RED DESERT – JACK MORROW HILLS WETLANDS COMPLEX

Regional Wetlands Conservation Plan

(*Photograph by Andrea Orabona*)

Wyoming Bird Habitat Conservation Partnership

Version 1.0

July 25, 2014

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

In Wyoming, about 90% of wildlife species use wetlands and riparian habitats daily or seasonally throughout their life cycles, and approximately 70% of Wyoming bird species are classified as wetland or riparian obligates (Nicholoff 2003). This planning effort addresses wetland habitats and associated wildlife species, particularly sensitive avian species, in the Jack Morrow Hills area of the Greater Red Desert (Red Desert).

The Red Desert is a high elevation, semi-arid landscape in southwestern Wyoming comprised of roughly 10 million acres (4.05 million ha) in portions of Sublette, Fremont, Natrona, Sweetwater, and Carbon Counties (Ferguson 2008; Fig. 1). This vast area covers approximately 15,000 mi^2 (38,850 km^2), from the Sweetwater River on the northern boundary to the Sierra Madre Range on the southern boundary, and from the North Platte River on the east to the Green River on the west (Thompson 2008). With an elevation ranging from approximately 5,000-9,500 ft (1,524-2,896 m), the Red Desert is the highest desert in North America. It is also one of the largest unfenced regions in the continental United States.

Fig. 1. Location of the Greater Red Desert and Jack Morrow Hills in Wyoming. *(Source: <http://worldevolved.blogspot.com/2008/09/protect-red-desert-in-wyoming.html>.)*

The Red Desert is situated at the intersection of four major ecoregions—the Great Basin, Colorado Plateau, Rocky Mountains, and Great Plains, and is classified as having high biodiversity and medium vulnerability (Copeland et al. 2007). This unique and diverse landscape provides important breeding, parturition, foraging, nesting, resting, wintering, and/or migratory stop-over habitat for about 350 species of Wyoming's wildlife, including several sagebrush obligate species and Species of Greatest Conservation Need (Nicholoff et al. 2003, WGFD 2010, Orabona et al. 2012). The largest migratory herd of pronghorn in the lower 48 states and the world's largest desert elk herd inhabit the region (NWF 1996-2012). The Red Desert is entirely within Bird Conservation Region 10 in the Intermountain West Joint Venture boundary (PIF 2010; Fig. 2).

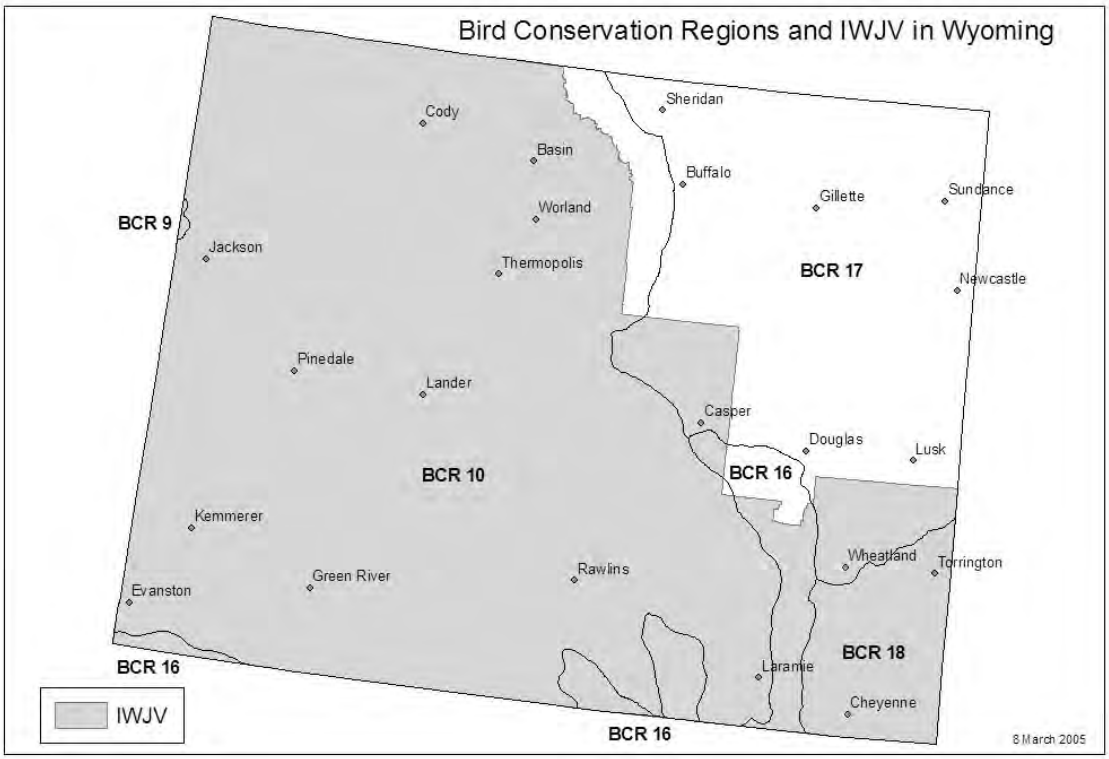

Fig. 2. Bird Conservation Regions and the Intermountain West Joint Venture boundaries in Wyoming (WSC-IWJV 2005).

The Wyoming Steering Committee of the Intermountain West Joint Venture classified the Red Desert as one of 48 Bird Habitat Conservation Areas (WSC 2005; Fig. 3).

