

# Draft Environmental Assessment and Land Protection Plan

*Proposed Wyoming Toad Conservation Area*

**Wyoming**

**October 2014**

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**CITATION**

Fish and Wildlife Service. 2014. Draft environmental assessment and land protection plan—Proposed Wyoming Toad Conservation Area, Wyoming. Lakewood, Colorado: U.S. Department of the Interior, Fish and Wildlife Service. 92 p.



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# Abbreviations

<b>AWVED</b>	Assessment of Wildlife Vulnerability to Energy Development
<b>EA</b>	Environmental assessment
<b>FWS</b>	U.S. Fish and Wildlife Service
<b>LCC</b>	Landscape conservation cooperative
<b>LPP</b>	Land protection plan
<b>NRCS</b>	Natural Resources Conservation Service
<b>Refuge System</b>	National Wildlife Refuge System
<b>Service</b>	U.S. Fish and Wildlife Service
<b>USDA</b>	U.S. Department of Agriculture
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>WGFD</b>	Wyoming Game and Fish Department
<b>WTCA</b>	Wyoming Toad Conservation Area
<b>WYNDDB</b>	Wyoming Natural Diversity Database

A glossary of these and other terms follows chapter 4 of the LPP.



# Summary



Sarah Armstrong/FWS

*The proposed action would protect habitat that is important for the future of the Wyoming toad.*

The U.S. Fish and Wildlife Service (Service) is proposing the Wyoming Toad Conservation Area to conserve vital wildlife habitat and migration corridors on the Laramie Plains of southeastern Wyoming.

## The Proposed Action

The proposed Wyoming Toad Conservation Area would protect up to 43,299 acres. The footprint of the project would be located in south-central Albany County, Wyoming, and would encompass three existing refuges: Bamforth, Hutton Lake, and Mortenson Lake National Wildlife Refuges.

The Service would set priorities for land protection based primarily on the needs of the endangered Wyoming toad. The conservation area would focus on the protection of wetlands, riparian corridors, and open landscapes.

In accordance with the National Environmental Policy Act and U.S. Fish and Wildlife Service policy, both a draft environmental assessment and a draft land protection plan have been prepared to analyze the potential effects of establishing the Wyoming Toad Conservation Area in southeastern Wyoming. Both documents are contained within this volume.

## Draft Environmental Assessment

The draft environmental assessment documents the following:

- purpose of the proposed conservation area
- issues
- two alternatives
- analysis of the potential environmental effects of establishing the conservation area

Alternative A is the no-action alternative. Areas that are not currently in some type of land protection status would remain in private ownership and be subject to changes in land use or habitat type.

Alternative B is the Service's proposed action:

- The Service would work to strategically protect wetland habitat for the establishment of up to five self-sustaining populations of Wyoming toad through fee-title purchase from willing sellers.
- The Service would seek to strategically buy conservation easements on privately owned lands that provide potentially valuable habitat for the Wyoming toad. The easements would also provide perpetual protection of valuable wildlife habitat for threatened and endangered species and migratory birds by restricting some types of future development.

## Draft Land Protection Plan

The draft land protection plan describes the priorities for acquiring interests within the boundary of the proposed Wyoming Toad Conservation Area: up to 33,299 acres in voluntary conservation easements and up to 10,000 acres in fee-title acquisition from willing sellers.

The Service has defined high and medium conservation priorities—based on scientific modeling results for the Wyoming toad, threatened and endangered species, and migratory birds—to set priorities for where to pursue easements and fee-title acquisition.

# Draft Environmental Assessment

## Chapter 1—Purpose of and Need for Action

*“Conservation is a state of harmony between men and land.”*

—Aldo Leopold



FWS

*View of Mortenson Lake National Wildlife Refuge with Sheep Mountain in the background.*

This draft environmental assessment (EA) documents the purpose of and the issues, alternatives, and analysis for the proposed Wyoming Toad Conservation Area (WTCA). The WTCA is located in the southern part of the Laramie Plains along a section of the Laramie River in Albany County, Wyoming. Chapter 1 provides background information and describes the conditions that led to the U.S. Fish and Wildlife Service (Service or USFWS) proposal to create the WTCA for the protection of important wetland and upland habitats. These lands would be protected primarily through voluntary perpetual conservation easements and limited fee-title acquisition from willing landowners.

### 1.1 Introduction

The Laramie Plains is an isolated mountain basin that was once covered by wetlands, riparian corridors, meadows, shrublands, and native prairie. In the spring, snow melt would fill streams and waterways as well as many shallow depressions scattered throughout the valley. These wetlands provided an oasis of food and rest for thousands of waterfowl and shorebirds making their northward migration to their breeding grounds. Linear riparian corridors bordered the Big and Little Laramie Rivers and their tributaries, supporting scattered woodlands of

cottonwoods and willows. The relatively fine soils and low annual precipitation kept the uplands in short mixed-grass prairie with scattered patches of shrubland. The Wyoming toad, a species endemic to the Laramie Plains, was once a common sight. Waterfowl, shorebirds, and grassland birds would dominate the skies, with raptors following the migration. Many mammals that depended heavily on white-tailed prairie dogs for prey and burrow habitats also lived in the area, including the swift fox and the black-footed ferret. Big game herds, including the American bison, once occupied almost all parts of the basin.

Today, the landscape has changed. Some wetlands have been filled or drained, others have been altered, and new wetlands in the form of flood-irrigated fields have been created. Only 4 percent of existing wetlands within the Laramie Plains are protected (Cope land et al. 2010a). Much of the water in the area is managed to support various human needs such as residential use, hay and crop production, and recreation. The strong ranching culture in the area has kept many of the habitats of the basin from being converted to other uses and has left much of the region's biodiversity intact. There are growing concerns that a significant increase in residential development threatens the remaining natural character of this landscape, in particular the habitats and species that make the Laramie Plains regionally important for biological diversity. Rural development on exurban lots has been growing at a rate of 10 to 15 percent a year (USDA 2006). Such development will likely diminish the future value of these important biological resources and working landscapes.

Once the western fringe of the range for many short mixed-grass prairie species, the Laramie Plains has increased in relative habitat value because of habitat loss, fragmentation, and conversion of native prairie to cropland elsewhere in the Great Plains. Because of the relatively large, intact ecosystem still available, the basin has become crucial habitat for many species. Without increased conservation measures to protect upland habitat from degradation and conversion to other uses, species that now depend on the high-elevation prairie as a last remaining refuge would be vulnerable.

The remaining wetlands play a vital role in providing resting and feeding areas for the thousands of migratory birds that continue to use the central flyway each spring and fall. However, increased sedimentation, nutrient runoff, salinization, and decreased water runoff jeopardize the functions and values of these wetlands. Similarly, riparian corridors are also affected by problems such as sedimentation, nutrient runoff, decreased water runoff, and stream channelization, which in turn affect fisheries and aquatic species such as the endangered Wyoming toad. With decreasing water quality and natural

water flow in the rivers and remaining wetlands, the recovery of the Wyoming toad could be impaired.

While increased human activity in the Laramie Plains has generally reduced habitat and wildlife populations, there have been some compensating effects. For example, irrigated hay meadows provide nesting cover for waterfowl. Some of the same flood-irrigated meadows may also hold water longer during the summer months, helping to retain higher late-summer flows in the surrounding rivers. Large ranches in the basin also provide large blocks of habitat that benefit wildlife.

The proposed WTCA would contribute to bird, mammal, reptile, and amphibian conservation efforts, as described in the Wyoming Toad Draft Revised Recovery Plan, North American Waterfowl Management Plan, United States Shorebird Conservation Plan, Partners in Flight's North American Landbird Conservation Plan, Wyoming Partners in Flight's Wyoming Bird Conservation Plan, North American Waterbird Conservation Plan, Wyoming Game and Fish Department Strategic Habitat Plan, Wyoming Game and Fish Department State Wildlife Action Plan, Platte/Kansas River Ecosystem—Analysis and Conservation Focus Area Development Plan, Black-footed Ferret Recovery Plan, Laramie Plains Wetland Complex—Regional Wetland Conservation Plan, and Wyoming Wetlands Conservation Strategy.

## 1.2 Proposed Action

The Service is proposing the WTCA to conserve vital wildlife habitat for the Wyoming toad in the Laramie Plains. The project would protect up to an additional 43,299 acres in the Wyoming Basin ecoregion (Bailey 1995) and the Great Northern Landscape Conservation Cooperative (LCC) (USFWS 2012). The entire footprint of this project would be located in south-central Albany County, Wyoming, and would encompass three existing refuges: Bamforth, Mortenson Lake, and Hutton Lake National Wildlife Refuges. The WTCA would focus on the protection of wetlands, riparian corridors, and upland habitat with the objective of conserving land through the acquisition of up to 33,299 acres of voluntary conservation easements and up to 10,000 acres in fee-title acquisition from willing sellers only (table EA-1).

Acquisition of fee-title and easement lands would be prioritized based on specific criteria that would help with meeting the criteria of the Wyoming Toad Draft Revised Recovery Plan (USFWS 2014). These criteria are meant to contribute to the recovery and eventual delisting of the Wyoming toad. The Wyo-

**Table EA-1. Summary of current and proposed acreage for the proposed Wyoming Toad Conservation Area, Wyoming.**

<i>National wildlife refuge</i>	<i>Executive boundary acres</i>	<i>Acquired acres</i>	<i>In-holding acres</i>
Mortenson Lake	2,500	1,927	573
Hutton Lake	1,968	1,968	0
Bamforth	1,166	1,166	0
			<i>Proposed conservation easement acres</i>
	<i>Potential new acres</i>	<i>Proposed fee title acres</i>	
Proposed project area	43,299	Up to 10,000	Up to 33,299
Project boundary total acres	47,200		

ming Toad Draft Revised Recovery Plan (USFWS 2014) calls for the establishment of five independent, self-sustaining populations within the toad's historical range. Furthermore, these five populations should be distributed across at least two basic habitat types: rivers and associated floodplains (lotic habitats) and ponds and lakes (lentic habitats). To accomplish this goal, more lands need to be acquired and protected within the Wyoming toad's historical range to reintroduce and conserve its populations in perpetuity.

Management practices on fee-title lands could include prescribed fire, livestock grazing with periodic resting of pastures, exclusion of nonnative fish, invasive species control, and disease management. A compatible use study would be conducted to determine if the area could be opened up for public use on any property acquired in fee title.

Conservation easements would be bought from willing sellers on parcels that contain habitat suitable to support conservation efforts. Easement acquisitions would focus on the protection of the Wyoming toad, but would also benefit other Federal trust resources (threatened and endangered species and migratory birds). Lands protected via easements would remain in private ownership and could continue to be grazed, hayed, farmed, or otherwise managed in accordance with current practices. However, subdivision and development would be restricted and subject to stipulations agreed on by the landowners and the Service. Furthermore, easements may include stipulations related to exercising water rights that could only be changed if the proposed changes would be beneficial to wildlife. Easement terms would be negotiated with individual landowners interested in a conservation easement. The WTCA, in conjunction with other conservation efforts in the region, would help to keep unfragmented blocks of wetland, grassland, and upland habitat. The WTCA would complement the conservation efforts of land trusts and entities such as The Nature Conservancy, Wyoming Stock Growers Land Trust, Wyoming Game and Fish Department (WGFD), and the Natural Resources Conservation Service (NRCS) (see figure EA-1).



FWS

Captive Wyoming toads at the Saratoga National Fish Hatchery in Wyoming.

