, was entirely absorbed by the fractures. In several of the holes the bit dropped when fractures were encountered. The Brule formation underlies the northern part of the area, where it crops out in several places and is exposed in many of the cuts in the Fort Laramie canal. It ranges in thickness from a feather edge to about 60 feet in the area; however, before erosion, the maximum thickness of the Brule formation was more than 300 feet. The fine-grained materials of the formation do not readily transmit water. However, fractures in the Brule formation are capable of transmitting large amounts of water and, in adjacent areas, wells develop water from this formation in sufficient quantities for domestic and stock use.

Quaternary System Sand and Gravel. The sand and gravel that overlies the Chadron formation and underlies the slope wash in the southern part of the area lies in a former channel of Cherry Creek. The sand and gravel consists largely of quartz but includes some pebbles of

siltstone that were derived from the Brule formation. Quartz pebbles as large as 1 inch in diameter were brought up in the end of the soil tube. The maximum thickness of these deposits is not known, as in most places, the soil tube did not completely penetrate the material; however, in one probe as much as 20 feet of fine sand was penetrated. Attempts have been made to develop water from this material for domestic and stock use; however, the water is so highly mineralized that it is generally unsuitable.

Slope Wash. The slope wash consists largely of silt and some fine sand. This material is derived from the weathering of the siltstone of the Brule formation, and it is generally indistinguishable from the weathered Brule. All unconsolidated silt and fine sand that was more than a few feet thick was mapped as slope wash. The maximum thickness of the slope wash that was encountered in drilling was ^4-8 feet. The slope wash covers most of the area and constitutes the farmed land. Near its base, the slope wash contains pebbles of siltstone from the Brule formation and it will yield 'small quantities of water¹ to wells that penetrate a sufficient thickness of these coarser materials. The water generally is too highly mineralized for domestic and stock use.

Additional parts of the study included: PHYSICAL AND HYDROLOGIC PROPERTIES including Grain size/ Permeability/ Porosity/ Moisture equivalent, specific retention and specific yield; THE WATER TABLE AND MOVEMENT OF GROUND WATER including Source of ground water/ Recharge from precipitation/ Recharge by seepage from irrigation canals and irrigated land/ Recharge by inflow from adjacent areas/ Evapotranspiration; GROUND-WATER DISCHARGE and FLUCTUATIONS OF THE WATER TABLE including Evapotranspiration/Seepage into drains/ Underflow/ and Seepage explanation where the water table was high throughout much of the area and had caused considerable damage to the farm land. Explanation stated that shallow-lying ground water caused damage by drowning the crops, by depositing harmful salts on and in the soil, and by rendering the land unworkable.

CHEMICAL QUALITY OF THE WATER

The section on chemical quality was used to define the character of water in the canal, wells, and springs in the slope wash and bedrock in the Soil and Moisture Conservation Demonstration Area. The relatively small size of the project area makes chemical-quality data particularly helpful in supporting hydrologic data that relate to direction of ground-water movement, the role of leakage from Fort Laramie canal, and the alterations in the ground water that result from irrigation practices in the area. The collection of water samples under water table conditions was made difficult by the sparsity of wells in the immediate area.

Additional parts of the chemical quality of water study included; Source of chemical substances in the water/Seasonal changes in chemical substances/Relation of irrigation water to the chemical quality of water/ and Quality of water as related to effects on the soil.

Full study can be found at <https://pubs.usgs.gov/circ/1953/0238/report.pdf>

The second soil survey, dated 1981, was prepared as part of a program of United States Department of Agriculture Soil Conservation Service in cooperation with Wyoming Agricultural Experiment Station. The report is referred to as **Soil Survey of Goshen County, Wyoming Northern Part**

Full study can be found at

[https://www.nrcs.usda.gov/Internet/FSE MANUSCRIPTS/wyoming/WY715/0/goshen.pdf](https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/wyoming/WY715/0/goshen.pdf)

