

UPPER LITTLE SNAKE VALLEY WETLANDS COMPLEX

Regional Wetlands Conservation Plan



Version 1.0

February 2, 2014

Table of Contents

ACRONYMS AND ABBREVIATIONS.....	3
INTRODUCTION	4
General Description and Land Use.....	4
Ecological Cover Types.....	4
Hydrology	5
Wetlands and Other Water Resources	5
WETLAND-ASSOCIATED WILDLIFE IN THE UPPER LITTLE SNAKE WATERSHED	7
THREATS TO WETLANDS.....	9
Energy Development	10
Rural Subdivision/Fragmentation.....	10
Colorado River Management.....	11
Potential Dam Construction.....	11
Agricultural Practices.....	11
Overutilization by Livestock and Wild Ungulates.....	12
ONGOING WETLAND CONSERVATION PROJECTS	12
Little Snake River Conservation District (LSRCD)	12
USFWS Partners for Fish and Wildlife Program	13
NGO Conservation Easements	13
OTHER PLANS AND INITIATIVES.....	13
Intermountain West Joint Venture (IWJV)	13
The Nature Conservancy	14
CONSERVATION OBJECTIVES	14
STRATEGIES TO ACHIEVE OBJECTIVES	15
Restore/Increase wetland acreage	15
Increase wetland acreage enrolled in perpetual conservation easements.....	15
Actively encourage perpetual conservation easements that tie water rights to the land ..	15
Engage the BLM and energy developers to integrate water quality maintenance and wetland avoidance into project development plans and permits	15
Secure adequate funding to support wetland conservation efforts including assistance and outreach programs.	15

Build partnerships within the local community to support wetland conservation efforts while maintaining traditional agricultural uses of the land..... 16

LITERATURE CITED17

APPENDIX 1. BIRD CHECKLIST FOR THE MUDDY CREEK WETLANDS18

APPENDIX 2: WYOMING AUDUBON SOCIETY (WAS) AVIAN SURVEY RESULTS FROM 2009 SURVEYS ON A RANCH ALONG BATTLE CREEK, TRIBUTARY TO THE UPPER LITTLE SNAKE RIVER.22

ACRONYMS AND ABBREVIATIONS

BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BOC	Board of Control (State Engineer's Office)
CRP	Conservation Reserve Program
CWA	Federal Clean Water Act of 1972
DEQ	WY Department of Environmental Quality
DEQ/WQD	DEQ Water Quality Division
DU	Ducks Unlimited
EPA	U.S. Environmental Protection Agency
EQUIP	Environmental Quality Incentives Program
IWJV	Intermountain West Joint Venture
LSRCD	Little Snake River Conservation District
LWCF	Land and Water Conservation Fund
NAWCA	North American Wetland Conservation Act
NGO	Nongovernmental Organization
NGPJV	Northern Great Plains Joint Venture
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
PFW	Partners in Flight
SCORP	Statewide Comprehensive Outdoor Recreational Plan
SEO	WY State Engineers Office
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
SWG	State Wildlife Grants
TNC	The Nature Conservancy
ULSV	Upper Little Snake Valley
USACE or COE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UW	University of Wyoming
WGFD	Wyoming Game and Fish Department
WHIP	Wildlife Habitat Incentives Program
WHMA	Wildlife Habitat Management Area
WNDD	Wyoming Natural Diversity Database
WRP	Wetlands Reserve Program
WWNRT	Wyoming Wildlife and Natural Resource Trust Fund
WY	Wyoming

INTRODUCTION

General Description and Land Use

The Upper Little Snake Valley (ULSV) wetlands complex lies along Colorado border in extreme south-central Wyoming. The Little Snake lives up to its name by “snaking” along the border of Wyoming and Colorado within the upper reaches before permanently entering Colorado approximately 10 miles west of Baggs, Wyoming. This wetland complex encompasses the valley of the mainstem on both sides of the border and includes tributaries on the Wyoming side, with particular emphasis on the Muddy Creek Wetlands Project. The Muddy Creek Project includes constructed wetlands associated with Muddy Creek and Red Wash near Dad, Wyoming approximately 20 miles north of Baggs. A portion of the complex also includes western foothills of the Sierra Madre Mountains. Typical habitats in the Sierra Madres are aspen, sagebrush, Gambel’s Oak, and conifers. Cottonwood riparian galleries line the Little Snake River and its major tributaries and in some locations, there are numerous oxbow wetlands in various functional conditions. The wetter valleys and associated streams include Fremont cottonwood riparian communities of importance to migratory birds, ungulates and native fish (TNC 2001). The Arizona monsoon regularly extends this far north in August, and partially accounts for the presence of a Gambel oak community, which occurs nowhere else in the state. Species of Greatest Conservation Need (SGCN) inhabiting the Upper Little Snake watershed include seven fish species, four amphibian species, two reptile species, 17 bird species, 11 bat species, and nine mammal species.