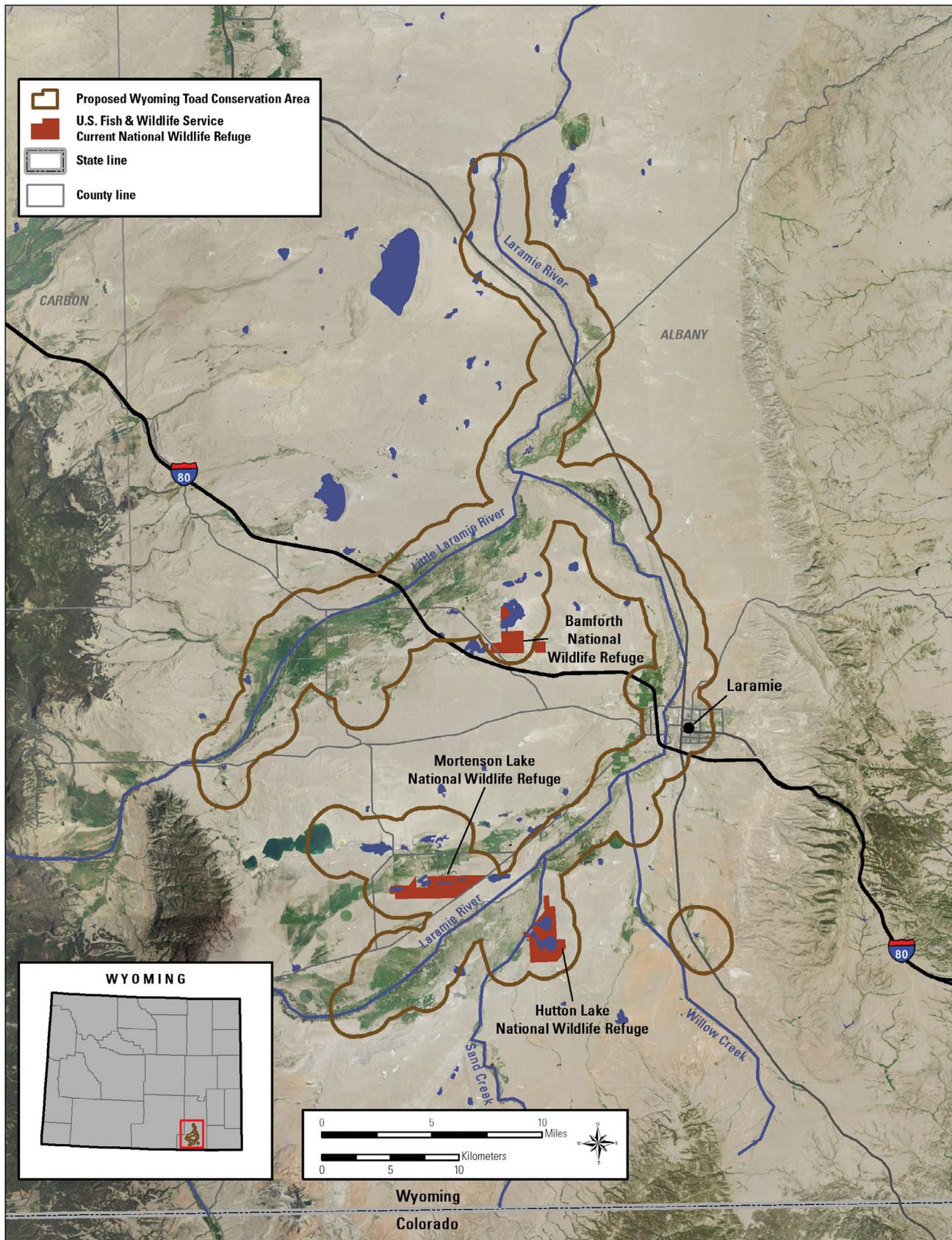


Figure EA-1. Map of the proposed Wyoming Toad Conservation Area in Wyoming.

## 1.3 Purpose of and Need for Proposed Action

The purpose of this project is to provide strategic habitat conservation measures that are necessary to conserve, restore, and enhance the wetland, riparian, and associated upland habitats that are essential for the recovery of the endemic, endangered Wyoming toad. This habitat also is important for breeding, foraging, and nesting populations of migratory shorebirds, waterfowl, and neotropical songbirds. Other native habitats that make up the Laramie Plains include shrublands, shortgrass prairie, and mixed-grass prairie, which are important for a variety of wildlife species including white-tailed prairie dog, pronghorn, and many grassland birds such as mountain plover and McCown's longspur. There are several goals for this project:

- Acquire and permanently protect wetland and riparian habitat to support Wyoming toad recovery and promote the establishment of multiple viable toad populations.
- Support the recovery and protection of other threatened and endangered species that occur in the WTCA.
- Protect, conserve, maintain, and enhance key migratory bird stopovers and breeding areas that serve as important feeding, resting, and nesting habitat for waterfowl, shorebirds, and neotropical migrants.
- Promote ecological resiliency by conserving existing wildlife habitats and working with willing private landowners who are interested in common goals.

## 1.4 Decisions to Be Made

The Service's planning team (see appendix A) will use this draft EA to review the environmental and management alternatives. Based on this EA, the Service's Director of Region 6, with the concurrence of the Director of the U.S. Fish and Wildlife Service, will make two decisions:

- Determine whether the Service should establish the WTCA, in accordance with its land protection planning policy.

- If yes, determine whether the selected alternative could have a significant impact on the quality of the human environment as required by the National Environmental Policy Act of 1969. If the quality of the human environment would not be significantly affected, a finding of no significant impact will be signed and made available to the public. If the alternative could have a significant impact, an environmental impact statement would be prepared to further address potential impacts.

## 1.5 Issues Identified and Selected for Analysis

During the first half of 2011, internal scoping meetings and several opportune conversations occurred between the project leader for the Arapaho National Wildlife Refuge and stakeholders interested in conserving wildlife in the Laramie Plains. Thoughts, concerns, issues, priorities, and values discussed during these meetings were noted and a letter of support was written (appendix B). The Service will solicit additional comments about the WTCA from the public through direct mailings, news releases, and direct contacts including a public meeting that is planned for fall 2014 in Laramie, Wyoming.

Topics and issues identified during the initial scoping process and during internal conversations among the WTCA planning teams that would be addressed by the proposed WTCA are as follows.

### Biological Issues

- The ability to successfully recover the Wyoming toad within the current configuration of landownership.
- The potential negative effects on wildlife and other natural resources because of development, including residential development, oil and gas exploration and development, wind development, gravel mining, and water and petroleum pipelines. Threats include noxious weed colonization and proliferation, decreased water quantity and quality, and decreased air quality.

- The ability to maintain habitat connectivity that is necessary to preserve the Wyoming toad and other wildlife.

## Socioeconomic Issues

- The potential impacts of more urban/exurban sprawl and energy development on working landscapes, rural values, tourism, tax revenues, cultural resources, water quantity and quality, and air quality.
- The potential impacts of the Service's acquisition of land either by fee title or conservation easement, including impacts on tax revenue, public access to fee-title lands, and future management choices for conservation easements.
- The different philosophical views held by members of the public on landownership by the government.
- The ability to protect open views and the ranching heritage.

## 1.6 National Wildlife Refuge System and Authorities

The WTCA would be part of the National Wildlife Refuge System (Refuge System), whose mission is "...to preserve a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Improvement Act of 1997). National wildlife refuges provide important habitat for native plants and many species of mammals, birds, fish, insects, amphibians, and reptiles. Refuges also play a vital role in conserving threatened and endangered species. Refuges offer a wide variety of wildlife-dependent recreational opportunities, and many have visitor centers, wildlife trails, and environmental education programs.

Land acquisition and conservation activities undertaken within the WTCA would also be consistent with the following policies and management plans:

- Migratory Bird Treaty Act (1918)
- Migratory Bird Hunting and Conservation Stamp Act (1934)
- Bald and Golden Eagle Protection Act (1940)
- U.S. Fish and Wildlife Act (1956)
- Land and Water Conservation Fund Act (1965)
- Endangered Species Act (1973)
- North American Waterfowl Management Plan (1994)
- Migratory Non-game Birds of Management Concern in the U.S. (2002)

The acquisition authorities for fee-title and easement lands within the proposed WTCA boundary are the U.S. Fish and Wildlife Act of 1956 (16 U.S.C. 742a–j) and the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–ee), as amended.

## 1.7 Related Actions and Activities

The Service is currently working with other public and private entities to protect wildlife habitat within the project area. Many organizations in Wyoming recognize the ecological significance of the Laramie Plains and the need to conserve this valuable landscape and the region's ranching heritage. Various organizations have been working for more than a decade to conserve the natural resources and open space of the Laramie Plains. The Wyoming Stock Growers Association, NRCS, Audubon Wyoming, Bureau of Land Management, WGFD, Laramie Rivers Conservation District, City of Laramie, and The Nature Conservancy have all been active in preserving parts of the Laramie Plains (see figure EA-2). Organizations and agencies that currently hold conservation easements within the conservation boundary include The Nature Conservancy, Wyoming Stock Growers Land Trust, the City of Laramie, and WGFD.

*Audubon Wyoming*, which is the National Audubon Society's State office, has been a strong, unified voice for an ethic of conservation in Wyoming, focusing on birds, other wildlife, and their habitats for the benefit of present and future generations. One of the National Audubon Society's Important Bird Areas, the Laramie Plains Lakes Complex, overlaps the Service's proposed project area. The National Audubon Society recognizes this area as an Important Bird Area because its habitats provide important stop-

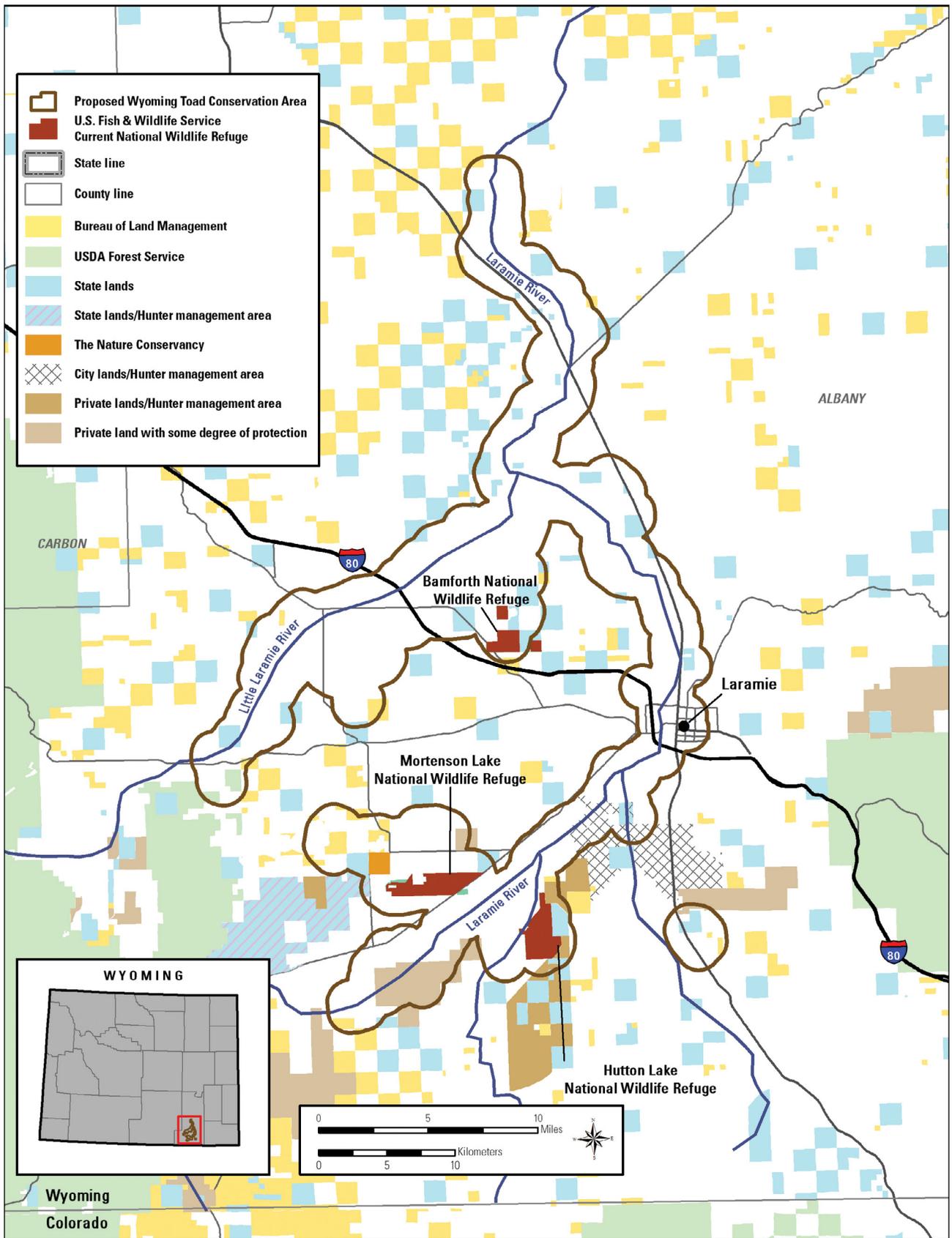


Figure EA-2. Protected lands in the Laramie Plains in Wyoming.

overs for migrating birds and breeding sites for species such as the American white pelican, American bittern, white-faced ibis, and black-crowned night-heron (Audubon Wyoming 2011).