RANGE: LOCAL SUPPORT DATA

Soils meeting their range of ecosystem functions requires a combination of physical, chemical, and biological properties that are a reflection of the environmental forces that formed the soil, including the climate, parent material, topography, and vegetation acting over a long period of time. Most natural resource work whether for agriculture, energy, or wildlife purposes begins with the evaluation of the soils to determine site potential. This information is necessary for accurate analysis of disturbance impacts, reclamation, and rangeland health evaluations to name a few. Soil report for the Northern Southeastern Section of NPVCD can be accessed here: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/wyoming/WY715/0/goshen.pdf

Policy: Range

#1: The District supports private landowner rights to manage grazing lands and supports proper and appropriate livestock grazing practices as a tool for the sound management of private, state, and federal lands.

#2: The District supports maintaining and improving existing grazing conditions to promote optimum production of forage for continued ecosystem function.

#3: The District supports and strongly encourages the control of noxious, invasive, and chemical resistant weeds and pests by owners, managers, and users of all lands.

#4: The District acknowledges that prescribed fire can be beneficial when used properly.

#5: The District supports and strongly encourages the control of prairie dogs by owners, managers, and users of all lands.

Objectives: Range

Encourage landowners to use the Natural Resources Conservation Service (NRCS) to attain proper seeding mixes of legumes, grasses, and forbs to improve soil structure and build organic matter.

Encourage landowners to use technical assistance from NRCS to gain knowledge of proper grazing practices and stocking rates to promote grazing systems that will build soil, rangeland health, and improve watershed conditions.

Promote productive and sustainable range management through incorporation of Best Management Practices (BMPs), proven grazing principles, and improved grazing practices.

Work with agriculture producers and partnering agencies to facilitate alternative and innovative methods for rangeland improvements.

Encourage landowners to use expertise of Goshen County Weed and Pest to reduce the distribution of noxious, invasive, and chemical resistant weeds.

DEVELOPMENT: LOCAL SUPPORT DATA

Land development is probably the most controversial area of this plan and yet is one of the most important. As the world environment changes and technology allows for us to experience global happenings as they occur, it is becoming increasingly harder to hold firm to local culture of a quiet agrarian society with strong values yet needing to keep pace with new technologies and growth. It is important to keep our open spaces open but is equally important to not fall behind on the global market.

Policy: Development

#1: The District supports new residential developments and commercial sites in or adjacent to areas currently zoned as residential and commercial zoning and concurs with the Goshen County Zoning Resolution statement.

#2: The District strives to achieve a sustainable balance between the needs of the community, energy development, agriculture, and the environment.

#3: Social, cultural, and environmental impacts of energy and industrial mineral development shall be fully analyzed during all NEPA analysis.

#4: The District supports local, state, and federal agencies in requiring proper construction, maintenance, and reclamation of transportation corridors such as access roads, pipelines, transmission lines, etc. to prevent resource deterioration.

#5: The District supports obtaining an executed surface use agreement providing for compensation to the surface owner for damages to the land and improvements as provided in W.S. 30-5-405(a) for all oil and gas operations where a split estate between mineral rights and surface ownership exists. Further, the District directs that a surface use agreement is for the protection of the surface resources, reclamation activities, timely completion of reclamation of the disturbed areas, and payment for damages caused by the oil and gas operations.

#6: The District supports all Constitutional private property rights in local, state, and federal agency policies, regulations, rules, and actions.

#7: The District supports utilizing legal remedies when federal or state governmental action operates to take property rights or some portion of the property right.

#8: The District supports federal and state agencies rejecting the submission of resource data that was collected while trespassing. Further, the District supports the prosecution of anyone guilty of trespassing to unlawfully collect resource data.

Objectives: Development

Stay abreast of emerging issues – including energy conservation, alternative energy, threatened and endangered species, public land issues, and other related topics.

Provide natural resource education opportunities to residents of all ages that encourage awareness of natural resources.

Support the minimization of ground disturbance associated with energy development (new roads and utility rights-of-way), and locate, when possible, outside of important habitats.