Current land uses remain predominantly agriculture-based and include sheep and cattle grazing, and growing mostly native or cultivated hay crops on small farms. Interest in habitat conservation and restoration is very high and the cost of conservation easements remains reasonable in this area. Landowners have been actively working with the U.S. Fish and Wildlife Service’s Partners for Fish and Wildlife program and the Little Snake River Conservation District to carry out a wide range of restoration projects benefiting federal trust and other species. From Baggs, Wyoming east to the Little Snake headwaters (including the Muddy Creek drainage), many landowners have expressed interest in selling conservation easements on both the Wyoming and Colorado sides. A number of landowners have signed the Upper Little Snake River Compact pledging to conserve the landscape and the culture of the area. Conservation easements are seen as a key strategy to meet those objectives.

Ecological Cover Types

The Upper Little Snake watershed consists of rangelands and forests. The dominant ecological system is Inter-mountain Basins Montane Sagebrush Steppe (Comer et al. 2003). Vegetation within this habitat type is typically less than 1.5 meters tall and dominated by sagebrush (*Artemisia* spp). Associated shrubs are seldom dominant and can include rabbitbrush

(*Chrysothamnus spp.*), snowberry (*Symphoricarpos oreophilus*), and bitterbrush (*Purshia Tridentate*) among others. The herbaceous layer is usually well represented, but bare ground can be extensive particularly on disturbed sites. Predominant grasses and sedges include fescues (*Festuca spp.*), squirreltail (*Elymus elymoides*), and *Carex spp.* among others.

Important wetland cover types include herbaceous planted and cultivated fields (primarily hay meadows) and montane riparian and woodland cover types. Typical riparian tree species can include box elder (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*) and Fremont's cottonwood (*P. fremontii*). Riparian shrubs include willows (*Salix spp.*) and younger cottonwoods (*Populus spp.*). Understory can include wetland-associated grasses and sedges, as well as annual and perennial forbs. Salt cedar (*Tamarix spp.*), Russian olive (*Elaeagnus angustifolia*), Canada thistle (*Cirsium arvense*), and smooth brome (*Bromus inermis*) often dominate in degraded riparian sites. Palustrine wetlands such as natural oxbows and man-made wetlands (e.g., the Muddy Creek wetland complex) are dominated by common hydrophytic vegetation including cattails (*typha spp.*), bulrush (*scirpus spp.*), sedges (*carex spp.*), spikerush (*eleocharis spp.*), water plantain (*alisma spp.*), arrowhead (*saggitaria spp.*), and pondweed (*potamogeton spp.*).

Hydrology

The Little Snake River watershed drains the project site. Major tributaries include Muddy Creek, Savery Creek, Slater Creek (primarily in Colorado), and Battle Creek. Additional tributaries include Cow Creek, Wild Cow Creek, Big Sandstone Creek, and Little Savery Creek. High Savery Dam (22,433 acre-foot capacity), was completed in 2005 and influences hydrology of the Savery Creek watershed and the Little Snake River downstream from its confluence with Savery Creek. Hydrology of the entire system can be influenced by irrigation withdrawals, particularly in late summer. Numerous oxbows along major tributaries as well as the mainstem of the Little Snake have become hydrologically isolated in most years.

Wetlands and Other Water Resources

Prior to settlement, wetlands in the Upper Little Snake Valley consisted predominantly of seeps, springs, oxbows along streams and other wetlands associated with the relatively narrow riparian corridors. Since the beginning of the 20th century, agricultural activities have both modified and created wetlands in this area. There are likely more emergent wetlands now than historically due to influence of irrigation projects including flood irrigation of hay meadows. However, historically heavy livestock grazing and loss of herbaceous cover along streams in the arid rangelands, along with beaver eradication, have led to channel destabilization and down-cutting in many locations (e.g., much of the Muddy Creek drainage). Margins of down-cut channels become desiccated, flows occur over shorter intervals, annual overland flooding is curtailed, and

large areas of associated wetlands and riparian communities are lost (Behnke et al. 1978, Brinson et al. 1981, Kauffman and Kreuger 1984, Briggs 1993, USDI-BLM 1993).

The irrigation canals and ditch systems were largely completed in the early 1900's. They include the Baggs ditch, the Buzzard Bend ditch, First Mesa ditch, and the Franklin ditch. Wetlands associated with irrigation include margins of storage reservoirs, seepage areas along canals and ditches, and natural or constructed basins that capture return flows from flood-irrigated fields and pastures. In some cases, irrigation runoff augments flows within streams that were historically dry by midsummer, thereby extending the flow period and sustaining enhanced wetland areas. Wetlands that existed prior to 1980 are reflected in the U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) database, however, wetlands built since then are not documented in the NWI database. The composition of wetlands within the Little Snake Complex is described in Table 1.

Table 1. Composition of wetlands within the Upper Little Snake Wetland Complex based on 1980 imagery.