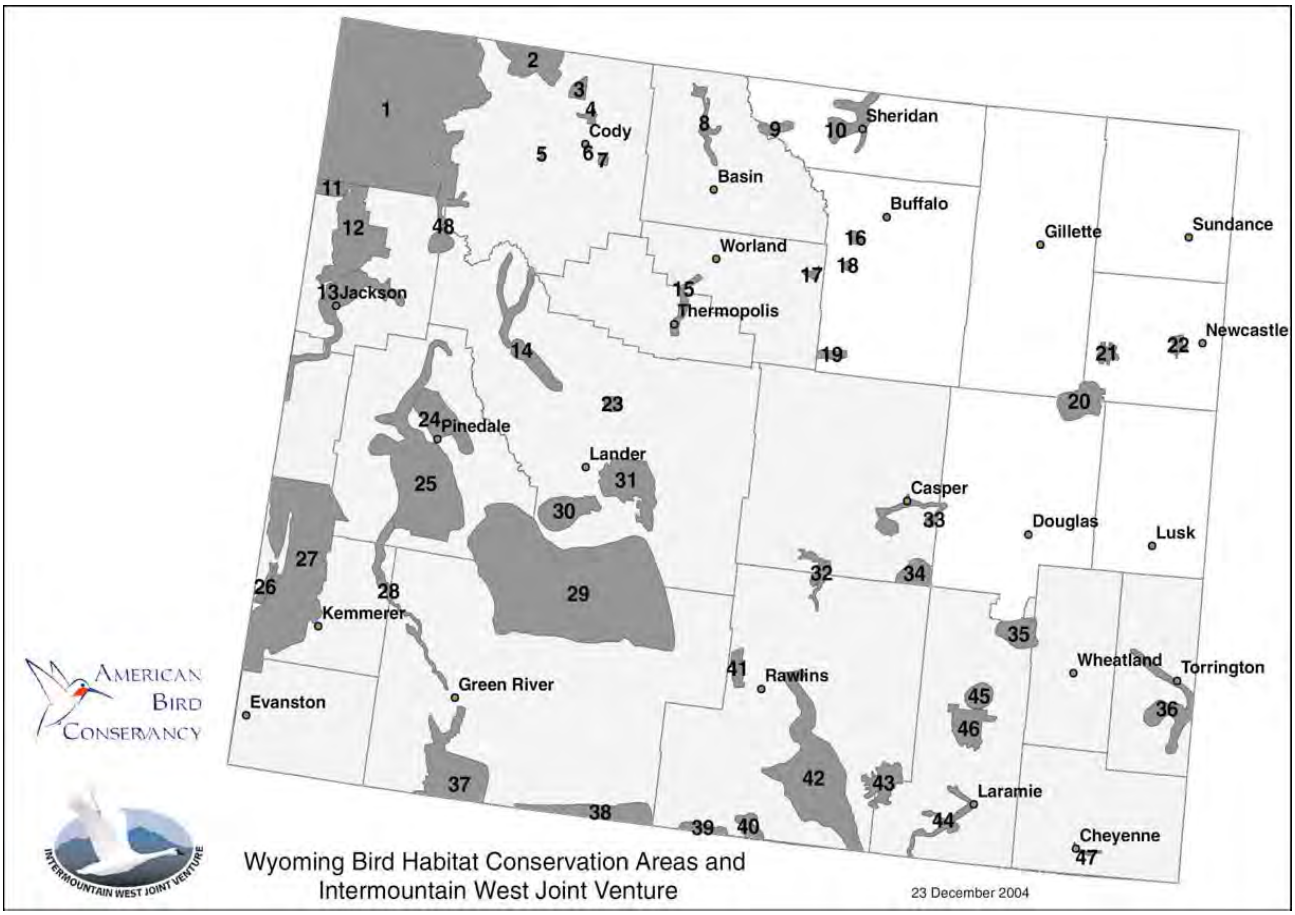

Fig. 3. Bird Habitat Conservation Areas in Wyoming; the Red Desert is number 29 (WSC 2005).

The Red Desert is also classified as a Conservation Action Site for Audubon Wyoming's Sagebrush Initiative, as well as an Important Bird Area (NAS 2012; Fig. 4). Seven Wilderness Study Areas (WSAs) and five Areas of Critical Environmental Concern occur within the Red Desert (BLM 2006). The Jack Morrow Hills, the focus of this wetland plan, is one of the designated WSAs.