*Bureau of Land Management* has a multiple-use mission and administers more public land than any other Federal agency, including more than 17.5 million acres in Wyoming. In the Laramie Plains, the Bureau of Land Management owns several sections of land, some of which have been set aside for wildlife as the Laramie Peaks Wildlife Habitat Management Area as identified in the Resources Management Plan for the district. The Laramie Peaks Wildlife Habitat Management Area is scheduled for management planning in the near future, and the Bureau of Land Management is interested in partnering with the Service.

*Intermountain West Joint Venture* strives to conserve priority bird habitats through partnership-driven, science-based projects and programs. It brings people and organizations together to make the best use of technical and financial resources, building a collective capacity to achieve conservation at meaningful scales. Each state within the Intermountain West Joint Venture has conservation partnerships. The Wyoming Bird Habitat Conservation Partnership's mission is to facilitate habitat conservation planning and projects that help achieve priority State, regional, and continental bird objectives through the North American Wetlands Conservation Act and other programs.

*Laramie Rivers Conservation District* is one of 34 conservation districts in Wyoming that were established to help landowners and resource users with conservation practices and provide leadership in natural resource management issues and efforts. Individual conservation districts offer a wide variety of programs to help anyone interested in conservation. They also play a key role in Federal land management planning processes and Federal and State legislative and administrative initiatives that affect local conservation and land use activities.

*Natural Resources Conservation Service* actively works in the Laramie Plains through its Wetlands Reserve Program, a voluntary easement program that offers landowners the opportunity to protect, restore, and enhance wetlands on private property. One property in the area is now under an easement agreement and is a Safe Harbor Act site for the Wyoming toad. NRCS does not own land in fee title, but rather provides technical and financial support to help landowners with wetland restoration efforts.

*Partners for Fish and Wildlife* is a program administered by the Service that works cooperatively with landowners to provide financial and technical support to voluntarily restore and enhance wildlife habitat on private land. Since the inception of

the Partners for Fish and Wildlife program in 1992, the Service has had a successful history of working with private landowners in Wyoming. Areas that have been targeted for wetland projects include the Laramie Plains, Goshen Hole, Wind River Indian Reservation, Great Basin, and the New Fork Pothole Region of the Upper Green River Basin. Statewide goals are to restore 15,000 acres of wetlands, restore or enhance 5 million acres of upland habitat, restore 1,000 miles of riparian habitat, and restore 1,000 miles of instream habitat. Much of the wetland work accomplished to date has been in the upper Wind River Basin and the Goshen Hole Wetland Complex.

*Private landowners and ranchers* have been instrumental in working with the various organizations and agencies to carry out conservation projects. More than 60 percent of the project area, including important habitat for wildlife, is in private landownership. Landowners in the area have already placed easements on 22,106 acres, showing local interest in conserving agriculture and open space.

*The Nature Conservancy* recognized the biological significance of the Laramie Plains wetlands in the 2008 Shirley Basin–Laramie Rivers Conservation Plan, which established a goal of protecting 125,000 acres of mixed-grass prairie and 100,000 acres of sagebrush steppe or shrubland (Pocewicz and Lathrop 2008). The plan also stated that at least 10 percent of these acres should be permanently protected from development through threat abatement and improved stewardship.

*USFWS Ecological Services* provides biological advice to Federal and State agencies, industry, and members of the public about the conservation of fish and wildlife and their habitats that may be affected by development activities. Ecological Services determines whether plant and animal species should be listed under the Endangered Species Act, as well as plans and coordinates the recovery of listed species and reviews Federal projects that may affect listed species. The Ecological Services program has been instrumental in the protection and recovery of the Wyoming toad.

*Wyoming Game and Fish Department* has been a strong partner in the region. The WGFD manages 12 public access areas within the Laramie Plains through landowner agreements, shared management, and fee title. The WGFD also owns and manages one conservation easement within the Laramie Plains.

*Wyoming Stock Growers Land Trust* holds conservation easements on over 201,000 acres of ranchland throughout the State. The Wyoming Stock Growers Land Trust is dedicated to conserving Wyoming's working family ranches and farms as well as the wide-open spaces, natural habitats, and rural communities they support.

*Wyoming Wildlife and Natural Resource Trust* was created as an independent State agency by the Wyoming legislature in 2005. The purpose of the Wyoming Wildlife and Natural Resource Trust is to enhance and conserve wildlife habitat and natural resource values throughout the State. The Wyoming Wildlife and Natural Resource Trust has funded 250 projects in all 23 counties in the State and has worked with the Service on wildlife improvements on fee-title lands at Hutton Lake National Wildlife Refuge.

## 1.8 Habitat Protection and Acquisition Process

Following the approval of a project boundary, habitat protection will occur through conservation easements and limited fee-title acquisition. It is the Service's long-established policy to acquire the minimum interest in land from willing sellers that is necessary to achieve habitat protection goals.

The acquisition authorities for fee-title and easement lands within the proposed WTCA boundary are the U.S. Fish and Wildlife Act of 1956 (16 U.S.C. 742a–j) and the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–ee), as amended. Land would be acquired primarily through the use of Land and Water Conservation Fund monies generated primarily from oil and gas leases on the Outer Continental Shelf, motorboat fuel tax revenues, and the sale of surplus Federal property. The Service could also buy land with Federal Duck Stamp revenue from the Migratory Bird Hunting and Conservation Stamp Act of 1934, other funds that meet fish and wildlife conservation purposes as identified by Congress, or donations from nonprofit organizations.

The basic considerations in determining whether land should be acquired through an easement or fee-title purchase include the biological significance of the area, existing and anticipated threats to wildlife resources, and landowner interest in the project. The buying of fee-title lands or conservation easements would occur with willing sellers only and would be subject to available funding. The biological, social, and economic impacts of conservation easements and fee-title acquisition are shown in table EA–2.

## Conservation Easements

An easement is a conservation tool that has been extensively employed by the Service and other organizations. Easements are bought from willing sellers and they involve the acquisition of specific property rights, such as the right to subdivide or develop certain types of new infrastructure, while all other rights are kept by the property owner. Easements tend to be a cost-effective means of habitat conservation that is acceptable to landowners, particularly in areas where current agricultural land use practices are consistent with wildlife resource protection.

### *Fee-Title Acquisition*

Fee-title acquisition will be limited to lands that can be bought from willing sellers in areas that would facilitate Wyoming toad recovery and promote the reintroduction of toads onto the land. Fee-title acquisition could triple or quadruple the cost of land conservation and add significant increases to Service management costs compared to conservation easements. Up to 10,000 acres is targeted for potential fee-title acquisition.

**Table EA-2. Social, economic, and biological effects of conservation easements and fee-title acquisitions for the proposed Wyoming Toad Conservation Area, Wyoming.**

<i>Issue</i>	<i>Conservation easements</i>	<i>Fee-title acquisitions</i>
Conservation value	<ul style="list-style-type: none"> <li>■ Wyoming toad recovery efforts would be supported with a tool that is preferred over fee title by many local partners.</li> <li>■ Used in combination with fee title, easements would ensure the maximum likelihood of achieving the recovery of the Wyoming toad.</li> <li>■ Habitat for migratory birds, and other and deer would be preserved.</li> </ul>	<ul style="list-style-type: none"> <li>■ Fee-title lands are essential to meeting the recovery goals for the Wyoming toad.</li> <li>■ The conservation value of fee-title lands may be greater than easement lands because the Service's ability to control habitat management would be increased.</li> </ul>
Effects on local communities	<ul style="list-style-type: none"> <li>■ The public would enjoy increased biodiversity, recreational quality, and hunting opportunities on nearby publicly accessible refuges and other public lands.</li> <li>■ Neighboring property values may increase.</li> <li>■ Traditional and historical ranching and farming landscapes would be preserved.</li> <li>■ Open space would be preserved.</li> </ul>	<ul style="list-style-type: none"> <li>■ Same as for easements except traditional and historical ranching and farming practices may not be preserved at the same level.</li> <li>■ Positive economic impacts may also result from increased Service habitat improvement expenditures injected into the local economy.</li> <li>■ Possible increase in refuge visitation and associated impacts of visitor spending in the local economy. However, neighbors and other public may be affected by increased visitation to refuge lands.</li> <li>■ Preservation of open space.</li> </ul>
Landowner compensation	<ul style="list-style-type: none"> <li>■ Landowners would be compensated for the fair market value of the easement.</li> <li>■ Easements would reduce the fair market value of the property.</li> <li>■ Easements would help keep land in agriculture.</li> <li>■ Landowners would keep the majority of use rights, but would forfeit their right to develop or subdivide the land. Other possible restrictions include development of vertical structures and diversion or sale of water rights.</li> </ul>	<ul style="list-style-type: none"> <li>■ Landowners would be compensated for the fair market value of the land.</li> <li>■ Landowners would forfeit all rights of ownership and turn ownership of the property over to the Service.</li> <li>■ Fee-title acquisition, for willing sellers, would meet landowner's long-term conservation objectives for their land.</li> </ul>
Effects on local government net revenue	<ul style="list-style-type: none"> <li>■ No changes to property tax revenues would be expected for agricultural lands.</li> <li>■ Other government revenues, such as personal income tax, may be changed throughout the region.</li> <li>■ Land protection through conservation easements could result in reduced future service costs for local governments and municipalities.</li> <li>■ Nearby land values may increase because of open views.</li> </ul>	<ul style="list-style-type: none"> <li>■ The Service does not pay property taxes on land it owns; thus, county tax revenue would decline.</li> <li>■ Lost property tax revenues would be partially replaced with Refuge Revenue Sharing payments.</li> </ul>

*Adapted from Thomas et al. 2012*

# Draft Environmental Assessment

## Chapter 2—Alternatives



Melanie Olds/FWS

*Yellow-headed blackbirds are found at Mortenson Lake and throughout the project area.*

This chapter describes the two alternatives identified for this project:

- The no-action alternative
- The proposed action, which gives the Service the authority to create the WTCA and the ability to use conservation easements and limited fee-title purchase within the new boundary for the purpose of wildlife and habitat conservation

These alternatives were developed in accordance with the requirements of the National Environmental Policy Act §102(2)(E) to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” The alternatives consider the effects of a conservation easement program and limited fee-title purchase within the project area boundary as shown in this draft EA.

Alternatives that were eliminated from detailed study are also briefly discussed.

### 2.1 Alternative A (No Action)

Under the no-action alternative, the areas that are not currently protected would remain largely in private ownership and would be subject to changes in land use or habitat type. Habitat conservation and restoration projects on private lands would continue through conservation easement initiatives in the Laramie Plains by public and private entities such as the NRCS, Wyoming Stock Growers Land Trust, and The Nature Conservancy. Public agencies and private land trusts would continue conservation efforts through securing easements but landowner choices for easements would be reduced without the Service’s ability to offer easements or purchase fee-title land from willing sellers. It would be unlikely that the acreage amount and type of habitat required for the recovery of the Wyoming toad would be successfully conserved.

## 2.2 Alternative B (Proposed Action)

Under the proposed action, the Service would establish the WTCA in south-central Albany County, Wyoming, with the objective of conserving up to 43,299 acres of wetlands, riparian areas, shrubland, and short mixed-grass prairies through conservation easements as well as up to 10,000 acres in fee title from willing sellers only.