Wetland Type	Number	Total area
Freshwater Emergent	1,566	9,773 acres
Freshwater Forested/Shrub	660	2,280 acres
Freshwater Pond	1,439	553 acres
Riverine	395	898 acres
Other	41	43 acres
TOTAL	4,101	13,546 acres

Fig. 1 illustrates the boundary of the area identified as the Upper Little Snake Wetland Complex and includes an overlay of the NWI wetlands database information. The Nature Conservancy of Wyoming (TNC) recently completed a geospatial assessment of the distribution, condition and vulnerability of Wyoming wetlands (Copeland et al. 2010). Over 30 priority wetland complexes were identified and delineated. Two wetland complexes identified in TNC's analysis are within the area delineated as the Upper Little Snake Wetland Complex. Relative to other wetland complexes in Wyoming, the Upper Little Snake ranks as moderate in overall diversity of species and rare species. The Conservancy's analysis indicated these complexes are subject to a relatively low threat level when compared to other wetland complexes in the state.

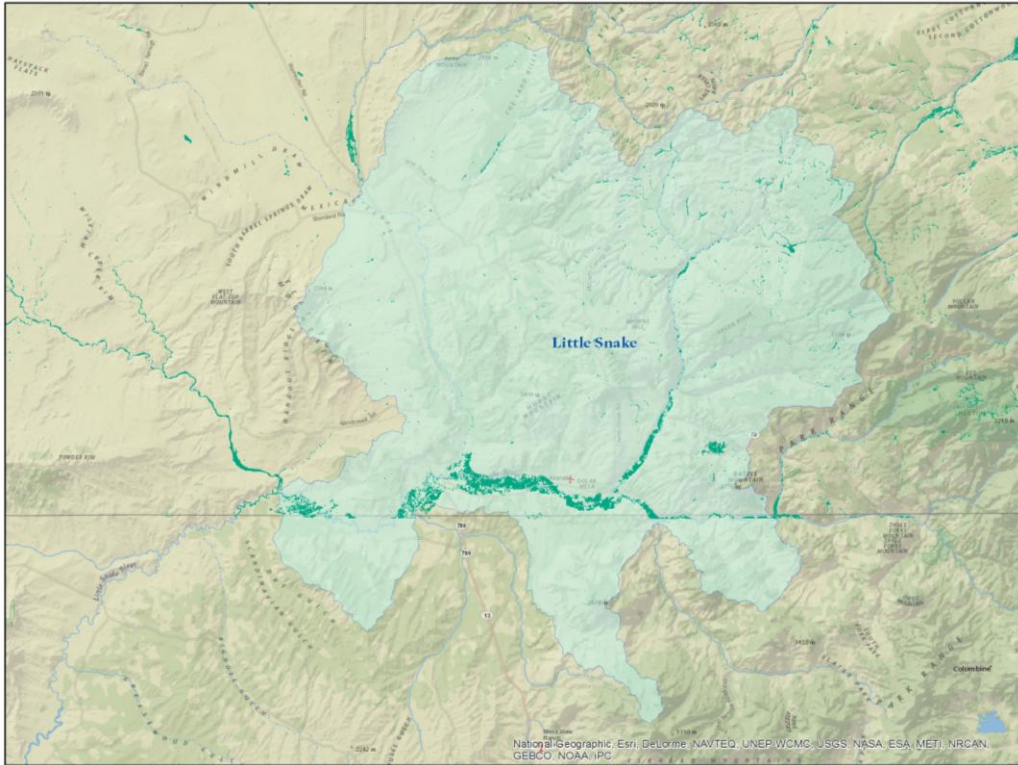


Fig. 1. Upper Little Snake Valley Wetland Complex

WETLAND-ASSOCIATED WILDLIFE IN THE UPPER LITTLE SNAKE WATERSHED

Several priority species utilize riparian habitats and wetlands throughout the Little Snake complex. The North American Wetlands Conservation Act (NAWCA) lists priority bird species that occur in Bird Conservation Region (BCR) 16. Those documented in the ULSV are reported in Table 2. A more inclusive list of species tracked by Wyoming Natural Diversity Database (WYNDD) is reported in Table 3. A bird list from the Muddy Creek Wetlands complex managed by Little Snake River Conservation District is provided in Appendix 1 and results of bird surveys conducted in 2009 by Wyoming Audubon (WA) on a tributary of the Little Snake are provided in Appendix 2.

The Wyoming Game and Fish Department (WGFD) conducted duck breeding pair surveys from the early 1950s through 1999 based on a stratified random sample design consisting of 58 count blocks throughout the state. However, no random count blocks were located in the Upper Little Snake Wetland Complex. WGFD does conduct sandhill crane (staging) and Canada goose (breeding) surveys in the area as part of coordinated multi-state survey efforts. Results from these surveys are reported in Migratory Game Bird Job Completion Reports, accessible at: <http://wgfd.wyo.gov/web2011/wildlife-1000496.aspx>

Table 2. Priority species identified by the North American Wetlands Conservation Act that are reported to occur in the Upper Little Snake Wetland Complex.