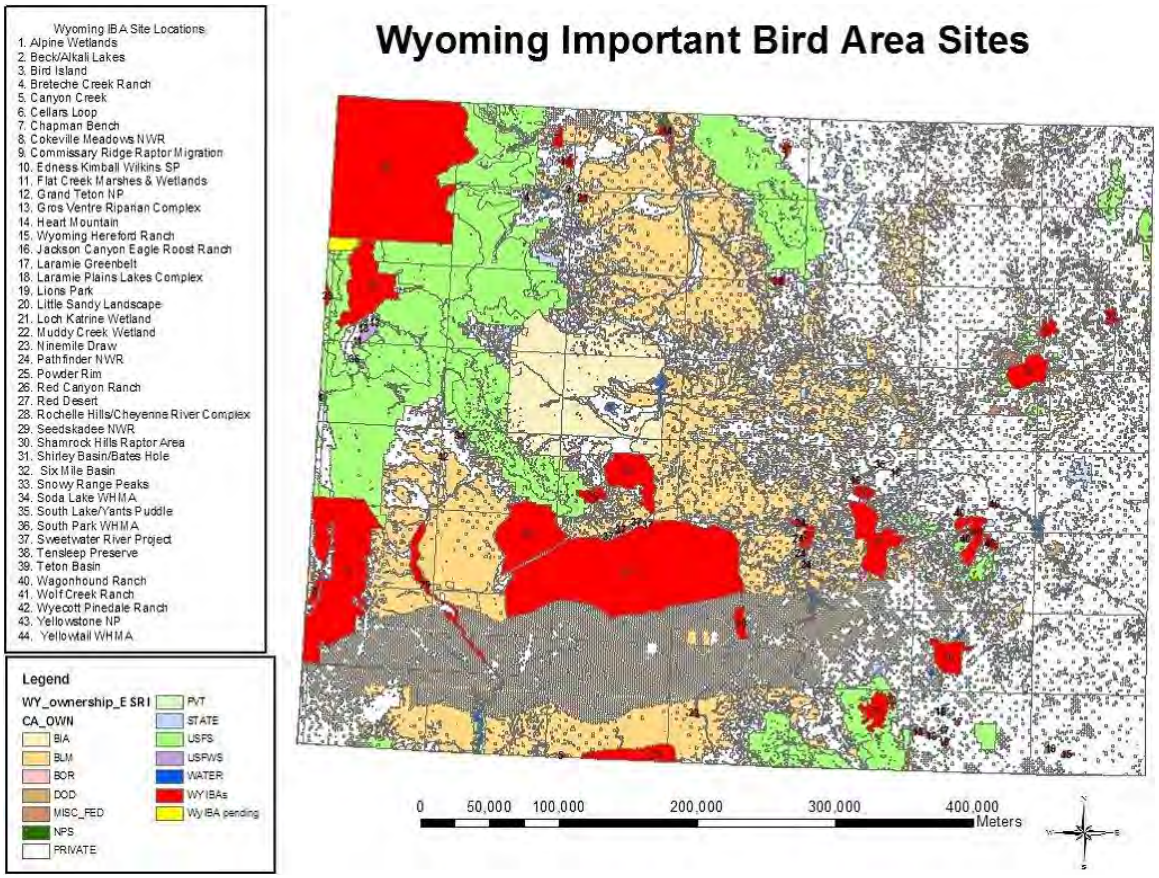

Fig. 4. Location of Wyoming's Important Bird Areas; the Red Desert is number 27. *(Source: <http://rockies.audubon.org/wyoming-ibas>.)*

GENERAL DESCRIPTION AND LAND USE

Lands within the Red Desert are managed predominantly by the United States Department of Interior Bureau of Land Management (BLM). Sections of land owned by the State of Wyoming are scattered across the entire area. Small "in-holdings" of private parcels are located within BLM-administered lands in the northern portion of the desert and a checkerboard pattern of alternating BLM and private sections dominates in the southern portion.

The Jack Morrow Hills is a 622,000 acre (251,715 ha) expanse in the northern segment of the Red Desert within portions of Fremont, Sublette, and Sweetwater Counties (BLM 2004; Fig. 5). The Jack Morrow Hills contain numerous wetland sites; some are individual seeps or springs, while others are complexes along the base of a mesa or butte.

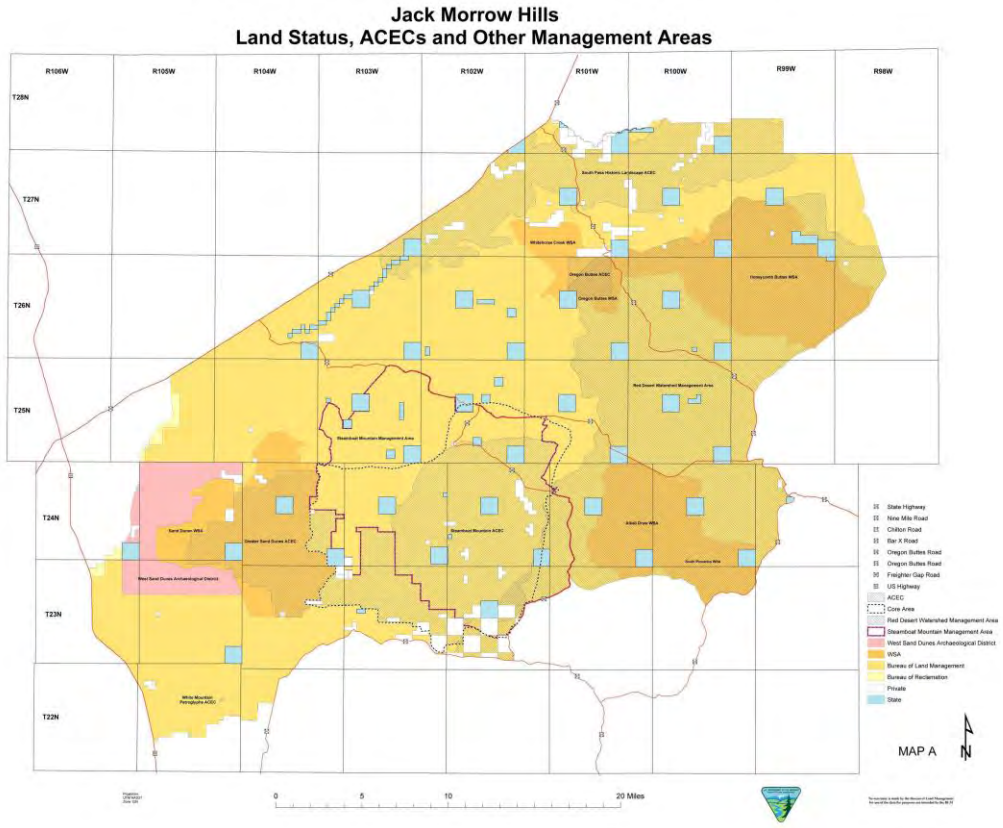

Fig. 5. Boundary of the Jack Morrow Hills within the Greater Red Desert.

(Source: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/field-offices/rock_springs/jmhcap/rod.Par.63658.File.dat/01maps.pdf>.)

Current land uses in the Red Desert include recreation (wildlife and feral horse viewing, hunting, hiking, mountain biking, horseback riding, camping, ORV use, and visiting sand dunes), livestock grazing (cattle and sheep), mining (coal, uranium), and energy extraction (oil, natural gas, and coalbed methane). The historic Oregon, California, Mormon, and Pony Express Trails cross the Jack Morrow Hills section of the Red Desert.

ECOLOGICAL COVER TYPES

The Red Desert falls within the Wyoming Basins ecoregion classification, where rolling sagebrush steppe, foothills shrublands and low mountains, and salt desert shrub basins are the primary ecological cover types (Chapman et al. 2004; Fig. 6.). A variety of bunchgrasses and forbs are typically interspersed throughout the shrublands.

