storage tanks, and watering troughs) that has been constructed throughout the years to provide for proper livestock grazing management in the grazing allotments within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundary. Although the preceding tables identify the spring sources that are most critical to livestock permittees, it should be noted that the majority of springs and livestock well sources within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundary are utilized by livestock at some point throughout the grazing year. These water sources ensure that livestock permittees can adhere to identified grazing management systems, which were designed to provide for proper livestock distribution.

There are several livestock wells that are crucial to livestock grazing management within the allotments. If the water table is lowered, the livestock permittees and the Bureau of Land Management would be responsible for costs associated with re-drilling the existing wells. This process can cost as much as $50.00/ft to re-drill the well. Costs associated with outfitting the well with pipe and pumps would also be incurred. If it was determined that the costs were too high to re-drill wells or funding was not available, there may be a substantial amount of Range Improvement Project infrastructure including livestock pipelines and troughs throughout the allotments in the preceding tables that are unusable and unsalvageable.

It should be noted that visual observations on spring resources by staff members throughout the Cedar City Field Office have revealed that the water production of these spring resources appears to be declining. The cause of this decline in water production at the springs is expected to be drought conditions that the Field Office has experienced in recent years. It would be expected, based upon groundwater modeling and estimated drawdown calculated by West Yost Associates, (Kenneth Loy and Tim Durbin, 2010) that the proposed water rights would result in further reduced water production at many of the spring critical to livestock use, especially for springs located along the valley floor and along the valley margins.

D. Hauling Water from Springs and Wells

In addition, there are several livestock permittees who depend on adequate water being available at these springs and livestock wells to provide water for water hauling locations throughout the allotments where there are no existing water sources available. The majority of livestock wells that have been identified are utilized extensively for water hauling purposes by livestock permittees throughout the identified grazing allotments. These water hauls were identified to further provide for proper livestock distribution and grazing management.

If water was not hauled to these areas upland vegetation would be unavailable to livestock due to distance from water. This would be expected to negatively impact livestock distribution patterns within the allotments that rely on water hauling practices. If the spring and livestock well sources are ever unavailable for livestock use, the livestock grazing permittees would have to rely on water sources in urban areas such as Milford, Utah to provide for water hauling opportunities. This would be expected to create a substantial financial hardship on livestock grazing activities due to the distance required to transport an adequate amount of water from urban areas to an individual grazing allotment. If permittees are not able to make arrangements to haul water from urban areas they may not be able to graze livestock on portions or all of the public lands, which would limit the value of their grazing permits and may cause negative economical impacts to their livestock operation.

If water cannot be hauled the result may be the implementation of livestock reductions through the decision process by the Bureau of Land Management to ensure that applicable laws and regulations are adhered to ensuring that proper livestock distribution and livestock stocking levels occur within the allotments.

5. Summary of Impacts on Grazing Management

A. Potential Acreage Impacted

A total of (977,099 - Total Grazing Allotment Acreage or 466,673 – Public Land Acres within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundaries) may potentially be negatively impacted within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundary that are administered by the Cedar City Field Office and a total of (477,329 - Total Grazing Allotment Acreage or 202,648 – Public Land Acres within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundary) of public land acres may potentially be negatively impacted within the jurisdiction of the Fillmore Field Office.

1. Acreage Potentially Impacted in Pine Valley Hydrologic Unit

As identified in the Pine Valley Hydrologic Unit Boundary (HUC) table above there are all or portions of 13 grazing allotments, (570,826 - Total Grazing Allotment Acreage or 243,595 – Public Land Acres within Pine Valley Hydrologic Unit Boundary) and 15 permittees within the Cedar City Field Office. There are 4 grazing allotments (239,899 - Total Grazing Allotment Acreage or 91,327 – Public Land Acres within the Pine Valley Hydrologic Unit Boundary) and 6 permittees within the Fillmore Field Office that may be potentially impacted by the proposal.

Field Office	Total Grazing Allotment Acreage	Total Public Land Acres within the Pine Valley HUC	Percent of Public Land within the Field Offices that may be Impacted (Total Grazing Allotment Acreage)	Percent of Public Land within the Field Offices that may be Impacted (Total Public Land Acres within the Pine Valley HUC)
Cedar City Field Office (CCFO)	570,826	243,595	27%	12%
Fillmore Field Office (FFO)	239,899	91,327	5%	2%
Totals	**810,725**	**334,922**	**32%**	**14%**

2. Acreage Potentially Impacted in Wah Wah Valley Hydrologic Unit

As identified in the Wah Wah Valley Hydrologic Unit Boundary table above there are all or portions of 8 grazing allotments (406,273 - Total Grazing Allotment Acreage or 223,078 – Public Land Acres within the Wah Wah Valley Hydrologic Unit Boundary) and 9 livestock permittees within the Cedar City Field Office and 5 grazing allotments (237,430 - Total Grazing Allotment Acreage or 111,321 – Public Land Acres within Wah Wah Valley Hydrologic Unit Boundary) and 8 permittees within the Fillmore Field Office that may potentially be impacted by the proposal.

Field Office	Total Grazing Allotment Acreage	Total Public Land Acres within the Wah Wah HUC	Percent of Public Land within the Field Offices that may be Impacted (Total Grazing Allotment Acreage)	Percent of Public Land within the Field Offices (Total Public Land Acres within the Wah Wah Valley HUC)
Cedar City Field Office (CCFO)	406,273	223,078	19%	11%
Fillmore Field Office (FFO)	237,430	111,321	4%	1%
Totals	**643,703**	**334,399**	**23%**	**12%**

B. Potential Impacts on Range Improvement Projects within the Pine Valley and Wah Wah Valley Hydrologic Units

A substantial amount of time and money has been invested into the planning, development and maintenance of water pipelines which distribute livestock to livestock, wildlife, wild horses, etc. in Pine and Wah Wah Valleys. Further, significant time and money has been invested in development of grazing management plans where these water distributions systems are a key component of plan implementations. There are approximately 143 miles of livestock pipelines which service allotments within the Pine Valley Hydrologic Unit Boundary and approximately 66 miles of livestock pipeline within the Wah Wah Valley Hydrologic Unit Boundary (Refer to Pine Valley and Wah Wah Valley Range Allotment Maps). The springs that are associated with these livestock pipelines typically service several allotments. The pipelines are critical to provide for livestock water while also maintaining proper livestock distribution throughout the allotments. Furthermore, there are several livestock wells within the Hydrologic Unit Boundaries, which livestock permittees utilize for hauling water to designated livestock water hauls within their respected allotment.

These range improvement projects (RIPs) are typically funded by multiple parties, including the State of Utah. The Cedar City Field Office, Utah Partners for Conservation Development, and the Livestock Grazing Board have provided funding to construct and implement these RIPs. The projects were identified within the respective allotments to provide for improved livestock distribution and management. In addition, the projects are expected to provide additional reliable water sources for wildlife and wild horses. The proposed water rights may have a detrimental impact to the successful implementation of these projects.

C. Potential Impacts on Vegetation Management

The proposed groundwater withdrawal project has the potential to significantly lower the water table within the Pine Valley and Wah Wah Valley Hydrologic Unit Boundaries, which may lead to lowering water levels in existing spring and well water sources that provide water to livestock, wildlife and wild horses. If available water is limited, detrimental impacts to upland vegetation may occur throughout the Hydrologic Unit Boundaries due to improper livestock distribution and the inability to adhere to existing grazing management systems. Available water is a necessity within these allotments to provide for the attainment of the Standards and Guidelines for Healthy Rangelands.

Dan Fletcher — 9-15-10

Dan Fletcher
Lead Range Management Specialist
Cedar City Field Office

Date

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Durbin, Timothy and Loy, Kenneth. Simulation Results Report for Eastern Nevada and Western Utah Regional Groundwater Model Provisional, Version 1.0. West Yost Associates, July 2, 2010.

Attachment 1

The Fundamentals of Rangeland Health stated in 43 CFR 4180

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity and the timing and duration of flow.

2. Ecological processes, including the hydrologic cycle, nutrient cycle and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.

4. Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities. They provide direction in the development and implementation of the standards for rangeland health.

Standards and Guidelines for Healthy Rangelands (1997)

Standard 1. Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform.

As indicated by:

a) Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation.
b) The absence of indicators of excessive erosion such as rills, soil pedestals, and actively eroding gullies.
c) The appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community [DPC], where identified in a land use plan, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological conditions.

<u>Standard 2.</u> Riparian and wetland areas are in properly functioning condition. Stream channel morphology and functions are appropriate to soil type, climate and landform.