Bird Conservation Region 16 NAWCA Priority Species	Reported to Occur in Upper Little Snake Valley Wetland Complex	Data Source(s)
American White Pelican	Yes	WYNDD, LSRCD
White-faced Ibis	Yes	WYNDD, LSRCD
Northern Harrier	Yes	LSRCD, WA
Swainson's Hawk	Yes	LSRCD
Snowy Plover	No	
Solitary Sandpiper	Yes	LSRCD
Marbled Godwit	Yes	LSRCD
Wilson's Phalarope	Yes	LSRCD
Black Tern	Yes	LSRCD
Yellow-billed Cuckoo	No	
Short-eared Owl	Yes	WYNDD
Black Swift	No	
Calliope Hummingbird	Yes	WYNDD
Lewis's Woodpecker	Yes	WYNDD
Red-naped Sapsucker	Yes	WAS
Western Wood-Pewee	Yes	WAS
Willow Flycatcher	Yes	LSRCD
Bell's Vireo	No	
Marsh Wren	Yes	LSRCD
American Dipper	Yes	WYNDD
Veery	No	
Wilson's Warbler	No	
Lazuli Bunting	Yes	WAS
Yellow-headed Blackbird	Yes	LSRCD

Table 3. Species tracked by Wyoming Natural Diversity Database that have been reported in the Upper Little Snake Wetland Complex.

Birds	Golden-crowned Kinglet	Virginia's Warbler
American Avocet	Grasshopper Sparrow	White-faced Ibis
American Bittern	Great Gray Owl	White-winged Crossbill
American Dipper	Greater Sage Grouse	Williamson's Sapsucker
American Peregrine Falcon	Hammond's Flycatcher	
American Three-toed Woodpecker	Juniper Titmouse	Mammals
American White Pelican (Breeding Colonies)	Lewis' Woodpecker	Preble's meadow jumping mouse
Ash-throated Flycatcher	Loggerhead Shrike	White-tailed Prairie Dog
Bald Eagle	Merlin	Wyoming pocket gopher
Black-necked Stilt	Mountain Plover	Canada lynx
Black-throated Gray Warbler	Northern Goshawk	
Bobolink	Osprey	Reptiles
Brewer's Sparrow	Peregrine Falcon	Smooth green snake
Burrowing Owl	Pygmy Nuthatch	Amphibians
Calliope Hummingbird	Red-eyed Vireo	Northern leopard frog
Columbian Sharp-tailed Grouse	Red-necked Phalarope	Boreal western toad
Common Goldeneye	Ring-necked Duck	Tiger Salamander
Common Loon	Rose-breasted Grosbeak	
Eastern Screech Owl	Sage Sparrow	Fish
Ferruginous Hawk	Sage Thrasher	Colorado River cutthroat trout
Flammulated Owl	Sandhill Crane	Bluehead sucker
Golden Eagle	Short-eared Owl	Flannelmouth Sucker

THREATS TO WETLANDS

Lands throughout much of the Upper Little Snake Wetland Complex remain as large, intact livestock ranching operations. Threats include ongoing commercial and industrial developments primarily related to natural gas production. This is largely a concern nearer the town of Baggs, with most of the development occurring to the north and primarily impacting upper tributaries that have lower densities of wetlands. As a result of new seismic exploration in late 2013, some gas drilling is occurring within the mainstem valley. Another emerging threat is the subdivision of larger ranches into smaller recreational properties, primarily driven by the rural housing market expanding northward from Steamboat Springs, Colorado. At present, most of the subdivision interest is focused just outside the watershed and to the south (in Colorado).

However, residential subdivision activity is increasing on the Wyoming side as well. Other threats include potential wind development, unsustainable agricultural practices on some sites, and uncertainty about potential changes to Colorado River management. The Upper Little Snake wetland complex was ranked as having relatively low in vulnerability to threats when compared against other complexes in Wyoming (Copeland, et. al. 2010). Conditions that threaten wetlands and the degree of risk they pose, are summarized in Table 4.

Table 4. Primary threats to wetlands in the Upper Little Snake Wetland Complex

	Low	Moderate	High	Extreme
Rural subdivision and fragmentation		x		
Energy development			x	
Colorado River management		x		
Potential dam construction		x		
Agricultural practices – conversions to center pivot irrigation		x		
Overutilization by livestock and wild ungulates	x			

Energy Development

Natural gas exploration, drilling and production continue in parts of the Upper Little Snake watershed. Though drilling activity seemed to abate somewhat during 2009 and 2010, it may well pick up again when favorable economics return. New seismic exploration in late 2013 suggests there may be increasing interest in energy resources in the uplands on the north side of the main stem valley. Portions of the watershed are also being considered for wind power development. While these activities may not directly impact wetlands, erosion and sedimentation from roads, well pads and other infrastructure could adversely impact many temporary wetlands throughout the area, and workforce housing could increase within and near riparian habitats.

Rural Subdivision/Fragmentation

Interest in subdividing rural properties in the Upper Little Snake is driven primarily by pressures from Steamboat Springs, Colorado some 50 miles to the south, and locally from the town of Baggs. Much of the private land available for development is associated with rivers and streams so significant subdivision development can be expected to directly threaten wetlands that are in large measure created and maintained by traditional flood irrigation. Some isolated wetlands

could be eliminated by drainage or filling at construction sites. Wetland habitat suitability for many sensitive species could also be impaired by associated infrastructure such as roads, buildings, fences, and powerlines, along with increased disturbance, spread of invasive species, and other stresses that come with higher densities of homes. Loose pets, especially cats, can be especially problematic for wetland dependent wildlife.