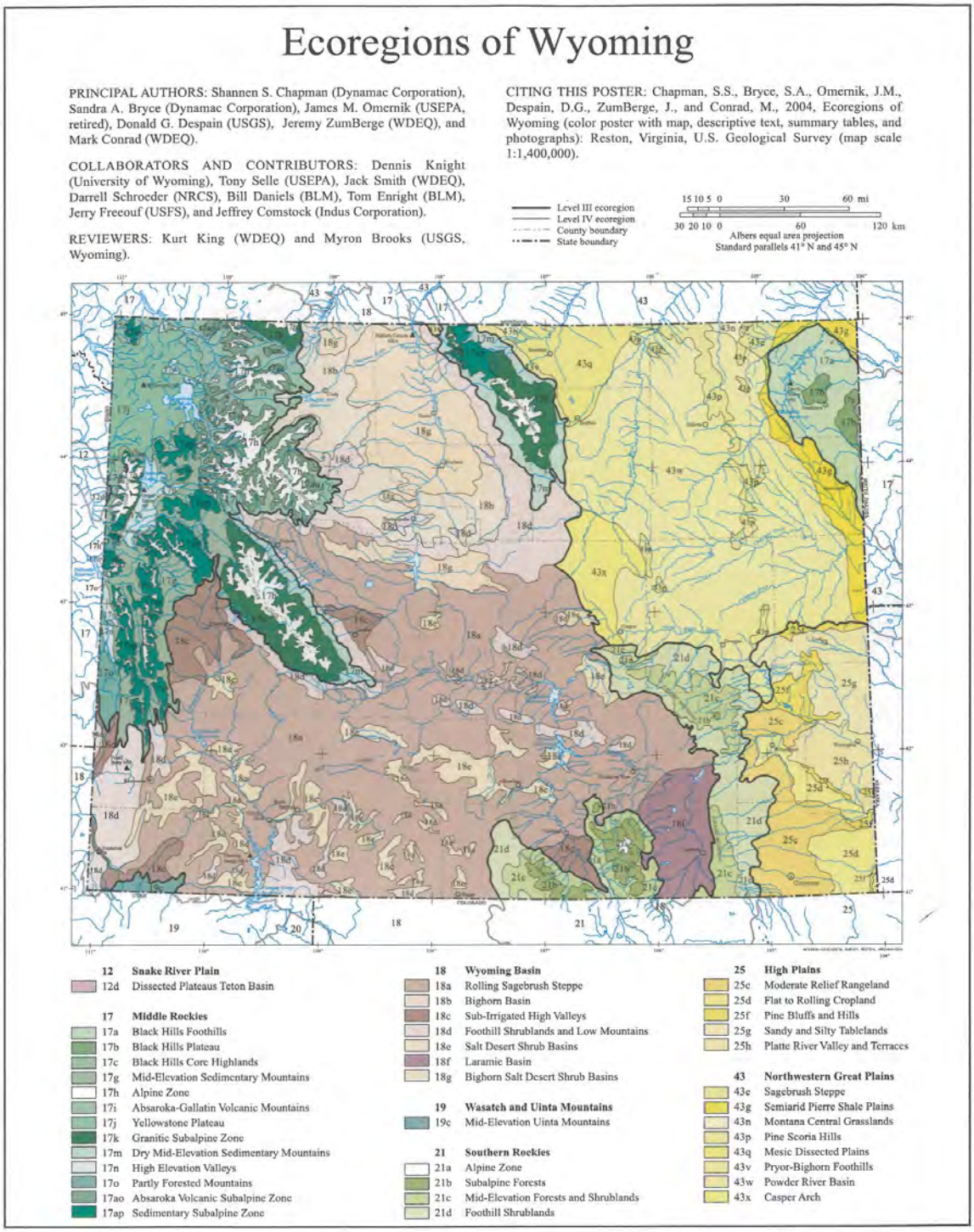

Fig. 6. Ecoregions of Wyoming.

(Source: <ftp://ftp.epa.gov/wed/ecoregions/wy/wy_eco_pg.pdf>.)

Diverse microhabitats throughout the Red Desert include juniper patches, stands of conifer and aspen, and numerous springs and seeps that support associated wetland plants and wildlife species, and serve as a water source for small streams such as Jack Morrow Creek. Dominant vegetation around the ponds, creeks, seeps, and springs in the Jack Morrow Hills includes cottonwood and aspen trees, willow shrubs, sedges and grasses, and forbs. The BLM classifies the aspen stands in the Jack Morrow Hills as a sensitive plant species (BLM 2006; Fig. 7).