The Service would work to strategically acquire fee-title lands from willing sellers only that would protect and conserve wetland and riparian habitat in perpetuity for the reintroduction and establishment of up to five independent, self-sustaining populations of Wyoming toads. Potential fee-title lands would be prioritized based on specific criteria that would help with meeting the recovery and delisting goals that are outlined in the Wyoming Toad Draft Revised Recovery Plan (USFWS 2014). The land bought through fee-title agreements would be managed cooperatively by staff at the Arapaho Refuge near Walden, Colorado, and the staff at the Wyoming Ecological Services office in Cheyenne, Wyoming. They are now working cooperatively to manage Mortenson Lake Refuge to conserve the endangered Wyoming toad. They would be responsible for monitoring and administering the newly acquired lands according to the Service's legal mandates and policies. Service staff would also continue to work with private landowners, researchers, and all other partners on the Wyoming toad recovery team.

The Service would also seek to strategically buy conservation easements from willing sellers on privately owned lands that provide potentially valuable habitat for the Wyoming toad and other species. The easements would provide perpetual protection of habitat for Federal trust species (migratory birds and threatened and endangered species) by restricting some types of future development. Development for residential, commercial, or industrial purposes such as energy and aggregate extraction; alteration of the natural topography; and conversion of wetlands, riparian areas, native grasslands, and shrubland to cropland would be prohibited. Conservation easements would also prohibit the draining, filling, or leveling of wetlands.

All lands that are protected by conservation easements would remain in private ownership; property taxes and land management, including invasive weed control, would remain the responsibility of the landowner. Control of public access to the land, including hunting, would remain under the control of the landowner. Perpetual easements may provide opportunities for the Partners for Fish and Wildlife program

and other conservation organizations to work with interested landowners on conservation projects.

The easement program would be managed by Service staff located at Arapaho Refuge near Walden, Colorado, who would be responsible for monitoring and administering all easements. Periodic visits and correspondence with landowners or their designees would ensure that land protection goals are being met. Photographs of the property would be taken when the easements are established to document baseline conditions.

The areas considered for fee-title and conservation easements within the project area would be prioritized based on the biological needs of the wildlife species of concern (migratory birds and threatened and endangered species), the threat of development, connectivity with other protected lands, and the quality of habitat for the Wyoming toad and other Federal trust species that occupy the same habitat. The acreage totals for fee-title acquisition and conservation easements are based in part on the amount of available habitat and the total acreage needed to effectively carry out desired conservation measures throughout the historical range of the Wyoming toad. The attached draft land protection plan (LPP) describes these priorities in detail.

## 2.3 Alternatives Considered but Eliminated from Further Analysis

The five alternatives that the Service considered but eliminated from further consideration are described below.

### County Zoning

In a traditional approach used by counties and municipalities, the local government would use zoning as a means of designating what types of development could occur in an area. According to Wyoming State Statutes 18-5-202(b), "the planning and zoning commission may prepare and amend a comprehensive plan including zoning for promoting the public health, safety, morals and general welfare of the unincorporated areas of the county." The Albany County Comprehensive Plan (2008) has been adopted and serves as a guide for future land use and development in Albany County. It is an advisory document rather than a regulatory document, but is the foundation for land management documents such as zoning, subdivi-

sion regulations, and other decisions made by the County. This alternative was not considered for further analysis because zoning would be subject to changing public sentiment and could result in frequent changes that would not guarantee the long-term prevention of residential or commercial development in the project area.

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## Various Configurations of the Boundary

Several other configurations of the WTCA project boundary were considered during the initial scoping discussions. Some of the possible project boundaries contained smaller areas while others contained much larger areas. The discussions of the various boundary configurations were based on several considerations. The area encompassed by the boundary would need to provide sufficient habitat to achieve the population goals for Federal trust resources such as migratory birds and threatened and endangered species, particularly the Wyoming toad. Large watershed-scale boundaries would be larger than what would be necessary for the toad to meet recovery goals and would be difficult to manage effectively and efficiently with current Refuge staffing levels. Conversely, a smaller area would not meet the objectives outlined in the Wyoming Toad Draft Revised Recovery Plan (USFWS 2014), and would not adequately protect habitat required by other Federal trust species. Small, noncontiguous parcels would not allow toads to successfully migrate to new areas and establish new toad populations.

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## Safe Harbor Act Agreements Only

Reintroduction of the Wyoming toad on private lands is now done through Safe Harbor Act agreements with landowners. Although such agreements are an important species conservation tool, they may

not provide permanent protection because landowners can opt out of these agreements at any time (USFWS 2013). Under current Service policy, populations reintroduced on private lands through Safe Harbor Act agreements may not count toward meeting recovery goals because they are not perpetually protected (USFWS 2013).

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## Easement-Only Acquisition (Exclusion of Fee Title)

It is the Service's policy to acquire the minimum interest in lands that is necessary to meet conservation objectives. The possibility of using an easement-only approach to habitat conservation was discussed internally. However, it was decided that the inclusion of some fee-title lands was necessary to achieve the recovery objectives in the Wyoming Toad Draft Revised Recovery Plan (USFWS 2013) that would lead to the delisting of the species. Conservation easements on private lands may be used to supplement Wyoming toad recovery goals but are not a replacement for fee-title lands (USFWS 2013).

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## Fee-Title Acquisition (Exclusion of Easements)

Fee-title ownership provides the strongest habitat protection and allows the greatest flexibility for adaptive management in response to new data or changing conditions. However, the exclusive use of fee title without easements would not be consistent with Service policy to use the minimum interest necessary to meet conservation objectives. Easements could contribute, and may be necessary, to meeting the minimum amount of permanently protected habitat required to achieve the recovery objectives for the Wyoming toad.



# Draft Environmental Assessment

## Chapter 3—Affected Environment



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*Creighton Lake*

This chapter describes the physical, biological, cultural, and socioeconomic resources of the WTCA that could be affected by the no-action alternative (alternative A) and the proposed action (alternative B). The WTCA consists of 43,299 acres within the Laramie Plains of southeastern Wyoming, which is part of the Wyoming Basin ecoregion (Bailey 1995) and the Great Northern LCC (USFWS 2012a).

Laramie Range. The average annual precipitation is 11 inches, most of which falls as snow in winter. Temperature extremes range from a record high of 97 °F in summer to a record low of -43 °F in winter (National Oceanic and Atmospheric Administration 2002). The area is known for persistent windy conditions and a short growing season that typically occurs between late May and early September.

### 3.1 Physical Environment

Below are descriptions of the climate and land features of the project area.

#### Climate

The Laramie Plains is a high, cold desert basin located at approximately 8,000 feet elevation between two mountain ranges, the Snowy Range and the

#### Geology

The physiography of the Laramie Plains has been influenced by shallow, warm sea water; a crustal uplift that affected Colorado and southeastern Wyoming; the Laramie Orogeny Mountain building episode; volcanic activity in the Yellowstone area; and ice ages. Most of the stable landforms in the area were created within the last 100,000 years by glacial outwash waters. Many of the valley soils are rather deep and alluvial in nature, having been derived from the surrounding granitic mountains (USDA 1998). Soil texture near the mountains tends to be coarse,

but it becomes progressively finer toward the basin center. The alluvial overburden is too thick to allow profitable petroleum development in most of the basin, although limited opportunities for such development do occur. The high, flat nature of much of eastern Wyoming is conducive to the development of strong winds, and several features on the land suggest that wind has played an important role in past geological development as well. Data suggests that the Laramie Plains is a deflation hollow or blowout that was formed by wind action (Morrison 1991).

## Minerals

Sand and gravel are the major mineral commodities in the Laramie Plains. Sand and gravel mines are scattered throughout the basin, with the biggest concentration near the southern part. Other minerals that are mined in the area include shale, gold, gypsum, and limestone. The potential for oil and gas exploration within the basin is rated as moderate, with scattered high potential areas outside the project area to the north. There are no active coal mining permits in the Laramie Plains at this time (Wyoming Department of Environmental Quality 2014).

## Water and Hydrology

Over 82 miles of the Laramie River and a 41-mile-long reach of the Little Laramie River flow through the proposed WTCA. The Laramie River's headwaters are in the Rawah Mountain Range in Colorado (figure EA-3), and the river itself ultimately empties into the North Platte River near Wheatland, Wyoming (USDA 1998). Smaller tributaries feed into the Laramie River from the Laramie Mountains to the east and the Medicine Bow Mountains to the west. The river is the primary source of water in the Laramie Plains. Because the open plains receive little precipitation, most surface and ground water is a result of snowpack runoff from the surrounding mountains. Historically, many of the natural wetlands were associated with riparian corridors and playa lakebeds. However, the number and area of natural wetlands in Wyoming have continued to decline, whereas the acreages of ponds and other human-created waterbodies have increased (Wyoming Joint Venture Steering Committee 2010). This holds true for the Laramie Plains as well. The Casper aquifer is an important water-bearing geological formation that underlies the entire Laramie Plains and supplies most of the drinking water for the city of Laramie and Albany County.

## 3.2 Biological Environment

This section describes the plant communities in the project area and the animals that they support. Table EA-3 shows the habitat types in the proposed WTCA.

### Plant Communities

Vegetation communities within the proposed project area vary with topography and range from wetlands (which are often alkaline or saline) and riparian areas to wide expanses of shortgrass prairie and shrubland (see figure EA-4). This section also describes the wildlife and species of concern found in these habitats.

**Table EA-3. Habitat types within the proposed Wyoming Toad Conservation Area, Wyoming.**

<i>Habitat type</i>	<i>Acres</i>	<i>Percent</i>
Barren Land	775	0.4
Forest, Deciduous and Evergreen	60	0.0
Developed, High Intensity	90	0.0
Developed, Low Intensity	1,990	1.1
Developed, Medium Intensity	1,370	0.7
Developed, Open Space	3,830	2.1
Emergent Herbaceous Wetlands	21,160	11.4
Hay/Pasture	29,620	15.9
Herbaceous	19,410	10.4
Open Water	2,360	1.3
Shrub/Scrub	101,610	54.6
Woody Wetlands	3,910	2.1
Total	186,185	100.0

### Wetlands

Wyoming is an arid state and lacks the surface water needed to support expansive wetland complexes (Hubert 2004). Before Euro-Americans arrived, wetlands covered about 3.2 percent of Wyoming (Dahl 1990); however, less than 2 percent of the historical wetlands remain today (Wyoming Joint Venture Steering Committee 2010). Although wetlands cover only a small area, about 90 percent of the wildlife in Wyoming uses wetlands and riparian habitats during some part of their life cycles (Nicholoff