Colorado River Management

A study completed in 2012 by the Bureau of Reclamation assessed the likely imbalance between supply and demand for Colorado River water. The study concluded that by 2060, demand will outstrip supply by 3.2 million acre feet, and that the probability of a shortage in the lower basin being declared in water year 2015 is 50 percent. The study also identified and evaluated opportunities to resolve imbalances, many of which, if implemented, will change the ways in which the River and its primary tributaries will be managed in the years ahead. Changes in future management have the potential to affect wetlands and riparian areas in the Little Snake River Valley.

Potential Dam Construction

Dams such as High Savery, directly inundate wetlands and riparian habitats along the stream reach within the reservoir basin. Dam operation often produces highly regulated flows and eliminates periodic high flow events needed for oxbow wetland formation and cottonwood regeneration. On the other hand, additional water made available for flood irrigation can increase wetland formation and maintenance. The potential for future dam development within the Upper Little Snake watershed is unknown, however additional sites (e.g., West Fork Battle Creek) continue to be studied (WWDC 2013).

Agricultural Practices

The majority of human created and maintained wetlands are dependent upon traditional flood irrigation practices. The Upper Little Snake is very high in the watershed and water availability is generally not thought to be a limiting factor. However future downstream demands on water resources could incentivize more efficient irrigation practices such as center-pivot systems. Should irrigation practices shift away from traditional flood irrigation, many created emergent wetlands would be at risk. Conversely, increased interest in water development for agricultural use, or to otherwise retain water in Wyoming, could result in locally increased water availability for wetlands depending on the form it takes and its management. Possible outcomes could include creation of more palustrine or forested/shrub wetlands, or an increase in riparian habitats.

Overutilization by Livestock and Wild Ungulates

Overutilization of riparian areas can inhibit cottonwood and willow regeneration and adversely affect vegetation composition and structure, water quality, stream morphology, fisheries habitat, and overall wildlife diversity and abundance. Grazing within wetlands can eliminate cover, damage root mats, trample nests, and increase nest predation rates (WGFD 2010).

ONGOING WETLAND CONSERVATION PROJECTS

No state or federal wildlife refuges or habitat management areas have been established within the ULSV wetland complex, however several agencies and organizations are actively working on conservation and management of wetlands and riparian habitat.

Little Snake River Conservation District (LSRCD)

Muddy Creek Wetlands Complex. LSRCD, along with several partners, developed the Muddy Creek Wetlands Project and provides ongoing support to operate and maintain it. The project includes some 5,000 acres of private (25%) and public (75%) land with over 2,500 acres of wetland habitats in some level of development or completion along approximately 6 miles of Muddy Creek and a tributary called Red Wash. The complex is adjacent to Hwy 789 approximately 20-25 miles north of the town of Baggs. Prominent features include 6 miles of a willow-dominated riparian corridor along Muddy Creek with associated flood plain and meadows ranging from 1/4 to 3/4 miles wide, constructed impoundments, natural basins, and adjacent upland sites dominated by sagebrush, greasewood and gardner saltbrush. At a regional level, the site is extremely important to migrating waterfowl and other wetland dependent birds. Appendix 1 contains a checklist of the bird species that have been observed on the site. This project is a splendid example of the “build it and they will come” principal, and exemplifies the mobility and pioneering capability of many waterfowl, waterbird, and shorebird species.

LSRCD Restoration and Enhancement Activities. LSRCD has led local efforts to implement a variety of conservation projects targeted at upland, wetland and riparian habitats on both public and private lands. In recent years LSRCD has invested more than \$8M into projects within their service area, with more than \$1.5M from the Wyoming Natural Resource Trust Fund to help fund 21 projects. For example, in 2010 the LSRCD successfully applied for a small NAWCA grant – the Purple Sage Ranch Oxbow wetland restoration project. Project purposes included: 1) restore hydrology to two oxbow lake wetlands; 2) protect 76 acres of riparian cottonwood gallery forest from further degradation; and 3) stabilize a 2,000 foot segment of the Little Snake River. Upon completion, the project will restore two oxbow lakes totaling 13.1 acres and stabilize approximately 2,000 linear feet of the river channel.

USFWS Partners for Fish and Wildlife Program

Partners for Fish and Wildlife (PFW) is a U.S. Fish and Wildlife Service Program established in 1987 to promote on-the-ground wetland restoration on private lands. The Wyoming program description can be downloaded at: <http://ecos.fws.gov/docs/partners/web/pdf/563.pdf>

The Upper Little Snake is among the priority areas identified statewide by the USFWS private lands program. Over the past 10 years, the Service has restored or enhanced 12 miles of in-stream habitat and associated riparian zones. While these projects have been primarily designed to recover habitat for Colorado cutthroat trout, many have also improved riparian habitat function.