As indicated by:

a) Streambank vegetation consisting of, or showing a trend toward, species with root masses capable of withstanding high streamflow events. Vegetative cover adequate to protect stream banks and dissipate streamflow energy associated with high-water flows, protect against accelerated erosion, capture sediment, and provide for groundwater recharge.
b) Vegetation reflecting: Desired Plant Community, maintenance of riparian and wetland soil moisture characteristics, diverse age structure and composition, high vigor, large woody debris when site potential allows, and providing food, cover and other habitat needs for dependent animal species.
c) Revegetating point bars; lateral stream movement associated with natural sinuosity; channel width, depth, pool frequency and roughness appropriate to landscape position.
d) Active floodplain.

<u>Standard 3.</u> Desired species, including native, threatened, endangered, and special-status species, are maintained at a level appropriate for the site and species involved.

As indicated by:

a) Frequency, diversity, density, age classes, and productivity of desired native species necessary to ensure reproductive capability and survival.
b) Habitats connected at a level to enhance species survival.
c) Native species reoccupy habitat niches and voids caused by disturbances unless management objectives call for introduction or maintenance of nonnative species.
d) Appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community [DPC], where identified in a land use plan conforming to these Standards, or (2) where the DPC is identified a community that equally sustains the desired level of productivity and properly functioning ecological processes.

<u>Standard 4.</u> BLM would apply and comply with water quality standards established by the State of Utah (R.317-2) and the Federal Clean Water and Safe Drinking Water Acts. Activities on BLM Lands would support the designated beneficial uses described in the Utah Water Quality Standards (R.317-2) for surface and groundwater. [1]

As indicated by:

a) Measurement of nutrient loads, total dissolved solids, chemical constituents, fecal coliform, water temperature and other water quality parameters.
b) Macro-invertebrate communities that indicate water quality meets aquatic objectives.

[1] BLM would continue to coordinate monitoring water quality activities with other Federal, State and technical agencies.

Guidelines for Grazing Management (1997)

1. Grazing management practices would be implemented that:

(a) Maintain sufficient residual vegetation and litter on both upland and riparian sites to protect the soil from wind and water erosion and support ecological functions;

(b) Promote attainment or maintenance of proper functioning condition riparian/wetland areas, appropriate stream channel morphology, desired soil permeability and infiltration, and appropriate soil conditions and kinds and amounts of plants and animals to support the hydrologic cycle, nutrient cycle and energy flow;

(c) Meet the physiological requirements of desired plants and facilitate reproduction and maintenance of desired plants to the extent natural conditions allow;

(d) Maintain viable and diverse populations of plants and animals appropriate for the site;

(e) Provide or improve, within the limits of site potentials, habitat for Threatened or Endangered Species;

(f) Avoid grazing management conflicts with other species that have the potential of becoming protected or special status species;

(g) Encourage innovation, experimentation and the ultimate development of alternatives to improve rangeland management practices;

(h) Give priority to rangeland improvement projects and land treatments that offer the best opportunity for achieving the Standards.

2. Any spring or seep developments would be designed and constructed to protect ecological process and functions and improve livestock, wild horse and wildlife distribution.

3. New rangeland projects for grazing would be constructed in a manner consistent with the Standards. Considering economic circumstances and site limitations, existing rangeland projects and facilities that conflict with the achievement or maintenance of the Standards would be relocated and/or modified.

4. Livestock salt blocks and other nutritional supplements would be located away from riparian/wetland areas or other permanently located, or other natural water sources. It is recommended that the locations of these supplements be moved every year.

5. The use and perpetuation of native species would be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, cannot achieve ecological objectives as well as nonnative species, and/or (d) cannot compete with already established native species.

6. When rangeland manipulations are necessary, the best management practices, including biological processes, fire and intensive grazing, would be utilized prior to the use of chemical or mechanical manipulations.

7. When establishing grazing practices and rangeland improvements, the quality of the outdoor recreation experience is to be considered. Aesthetic and scenic values, water, campsites and opportunities for solitude are among those considerations.

8. Feeding of hay and other harvested forage (which does not refer to miscellaneous salt, protein and other supplements) for the purpose of substituting for inadequate natural forage would not be conducted on BLM lands other than in (a) emergency situations where no other resource exists and animal survival is in jeopardy, or (b) situations where the Authorized Officer determines such a practice would assist in meeting a Standard or attaining a management objective.

9. In order to eliminate, minimize or limit the spread of noxious weeds, (a) only hay cubes, hay pellets or certified weed-free hay would be fed on BLM lands, and (b) reasonable adjustments in grazing methods, methods of transport and animal husbandry practices would be applied.

10. To avoid contamination of water sources and inadvertent damage to non-target species, aerial application of pesticides would not be allowed within 100 feet of a riparian/wetland area unless the product is registered for such use by the EPA.

11. On rangelands where a standard is not being met, and conditions are moving toward meeting the standard, grazing may be allowed to continue. On lands where a standard is not being met, conditions are not improving toward meeting the standard or other management objectives, and livestock grazing is deemed responsible, administrative action with regard to livestock would be taken by the Authorized Officer pursuant to CFR 4180.2(c).

12. Where it can be determined that more than one kind of grazing animal is responsible for failure to achieve a Standard, and adjustments in management are required, those adjustments would be made to each kind of animal, based on interagency cooperation as needed, in proportion to their degree of responsibility.

13. Rangelands that have been burned, seeded or otherwise treated to alter vegetative composition would be closed to livestock grazing as follows: (1) burned rangelands, whether by wildfire or prescribed burning, would not be grazed for a minimum of one complete growing season following the burn; and (2) rangelands that have been seeded or otherwise chemically or mechanically treated would not be grazed for a minimum of two complete growing seasons.

14. Conversions in kind of livestock (such as from sheep to cattle) would be analyzed in light of Rangeland Health Standards. Where such conversions are not adverse to achieving a Standard, or they are not in conflict with BLM land use plans, the conversion would be allowed.

United States Department of the Interior

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TAKE PRIDE IN AMERICA

Potential Impacts from Central Iron County Water Rights Applications 14-118 and 69-101 to Wild Horse Populations on Public Lands Managed By the U.S. Department of Interior, Bureau of Land Management

Chad Hunter
Rangeland Management Specialist
Cedar City Field Office
Bureau of Land Management
September 2010

Introduction

The purpose of this report is to provide a summary of the potential impacts of the proposed water rights on wild horse populations within Wah Wah Valley and Pine Valley. The report begins with an overview of the legal and regulatory framework that guides BLM management of wild horse populations. The report then describes the herd management areas (HMAs) located within Wah Wah Valley and Pine Valley, including identification of water sources that are critical to management of wild horse populations. The final part of the report discusses potential responses of wild horse populations to reduced water availability, assuming that flow from a significant percentage of springs will be reduced or eliminated, based on groundwater level simulations performed by West Yost Associates (Durbin and Loy, 2010).

Legal and Regulatory Framework for Wild Horse Management

With passage of the Wild Horse and Burro Act of 1971 (Public Law 92-195), Congress stated that "Wild horses are living symbols of the pioneer spirit of the West." In addition, the Secretary of Interior was ordered to, "…manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands."
Management of wild horses is also conducted in accordance with amendments to the wild horses and burro act which include:

- Public Law 94-579 (Federal Land Policy and Management Act of 1976)
- Public Law 95-514 (Public Rangelands Improvement Act of 1978).
- Fiscal Year 2005 Omnibus Appropriation Act (PL 108-447, Division E, Title 1, Section 142)

Public law 92-195, as amended, requires the protection, management, and control of wild free-roaming horses and burros on public lands.

BLM's Pinyon Management Framework Plan (MFP) approved on June 1, 1983 covers the wild horse management in the Wah Wah and Pine Valleys Hydrologic Units.

Wild Horse management regulations are found in 43 Code of Federal Regulations (CFR) 4700 and policies. The following are excerpts from 43 CFR relating to the protection, management, and control of wild horses under the administration of the BLM.

> 43 CFR 4700.0-2 One of the objectives regarding wild horse management is to manage wild horses "as an integral part of the natural system of the public lands under the principle of multiple use . . ."
>
> 43 CFR 4700.0-6(a-c) Requires that BLM manage wild horses "...as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat ... considered comparably with other resource values ..." while at the same time "...maintaining free-roaming behavior."
>
> 43 CFR 4710.4 "Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management of wild horses shall be at the minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans."

Ultimately, the BLM is to manage the wild horses and burros to maintain a thriving ecological balance with as little involvement as possible while the wild free roaming behavior is affected as little as possible. During drought periods the BLM has hauled water for up to 6 six months for wild horse health and survival. The BLM policy is to not feed the wild horses on the range. When water and forage is not adequate enough to sustain wild horse health emergency gather and removals have and would take place. Appropriate Management Levels (AML) or population managed for on the range in an area is based primarily on the forage and water available in an area.