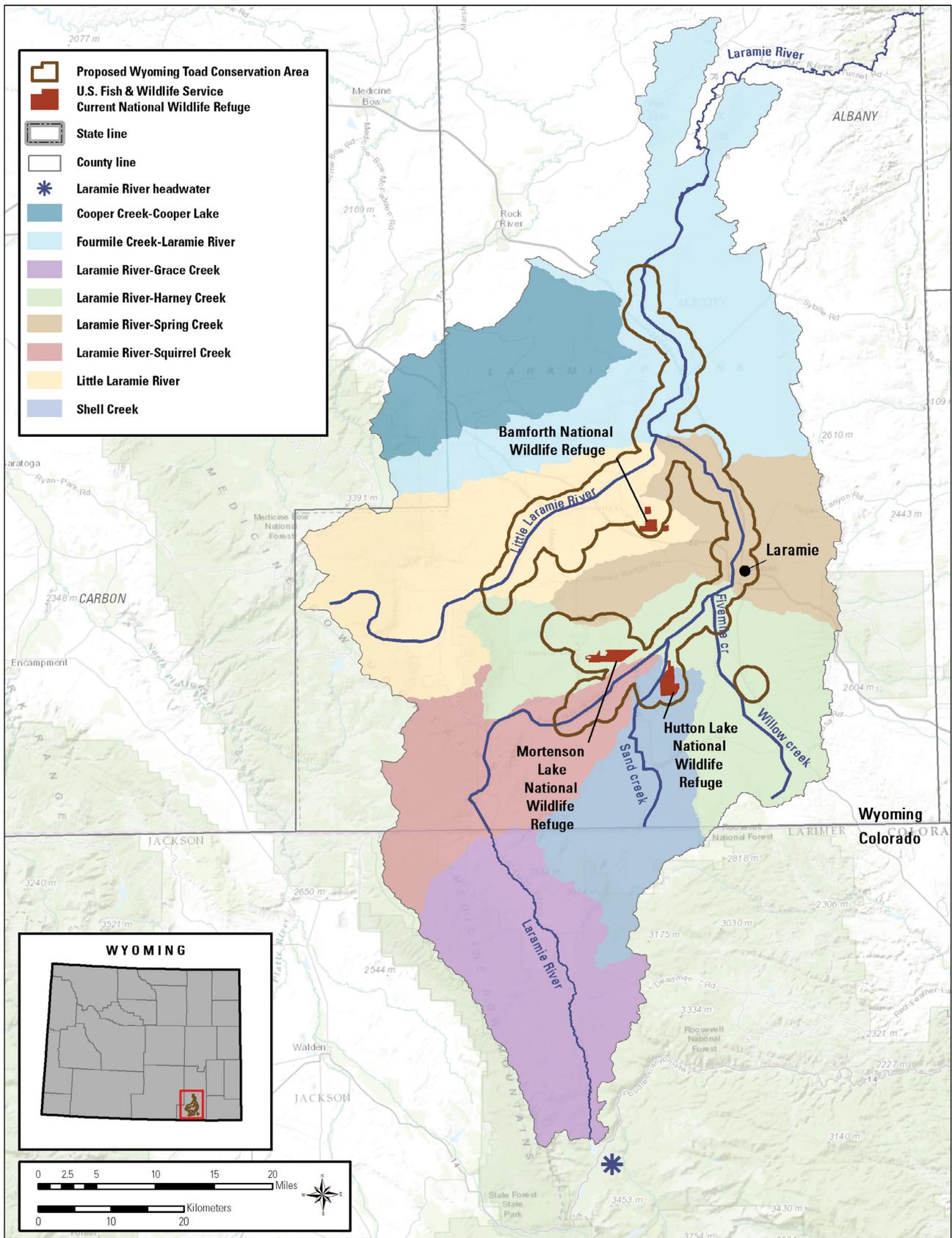


Figure EA-3. Hydrologic units in the Laramie Plains in Wyoming and Colorado.

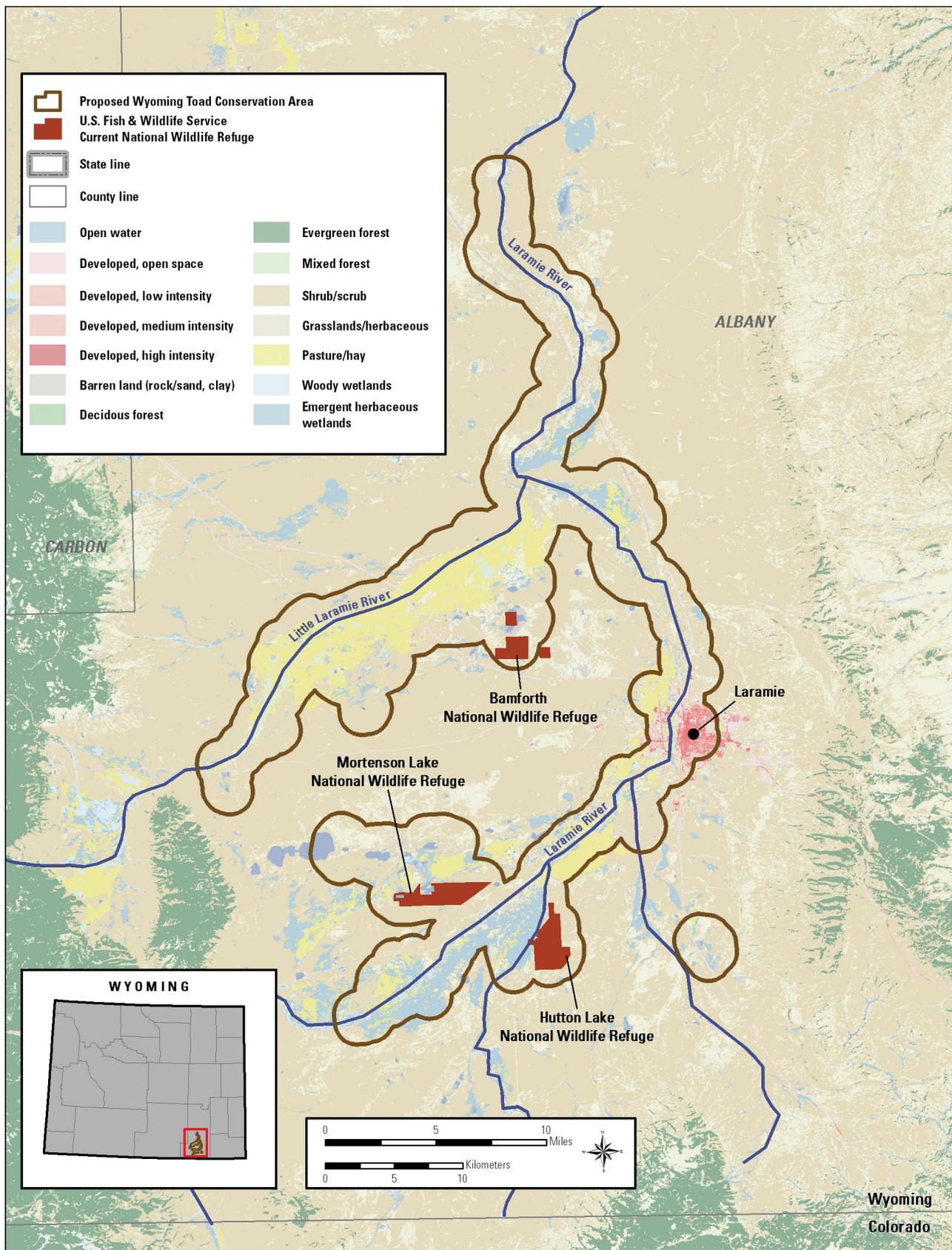


Figure EA-4. Land cover within the Laramie Plains in Wyoming.



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*Wetlands in the Laramie Plains.*

2003, Copeland et al. 2010a). Within the Intermountain West, more than 140 bird species and 25 mammal species are either dependent on or associated with wetlands (Gammonley 2004, Copeland et al. 2010a). Although wetland complexes tend to have greater overall use by wildlife (Wyoming Joint Ventures Steering Committee 2010), isolated wetlands in arid environments, such as many of the wetlands found on the Laramie Plains, are also extremely valuable for wildlife because they provide a crucial water source as well as needed food and cover. In these environments, wetlands are a hub of activity for the terrestrial wildlife that inhabits the surrounding area (WGFD 2010). However, Copeland et al. (2010a) found that wetlands within Wyoming's desert shrublands and grasslands are poorly protected and therefore vulnerable, especially in the face of anticipated future land use changes.

Wetlands in the Laramie Plains consist of small ephemeral ponds, stock ponds, irrigated and nonirrigated meadows, playas, lakes, and riverine oxbows and floodplains. These different wetland types provide important breeding, staging, and stopover habitats for migrating waterfowl, shorebirds, and colonial waterbirds each spring and fall (Copeland et al. 2010b). Wetlands provide food-rich habitat so that these species can acquire the energy and nutrients needed to complete the long flights from wintering grounds to breeding grounds and back, as well as places to rest. Many bird species also use the wetlands in the Laramie Plains for breeding.

Many other wildlife species are dependent on these wetlands as well, including amphibians and reptiles. Amphibians, including the Wyoming toad and other species of toads, frogs, and salamanders, need water for breeding and larval development as well as to prevent desiccation. Reptiles such as garter snakes also prefer wetland habitats because they can feed on aquatic species.

### ***Irrigated and Nonirrigated Meadows and Pastures***

Privately owned wet meadow habitats are some of the most important unprotected wetlands in the Intermountain West. Since the early 1900s, flood irrigation has created many wet meadows in western North America (Peck and Lovvorn 2001). Irrigated wet meadows that are hayed and grazed annually (hay meadows) represent a particularly important subset of wetland habitat. These privately owned wetlands typically occur at mid- to high elevations (4,500 to 8,500 feet) in landscapes that are dominated by intact wetland, grassland, and shrub habitats. These areas are often made up almost entirely of native plant communities and can support high nesting densities of wetland- and grassland-nesting birds. These areas provide brood habitat for waterfowl and other waterbirds by supplying both protective cover from predators and productive foraging sites for rapidly growing ducklings and chicks.

Wet meadows also provide crucial foraging habitat for migrating waterfowl and shorebirds. The quality and availability of spring migration habitat has direct implication for the survival and breeding productivity of migratory birds. The Laramie Plains provides important complexes of wet meadow, flooded pasture, and hayfields used by many species of waterfowl, shorebirds, and other waterbirds, including northern pintail, Clark's grebe, white-faced ibis, American bittern, Wilson's phalarope, American avocet, marbled godwit, long-billed dowitcher, and sandhill crane. The irrigated meadows and floodplain of the river are also believed, based on Baxter's observations, to be important historical habitats for the Wyoming toad.

### **Riparian Areas**

Riparian areas are vegetation communities that are immediately adjacent to and influenced by the hydrology of creeks, streams, and rivers. Riparian plant communities can be dominated by trees, shrubs, herbaceous vegetation, or a combination of these types. Riparian areas account for less than one percent of the western landscape, but they can be relatively more productive than other ecosystems (Svejcar 1997). Breeding bird densities can be up to 10 times greater in riparian areas than in adjacent, nonriparian habitats (Lohman 2004, Copeland et al. 2010). It is estimated that riparian habitat covers less than 2 percent of the State of Wyoming (Merrill and Fishery 1996).

Riparian habitats support high species diversity and density as well as promote the exchange of energy, nutrients, and species between riparian, aquatic, and upland systems (Johnson and McCormack 1979, Gregory et al. 1991, Poff et al. 2011). It is estimated that about 90 percent of the total wildlife species in Wyoming use wetlands and riparian habitats either daily or seasonally and about 70 percent of Wyoming bird species depend on wetlands or riparian areas (Nicholoff 2003). Riparian areas are important migration and dispersal corridors that enable species to readily move through harsh grassland and desert environments.

Many bird species use the riparian corridors of the Laramie Plains during spring and fall migration, and many others stay through the summer to breed. Insect production is high in riparian communities, leading to locally abundant concentrations of insectivorous birds and bats. In the Laramie Plains, narrow-leaf cottonwoods and several willow species are adapted to the natural flow dynamics of the streams and rivers in the area, but throughout the west, many riparian areas have declined because of widespread damming and water diversion. Many riparian and wetland areas within the Laramie Plains now sup-

port a variety of exotic and invasive plants, such as Russian olive and Canada thistle. Both the ranching and wildlife conservation communities have devoted significant resources in efforts to control invasive plants in the region.

### **Grasslands and Shrublands**

The composition and structure of grasslands are affected by short growing seasons as well as frequent and occasionally intense natural disturbances such as drought, fire, and herbivory (Nicholoff 2003). Between 1950 and 1990, the grasslands west of the Mississippi River declined by 27.2 million acres (Conner et al. 2001). The greatest threats to grassland and shrubland ecosystems are oil and gas development, increasing urban and agricultural development, and invasive species. Usually dominated by grazers, grasslands are known to support large numbers of wildlife and have a significant influence on the plant and animal composition of grassland habitats (WGFD 2010).

In Wyoming, prairie grasslands usually occur below the elevation of 7,000 feet, but the Laramie Plains, which is at approximately 8,000 feet, contains the highest elevation grasslands in Wyoming (Knight 1996). Grasslands in Wyoming are characterized by interspersed short- and mixed-grass prairies and are typically unsuitable for farming; however, they provide an abundant grazing resource for cattle and sheep. Most of Wyoming's prairie grasslands are privately owned (WGFD 2010).

Prairie grasslands support an impressive array of wildlife. White-tailed prairie dogs thrive in recently disturbed areas, living in large colonies, digging burrows, and keeping the surrounding vegetation short.