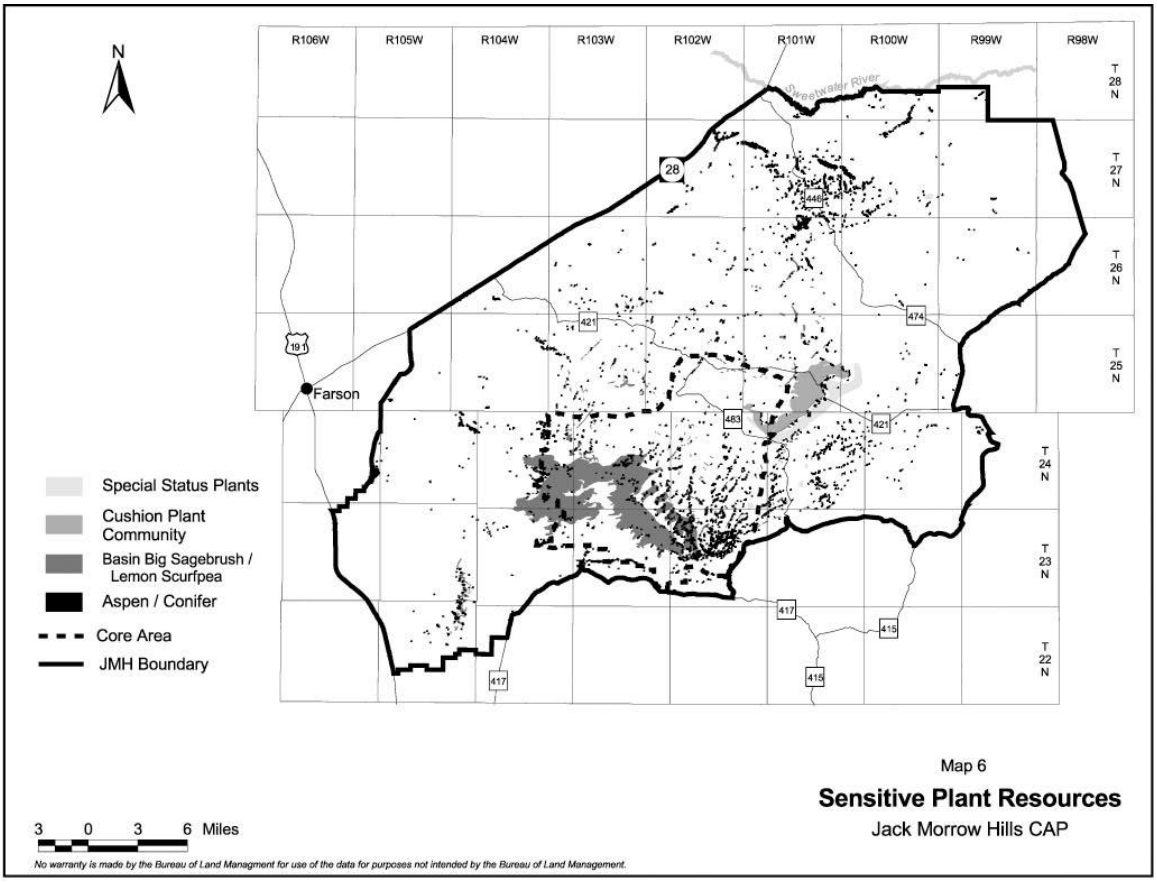

Fig. 7. Location of sensitive plant resources in the Jack Morrow Hills.

(Source: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/field-offices/rock_springs/jmhcap/rod.Par.36870.File.dat/12map06.pdf>.)

HYDROLOGY

The Jack Morrow Hills landscape is divided by 3 major basins: the Green River/Colorado River Basin, Sweetwater River/Platte River Basin, and Great Divide Basin (BLM 2006; Figure 8). The Great Divide Basin drains 4% of Wyoming, but is a closed basin and does not contribute to any tributary (WWC Engineering 2010).

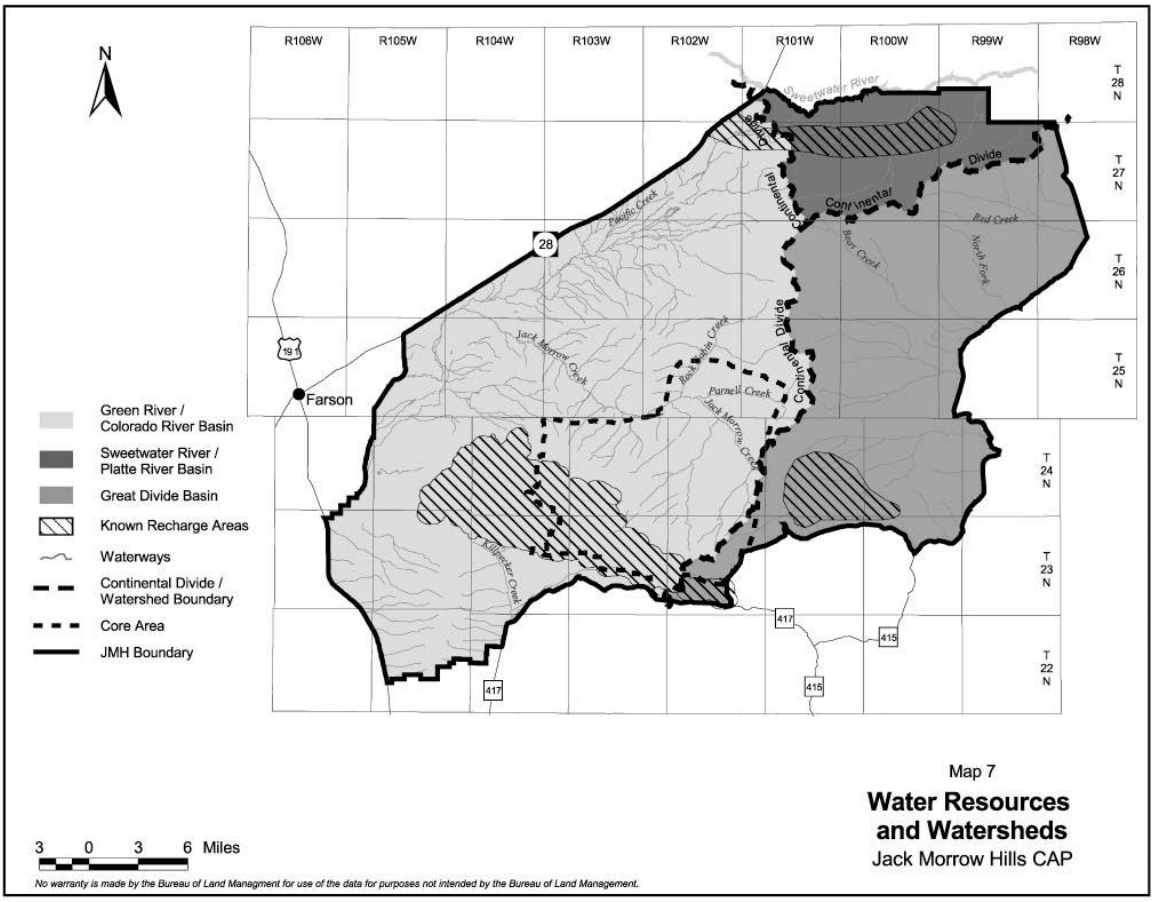

Fig. 8. Water resources and watersheds in the Jack Morrow Hills.

(Source: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/field-offices/rock_springs/jmhcap/rod.Par.29813.File.dat/13map07.pdf>.)

WETLANDS AND OTHER WATER RESOURCES

Unique wetland habitats are found in the Jack Morrow Hills and throughout the Red Desert, most as naturally occurring creeks, spring, seeps, and ponds, as well as human-created reservoirs. These wetland habitats enable the desert to support an abundance and diversity of wildlife. They provide significant foraging, breeding, and resting micro-habitats for populations of birds, mammals, amphibians, reptiles, microorganisms, and plants, and they create habitat diversity in an otherwise arid environment.