Wild Horse Areas Associated with Wah Wah Valley Hydrologic Unit

The following herd management areas (HMAs) and herd areas (Has) are located wholly or partially within the Wah Wah Valley Hydrologic Unit (HU).

Frisco HMA

- Wah Wah Valley Hydrologic Unit includes part of the Frisco Herd Management Area (HMA) which occurs on the San Francisco and Beaver Lake mountains.
- There are three named springs (*James, Pitchfork, and Crystal Springs*) are within the HMA and the Wah Wah Hydrologic Unit.
- Of the three springs, Pitchfork spring is the most productive and is the most critical. It has a pipeline with two (soon to be three) troughs that increase the area of use for wild horses.
- All water sources (*springs, seeps, well, etc.*) within or adjacent to the HMA where wild horses can access are used to some extent by wild horses.
- There are several other springs, seeps, and well within 10 miles of the Wah Wah Hydrologic Unit that are utilized by Frisco HMA wild horses. There would be direct and indirect impacts to these springs by the reduction of elimination of water source for wild horses within the Wah Wah

Hydrologic Unit. Some of those springs include: State Pond, Morehouse, Coyote, Tub, Horse, Three Kilns and Armstrong.

Blawn Wash Herd Area (HA)

- Wah Wah Hydrologic Unit includes part of the Blawn Wash HA which occurs in the Wah Wah Mountains and Wah Wah Valley.
- Springs within the boundary of the Wah Wah Valley Hydrologic Unit and the Blawn Wash HA include: Head of Willow Creek, Ikies, Bucket Ranch, and Willow Springs.
- Springs used by wild horses within the boundary of the Wah Wah Valley Hydrologic Unit but outside the Blawn Wash HA boundary include: Skellys, Hospital, Gun, and Kiln Spring (with pipeline and troughs).
- Springs used by wild horses outside of the Wah Wah Valley project boundary but within the Blawn Wash HA boundary include: Blawn Wash, Bumblebee, and Iron Mine springs.
- Of these springs the most critical springs for wild horses include: Head of Willow Creek, Willow, Kiln Springs, Blawn Wash, Bumblebee, and Iron Mine springs.
- All water sources (*springs, seeps, well, etc.*) within or adjacent to the HA where wild horses can access are used to some extent by wild horses.

Wild Horse Areas Associated with Pine Valley Hydrologic Unit

The following herd management areas (HMAs) and herd areas (Has) are located wholly or partially within the Wah Wah Valley Hydrologic Unit (HU).

Blawn Wash HA

- The Pine Valley Hydrologic Unit includes part of the Blawn Wash Herd Area (HA) which occurs primarily in the Wah Wah Mountains and Pine Valley.
- Springs within the boundary of the Pine Valley Hydrologic Unit and the Blawn Wash HA include: Water Hollow (pipeline and troughs), and Burnt Stump springs.
- Springs used by wild horses within the Pine Valley Hydrologic Unit but outside the Blawn Wash HA boundary include: Teton Spring.
- Of these springs the most critical springs for wild horses include: Water Hollow and Teton Springs.
- All water sources (*springs, seeps, well, etc.*) within or adjacent to the HA where wild horses can access are used to some extent by wild horses.

Sulphur HMA

- The Pine Valley Hydrologic Unit includes part of the Sulphur HMA which occurs in the Mountain Home, Indian Peak Mountains and Pine Valley.
- Springs within the boundary of the Pine Valley Hydrologic Unit and the Sulphur HMA include: Mountain Home, Biting (Vance), Cottonwood, Pot Sum Pah, Mud, Upper Pine, Spike Hollow, Meadow, Sand, Victor, Forked, Carney, Tunnel, Tub, Cherry, Buckhorn, Pinto, Big Pinto, Little Pinto, and Ripgut Springs.
- Springs used by wild horses within the boundary of the Pine Valley Hydrologic Unit but outside the Sulphur HMA boundary include: Cougar, North Sulphur, South Sulphur, Sulphur, Ryan, Cobb, Salt Cabin, Big Basket, Little Basket, Arrowhead, and Pipeline Springs.

- Of these springs the most critical springs for wild horses include: Mountain Home, Biting (Vance), Cottonwood, Pot Sum Paw, Mud, Upper Pine, Spike Hollow, Meadow , Cougar, Cobb, North Sulphur, South Sulphur, Sulphur, Ryan, Ripgut, Salt Cabin, Big Basket, and Little Basket springs.
- All water sources (*springs, seeps, well, etc.*) within or adjacent to the HMA where wild horses can access are used to some extent by wild horses.

Overview of Herd Areas and Populations

The following table provides an overview of herd areas managed by BLM within the Wah Wah Valley Hydrologic Unit and Pine Valley Hydrologic Unit. Most of the acreage within the Four Mile HMA is located outside of Pine Valley and Wah Wah Valley. However, horses from the Four Mile HMA travel outside of their HMA boundary and into Pine Valley Hydrologic Unit and Wah Wah Valley Hydrologic Units on a regular basis.

FY-2010 WILD HORSE POPULATIONS FOR BLAWN WASH, FRISCO, FOUR MILE AND SULPHUR
(*CEDAR CITY FIELD OFFICE*, UTAH)

(Date= 2/24/10)

HERD AREA NAME	ALLOWABLE MANAGEMENT LEVEL	LAST COUNT	ESTIMATED POPULATION	LAST CENSUS
Blawn Wash	**0**	65	45	2008
Frisco	**12-60**	105	117	2010
Four Mile	**30-60**	72	30	2008
Sulphur*	**165-250***	348	230	2008
TOTALS	**207 - 370**	---	**422**	---

Responses of Wild Horses to Reduced Water Availability

Potential responses of wild horses to reduced water production or elimination of water sources within the WahWah Valley and Pine Valley are outlined below.

1. Wild horses that experience a reduction in production or elimination of a water source(s) generally respond in two different ways.

    - First, if the water source is lost, wild horses will move to other nearby water sources. Wild horses must be in good condition, know about the other water sources, and the other water sources must be within traveling distance (varies with terrain, fences, natural boundaries, weather etc.). If water is not available at the new location, they may try another location that is within traveling distance, or they may return to the original water source. The horses may repeat this cycle several times until the horses find water or until the horse condition deteriorates to the point the horses can no longer travel. The horses will then stay near a water source as it dries up and they ultimately die.

    - Second, some horses are habituated to only one or two water sources. These horses will not leave the water source and will stay at the location as it dries up. The horses will paw at the water source as the source dries up, attempting to increase the production of the source. In doing so, the water sources will be damaged by soil compaction and/or facility damage. As water availability decreases to the point where horses can't sustain their health, they will begin eating moist sand in an attempt to get the moisture they need. If the horses don't get normal amounts of water to drink the sand will become impacted within the intestines of the horse. Impaction and the lack of water will cause the horses' health to deteriorate until they die. Very few horses that have been found in this condition have survived.

2. Within Utah in the last 10 years there have been two known situations where water sources have had extremely low production or dried up and wild horses have died.

    - Needle Point Spring BLM Fillmore Field Office- Sixteen horses died in July, 2001 as the surface water dried up, due to private hay irrigation pivots that were placed close to the spring near the Utah-Nevada border. The water that formerly came to the surface at Needle Point spring was drawn down by the pivots and water was no longer available for wild horses, wildlife, or livestock. The wild horses in the area were habituated to the water source and died there waiting for water, even though other springs within the wild horse management area still had flow.

    - Airstrip Spring - Muddy Creek HMA- BLM Price Field Office - Twenty horses died as a small spring dried up due to drought and too many wild horses drinking at the source. Approximately seven horses were rescued, but only four survived. The rescued horses that died after capture were examined by a veterinarian and determined to be 25% dehydrated. These horses were given adequate water and forage, but it was found that the sand plugged up the digestion track and nothing could be done to save the horses.

3. Wild Horse habitat is reduced as water sources are reduced or eliminated within or adjacent to HMAs or HAs. Forage is only available to wild horses if it is within traveling distance from a water source. This travel distance must be short enough and forage adequate enough to provide maintenance of the horse's health. This traveling distance does vary with weather, season, terrain, horse health, forage quantity, forage quality, and other factors, but is generally under 8 miles from the water source.

4. Horses that move from a depleted water source to a more productive water source cause increased impacts to the productive water source and the surrounding area. In most cases, the water source and surrounding habitat is already sustaining the maximum population of wild horses for the area. Adding additional wild horses into the area will cause added stress to the horses and habitat.