NGO Conservation Easements

Several organizations including The Nature Conservancy (TNC), Colorado Cattlemen's Agricultural Land Trust (CCALT) and Wyoming Stock Grower's Agricultural Land Trust (WSGALT) have worked with local ranchers to purchase or accept donations of perpetual conservation easements on lands that contain important wetland or riparian habitats. The total area of easements is currently over 3,800 acres with more projects in progress both in Wyoming and along the mainstem of the Little Snake in Colorado. The Battle Creek corridor is conserved through a perpetual conservation easement extending from the National Forest boundary to the confluence with the Little Snake River.

OTHER PLANS AND INITIATIVES

Portions of the Upper Little Snake Valley project area are included in conservation plans at several scales. Wyoming's State Wildlife Action Plan (Wyoming Game and Fish Department 2010) designates the Savery Creek watershed as a priority site and WGFD's current Strategic Habitat Plan designates the Little Snake corridor as important.

Intermountain West Joint Venture (IWJV)

Coordinated Implementation Plan for Bird Conservation in Central and Western Wyoming (BCR's10, 16, 18) (Intermountain West Joint Venture 2013).

The major purpose of the Wyoming Implementation Plan is to assist the IWJV Management Board in reviewing and ranking various habitat protection, restoration, and enhancement projects for funding through the North American Wetlands Conservation Act (NAWCA) and other programs. The Little Snake and Battle Creek are two of 48 priority bird habitat conservation areas identified in the plan. In 2010, a NAWCA small grant was awarded to the

Little Snake River Conservation District to restore hydrology to wetlands, protect the cottonwood gallery forest from further degradation, and stabilize river banks.

The Nature Conservancy

The Nature Conservancy of Wyoming has identified the ULSV as an important wetland concentration area and a statewide priority in the Conservancy's current portfolio of conservation sites. Species and habitats that occur there are listed as priorities in the WY-Partners in Flight Conservation Plan (Rich et al. 2004), North American Waterfowl Management Plan (US Fish and Wildlife Service and Environment Canada 1986), and the Intermountain West Regional Shorebird Plan (Oring et al. 2012). Many bird species inhabiting the ULSV also appear on the U.S. Forest Service and Bureau of Land Management species of concern lists as well as the Audubon Watch list.

CONSERVATION OBJECTIVES

The following objectives are recommended to conserve, create, enhance, and/or manage wetlands within the Upper Little Snake Valley Wetland Complex:

- 1) Strive for no net loss of existing wetlands.
- 2) Increase the overall area of wetlands protected with perpetual conservation easements by at least 1,000 acres by 2020.
- 3) In the deeds of conservation easements, tie existing water rights to the land to maintain existing uses and maintenance of wetlands.
- 4) Engage the Bureau of Land Management (BLM) and energy companies to ensure project development plans include adequate measures to maintain water quality and avoid disturbances within or near wetlands and riparian habitats. Where impacts are unavoidable, encourage funding of wetland projects to fulfill mitigation requirements on either an "in-kind" or "out-of-kind" basis.
- 5) Support maintenance, management, and continued enlargement of the Muddy Creek Wetlands Project.
- 6) Secure adequate funding to implement wetland conservation efforts, including assistance and outreach programs.
- 7) Build partnerships within the local community to support wetland conservation efforts while maintaining traditional agricultural uses of the land.
- 8) Develop baseline assessment to monitor long-term trends in wetland conditions through an EPA funded wetland program development grant.

STRATEGIES TO ACHIEVE OBJECTIVES

Restore/Increase wetland acreage

- Restore functional oxbow wetlands by reconnecting them with active channels, or employ other restoration techniques.
- Incorporate riparian habitat restoration into proposed and ongoing projects such as aspen regeneration and fisheries habitat restoration.
- Utilize ongoing programs and incentives offered by Wyoming Water Development Commission to improve wetlands or water supplies for wetlands.

Increase wetland acreage enrolled in perpetual conservation easements

- Disseminate information about conservation initiatives and encourage continued landowner interest and participation.
- Provide landowners, land trusts, and other easement holders with information about the importance of wetlands when considering land conservation projects.
- Continue to explore funding alternatives.
- Continue working directly with the Little Snake River Conservation District, other partners, and landowners to explore various easement options.

Actively encourage perpetual conservation easements that tie water rights to the land

- Inform land trusts and others about the importance of maintaining water rights to sustain wetlands on conservation easements.
- Develop and incorporate language in conservation easement deeds to assure water rights will be maintained in good standing within the easement properties.

Engage the BLM and energy developers to integrate water quality maintenance and wetland avoidance into project development plans and permits

- Provide surface management agencies (BLM, USFS) and project proponents with spatial information on wetland types and distribution as they relate to terrestrial and aquatic species of concern.
- Ensure reviewers (WGFD, USFWS) consider potential impacts to wetlands and wetland-dependent species when evaluating project plans or permits.

Secure adequate funding to support wetland conservation efforts including assistance and outreach programs.

- Evaluate funding sources, including Intermountain West Joint Venture (IWJV) and USDA-NRCS, to support educational outreach and technical assistance.
- Evaluate local landowner and partner interest in, and feasibility of, implementing other previously underutilized programs such as the Wetland Reserve Program (WRP).