Support restriction of surface occupancy to already disturbed areas or edges of habitat, or adjacent to previously disturbed corridors, so impacts on native plant or wildlife will be minimal.

Support reseeding disturbed areas with native species, develop weed management plans, and work with agencies to provide soil and reclamation information to energy development projects.

COMMUNITY: LOCAL SUPPORT DATA

Natural assets such as rivers, forests, grasslands and wetlands benefit society through the ecosystem services they provide, including water purification, air quality improvements, and flood protection, among other benefits. However, these services are frequently left out of resource management decisions because they aren't easily quantified or assigned a monetary value. As a result, society undervalues these environmental benefits, contributing to the loss of natural systems. Environmental markets can provide incentives to preserve ecosystems and the services they provide. To better understand what impacts projects may have on landscapes,

culture, and customs, it is of great interest to have federal agencies fully characterize the socioeconomic bearings of projects both quantitatively and qualitatively.

Generally, however, the public does not have an adequate understanding of agriculture and the conservation measures that many farmers and ranchers already employ, since media attention is generally focused around negative stories. This lack of understanding has increased greatly during the past 50 years of increasing urbanization, as fewer and fewer people make their living directly from agriculture. The lack of understanding can lead to misperceptions about the industry and environmental impacts and can contribute to the communications gap between the agricultural community and urban/environmental interests, reducing their ability to work together constructively to address current issues.

Policy: Community Services

#1: The balance between local economic growth and quality of life, and community stability of customs and culture are important to the District. Therefore, local, state, and federal agency plan's or management recommendations shall include a socio-economic impact description that addresses the effects on the District natural resources, economies, and health and welfare of the District citizens.

#2: The District shall review subdivision plans and make recommendations on soil suitability, potential soil erosion during and after construction, potential flooding, or wetland concerns to the Goshen County Commissioners/Goshen County Planning Office as clarified in 18-5-306 (a)(xii)(B)(b) of the Wyoming State Statutes.

#3: The District will provide cooperators with program funding and information regarding selection of appropriate varieties of trees for the intended use, the use of trees as windbreaks and living snow fences, proper tree planting techniques and maintenance, tree irrigation systems, and wildlife interactions.

#4: The District strives to reduce risk of groundwater contamination by offering a collection day for urban and rural pesticides and fertilizers, hazardous household chemicals, and electronic waste.

#5: The District will participate in the Local Work Group to address resource concerns and NRCS programs.

#6: The District will work with local educators to provide natural resource presentations which enhance their students' natural resource knowledge, and provide agriculture and natural resource education in public schools, with youth organizations, and in other venues where youth and children receive formal education.

#7: The District will provide educational opportunities to the public on natural resource issues and topics through seminars, events, workshops, tours, and hands-on experiences.

Objectives: Community Service

Participate as a Cooperating Agency with special expertise as provided by the National Environmental Policy Act in federal land planning and implementation.

Participate in educational opportunities to gain knowledge and skills for resource issues and to provide current information to district residents.

Expand educational resource, technical assistance, and funding availability information through all mediums at our disposal (newspapers, radio, social media, website, newsletters, and posters).

Provide guidance, information, and education to elected government officials and decision makers on conservation and natural resource management issues, and supply education and education materials to schools, organizations, and cooperators/landowners.

Support education of the benefits of trees and make available affordable trees and planting services to provide for improved natural resource conditions and community aesthetics within the District.

Proactively plan, coordinate, and install new living snow fences, and promote maintenance of existing living snow fences.

Take advantage of any training opportunities regarding ecosystem services.

WILDLIFE: LOCAL SUPPORT DATA

Wildlife within the District represent a national treasure in terms of opportunities to view and hunt, but management is required to ensure balance of species propagation without undue burden on landowners. The District will focus on species recovery by improving ecosystem health instead of single species listings.

Policy: Wildlife

#1: The District promotes wildlife conservation, sustainability of healthy wildlife habitat and populations, and their contributions to the local economy while accounting for wildlife effects on economic stability.