5. Population objectives for herd areas may have to be reduced if habitat and water sources are reduced. Reduced populations may make some HMAs populations too small to support genetic diversity without intensive management, such as introduction of outside horses to the herd.

Chad Hunter 9/23/10

Chad Hunter **Date**
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September 2010

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United States Department of the Interior

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TAKE PRIDE IN AMERICA

September 17, 2010

POTENTIAL IMPACTS FROM CENTRAL IRON COUNTY WATER RIGHTS APPLICATIONS 14-118 AND 69-101 TO RIPARIAN AND WETLAND AREAS ON PUBLIC LANDS MANAGED BY THE U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT

Prepared by:
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September 2010

Introduction

The purpose of this report is to provide a summary of the potential impacts of the proposed water rights on riparian and wetland areas within Wah Wah Valley and Pine Valley. The first part of the report an overview of the total number of acres and stream miles of riparian and wetland habitat that could be impacted by the proposed water rights, along with a description of the potential impacts associated with reduction or cessation of flow from groundwater aquifers. The second part of the report provides documentation of the individual riparian and wetland complexes that could be impacted by the proposed water rights, based on groundwater level simulations performed by West Yost Associates (Durbin and Loy, 2010).

I. Potential Impacts to Riparian Areas from Water Drawdown

The total acres and miles of spring/wetlands on public lands administered by the Cedar City Field Office in Pine Valley are:

24.3 acres
7.7 miles

Total acres and miles of springs/wetlands on public lands administered by the Cedar City Field Office in Wah Wah Valley are:

6.1 acres
12.6 miles

All of these spring and wetland complexes are located within areas for which the modeling and simulations performed by West Yost Associates show at least a five-foot groundwater drawdown at the end of the 200-year simulation period.

There are general assumptions that can be made about impacts to springs and streams in the Pine, Wah Wah, and Hamlin Valleys should water drawdown occur. The riparian and wetland systems in these valleys are dependent on ground water as the source for their water. Riparian vegetation development is dependent on the ground water for growth, reproduction, and vigor. In general, riparian systems that are perennial in nature will be comprised of more obligate wetland species while intermittent and flashy systems will contain more facultative vegetation. The riparian systems in these valleys require obligate, facultative wetland, or facultative plant species in order to dissipate energy from high flows (i.e. spring runoff) on streams and overland or subsurface flows on springs. These physical processes allow a spring or stream to function properly

Though it is difficult to state at what drawdown level there would begin to be a change riparian vegetation composition, water drawdown at any level would remove surface and subsurface flows from springs in the Pine, Wah Wah, and Hamlin Valleys. Removing water from water dependent systems would not allow these riparian systems to carry the physical processes outlined above because changes in vegetative composition would occur. Lotic (flowing) systems in these valleys are dependent on water from springs and not snow melt for their water supply; therefore, they would dry up. Riparian vegetation would disappear entirely from spring and streams because the vegetation is dependent on soils and soil features that are influenced by water. Obligate wetland species would be the first leave a system, followed by facultative wetland and facultative species. As drawdown occurs, upland species begins to encroach on the riparian/wetland areas and eventually dominate the sites. The only water that would continue to influence lotic systems would be from snow melt and seasonal monsoon rains. However, these types of water flows would not be sufficient to maintain soil moisture characteristics, and thus, riparian vegetation. Modeled springs in the Pine and Wah Wah Valleys would become ephemeral in nature, meaning that water is only available to them in direct response to precipitation and generally have flows of less than 30 days.

Because these riparian/wetland features are rare relatively to the total number of acres in the Pine and Wah Wah Valleys, indirectly, should springs and streams that dry up due to water drawdown, wildlife, wild horses, and livestock will concentrate use on other streams and springs. A majority of the causal factors for spring and streams not functioning properly in these valleys is due to excessive use by wildlife, wild horses, and livestock grazing. Additional pressure could cause excessive trampling and overutilization of riparian vegetation on other systems, causing these systems to not function properly.

II. Methodology Used to Assess Wetland/Riparian Areas Potentially Affected by the Proposed Water Rights

The following Riparian Condition Assessments have been completed on selected riparian and wetland areas in the Pine, Wah Wah, and Hamlin Valleys of the Cedar City Field Office. The assessments include those systems on public land that were modeled in the "Simulation Results Report Eastern Nevada-Western Utah Regional Groundwater Flow Model" (Loy and Durbin 2010).

Assessments were performed in accordance with the guidelines found in Technical Reference 1737-15 *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (1998) and Technical Reference 1737-16 *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas* (1999).

A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to (Technical References 1737-15 and 16):

- dissipate energies associated with spring runoff and surface/subsurface flows
- filter sediment and aid floodplain development
- improve flood water retention and ground water recharge
- develop root masses that stabilize soils and streambanks against cutting action
- restrict water percolation
- develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production
- support greater biodiversity

Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation are Functional-At Risk. Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate energy associated with high flows are Nonfunctional.

The riparian and water resources assessed for Proper Functioning Condition are summarized in the following tables and discussed below: (Note: Bannion Spring is not included in the table. During a site visit in 2009, an Interdisciplinary Team determined that Bannion Spring lacked the potential and characteristics of a wetland area.)

Table 1. Lentic Resource Inventory

Lentic (Springs/Wetlands) Resources							
Site Name (Valley Location)	**Year Assessed**	**Riparian Functional Rating**					
		PFC	**FAR-UP**	**FAR-NA**	**FAR-DN**	**NF**	**50-Year Drawdown (ft)**
Biting Spring (Pine Valley)	2009			0.55			10-20
Muddy Spring-exclosure (Pine Valley)	2009			0.01			5-10
Muddy Spring-Out (Pine Valley)	2009			0.07			5-10
Sheep Creek Reservoir (Pine Valley)	2009	2.2					10-20
Water Hollow-Upper (Pine Valley)	2009	1.3					10-20
Water Hollow-Lower (Pine Valley)	2009	2.5					10-20
Willow Creek Spring (Wah Wah Valley)	2006	6					2-5
Willow Spring (Pine Valley)	2009	0.1					5-10
Pipeline Spring (Hamlin Valley)	2009			0.15			5-10
Spanish George Spring-Spanish George Allotment (Hamlin Valley)	2009	0.67					5-10
Spanish George Spring-Bennion Spring Allotment (Hamlin Valley)	2009			2.8			5-10

PFC=Proper Functioning Condition
FAR-UP= Functional at risk with upward trend
FAR-NA= Functional at risk, trend not apparent
FAR-DN= Functional at risk with downward trend
NF= Non-functional

Table 2. Lotic Resource Inventory

Lotic (Streams) Resources							
Site Name (Valley Location)	Year Assessed	Riparian Functional Rating					
		PFC	FAR-UP	FAR-NA	FAR-DN	NF	Total Miles
Sheep Creek 1 (Pine Valley)	2009				0.06		0.06
Sheep Creek 2 (Pine Valley)	2009				0.08		0.08
Sheep Creek 2-out (Pine Valley)	2009					0.44	0.44
Sheep Creek 3 (Pine Valley)	2009				0.43		0.43
Willow Creek I (Wah Wah Valley)	2006	0.63					0.63
Willow Creek II (Wah Wah Valley)	2006	5.7					5.7

Riparian wetland vegetation is divided into the following categories: obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and obligate upland (UPL). Riparian wetland plants are hydrophytic, which means these plants have to be in contact with the water table and explains why they can be used as indicators of soil moisture characteristics (TR-1737-15, 1998).

Definitions:

Obligate (OBL): Plant species that occur almost always (estimated probability >99 percent) under natural conditions in wetlands.

Facultative Wetland (FACW): Plant species that usually occur in wetlands (estimated probability 67-99 percent), but occasionally are found in non-wetlands.

Facultative (FAC): Plant species that are equally likely to occur in wetlands or nonwetlands (estimated probability 34-66 percent).

Facultative Upland (FACU): Plant species that usually occur in nonwetlands (estimated probability 67-99 percent), but occasionally are found in wetlands (estimated probability 1-33 percent).

Upland (UPL): Plant species that occur in wetlands in another region, but occur almost always (estimated probability >99 percent) under natural conditions in nonwetlands in the region specified.

III. Characteristics of Riparian/Wetland Areas Potentially Affected by the Proposed Water Rights

The following are summaries of assessments on the modeled springs and streams summarized in the tables above:

A. Biting Spring

Biting Spring is a lentic system comprised of approximately 0.55 acres. The spring is rated as Functional - At Risk. No prior photos or assessments were found, therefore, the spring was rated with no apparent trend.