The BLM (2006) states that riparian areas in the Jack Morrow Hills will be managed to attain or maintain a minimum standard proper functioning condition, which is the minimum acceptable level of ecological condition [the Jack Morrow Hills Coordinated Activity Plan]. Riparian areas will be managed to ensure those species capable of stabilizing soils and stream banks are dominant. Vegetation, land form, and woody debris will be managed to create resiliency in the creek or wetland that affords protection from erosive forces, and allows the system to capture sediment, provide for infiltration, and create habitat. Riparian areas will be maintained, improved, or restored to enhance the condition of forage, provide habitat for wildlife, and improve water quality. Sites will be assessed as needed to determine their condition and whether specific management actions are necessary for improvement. Where needed, site-specific activities (e.g., erosion control, sedimentation, ground cover enhancement, improved water quality) will be identified and implementation plans will be prepared to achieve or maintain the minimum proper functioning condition.

WETLAND-ASSOCIATED WILDLIFE

Familiar birds in the Greater Red Desert include Golden Eagle, Ferruginous Hawk, Northern Harrier, Prairie Falcon, Greater Sage-Grouse, Mountain Plover, Mourning Dove, Burrowing Owl, Common Raven, Yellow-rumped Warbler, Sage Sparrow, Brewer's Sparrow, Sage Thrasher, Lazuli Bunting, Horned Lark, Red-winged Blackbird, and Brewer's Blackbird. Common mammals are pronghorn, elk, mule deer, white-tailed jackrabbit, white-tailed prairie dog, Wyoming ground squirrel, sagebrush vole, coyote, mountain lion, short-tailed weasel, and American badger. Typical amphibians and reptiles include the tiger salamander, great basin spadefoot, prairie rattlesnake, and gopher snake.

Wetlands and associated habitats in the Jack Morrow Hills provide necessary resources for a disproportionate abundance of avian species (Orabona et al. 2012). In 2004, the Wyoming Game and Fish Department (WGFD) Nongame Bird Biologist conducted a seasonal inventory of avian species occurrence in the Jack Morrow Hills wetlands and immediately adjacent uplands. Regularly occurring species detected during this inventory, as well as species detected during annual Breeding Bird Survey routes conducted in the area, are listed in Table 1.

Table 1. Avian species reported by the Wyoming Game and Fish Department in the Jack Morrow Hills. Species detected in wetlands and associated habitats are denoted in bold (Orabona et al. 2012). Species of Greatest Conservation Need are denoted in italics (WGFD 2010).

American Avocet	Golden Eagle	**Northern Shoveler**
American Coot	**Great Blue Heron**	**Orange-crowned Warbler**
American Crow	Great Horned Owl	Pine Siskin
American Goldfinch	***Greater Sage-Grouse***	Prairie Falcon
American Kestrel	Green-tailed Towhee	**Red-breasted Nuthatch**
American Robin	**Green-winged Teal**	**Red-tailed Hawk**
American White Pelican	**Hermit Thrush**	**Red-winged Blackbird**
American Wigeon	Horned Lark	Rock Wren
Barn Swallow	**House Wren**	*Sage Sparrow*
Black-billed Magpie	Juniper Titmouse	*Sage Thrasher*
Blue-gray Gnatcatcher	**Killdeer**	**Savannah Sparrow**
Brewer's Blackbird	*Lark Bunting*	Say's Phoebe
Brewer's Sparrow	Lark Sparrow	***Short-eared Owl***
Broad-tailed Hummingbird	**Lazuli Bunting**	**Song Sparrow**
Brown-headed Cowbird	**Least Flycatcher**	**Spotted Sandpiper**
Bullock's Oriole	**Least Sandpiper**	**Spotted Towhee**
Burrowing Owl	**Lesser Yellowlegs**	***Swainson's Hawk***
California Gull	Loggerhead Shrike	**Tree Swallow**
Canada Goose	***Long-billed Curlew***	**Vesper Sparrow**
Canvasback	**Long-eared Owl**	**Violet-green Swallow**
Chipping Sparrow	**Mallard**	**Warbling Vireo**
Clark's Nutcracker	**MacGillivray's Warbler**	**Western Meadowlark**
Cliff Swallow	*Merlin*	**Western Tanager**
Common Grackle	Mountain Bluebird	**Western Wood-Peewee**
Common Nighthawk	*Mountain Plover*	**White-breasted Nuthatch**
Common Poorwill	Mourning Dove	***Willow Flycatcher***
Common Raven	**Northern Flicker**	**Wilson's Phalarope**
Cordilleran Flycatcher	***Northern Goshawk***	**Wilson's Warbler**
Dark-eyed Junco	**Northern Harrier**	**Yellow-rumped Warbler**
European Starling	***Northern Pintail***	**Yellow Warbler**
Ferruginous Hawk		

THREATS TO WETLANDS

For over a century, citizens have recognized the unique values of the Red Desert and have struggled to protect them. In 1898, Wyoming hunters tried to designate much of the Red Desert as a Winter Game Preserve due to the high numbers of pronghorn and desert elk that inhabit the area. Unfortunately, this effort did not succeed. Since 1898, attempts to protect the Jack Morrow Hills Area as a National Park, a National Wildlife Refuge, a Wild Horse Refuge, and a North American Antelope Range have also been unsuccessful.

The principal threats to wetland habitats in the Jack Morrow Hills are presented in Table 2, and some of the most pressing threats are described in the text that follows.

Table 2. Principal threats to wetlands in the Jack Morrow Hills.

Severity / Threat Source	Low	Moderate	High	Extreme
Climate change/drought				x
Invasive species	x			
Livestock grazing		x		
Energy/mineral development			x	
Unrestricted human access				x

LIVESTOCK GRAZING

Livestock grazing is the only agricultural activity within the greater Red Desert, including the Jack Morrow Hills. The BLM Lander and Rock Springs Field Offices of the BLM administer the grazing leases. Within the Jack Morrow Hills, a recent 5-year average of grazing use consisted of 11,602 Animal Unit Months (AUMs) including 10,649 cattle AUMs and 953 sheep AUMs (BLM 2006). Unmanaged livestock grazing is a concern when animals congregate and spend disproportionate time in sensitive wetland habitats to take advantage of abundant food, water, and shade provided by these sites. Overutilization can result in vegetation overgrazing and trampling, nest destruction, soil compaction, and fouled water sources. Livestock water developments are designed to improve resource conditions and livestock distribution, and provide additional watering sites. Water supplied to these developments comes from the Colorado River drainage (80%) and the Platte River drainage (20%). This type of off-site watering option reduces impacts to wetlands, associated habitats, and other water sources, as it eliminates the problems

associated with sensitive plant and soil trampling, livestock congregating and lingering in sensitive habitats, and direct competition between livestock and wildlife.