Build partnerships within the local community to support wetland conservation efforts while maintaining traditional agricultural uses of the land.

- Support the LSRCDD, individual landowners, and other partners in their efforts to conserve wetlands and traditional agricultural operations in the valley.
- Assist local leaders to incorporate wetlands restoration and conservation within landscape scale conservation planning as requested.

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**APPENDIX 1. BIRD CHECKLIST FOR THE MUDDY CREEK WETLANDS
(COMPILED BY THE LITTLE SNAKE CONSERVATION DISTRICT)**

Species	Scientific Name	Breeder/Migrant	Occurrence
Song Birds:			
American Robin	Turdus migratorius	B	COMMON (C)
American Goldfinch	Carduelis tristis	B	C
American Tree Sparrow	Spizella arborea	B	C
Bank Swallow	Riparia riparia	B	C
Barn Swallow	Hirundo pyrrhonota	B	C
Bewick's Wren	Thryomanes bewickii	B	RARE(R)
Brewer's Blackbird	Euphagus cyanocephalus	B	OCASSIONAL
Brewer's Sparrow	Spizella breweri	B	O
Broad-tailed	Selasphorus platycercus	?	O
Brown-headed Cowbird	Molothrus ater	B	C
Cliff Swallow	Petrchelidon pyrrhonota	B	C
Common Yellowthroat	Geothlypis trichas	B	C
Eastern Kingbird	Tyrannus tyrannus	B	O
Green-tailed Towhee	Pipilo chlorurus	B	R
Grey Catbird	Dumetella caolinensis	B	O
Grey Flycatcher	Empidonax oberholseri	B	R
Horned Lark	Elemophilia alepstris	B	C
House Finch	Carpodacus mexicanus	B	C
House Wren	Troglodytes troglodytes	B	O
Lark Bunting	Calamoxpiza melanocorys	B	O
Loggerhead Shrike	Lanius ludovicianus	?	R
Marsh Wren	Cistothorus palustris	B	O
Mountain Bluebird	Sialia currocoides	B	O
Mountain Plover	Charadrius montanus	B	VERY RARE (VR)
Mourning Dove	Zenaidura macoura	B	C
N. Rough-winged	Stelgidopteryx serripennis	B	C
Northern Flicker	Colaptes auratus	B-M	O
Northern Oriole	Icterus galbula	B	O
Red-winged Blackbird	Agelaius phoenicues	B	C
Rock Wren	Salouctes obsoletus	?	R
Sage Sparrow	Amphispiza belli	B	C
Sage Thrasher	Orescoptes montanus	B	O
Savannah Sparrow	Passerculus sandwichensis	B	O
Say's Phoebe	Sayornis saya	B	O
Song Sparrow	Melospiza melodia	B	C
Swainson's Thrush	Catharus ustulatus	B	R
Vesper Sparrow	Pooecetes gramineus	B	O
Violet-green Swallow	Tachycineta thalassina	B	C

Species	Scientific Name	Breeder/Migrant	Occurrence
Warbling Vireo	Vireo gilvus	B	O
Willow Flycatcher	Empidonax traillii	B	R
Western Kingbird	Tyrannus verticalis	B	O
Western Meadowlark	Sturnella neglecta	B	C
Yellow Warbler	Dendroica petechia	B	C
Yellow-headed Blackbird	Xanthocephalus xanthocephalus	B	C
Yellow-rumped Warbler	Dendroica coronata	B	R
Wading/Shore Birds:			
Avocet	Recurvirostra americana	B-M	C
American Bittern	Botaurus lentiginosus	B	R
Black-bellied Plover	Pluvialis squatarola	M	VR
Black-necked Stilt	Himantopus mexicanus	B-M	O
Black Crowned Night	Nycticorax nycticorax	M	VR
Common Snipe	Gallinago gallinago	B	C
Cattle Egret	Bubulcus ibis	Summer resident	R
Great Blue Heron	Ardea herodias	B-M	C
Greater Yellowlegs	Tringa melanoleuca	M	R
Killdeer	Charadrius vociferus	B	C
Least Sandpiper	Calidris minutilla	M	O
Lesser Golden Plover	Pluvialis dominica	M	VR
Lesser Yellowlegs	Tringa melanoleuca	M	R
Long-billed Curlew	Numenius americanus	M	VR
Long-billed Dowitcher	Limnodromus scolopaceus	M	O
Great Egret	Casmerodius albus	Summer Resident	VR
Marbled Godwit	Limosa fedoa	M	O
Sandhill Crane	Grus canadensis	M	O
Semi-Palmated Plover	Charadrius semi-palmatus	M	O
Snowy Egret	Egretta thula	B-M	O
Sora	Porzana carolina	B	C
Spotted Sandpiper	Actitis macularia	B	C
Solitary Sandpiper	Tringa solitaria	M	R
Virginia Rail	Rallus limicola	B-M	R
White-faced Ibis	Plegadis chihi	B-M	C
Willet	Catoptrophorus semipalmatus	M	O
Wilson Phalarope	Steganopus tricolor	B	C
Lesser Golden Plover	Pluvialis dominica	M	VR
Waterbirds/ducks			
American Coot	Fulica americana	B	C
American Wigeon	Mareca americana	B&M	C
Blue-winged Teal	Anas discors	B&M	C
Bufflehead	Bucephala albeola	M	O
Canada Goose	Branta cnaadensis	B&M	C
Canvasback	Aythya valisineria	B&M	O