1. Plant Community

The vegetative community at Biting Spring is comprised Nebraska sedge (OBL), Baltic Rush (FACW), red top (FACW), hardstem bulrush (OBL), and watercress (OBL). Upland vegetation communities are dominated by rabbitbrush, greasewood, and inland saltgrass.

2. Riparian Condition

Though vegetation exhibited good vigor and the proper riparian communities are present in the system, there is not adequate vegetative cover present to dissipate energy of overland flows. Natural surface flows are also being altered by disturbance. Upland watershed conditions are contributing to excessive erosion and deposition of sediment into the spring.

3. Causal Factors

Causal factors identified for the Functional – At Risk rating include excessive hoof action/trampling by livestock and elk. Livestock were present in the area at the time of the assessment and elk sign is evident throughout the area. Excessive trampling and grazing in the uplands surrounding the spring is causing excessive amounts of soil to be deposited into the spring system.

B. Muddy Spring

Though Mud Spring is located in the Cedar City Field Office, the spring is located within a grazing allotment administered by the Fillmore Field Office. Mud Spring consists of two lentic systems, one inside a livestock exclosure and the other created by overflow from a livestock trough. Inside the exclosure, the wetland area is approximately 0.01 acre and is rated as Functional – At Risk with no apparent trend. Outside the exclosure, the wetland area is approximately 0.07

acre and is rated as Functional – At Risk with no apparent trend. No prior photos or assessments were found, therefore, the spring was rated with no apparent trend.

1. Plant Community

The vegetative community at Mud Spring (exclosure) consists of Baltic rush (OBL). Outside the exclosure, Mud Spring consists of common spikerush (OBL), mesic forbs, and inland saltgrass (FAC). The upland community consists of rabbitbrush, pinyon-juniper, and limited herbaceous understory.

2. Riparian Condition

a) Mud Spring (exclosure)

Surface and subsurface flows are being negatively impacted by the water development; the riparian-wetland area appears to be shrinking. Rabbitbrush is encroaching on the spring.

b) Mud Spring (outside)

There is excessive erosion/deposition form the adjacent uplands and excessive hoof action (livestock and wildlife) with the riparian/wetland area. The riparian vegetative community is not diverse and is not adequate to dissipate energy.

3. Causal Factors

a) Mud Spring (exclosure)

It appears that the water development is negatively impacting the spring and its ability to enlarge and reach potential.

b) Mud Spring (outside)

Causal factors include use by livestock and wildlife (hoof action) and lack of an herbaceous understory in the uplands. It is difficult to assess potential of this system since it relies on overflow from the adjacent trough.

C. Water Hollow Springs

The Water Hollow system consists of two springs: upper and lower. The upper spring is on both BLM and Utah State Institution and Trust Lands Administration (SITLA) land and is approximately 1.3 acres. The lower portion of Water Hollow is completely contained within SITLA and in approximately 2.5 acres. Both springs are rated at Proper Functioning Condition.

1. Plant Community

Upper Water Hollow Spring consists of Nebraska sedge (OBL), Baltic rush (FACW), red top (FACW), mesic forbs, Kentucky bluegrass (FACU), and quaking aspen. Lower Water Hollow Spring consisted of Baltic rush, red top, and Kentucky bluegrass. Uplands consist primarily of sagebrush, pinyon-juniper and Wood's rose.

2. Riparian Condition

On both the upper and lower springs on Water Hollow, there was adequate vegetation to dissipate energy during overland flows. Riparian-wetland areas have achieved their potential extent and are in balance with the water and sediment being supplied by the watershed. There is no evidence of use by livestock or wild horses. The area is used by big game wildlife, primarily elk.

D. Willow Spring

Willow Spring is approximately 0.1 acre. It is rated as Functional – At Risk with no apparent trend. No prior photos or assessments were found, therefore, the spring was rated with no apparent trend.

1. Plant Community

Willow Spring consists of Nebraska sedge (OBL), Baltic rush (FACW), salt cedar (FACW), and rabbitsfoot grass (FACW). Upland communities consist of pinyon-juniper, sagebrush, and rabbitbrush with a limited herbaceous understory.

2. Riparian Condition

Though wildlife, wild horses, and livestock make use of the spring, hoof action and grazing has not altered surface flows and there is adequate vegetation to dissipate energy. The water development is not negatively impacting the system. There is excessive erosion and deposition coming off the uplands. The riparian-wetland area is not in balance with the sediment being supplied.

3. Causal Factors

Because of the poor condition of the uplands (i.e. lack of herbaceous understory), excessive amounts of soil is fed into the spring and the spring is unable to filter it through the system.

E. Sheep Creek

Sheep Creek consists of four lotic reaches and a lentic system. Three of the four lotic systems are contained within exclosures. Sheep Creek 1 is approximately 0.06 mile, Sheep Creek 2 is approximately 0.08 mile, and Sheep Creek 3 is approximately 0.43 mile. Sheep Creek 2 –Out is located downstream from the Sheep Creek 2 exclosure and is approximately 0.44 mile. The lentic system on Sheep Creek is a Reservoir that is approximately 2.2 acres.

1. Sheep Creek Reservoir

a) Plant Community

The Sheep Creek Reservoir consists of Baltic rush (FACW) and hardstem bulrush. Upland plant communities consist of sagebrush, rabbitbrush, and pinyon-juniper.

b) Riparian Condition

The reservoir is rated at Proper Functioning Condition. Though water levels are low, the shoreline is covered with Baltic rush which will dissipate energy from wave action and overland flows. The reservoir structure accommodates safe passage of flows. Though the upper portion of the reservoir is being encroached by upland species due to drought, it is not impacting the functionality of the system.

2. Sheep Creek 1 Exclosure

a) Plant Community

Sheep Creek 1 consists of Baltic rush (FACW), yellow willow (OBL), and mesic forbs. Upland plant communities consist of sagebrush, rabbitbrush, and pinyon-juniper.

b) Riparian Condition

Sheep Creek 1 is rated as Functional – At Risk with a downward trend. The stream channel is incised and downcut in portions of the reach with no access to floodplain. There is not enough riparian vegetative cover in portions to dissipate energy.

c) Causal Factors

The exclosure is down in several places, allowing livestock access into the riparian area. There is evidence of trampling and overgrazing along the streambank. Trend was down because of deteriorating conditions since the last assessment as evident from photos. It is difficult to assess the potential of the reach: the ID Team was unsure if the reach is dependent on overflow from the reservoir or if it has spring runoff.

3. Sheep Creek 2 Exclosure

a) Plant Community

Sheep Creek 2 consists of coyote willow (OBL), yellow willow (OBL), Baltic rush (FACW), mesic forbs, and Kentucky bluegrass (FACU). Upland plant communities consist of sagebrush, rabbitbrush, and pinyon-juniper.

b) Riparian Condition

Sheep Creek 2 Exclosure is rated as Functional – At Risk with a downward trend. The stream was incised and downcut, not allowing water to access the floodplain. There is not adequate vegetation to dissipate energy. There is excessive erosion and sedimentation from the watershed.

c) Causal Factors

The exclosure is down in several places, allowing livestock access into the riparian area. There is evidence of trampling and overgrazing along the streambank. Trend was down because of deteriorating conditions since the last assessment as evident from photos.

4. Sheep Creek 2 – Out

a) Plant Community

Except in the area just adjacent to the Sheep Creek 2 Exclosure, there is no wetland-riparian vegetation present on the reach. The upland plant community consists of sagebrush, rabbitbrush, and pinyon-juniper.

b) Riparian Condition

The reach is rated as Nonfunctional. The reach exhibits no feature of a functioning stream. Reach is wide and devoid of vegetation for the most part. It is difficult to assess the potential of the reach for recovery due to its intermittent nature.

c) Causal Factor

Causal factors for the reach's nonfunctional condition are most likely due to repeated use by cattle and wildlife. To what extant each is responsible as a causal factor and how long the reach has been in this condition is difficult to assess.

5. Sheep Creek 3 Exclosure

a) Plant Community

Sheep Creek 3 is composed of Baltic rush (FACU), mesic forb, and yellow willow (OBL). Upland plant communities are comprised of western wheatgrass, pinyon-juniper, rabbitbrush, sagebrush, and bull thistle.

b) Riparian Condition

The reach is rated as Functional – At Risk with a downward trend. The reach is incised and downcut in portions, and appears to be shrinking. The correct riparian vegetative communities are present but are not adequate to dissipate energy.

c) Causal Factors

The exclosure fence is down in several locations allowing access to livestock. Livestock have overgrazed and trampled along streambanks and greenline. The site is also much drier than the last assessment (there was water in the stream in 2005 at the same time of year). Trend was down because of deteriorating conditions since the last assessment as evident from photos.