ENERGY AND MINERAL EXPLORATION AND DEVELOPMENT

The majority of the Red Desert lacks legal protection, so is available for extensive exploration and development of energy and mineral resources including coal, oil, natural gas, coalbed methane, and uranium. Such development is among the greatest threats to riparian and wetlands habitats within the Red Desert. Most impacts come from the associated infrastructure such as roads, pipelines, well pads, utility lines, fences, and vehicular traffic (NWF 1996-2012, BLM 2006). Uranium mining prospects in the Great Divide Basin are predominantly in the northeastern portion (WWC Engineering 2010). Active oil and gas extraction continues to encroach into the Red Desert's borders. The Jack Morrow Hills is particularly susceptible, with more than 45% of the area having potential for oil and gas development and 156 oil and gas wells already in place there. Industrial development can fragment and degrade habitat, disrupt historic wildlife migration corridors and breeding sites, cause air and noise pollution, and alter and degrade soils and water sources vital to native plants and wildlife.

In 2006, the Green River Basin produced 13.9 million tons of coal, 15.9 million barrels of crude oil, 19 million tons of trona, and 1,451,245 thousand cubic feet (MCFs) of natural gas (WWC Engineering 2010).

In the Jack Morrow Hills Coordinated Activity Plan (CAP), the BLM (2006) states that all existing leases in the area would experience some development over the 20-year planning period, with development concentrated in the high potential areas. Surface disturbance associated with oil and gas development in the CAP includes access roads, drill pads, and pipelines and powerlines (BLM 2004; Table 3). However, the predominant impact to wildlife is displacement due to human and equipment activity rather than direct loss of habitat.

According to the BLM's 2004 Final Environmental Impact Statement for the Jack Morrow Hills, "It is assumed that each water development within the Colorado and Platte River basins in the planning area causes a depletion to the respective systems because all water used for drilling and completion of wells within the Green River and the Sweetwater River Basins contributes to the surface flows of the Colorado River or Platte River or their tributaries. Drilling of wells would require water to make up drilling fluid. In general, oil and gas wells drilled in the depth ranges expected in the planning area require 1 to 1.5 acre-feet of water each. Using 1.5 acre-feet of water per well, depletions from these actions would total approximately 367.5 acre-feet in the Colorado River system and 15 acre-feet in the Platte River system. Based on a 20-year time span, the average annual depletion for the Colorado River and Platte River systems would be 18.4 acre-feet and 0.75 acre-feet, respectively." While these amounts may not be individually

significant, they do contribute to ongoing cumulative depletions, which became severe during the history of these basins.

Table 3. Disturbances from oil and gas development in the Red Desert Jack Morrow Hills (BLM 2004).

Development Activity	Amount	Associated Surface Disturbance	Other Information
Oil	205 wells	1,600 acres (648 ha)	190 acres (77 ha) attributed to fluid mineral development
Gas recovery from existing wells	145.4 billion cubic feet (4.1 billion cubic m)	[Information not available]	24.3 billion cubic feet (0.69 billion cubic m) remaining to be produced
Access roads	Road width = 40 feet (12.2 m); travelway width = 12-14 feet (3.7-4.3 m)	4.8 acres (1.9 ha) per linear road mile; 1.5 miles (2.4 km) of road construction per exploration well; 0.375 miles (0.6 km) of road construction per developed well; 4 acres (1.6 ha) of long-term disturbance per producing well, access road stabilized per abandoned dry well after 3 years, and access road stabilized per producing well after abandonment of 3 years	
Drill pads		Average initial disturbance = 3 acres (1.2 ha) per well; long-term disturbance = 0.7 acres (0.3 ha) per producing well	
Pipelines and powerlines		Initial disturbance = 6.0 acres (2.4 ha) per producing well	

The BLM (2006) also estimates that two coalbed gas exploration projects totaling 50 wells would be drilled within the Jack Morrow Hills CAP area during the planning period. For dewatering purposes, coalbed gas wells are drilled in a pod formation, with about 25 wells per pod. Thus, impacts are expected to be "intense and localized", although affecting less acreage than traditional oil and gas well development.

Development of salable mineral materials is expected to occur within the final 10 years of the Jack Morrow Hills CAP planning period (BLM 2006).

UNRESTRICTED HUMAN ACCESS

Most of the springs in the Jack Morrow Hills are unfenced, with two-track road access along or directly to wetlands. Unrestricted human access has proven to be one of the most pressing threats to the integrity and functionality of these springs. Detrimental use and damage that has been documented in several springs includes driving vehicles through sensitive habitats and over wet/moist soils, placement of crude pit toilets within the springs and human excrement in spring water, vegetation trampling and soil compaction from excessive use, and remains of trash and fire pits (Figs. 9 and 10). Damage by unrestricted livestock use has also been documented at the largest spring at the northern base of Steamboat Mountain. Damage caused by livestock includesd trampling of wetland plants and wet/moist soils, trailing through sensitive wetland habitat, and livestock waste in spring water.

In the Jack Morrow Hills CAP, the BLM (2006) states that a transportation plan specific to the area would be developed in cooperation with interested parties. Emphasis will be placed on providing access while ensuring the health of each watershed and protection of crucial wildlife habitats and sensitive resources.

Source: Andrea Orabona

Fig. 9. Negative human impacts to Red Desert springs – pit toilets and human waste.

Source: Andrea Orabona

Fig. 10. Negative human impact to Red Desert springs – trash.

CONSERVATION OBJECTIVES

The highest priorities in the Jack Morrow Hills are to protect the existing springs and seeps, and the associated vegetation and wildlife, from habitat loss and degradation due to human disturbance and incompatible uses, unregulated livestock grazing during critical growing and breeding seasons, and energy development. This includes maintaining or improving water quality and vegetation condition that have been degraded due to these activities.