*Pronghorn in the uplands of the Laramie Plains.*

Their burrows and open patches of ground create habitat for other wildlife species, including the black-footed ferret, long-tailed weasel, swift fox, mountain plover, and burrowing owl (Kotliar et al. 1999, Kotliar 2000, WGFD 2010). Prairie dogs also provide a prey base for species such as black-footed ferret, ferruginous hawk, and golden eagle.

Wyoming once represented the western edge of the range for many species such as mountain plover, ferruginous hawk, swift fox, and pronghorn. Intensive conversion of grassland in the Great Plains resulted in the loss of these habitats outside of Wyoming. Populations in Wyoming have remained largely intact, and the core of these species' distributions is now considered to be in Wyoming (WGFD 2010).

Shrublands in the Laramie Plains are dominated by greasewood, saltbrush, and rabbitbrush, as well as some sagebrush. Shrublands are often intermixed with the prairie grassland community. Greasewood shrubland and saltgrass meadows are characteristic of the playas and other comparatively wet depressions (Knight 1996) that are scattered across the Laramie Plains. Shrubland communities provide habitat for a suite of wildlife species, including golden eagle, prairie falcon, mountain plover, Brewer's sparrow, jackrabbit, coyote, bobcat, badger, pronghorn, and mule deer. Pronghorn are more common than deer in salt-desert shrub vegetation; however, both are highly mobile and use associated habitats, especially sagebrush and grasslands (Blaisdell et al. 1984).

## Wildlife

The habitats within the Laramie Plains support a wide variety of wildlife. Appendix C lists the species that are known and suspected to occur within the project area.

### **Amphibians and Reptiles**

Due to the cold, arid climate, amphibian and reptile diversity within the Laramie Plains is low compared with other areas of the country, but there are several species that thrive here. The shrublands are home to the short-horned lizard as well as several species of snakes. Because of the arid nature of the region, amphibians are restricted to the riparian and wetland areas; these areas provide habitat for the tiger salamander, boreal chorus frog, Wyoming toad, and northern leopard frog. Although the northern leopard frog was once abundant throughout its range, it has experienced significant declines in the west (Smith and Keinath 2004a). A variety of factors, including habitat loss, disease, chemical contamina-



*Northern pintail*

FWS

tion, introduced predators, and general environmental degradation have been linked to observed population declines, but no one primary factor has emerged as the cause of the decline, and most likely it is caused by multiple factors that can vary from site to site (Smith and Keinath 2004a). This species is listed as a Species of Greatest Conservation Need by the WGFD (2010). See the discussion of Wyoming toad under species of special concern below.

### **Birds**

The Laramie Plains provides migratory and breeding habitat for many bird species, many of which are not found in any other area of Wyoming. Audubon Wyoming (2011) has designated the Laramie Plains Lakes Complex as an Important Bird Area because of the diversity of birds found within the basin, which highlights the regional and continental significance of the area. Thirty-eight of the 55 birds on the WGFD Species of Greatest Conservation Need List and 59 of 97 birds on the Intermountain West Joint Venture priority species list occur in the Laramie Plains. More than 146 species of birds have been documented on the refuges. Some of these birds are year-round residents, but many migrate through the basin on their way to and from breeding and wintering grounds. Others come to the basin to breed or spend the winter.

Given the scarcity of water in the semi-arid landscape of the Laramie Plains, it is not surprising that wetlands within the basin are regionally important to both resident and migrant waterbirds (Nicholoff 2003). The marshes and open water of the basin support 26 species of waterfowl, including canvasback, northern pintail, Barrow's goldeneye, lesser scaup, and redhead, all of which are Species of Greatest Conservation Need in Wyoming (WGFD 2010). Many

waterfowl species are also known to breed in the basin, including American wigeon, blue-winged teal, cinnamon teal, northern shoveler, canvasback, northern pintail, green-winged teal, lesser scaup, gadwall, ruddy duck, common merganser, and Canada goose. American avocet and Wilson's phalarope are shorebirds that migrate from their winter ranges in Mexico and Central and South America to breed in the wetlands of the Laramie Plains. At least 22 other species of shorebirds use these wetlands as either stopover or breeding habitat. Two shorebird species that migrate through the basin, the long-billed curlew and the marbled godwit, are focal species for the USFWS Migratory Bird Program and are USFWS Region 6 Birds of Conservation Concern. Seventy percent of Wyoming bird species are wetland or riparian obligates (Nicholoff 2003).

The upland areas in the Laramie Plains provide essential habitat for many bird species. Shrub and grassland habitats support species such as golden eagle, burrowing owl, Brewer's sparrow, sage sparrow, and grasshopper sparrow. Prairie falcon is a common resident and uses the upland areas for feeding and resting. The mountain plover, a tier I Species of Greatest Conservation Need within the State of Wyoming, breeds in at least five concentrated areas in Wyoming, one of which is the Laramie Plains. The mountain plover is affected by the loss of breeding habitat as a result of fire suppression, conversion of native grasslands to croplands, and habitat loss to urbanization (WGFD 2010). Figures EA-5 through EA-8 show migratory bird concentrations for wetland birds, grassland birds, riparian birds, and raptors (Pocewicz et al. 2013). Pocewicz et al. (2013) used current migration literature and expert conservationists to get a clearer picture of where important bird migration habitat is throughout the region.

## Mammals

Many species of small mammals live in the region, including the white-tailed prairie dog, muskrat, and American beaver, as well as multiple species of ground squirrel, mouse, vole, and shrew. The white-tailed prairie dog is considered a keystone species because species including black-footed ferret, swift fox, American badger, ferruginous hawk, and several other large raptors depend on prairie dogs as prey; species including black-footed ferret, burrowing owl, and swift fox depend on prairie dogs to provide burrows as cover and den substrate; and species including mountain plover and McCown's longspur depend on prairie dogs for shortgrass and semibarren habitats. Black-footed ferrets, in particular, depend so strongly on prairie dogs that ferret recovery and management is, in effect, prairie dog management.

Four of Wyoming's seven big game species, mule deer, white-tailed deer, elk, and pronghorn, are known to reside in or migrate through the project area.

## Fish and Aquatic Invertebrates

Fish and aquatic invertebrate populations that were present before Euro-American settlement are not well known in much of the west, and the North Platte River basin, which contains the Laramie Plains, is no exception. The list of aquatic species in appendix C is short and likely incomplete, especially in regards to aquatic invertebrates. It is well accepted that there were no sport fish in the Laramie Plains, or elsewhere in the entire North Platte River basin, before Euro-American settlement (WGFD 2010). Small fish such as hornyhead chub and Iowa darter probably dominated fish assemblages, but these species were greatly affected by the deliberate introduction of various trout species and other exotic taxa, including carp, beginning during early Euro-American settlement and continuing until the present. It is believed that hornyhead chub is found only in the North Laramie River and the Lower Laramie River, and it is believed to be extinct in Montana, Colorado, North Dakota, South Dakota, Nebraska, and Kansas (WGFD 2010). Populations of native aquatic invertebrates were probably also dramatically changed by the introduction of nonnative fish.

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## Species of Special Concern

Several federally listed species live in, or have home ranges that overlap, the conservation area.

### Wyoming Toad

The project area now supports one endangered species, the Wyoming toad (*Anaxyrus (Bufo) baxteri*). First described in 1946 by Dr. George T. Baxter, it is thought to be a glacial relict. The toad once flourished in the Laramie Plains, but in the 1970s the population dramatically declined, and by the 1980s, individuals were extremely rare (Baxter and Stromberg 1980, Stromberg 1981, Vankirk 1980, Baxter and Meyer 1982, Baxter and Stone 1985, Lewis et al. 1985). The species was federally listed as endangered in 1984 under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). In 1993, under the authority of the Endangered Species Act, Mortenson Lake Refuge was established for the protection of the last known Wyoming toad population. It is considered the most endangered amphibian in North America (IUCN 2012).

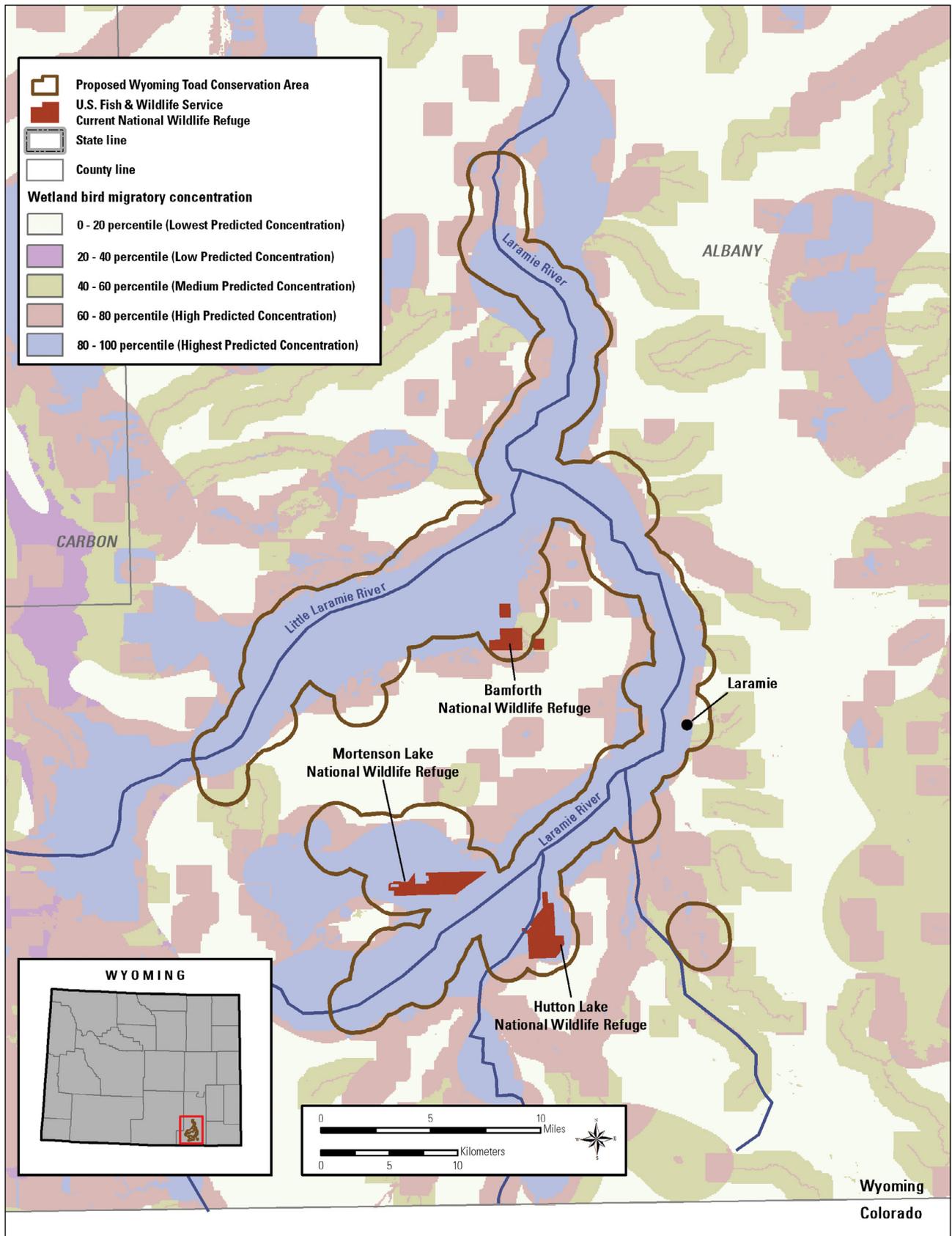


Figure EA-5. Concentration areas for migratory wetland birds in the Laramie Plains in Wyoming.