F. Willow Creek Spring

Willow Spring Creek consists of 3 riparian and wetland reaches on public land which were assessed for Proper Functioning Condition in 2006. Willow Creek Spring is a wetland approximately 6 acres in size. This spring is the source of flowing water for Willow Creek segments I and II, which are approximately 0.6 mile and 4.3 miles respectively.

1. Willow Creek Spring

a) Plant Community

Willow Creek Spring is composed of Nebraska sedge (OBL), Kentucky bluegrass (FACU), redtop bent (FACW), Baltic rush (FACW), and Wood's rose (FACU). Uplands are composed of sagebrush, rabbitbrush, and Utah juniper.

b) Riparian Condition

The spring was rated at Proper Functioning Condition. The spring has an exclosure fence constructed around it to exclude livestock; though elk are still making use of it.

2. Willow Creek I

a) Plant Community

Willow Creek I is composed of Nebraska sedge (OBL), Kentucky bluegrass (FACU), redtop bent (FACW), Baltic rush (FACW), and Wood's rose (FACU). Uplands are composed of Wood's rose, snowberry, aspen, maple, and Utah juniper.

b) Riparian Condition

Willow Creek I was rated at Proper Functioning Condition. There is adequate vegetation in the system to dissipate energy. Sinuosity, width/depth ratio, and gradient are in balance with the landscape settings; and the stream is in balance with the sediment and water being by the watershed.

3. Willow Creek II

a) Plant Community

Willow Creek II is composed of scattered willows and cottonwoods, with a limited riparian herbaceous component. Uplands are dominated by Utah juniper, sagebrush, and chokecherry.

b) Riparian Condition

Willow Creek II was rated at Proper Functioning Condition. Though the stream is intermittent and potential is limited, Sinuosity, width/depth ratio, and gradient are in balance with the landscape settings; and the stream is in balance with the sediment and water being by the watershed.

G. Pipeline Spring

1. Plant Community

Pipeline Spring is comprised of Nebraska sedge (OBL), spikerush (OBL), and Kentucky bluegrass (FACU). Uplands are comprised of pinyon and juniper, Wood's rose, and mountain brome.

2. Riparian Condition

Pipeline Spring was rated as Functional-At Risk. Riparian vegetation is healthy and vigorous. The riparian-wetland area has achieved its potential extent and is in balance with the water and sediment being supplied by the watershed. There is a large elk wallow in the middle of the spring. The spring development and associated pipeline is not dewatering the spring.

3. Causal Factors

Natural surface and subsurface flow patterns are being altered by disturbance from wildlife (elk). There is a large wallow in the middle of the spring. Because of the wallow and excessive trampling, there is not adequate vegetation to dissipate energy. No apparent trend was determined at the time of the assessment because of lack of information.

H. Spanish George Spring

1. Spanish George Allotment

a) Plant Community

This reach of the Spanish George Spring is comprised of Nebraska sedge (OBL) and Baltic rush (FACW). Uplands are comprised of juniper, Wyoming big sagebrush, and rabbitbrush, with a limited herbaceous component.

b) Riparian Condition

This reach of Spanish George Spring is rated at Proper Functioning Condition. There is a small wallow on the spring but is not impacting the functionality of the spring. There is adequate vegetation to dissipate energy and the wetland area is in balance with the water and sediment being supplied by the watershed.

2. Bennion Spring Allotment

a) Plant Community

This portion of the Spanish George Spring is comprised of Nebraska sedge (OBL), Baltic rush (FACW), brookgrass (OBL), watercress (OBL), and Kentucky bluegrass (FACU). Uplands are comprised of juniper, Wyoming big sagebrush, and rabbitbrush, with a limited herbaceous component.

b) Riparian Condition

This reach of the Spanish George Spring is rate as Functioning-At Risk. The riparian-wetland area is shrinking from excessive deposition and erosion from the uplands. There is inadequate vegetation to dissipate energy. This is also a headcut at the upper portion of the reach.

c) Causal Factors

This portion of the reach receives year round use from wild horses and summer long use from cattle (the other portion has spring/fall grazing by cattle and limited wild horse use; and therefore, fewer impacts). There is

excessive trampling, which alters flow patterns and does not leave adequate vegetation to dissipate energy.

I. Other Information

In addition to those springs that were modeled by Loy and Durbin (2010), other important springs occur in Pine and Hamlin Valleys that could experience water drawdown based on Scenario A of the simulated drawdown after 50 years. These springs and associated PFC assessments are included but not limited to those in the following table:

Lentic (Springs/Wetlands) Resources							
Site Name (Valley Location)	**Year Assessed**	**Riparian Functional Rating**					
		PFC	**FAR-UP**	**FAR-NA**	**FAR-DN**	**NF**	**50-Year Drawdown (ft)**
Chokecherry Spring (Pine Valley)	2009			2.37			5-10
Meadow Spring (Pine Valley)	2008				1.34		5-10
Mackleprang East Spring (Pine Valley)	2008	1.9					5-10
Mackleprang West (Pine Valley)	2009			1.18			5-10
Big Basket Spring (Hamlin Valley)	2007				2.14		5-10

/s/ Kevin Wright

09/17/2010

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September 2010

Date

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Potential Impacts from Central Iron County Water Rights Applications 14-118 and 69-101 to Wildlife Watering Sources and Wildlife Management on Public Lands Managed by the U.S. Department of Interior, Bureau of Land Management

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September 2010

Introduction

The purpose of this report is to provide a summary of the potential impacts of the proposed water rights on wildlife watering sources and wildlife management within Wah Wah Valley and Pine Valley. The first part of the report describes the wildlife species that are present in the two valleys and the relationship of those species to water sources. The second part of the report describes potential impacts to those species from the proposed water rights.

BLM lands provide habitat for threatened, endangered and sensitive species as well as many game and non-game wildlife species. BLM's threatened and endangered species program strives to recover populations of listed species so that the protections afforded by the Endangered Species Act are no longer necessary and to conserve significant natural areas, such as rare, vulnerable, and representative habitats and ecosystems. The BLM manages habitat to support the objectives of the Utah Division of Wildlife Resources (UDWR) big game herd management plans and the Utah State Wildlife Action Plan.

BLM works closely with the U.S. Fish and Wildlife Service, other Federal agencies, the State of Utah, non-governmental organizations, universities, individuals, and private landowners to develop and implement programs for wildlife habitat management.

Policy, regulations, and plans applicable to wildlife habitat management in this area include:

Federal Land Policy and Management Act of 1976
Executive Order 13186 Migratory Bird Treaty Act
Executive Order 13443 Facilitation of Hunting Heritage and Wildlife Conservation (16 August 2007)
Endangered Species Act of 1973, as amended
Pinyon Management Framework Plan (1983)
BLM special status species policy (6840 Manual, 12/15/2009)
Eagle Protection Act, 1940 as amended
Deer Herd Unit Management Plan, Deer Herd Unit #20, (Southwest Desert) (2006)
Elk Herd Unit Management Plan, Elk Herd Unit #20, (Southwest Desert) (2008)

Wildlife Resources within the Wah Wah Valley Hydrologic Unit

A wide diversity of wildlife species occurs within the Wah Wah Valley Hydrologic Unit. Habitat types include desert scrub, sagebrush steppe, pinyon pine and juniper woodland, riparian and mixed conifer.

There are three types of wildlife most likely to be impacted by the proposed water rights in Wah Wah Valley: game species (mule deer, elk, pronghorn, chukar and wild turkey), sensitive species, and migratory birds.

Game species

The following table shows the occurrence of wildlife habitats that have been mapped by the Utah Division of Wildlife Resources (UDWR) within the unit.

Presence of Important Wildlife Habitats.

Habitat Type	Beaver County	Millard County
Chukar (substantial yearlong)	X	X
Elk (crucial yearlong)	X	X
Mule deer (crucial summer)	X	X
Mule deer (crucial winter)	X	
Pronghorn (crucial yearlong)	X	X
Wild turkey (crucial yearlong)	X	

The hydrologic unit is within the Utah Division of Wildlife Resources (UDWR) Southwest Desert Wildlife Management Unit. The following table shows the mule deer and elk objectives, and percent of BLM habitat, from this plan.