#2: The District supports the following 17 points, as adopted by the Western Coalition of Conservation Districts, as it pertains to the Endangered Species Act (ESA):

Provide full compensation to individual for current and long-term “takings”. Take into consideration cost-benefit analysis and mitigate for adverse economic, social, and cultural needs of the human element.

Consider and evaluate cumulative effects in accordance with the National Environmental Policy Act (NEPA). Single species management does not consider ecosystem needs and may be detrimental to the well-being of other organisms.

Focus on species recovery by improving ecosystem health instead of single species listing. Listing should be incentive based rather than regulatory.

Seek scientific consensus and require mandatory non-governmental, no-biased peer review prior to the listing of any species.

Petitioners requesting endangered or threatened species designation should be responsible for costs incurred if a listing is determined to be unwarranted.

Require appropriate bonding by any petitioner for a proposed listing of a species. Bond to be forfeited if a species is determined not warranted to be listed.

Ensure agency regulations conform to ESA law.

Allow states to design, control, and implement functionally equivalent, state-specific programs for endangered species recovery planning and critical habitat designation with federal funding.

Codify applicant status to make clear that permit applicants (consists of any individual seeking a federal permit or license) are provided the opportunity of direct involvement in the Section 7 process.

Allow implementation action of any project or activity already underway prior to completion and formal approval of a Recovery Plan

Direct the Secretaries of Agriculture, Commerce and Interior to streamline the ESA Section 7 consultation process through a tiered programmatic consultation at the national, state, and local level.

Eliminate the proposed listing of any sub-species.

Not allow taxpayer funds to be utilized by non-government entities to sue the Government or others

Enhance the incidental take rules to reduce the need for civil violations penalties.

Expedite the delisting process.

Revise the “taking” definition to protect private and state property rights in conformance with the United States Constitution. (Section 3(19))

Provide for “safe-harbor” provisions to make the act more flexible and to encourage landowners to manage lands in a more “endangered species friendly” manner.

#3: The District supports the Wyoming Game and Fish Department being the sole agency responsible for managing all wildlife species in Wyoming not listed as threatened or endangered per the Endangered Species Act.

#4: The District supports proactive management of candidate and sensitive species to avoid further ESA listing protections.

#5: The District encourages using livestock and other tools to improve wildlife habitat.

Objectives: Wildlife

Maintain cooperative efforts with federal and state wildlife agencies on their respective projects to avoid or mitigate adverse impacts to wildlife species and habitats.

Promote the critical role agricultural producers have in providing habitat to wildlife within the District.

Support wildlife habitat improvement and wildlife friendly fencing projects.

Promote projects that improve the quality of riparian and upland habitats that support wildlife.

Work with government agencies, local cooperators, and other interested parties in the management, maintenance and improvement of wildlife habitat, emphasizing voluntary and incentive-based programs.


Work to encourage the use of tools such as grazing, plantings, water development, fire, chemical application, and other best management practices to improve wildlife habitat.

RESOLUTION OF ADOPTION

The North Platte Valley Conservation District Board of Supervisors is committed to providing its residents solid, principled natural resources management leadership, and promoting practical conservation methodology. The Board encourages a comprehensive coordination effort between landowners, operators, this district, and cooperating organizations to ensure long-term benefits to our land, water quality and quantity, and air.

Therefore, be it resolved, the North Platte Valley Conservation District Board of Supervisors adopts this Local Land Use and Natural Resource Management Plan for 2022-2026.

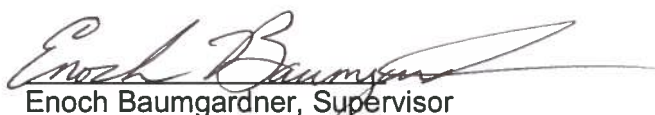

Art Davis, Chair


Date


David Cushman, Vice-Chair


Chrissy Ochsner, Treasurer


Kaye McKee, Supervisor


Enoch Baumgardner, Supervisor