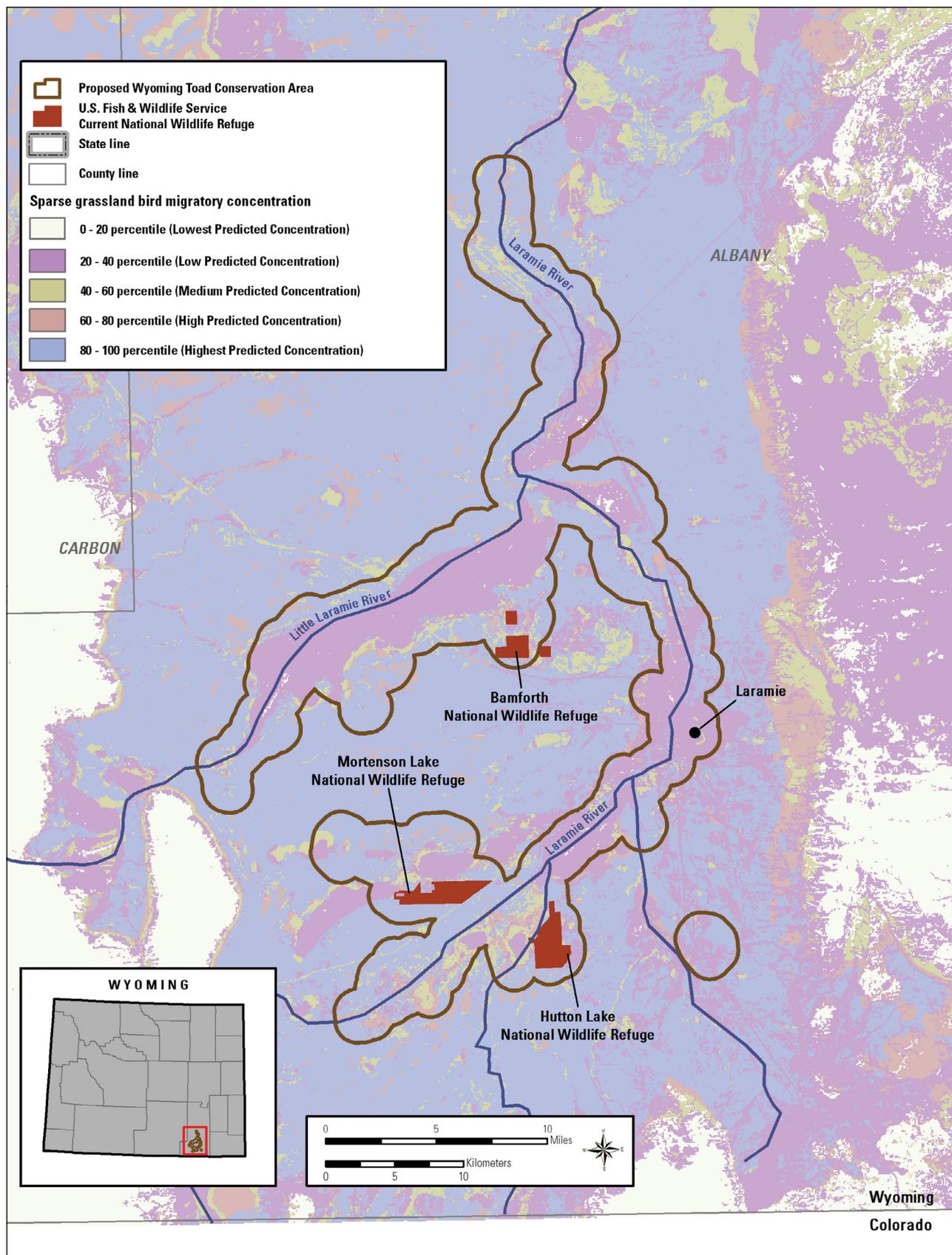


Figure EA-6. Concentration areas for migratory grassland birds in the Laramie Plains in Wyoming.

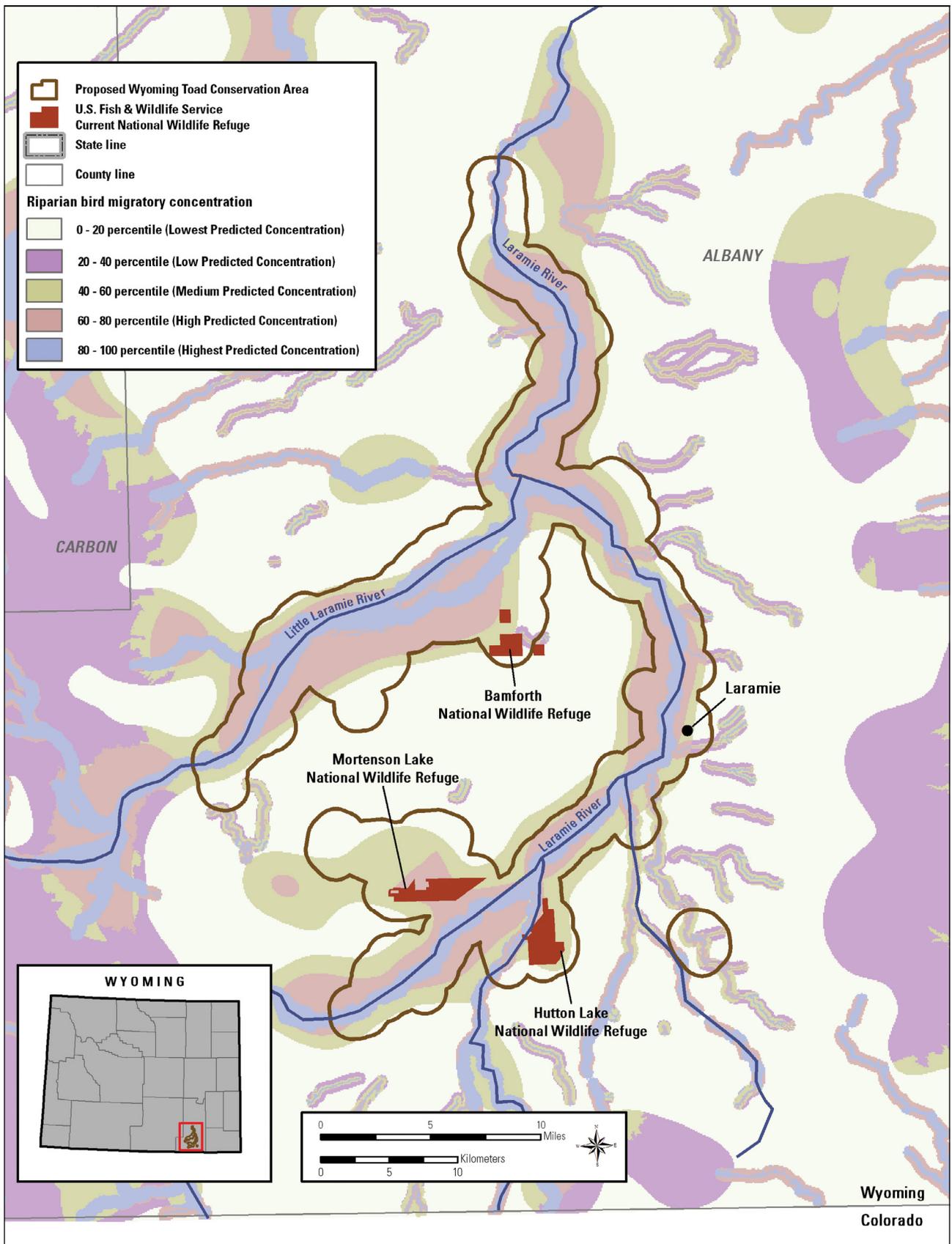


Figure EA-7. Concentration areas for migratory riparian area birds in the Laramie Plains in Wyoming.

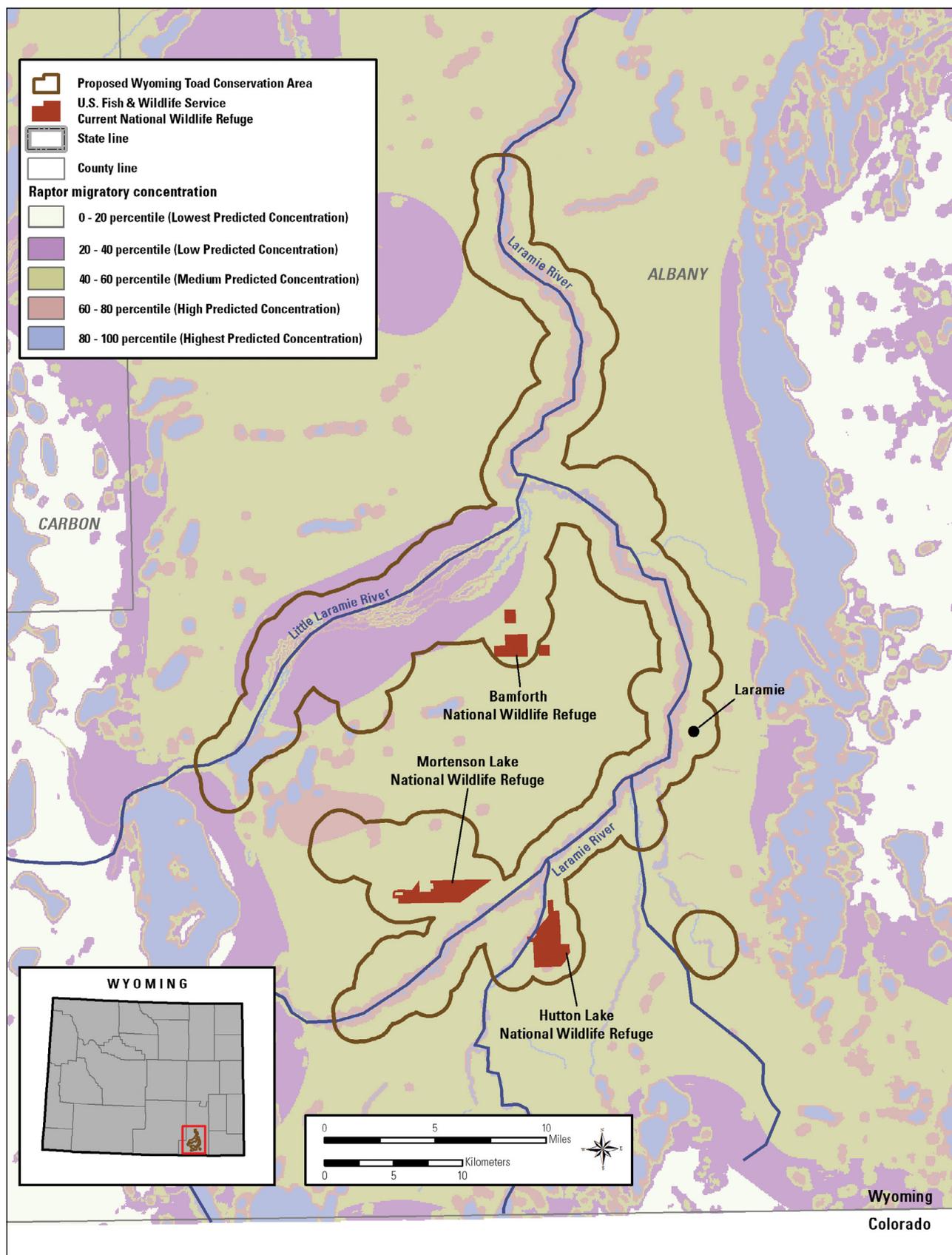


Figure EA-8. Concentration areas for migratory raptors in the Laramie Plains in Wyoming.

The historical distribution of the Wyoming toad, based on scientific records from Dr. George Baxter and Ronald Beiswenger's research, includes the floodplain ponds and small seepage lakes associated with the Big and Little Laramie Rivers as well as other wetlands within the shortgrass communities of the Laramie Plains in Albany County, Wyoming (figure EA-9). Current distribution is limited to Mortenson Lake Refuge and one nearby Safe Harbor Act site. There are very few Wyoming toads thought to be in the wild and approximately 500 in captivity. The small number of individuals is considered one of the severe threats to the toad. Another major threat to the Wyoming toad is infectious disease, including the amphibian fungus *Batrachochytrium dendrobatidis* (*Bd*) which has been linked to amphibian declines worldwide (Berger et al. 1998). *Bd* was documented in wild Wyoming toads from Mortenson Lake in 2000 and in 2001 (USFWS 2013). The other severe threat to the Wyoming toad that is discussed in the draft recovery plan is the lack of perpetually protected habitat. The proposed action directly addresses this severe threat to the Wyoming toad by protecting habitat that is needed for the next step of recovery and which is important for the future of Wyoming toad conservation.