Southwest Desert Unit Big Game Management Information

	Southwest Desert Unit #20
Mule deer population long-term objective[1]	4,000
Mule deer population 2006-2011 objective[1]	3,200
Mule deer post 2009 hunt population estimate	1,600
% of mule deer winter range managed by BLM	85
% of mule deer summer range managed by BLM	84
Approximate acres of deer habitat	2,1262,83
Elk population objective[1]	975
Elk post 2009 hunt population estimate	1,150
% of elk year-long range managed by BLM	84
Approximate acres of elk habitat	751,945
Approximate acres within unit	3,333,330

[1] Population objective is the target winter herd size based on a modeled winter population

The mid and high elevations of the Wah Wah and San Francisco Mountains provide important summer mule deer and elk habitat. Riparian areas and waters are vital during summer. Deer fawn production is closely tied to the abundance of succulent, green forage during the spring and summer months (UDWR 2008). In desert mountain ranges, succulent forage can be found in riparian areas during the summer. All water sources including springs, seeps, ponds, guzzlers and livestock troughs (if in appropriate locations), would be used by and provide important habitat values to mule deer and elk.

Pronghorn may be found throughout the hydrologic unit except for the very tops of the mountains. Pronghorn would be expected to move around during the year. Generally, pronghorn would move onto the lower elevation desert areas during the winter, but movement is also dependent upon winter snow conditions. Primary pronghorn forage plants include forbs and big sagebrush (*Artemisia tridentata*), black sagebrush (*Artemisia nova*), winterfat (*Ceratoides lanata*) and bud sage (*Artemisia spinescens*). Access to water sources, especially during summer, can be a limiting factor for pronghorn.

There are four wildlife guzzlers within the hydrologic unit designed to provide water to pronghorn as a target species. Additionally, there are two wildlife waters that are fed by the Kiln Spring pipeline on the Willow Creek allotment. These drinkers each have an approximate 2000 gallon underground storage tank that is filled by the pipeline. This allows water to be available in the summer months to wildlife when the pipeline is turned off.

Chukars occur in mountainous terrain in the northern Wah Wah Mountains, the San Francisco Mountains and northeast through High Rock Pass, Black Rock Pass and into the Red Hills, and in the Black Hills. Chukar use steep, rocky terrain as a means of escaping predators and are usually found in or close to areas with steep slopes. Chukars prefer a grass and forb understory with some shrubs and scattered trees. Water is crucial during the summer and for chick survival.

A small amount of wild turkey habitat has been mapped by UDWR in the southern Wah Wah Mountains that represents a Rio Grande turkey translocation area. Water sources and riparian habitat are critical for this species. Turkeys feed on a variety of seeds, fruits, nuts, tubers, bulbs, grasses and sedges, as well as insects such as grasshoppers. Insects are important in the diet of chicks. Large ponderosa trees can be important roost sites. Valuable habitat is provided by Bucket Ranch and Head of Willow Creek Springs as well as unnamed springs. Important riparian habitat occurs along Willow and Center Creeks.

BLM/State Sensitive Species

In addition to federally listed species, BLM protects by policy (section 6840 of the BLM Manual) other special status animal species. Utah BLM is in the process of compiling a sensitive species list. Until this list is approved, BLM has adapted the State of Utah sensitive wildlife species list as their special status wildlife species list. The likelihood of occurrence of special status vertebrates within the hydrologic unit are shown below.

Sensitive Species likely to occur[1] within Hydrologic Unit

Sensitive Species within Beaver and Millard Counties[2]	Wah Wah Valley Hydrologic Unit
Bald Eagle	Likely winter resident
Big Free-Tailed Bat	Potential habitat
Burrowing Owl	Documented[3]
Dark Kangaroo Mouse	Potential habitat
Ferruginous Hawk	Documented[3]
Fringed Myotis	Potential habitat
Greater Sage-Grouse	Historic range
Kit Fox	Documented
Long-Billed Curlew	Potential habitat
Northern Goshawk	Documented
Pygmy Rabbit	Potential habitat
Short-Eared Owl	Potential habitat
Spotted Bat	Potential habitat
Townsend's Big-Eared Bat	Potential habitat

[1] Utah Natural Heritage Program
[2] UDWR: http://dwrcdc.nr.utah.gov/ucdc/ViewReports/sscounty.pdf
[3] BLM files

Of the species reported in the table above, the species that are most likely to be directly impacted by reduced water availability are greater sage-grouse and bats.

Greater sage-grouse likely occurred in the area historically. There have been no reported sightings in many years. Water sources and wet meadows are very important habitat features for sage grouse.

Bats use a wide variety of habitats with water being a very important habitat feature to all species. Riparian areas and stock ponds would have the highest value to bats. Forested and cliff areas, especially near water sources, would be expected to receive high use by bats. The lower elevations of the hydrologic unit are rated as very low and low value habitat. The mid to high elevations are rated as moderate to high value habitat (Bat Habitat Suitability Analysis Model). The highest value habitat occurs on the eastern side of the Wah Wah Mountains where forests, cliffs and springs are all important habitat features.

Wildlife Resources within the Pine Valley Hydrologic Unit

There are four types of wildlife most likely to be impacted by the proposed water rights in Pine Valley: the federally threatened Utah prairie dog, game species (mule deer, elk, pronghorn, and wild turkey), sensitive species including greater sage-grouse and bats, and migratory birds.

Threatened Species

Utah prairie dog habitat has been mapped in two complexes in Pine Valley. The Pine Valley complex contains about 530 acres and the Water Hollow complex contains about 370 acres. Utah prairie dogs prefer grasslands and shrub steppe habitat with low shrub canopy cover.

Game species

The following table shows the occurrence of wildlife habitats that have been mapped by the Utah Division of Wildlife Resources (UDWR) within the hydrologic unit.

Presence of Important Wildlife Habitats

Habitat Type	Beaver County	Iron County	Millard County
Chukar (substantial yearlong)	X		X
Elk (crucial yearlong)	X	X	X
Mule deer (crucial summer)	X	X	X
Mule deer (crucial winter)	X	X	
Pronghorn (crucial yearlong)	X	X	X
Wild turkey (crucial yearlong)	X	X	

The hydrologic unit is within the Utah Division of Wildlife Resources (UDWR) Southwest Desert Wildlife Management Unit. Refer to the mule deer, elk and pronghorn discussion above for the Wah Wah Valley Hydrologic Unit as it also applies to the Pine Valley Hydrologic Unit.

There are seven wildlife guzzlers within the hydrologic unit designed to provide water to pronghorn as a target species.

Chukars occur in mountainous terrain in the northern Wah Wah Mountains and around the Desert Range Experimental Station. Chukar use steep, rocky terrain as a means of escaping predators and are usually found in or close to areas with steep slopes. Chukars prefer a grass and forb understory with some shrubs and scattered trees. Water is crucial during the summer and for chick survival.

Wild turkey habitat has been mapped by UDWR in the southern Wah Wah Mountains and in various locations in the Needle Range from Mountain Home to Arrowhead Pass. These are Rio Grande turkey translocation areas. Water sources and riparian habitat are critical for this species. Turkeys feed on a variety of seeds, fruits, nuts, tubers, bulbs, grasses and sedges, as well as insects such as grasshoppers. Insects are important in the diet of chicks. Large ponderosa trees can be important roost sites. Important springs and riparian habitat for wild turkeys include: Pinto Springs and Creek, the head of Atchison, Sheep, Cottonwood and Commissary Creeks and associated springs, water sources in the area of northern Indian Peak such as Indian Creek, Upper and Lower Indian Springs, Willow Spring, Chokecherry Spring and Meadow Spring, and areas in Mountain Home such as Loper's Spring, Cottonwood Spring and Creek, and numerous other springs.

BLM/State Sensitive Species

In addition to federally listed species, BLM protects by policy (section 6840 of the BLM Manual) other special status animal species. Utah BLM is in the process of compiling a sensitive species list. Until this list is approved, BLM has adapted the State of Utah sensitive wildlife species list as their special status wildlife species list. Species that would be found within the hydrologic unit are shown below.

Potential Occurrence[1] of Sensitive Species within Hydrologic Unit

Sensitive Species within Beaver, Iron and Millard Counties[2]	Pine Valley Hydrologic Unit
Bald Eagle	Likely winter resident
Big Free-Tailed Bat	Potential habitat
Burrowing Owl	Documented
Dark Kangaroo Mouse	Potential habitat
Ferruginous Hawk	Documented[3]
Fringed Myotis	Potential habitat
Greater Sage-Grouse	Documented
Kit Fox	Documented
Long-Billed Curlew	Potential habitat
Northern Goshawk	Documented
Pygmy Rabbit	Documented
Short-Eared Owl	Potential habitat
Spotted Bat	Potential habitat
Townsend's Big-Eared Bat	Potential habitat

[1] Utah Natural Heritage Program

[2] UDWR: http://dwrcdc.nr.utah.gov/ucdc/ViewReports/sscounty.pdf
[3] BLM files

According to the information in the table above, several sensitive species are likely to be found within the Pine Valley Hydrologic Unit.