The following objectives are recommended to conserve, enhance, and/or manage wetlands within the Jack Morrow Hills:

1) Strive for no net loss of existing wetlands within the Jack Morrow Hills.

2) By 2016, double the wetland sites protected from damage or degradation by increasing from two fenced springs to four fenced springs.

3) Build partnerships with land and wildlife management agencies to support wetland conservation efforts while maintaining traditional wildlife, recreational, and agricultural uses of the land.

4) Engage with energy developers to ensure wetland avoidance and water quality maintenance are addressed in project development plans.

5) Secure adequate funding to implement wetland conservation efforts, such as fencing and off-site water developments.

CONSERVATION STRATEGIES

NO NET LOSS OF EXISTING WETLANDS.

- Work cooperatively with personnel from the WGFD and BLM Rock Springs Field Office to ensure the values of wetland-associated habitats in the Jack Morrow Hills are understood.
- Where feasible, ensure aspen regeneration is considered in land use planning.

INCREASE WETLAND ACREAGE PROTECTED.

- Work cooperatively with personnel from the WGFD and BLM Rock Springs Field Office to prioritize the wetlands and associated habitats in need of conservation attention, and determine the best course of action to obtain satisfactory protection.

- If needed, develop a NAWCA Small Grant application to assist with conservation efforts (e.g., fence important springs in the Jack Morrow Hills to prevent further deterioration and improve water quality, enhance wetland-associated habitat).

BUILD PARTNERSHIPS TO SUPPORT WETLAND CONSERVATION EFFORTS WHILE MAINTAINING TRADITIONAL AGRICULTURAL AND COMPATIBLE RECREATIONAL USES OF THE LAND.

- Work cooperatively with federal, state, and private partners to support the efforts needed to both conserve wetlands and associated habitats, and to maintain traditional agricultural operations in the Jack Morrow Hills.
- Work cooperatively with federal, state, and private partners to support the efforts needed to both conserve wetlands and associated habitats, and to maintain compatible recreational activities (e.g., wildlife viewing, hunting, hiking, camping) in the Jack Morrow Hills.

CONSERVATION PARTNERS

Key partners that should be engaged to achieve conservation objectives and strategies within the Jack Morrow Hills include the Bureau of Land Management, Wyoming Game and Fish Department, Wyoming Wildlife Federation, Wyoming Outdoor Council, The Nature Conservancy, and Audubon Rockies, along with its regional Chapter, the Red Desert Audubon. The BLM is the surface and mineral management agency, the WGFD is responsible for management of all wildlife, and the remaining partners are non-governmental organizations with a high degree of interest in preservation of the unique natural characteristics of the Red Desert.

REFERENCES:

Chapman, S. S., S. A. Bryce, J. M. Omemik, D. G. Despain, J. ZumBerge, and M. Conrad. 2004. Ecoregions of Wyoming (color poster with map, descriptive text, summary tables, and photographs; map scale 1:1,400,000). U.S. Geological Survey, Reston, Virginia, USA.

Copeland, H. E., J. M. Ward, and J. M. Kiesecker. 2007. Assessing tradeoffs in biodiversity, vulnerability, and cost when prioritizing conservation sites. Journal of Conservation Planning. Volume 3:1-16.

Copeland, H. E., S. A. Tessmann, E. H. Girvetz, L. D. Roberts, C. Enquist, A. Orabona, S. Patla, and J. Kiesecker. 2010. A geospatial assessment on the distribution, condition, and vulnerability of Wyoming's wetlands. Ecological Indicators 10(4):869-879.

Ferguson, C. 2008. Geology of the Red Desert. Pages 85-105 *in* Red Desert: History of a Place. A. Proulx, editor. University of Texas Press, Austin, Texas, USA.

National Audubon Society. 2012. Audubon Wyoming: IBAs in Wyoming. Online <http://wy.audubon.org/BirdSci_IBA_WY.html>.

National Wildlife Federation [NWF]. 1996-2012. Online <http://www.nwf.org/wildlife/wild-places/red-desert.aspx>.

Nicholoff, S. H., compiler. 2003. Wyoming Bird Conservation Plan, Version 2.0. Wyoming Partners In Flight. Wyoming Game and Fish Department, Lander, Wyoming, USA.

Orabona, A., C. Rudd, M. Grenier, Z. Walker, S. Patla, and B. Oakleaf. 2012. Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming. Wyoming Game and Fish Department Nongame Program, Lander, Wyoming, USA. 232pp.

Partners in Flight [PIF]. 2010. Online <http://www.partnersinflight.org/description.cfm>.

Thompson, C. 2008. Water in the Red. Pages 107-119 *in* Red Desert: History of a Place. A. Proulx, editor. University of Texas Press, Austin, Texas, USA.

USDI Bureau of Land Management [BLM]. 2004. Final Environmental Impact Statement for the Jack Morrow Hills Coordinated Activity Plan/Proposed Green River Resource Management Plan Amendment, Volumes 1 and 2 plus Appendices. Rock Springs, Wyoming.

USDI Bureau of Land Management [BLM]. 2006. Jack Morrow Hills Coordinated Activity Plan. Online <http://www.blm.gov/wy/st/en/field_offices/Rock_Springs/jmhcap/rod.html>.

WWC Engineering. 2010. Green River Basin Plan, December 2010. Prepared for Wyoming Water Development Commission Basin Planning Program.

Wyoming Game and Fish Department [WGFD]. 2010. State Wildlife Action Plan. Wyoming Game and Fish Department, Cheyenne, USA.

Wyoming Steering Committee [WSC]. 2005. Coordinated Implementation Plan for Bird Conservation in Central and Western Wyoming (BCRs 10, 16, 18). Intermountain West Joint Venture.

Wyoming Joint Ventures Steering Committee. 2010. Wyoming Wetlands Conservation Strategy: Version 1.0. WY Game and Fish Department, Cheyenne. 108pp. Online <http://gf.state.wy.us/habitat/WetlandConservation/Wyoming%20Wetlands%20Conservation%20Strategy%20September%207,%202010.pdf>.