Species	Scientific Name	Breeder/Migrant	Occurrence
Cinnamon Teal	Anas discors	B&M	C
Clark's Grebe	Aechmorphus clarkii	M	O
Common Goldeneye	Bucephala clangula	M	O
Common Merganser	Mergus merganser	B&M	O
Double-crested	Phalacrocorax auritus	M	R
Eared Grebe	Podiceps nigricollis	B&M	C
Gadwall	Anas strepera	B&M	C
Green-winged Teal	Anas crecca	B&M	C
Lesser Scaup	Aythya affinis	B&M	C
Mallard	Anas platyrhynchos	B&M	C
Northern Pintail	Anas acuta	B&M	C
Northern Shoveler	Anas clypeata	B&M	C
Pied-billed Grebe	Podilymbus podiceps	B&M	O
Redbreasted Merganser	Mergus serrator	M	R
Redhead	Aythya americana	B&M	C
Ring-necked Duck	Aythya collaris	B&M	O
Ross' Goose	Chen rossii	M	R
Ruddy Duck	Oxyura jamaicensis	B&M	C
Snow Geese	Chen caerulescens	M	R
Tundra Swan	Cygnus columbianus	M	R
Western Grebe	Aechmorphus occidentalis	B&M	C
Raptors:			
American Kestrel	Falco sparverius	B&M	O
Bald Eagle	Haliaeetus leucocephalus	M	R
Burrowing Owl	Athene cunicularia	B	R
Common Nighthawk	Chordeiles minor	B&M	C
Ferruginous Hawk	Buteo regalis	B	O
Golden Eagle	Aquila chrysaetos	B	C
Long-eared Owl	Asio Otus	B	R
Northern Harrier	Circus cyaneus	B	C
Red-tailed Hawk	Buteo jamaicensis	B	C
Rough-legged Hawk	Buteo lagopus	M	O
Swainson's Hawk	Buteo swainsoni	M	O
Peregrine Falcon	Falco peregrinus	M	R
Upland Game Birds:			
Sage Grouse	Centrocercus urophasianus	B	O
Crows:			
American Crow	Corvus brachyrhynchos	M	C
Common Raven	Corvus corax	M	O
Black billed magpie	Pica pica	B	C
Terns and Gulls:			
Black Tern	Chlidonias niger	M	O
Forster's Tern	Sterna forsteri	M	O

Species	Scientific Name	Breeder/Migrant	Occurrence
Franklin's Gull	Larus pipixcan	M	O
Herring Gull	Larus argentatus	m	O
Ring-billed Gull	Larus delawarensis	M	O
Other Birds:			
Belted Kingfisher	Ceryle alcyon	M	O
White Pelican	Pelecanus erythrorhynochus	M	C

**APPENDIX 2: WYOMING AUDUBON SOCIETY (WAS) AVIAN SURVEY RESULTS
FROM 2009 SURVEYS ON A RANCH ALONG BATTLE CREEK,
TRIBUTARY TO THE UPPER LITTLE SNAKE RIVER.**

	7/7/2009	7/8/2009	8/24/2009	8/25/2009	
Common Name	No	No	No	No	Total
Canada Goose				7	7
American Wigeon				22	22
Mallard	1			42	43
Blue-winged Teal				15	15
Northern Pintail				2	2
Green-winged Teal				10	10
Lesser Scaup				5	5
Sage-grouse				3	3
Great Blue Heron		1			1
Bald Eagle			1		1
Northern Harrier				2	2
Cooper's Hawk			1	1	2
Red-tailed Hawk	3	1	2		6
American Kestrel				3	3
American Coot				3	3
Sandhill Crane	3	1	2	6	12
Killdeer				7	7
Spotted Sandpiper				5	5
Wilson's Snipe				1	1
Mourning Dove				1	1
Common Nighthawk			42		42
Broad-tailed Hummingbird	10	3			13
Rufous Hummingbird					
Belted Kingfisher			1		1
Red-naped Sapsucker	1				1
Downey Woodpecker	1		1		2
Hairy Woodpecker	1			1	2
Northern Flicker	5	2	5	1	13
Western Wood Peewee	5	3			8
Cordilleran Flycatcher	1				1
Loggerhead Shrike	1				1
Warbling Vireo		2			2

Common Name	No	No	No	No	Total
Clark's Nutcracker			5		5
Black-billed Magpie		4	2	63	69
American Crow		1	9	7	17
Common Raven	1				1
Tree Swallow	6	1	20		27
Violet-green Swallow	2	2			4
Barn Swallow			4		4