Greater sage-grouse are documented within Pine Valley. The UDWR has mapped leks, brood rearing and winter habitat in the valley. Water sources and wet meadows are very important habitat features for sage grouse. Four leks, also known as strutting or breeding grounds have been documented.

It is estimated that Utah sage grouse occupy only 41% of the historic habitats and are half as abundant as they were prior to 1850 (Beck and Mitchell 1997, Beck et al. 2003).

The BLM National Sage-Grouse Habitat Conservation Strategy contains several habitat management practices that focus on water-dependent habitat:

Maintenance of Wet Habitats - Maintain seeps, springs, wet meadows, and riparian vegetation in a functional and diverse condition for young sage-grouse and other species that depend on forbs and insects associated with these areas. Consider fencing if vegetation associated with these wet areas cannot be maintained with current livestock, wildlife or wild horse and burro use and the impacts of the fence are outweighed by the improved habitat quality.

Habitat Protection - Avoid developing springs for livestock water, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may adversely affect wet meadows used by grouse for foraging.

Habitat Restoration - Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats.

Desired Condition: Properly functioning hydrologic systems that enhance sage-grouse populations or habitat conditions.

Bats use a wide variety of habitats with water being a very important habitat feature to all species. Riparian areas and stock ponds would have the highest value to bats. Forested and cliff areas, especially near water sources, would be expected to receive high use by bats. The lower elevations of the hydrologic unit are rated as very low and low value habitat. The mid to high elevations are rated as moderate to high value habitat (Bat Habitat Suitability Analysis Model). The highest value habitat occurs on the eastern side of the Pine Valley Mountains, west slope of the Wah Wahs and in the Tunnel Spring Mountains where forests, cliffs and springs are all important habitat features.

The Hamlin Valley Utah Bird Conservation Area overlaps into the southern portion of Pine Valley. Bird Habitat Conservation Areas are intended to display areas where bird habitat conservation projects may take place, where state partners believe the best opportunity exists for

effective conservation activities. However, the BHCAs have no official status. In the case of all of these units (private or public) BHCA designation simply notes where conservation activities could occur. Such action would, of course, be predicated on concurrence, collaboration and cooperation with all landowners involved. The Hamlin Valley BCA was considered important to birds due to the large expanse of shrub-steppe habitat, historic and existing sage grouse leks and year-round sage grouse habitat and current nesting habitat for priority shrub-steppe birds.

Potential Impacts to Wildlife Species

According to groundwater modeling and simulations conducted by West Yost Associates (Durbin and Loy 2010), the proposed water rights would result in significant reduction of groundwater levels near valley floor and valley margin springs. The following analysis assumes potential reduction or loss of flow at these springs, and potential reduction of flow from a smaller subset of springs located within mountain block areas that are hydrologically connected to regional aquifers.

Big Game

If water sources disappear during the summer when fawns and calves are young, the most likely impact would be loss of that year's production. This would occur if other sources are not available nearby (young animals cannot travel far), but are near enough that adult animals could find water. Loss of water may also cause mortality of adults. Proposed well locations are located in pronghorn habitat and direct impacts from construction and loss of habitat would occur to this species.

A close relationship was observed between pronghorn distribution and water locations in Wyoming's Red Desert; 95% of 12,465 pronghorn surveyed from the air were within 4 miles (6.4 km) of a water source (Sundstrom 1968). Most pronghorn observations in Arizona and New Mexico are usually within two miles (3.2 km) of water (Ockenfels et al. 1994, Clemente et al. 1995). Occasionally, adult males are seen farther from water. Benson (1956) considered the advent of water developments in Saskatchewan to be associated with the dispersion of pronghorn populations. In Oregon (Anonymous 1961), it was speculated that although suitable forage was available for pronghorn, the limiting factor was adequate drinking water in late summer. Beale and Smith (1970) suggested that water developments might encourage a greater distribution of pronghorn where natural water sources were limited, particularly during dry seasons or drought years. Water developments may also increase competition with livestock and elk into formerly unused habitats, however. Minimum distance to water may be as important as maximum distance. Pronghorn in Arizona avoided the first 400 yards (400 m) from water sources, possibly reducing the threat of predation (Ockenfels et al. 1992, Ockenfels et al. 1994). If an area is well watered, distance to water may vary little with the season (Ockenfels et al. 1994). In southern New Mexico, pronghorn ranged farthest from developed water in summer, when precipitation was the highest, thereby reducing reliance on stock tanks and other artificial water sources (Clemente et al. 1995).

In Nevada (Wasley 2004), it was found that poor habitat quality for mule deer is often the effect of a drought or some significant human related disturbance. If water distribution patterns change

or water availability decreases, as it would in conjunction with a drought, mule deer may be required to meet their water intake requirements with fewer available options. In the event mule deer lose water sources, they become more concentrated on fewer waters, once again increasing their susceptibility to predation, particularly by mountain lions which are known to frequent water sources for hunting.

Very little work has been conducted to examine the potential for competition between feral horses and mule deer. Horses have been observed to aggressively defend water sources in water-limited habitats, at the expense of mule deer. Horses could possibly be in direct competition with mule deer in many areas of Nevada, especially the more water-limited portions of their range. The greatest potential for competition likely exists on transitional ranges and winter ranges. Although competition is certainly possible on mule deer summer range, the elevation and terrain of most mule deer summer range may decrease the potential. Despite recent concerns over wildlife habitat lost to feral horse use, horse numbers are still only a fraction of cattle numbers and, excluding localized incidences, likely provide only a fraction of the competition of cattle in Nevada. However, implementation of the proposed water rights may cause similar types of direct competition and predation impacts within the hydrologic units in Utah.

The Utah Elk Statewide Management Plan states that water is also an important component of elk habitat, and the lack of sufficient water distribution could limit the number of elk in certain areas of Utah. In Utah, Jeffrey (1963) found that elk on summer range preferred areas within 0.33 miles of a permanent water source. Other studies have shown elk use of summer range declined markedly beyond 0.5 mile from water (Mackie 1970, Nelson and Burnell 1975).

The loss of water sources would likely have substantial impacts on big game distribution and populations within the hydrologic units, and increase both predation and competition between species.

Sensitive Species and Habitat

Most notable impacts would be the loss or degradation of habitat. These may impact a species directly or indirectly through the loss of prey species associated with the degraded habitat. Long-term impacts would likely be a decrease in population levels. Sensitive species known to occur near the proposed well locations are kit fox, burrowing owl and ferruginous hawk. Direct impacts from construction and loss of habitat may occur to these species.

In general, the long term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of hibernacula. Chemicals in the environment that affect bats or their prey are also a threat. Because of low fecundity, high juvenile mortality, and long generational turnover, many bat populations may be vulnerable to human-induced pressures.

For most North American species of bat, including the Townsend's big-eared bat, their long term persistence is threatened by impacts to both roosting and foraging habitat, and loss of riparian habitat.

Although riparian areas represent less than one percent of the land within Utah, they are among the most important and heavily used wildlife habitat in this region. Animals including migratory songbirds, deer, elk and amphibians rely on these riparian corridors for food, cover, breeding habitat and movement corridors. It has been found that over 75 percent of all Utah's bird species breed or forage in riparian habitat and are considered 'riparian dependent' in Utah (UDWR).

Utah prairie dog

Utah prairie dogs can survive without free water; however, they have been observed drinking water when available, especially on dry rangelands. The recovery plan states that there is a positive correlation between available moisture and prairie dog abundance and density, or a direct correlation between the amount of moisture available in vegetation and prairie dog densities. Prairie dogs appear to prefer swale type formations where moist herbage is available. Changes to vegetation species or class types or losses of these types of habitat would impact prairie dogs. Proposed wells and pipelines in Pine Valley may impact Utah prairie dogs directly through disturbance and loss of habitat, or indirectly through changes in vegetation, or habitat fragmentation caused by increased disturbance and access.

Greater sage-grouse

Two well locations are within mapped brood rearing habitat and two wells are adjacent to mapped habitat. Sage grouse surveys and a review of the habitat maps are currently ongoing and additional wells are likely located within sage grouse habitat.

The U.S. Fish and Wildlife Service's Greater Sage-Grouse Interim Status Update stated the following information on impacts of water developments. Development of springs and other water sources to support livestock in upland shrub-steppe habitats can artificially concentrate domestic and wild ungulates in important sage-grouse habitats, thereby exacerbating grazing impacts in those areas such as through vegetation trampling (Braun 1998). Diverting the water sources has the secondary effect of changing the habitat present at the water source before diversion. This could result in the loss of either riparian or wet meadow habitat important to sage-grouse as sources of forbs or insects. Water developments for livestock also could be used as mosquito breeding habitat, and thus have the potential to facilitate the spread of West Nile virus.

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