Little is known about the habitat requirements for the Wyoming toad but the current thought is that the toad historically occurred in rivers and associated floodplains (lotic habitats) of the Big and Little Laramie Rivers and ponds and lakes (lentic habitats). Ongoing research, supported by the Service and a multitude of public and private partners on the Wyoming toad recovery team, is focused on practical aspects of Wyoming toad recovery, such as defining optimal habitat for the early stages (egg, tadpole, and metamorph) of the toad's life cycle in terms of thermal regimes, and devising optimal early stage rearing pens that will optimize the survival of released tadpoles.

### **Black-footed Ferret**

The black-footed ferret (*Mustela nigripes*) is a nocturnal predator that is an extreme habitat-prey specialist, meaning that it lives only in prairie dog burrows and it eats mostly prairie dogs. First described in 1851 by Audubon and Bachman, the ferret was listed in 1967 under the Endangered Species Preservation Act and was listed in 1973 under the current Endangered Species Act (Esch et al. 2005). In 1981, a small population was discovered near Meeteetse, Wyoming (USFWS 1988), and captive breeding and reintroduction efforts began that continue today.

Although the species does not now live in the project area, there are black-footed ferret colonies to the

north that could expand to the Laramie Plains within the next few years from the original reintroduction center in the Shirley Basin. The project area is within the historical range of the black-footed ferret, and Albany County has been identified as a possible reintroduction area by the Black-Footed Ferret Recovery Team. While all of the colonies in the Laramie Plains have not been formally surveyed and monitored, an informal assessment of the area in 2010 noted that most prairie dog colonies were active. On Hutton Lake Refuge alone, 541 acres of white-tailed prairie dog colonies have been mapped.

### **Greater Sage-Grouse**

The greater sage-grouse (*Centrocercus urophasianus*) occupies northern and extreme southern Albany County, but is not known to occupy the proposed project area because of a lack of extensive sagebrush-dominated habitat. Individuals and small groups may occasionally use the project area during periods when birds are dispersing to new areas or migrating to different seasonal ranges. It is recognized that riparian margins and wet meadows, which are prevalent in the project area, are important components of sage-grouse habitat when near expanses of sagebrush.

### **Preble's Meadow Jumping Mouse**

The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is a small rodent in the Dipodidae family and is one of 12 recognized subspecies of *Zapus hudsonius*, the meadow jumping mouse. The range of the Preble's subspecies in the Laramie



*Black-footed ferret*

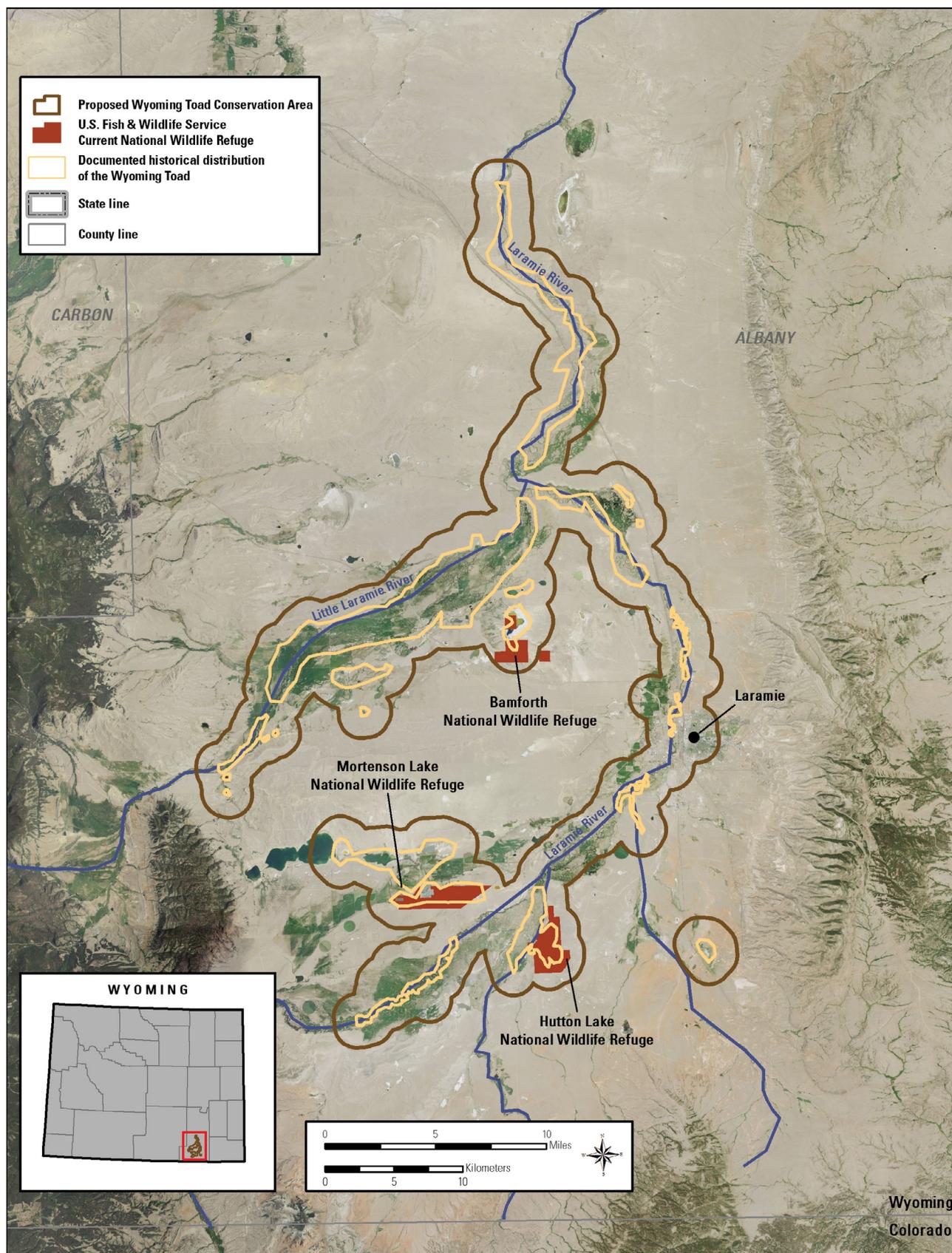


Figure EA-9. Historical range of the Wyoming toad based on Dr. George Baxter and Ronald E. Beiswenger’s paper maps displaying locations and field notes digitized by the Service.

Plains of Wyoming has not been documented with certainty, but there is some chance that it co-occupies the basin with the closely related and physically indistinguishable western jumping mouse (*Zapus princeps*). Preble's meadow jumping mouse lives in areas of lush riparian vegetation, usually with some woody overstory in the form of trees or shrubs, immediately next to streams, ditches, ponds, or lakes. The subspecies will range occasionally into upland habitats, but always returns to and centers its activities in dense vegetation near water. In Wyoming, Preble's meadow jumping mouse has been definitively documented east of the Laramie Mountains in eastern Albany, western Laramie and Platte, and southern Converse Counties. If Preble's meadow jumping mouse is documented in the future, the proposed action will have direct and positive effects on the subspecies' recovery by providing and maintaining high-quality riparian habitat.

### **Little Brown Bat**

The little brown bat (*Myotis lucifugus*), which is one of the most common bats in southeastern Wyoming, may use the project area. The species roosts during the day in cavities and other sheltered areas in a wide variety of substrates—buildings, caves, cliffs, boulders, trees (both live and dead), downed logs, and similar habitats—and feeds at night on a variety of insects over wetlands and riparian corridors. The little brown bat does not migrate, but rather hibernates through the winter in secure cavities. The species is now being reviewed for listing under the Endangered Species Act due primarily to huge losses in little brown bat populations in the eastern United States that have been caused by an exotic fungus, termed “white-nose syndrome.” The fungus and associated syndrome have been moving steadily westward over the past 6 years, but have not yet reached Wyoming or affected Wyoming bat populations (Griscom et al. 2012). However, there is reason to assume that this fungus will eventually threaten bats in the region. Preservation of wooded riparian corridors that provide roosting and feeding habitat, as well as wetlands and wet meadows that provide feeding habitat, would help alleviate the possible negative effects of “white-nose syndrome.”

### **Mountain Plover**

The mountain plover (*Charadrius montanus*) is a migratory shorebird that is native to shortgrass prairie and shrub-steppe habitat of the western Great Plains and Colorado Plateau. The plover nests in regions that were historically affected by a variety of herbivores, including prairie dogs, bison, and pronghorn. Breeding and wintering habitats for the species



*Little brown bat*

FWS

often reflect some measure of disturbance, be it through fire, grazing, or the presence of digging or burrowing mammals such as prairie dogs (Smith and Keinath 2004b). In Wyoming, five mountain plover breeding areas have been identified, including one in the Laramie Plains.

## **3.3 Cultural Resources**

Archeological remains representing 12,000 years of human occupation have been found in the Laramie Plains. Although there have been few formal investigations completed in the area, evidence from the earliest Paleo-Indian occupation through the advent of rural and agricultural development by Euro-Americans in the early 20th century has been documented in a variety of geographical settings. Although these sites exhibit a wide range of artifacts and features, definite trends in site types and changes through time are clear.

Current archaeological evidence shows that the earliest humans, called the Paleo-Indians, migrated to the region at the close of the last Ice Age approximately 12,000 years ago, and, although the record is thin, there was probably significant use of the area

by indigenous people (Larson and Letts 2003). These people had a highly mobile lifestyle that depended on big game hunting, including for such now-extinct species as mammoths and ancient bison. The hallmarks of most Paleo-Indian sites are the spear points that are generally recovered from animal kill and butchering sites and small temporary camps. Evidence of the Paleo-Indian occupation of the Laramie Plains area is sparse and most often consists of isolated spear points.

There was a gradual but definite shift in the pattern of human use of the region beginning about 9,000 years ago. These changes were because of regional climatic fluctuations and an increasing human population, coupled with tremendous social change and technological innovation. Although this stage, which is referred to as the Archaic stage, lasted until about 2,000 years ago, it is better represented in the archaeological record than the preceding Paleo-Indian stage. The interpretation of the remains is difficult. On many sites, evidence of a greater diversity of tools and increased use of native plants is found, but the remains also suggest a more localized and less mobile population.

Approximately 1,500 years ago, the use of the bow and arrow marked the beginning of the Late Prehistoric Period. The increase in the number of known archaeological sites for this period may show a growing human population or the influx of peoples from other regions, or it may just reflect our ability to locate these more recent sites. Remains of these early occupations include fire hearths, lithic scatters (stone tools and the byproducts from making them), quarry sites, and stone circles that are probably tipi rings. Fewer than 20 of these sites have been formally recorded in the Laramie Plains.

Euro-American diseases such as smallpox and influenza probably affected Native American populations in the region far in advance of direct contact with Euro-Americans themselves, possibly as early as 1600. Similar dynamics may have occurred with Eurasian livestock diseases and native ungulates. Rocky Mountain tribes adopted the horse, imported by early Spanish colonists, as a central advancement by approximately 1750. By the early 1800s, Euro-Americans were becoming more common in the area and evidence of trade with the Native Americans in horses, firearms, and ornamental items is increasingly evident in the archaeological record. Native American tribes, including the Crow, Cheyenne, Sioux, and Arapaho, lost their lands with the Fort Laramie Treaty of 1868, and many were relocated to reservations outside Wyoming.

As is the case with much of the West, the early Euro-American exploration of the Laramie Plains owes much of its beginnings to the fur-trapping trade. In 1820, Jacques Laramie trapped along the

river that now bears his name. Although thousands of Euro-Americans traveled through what is now the State of Wyoming in the 1840s and 1850s, most were heading farther west on the nearby Oregon, California, Overland, and Mormon trails, and few of them settled in what would become Wyoming. From 1862 to 1868, approximately 20,000 people per year traveled along the Overland Trail, which ran approximately 3 miles north of what is now Hutton Lake National Wildlife Refuge. The stage stations established by the Overland Stage Company became the first permanent Euro-American structures in the area (Larson and Letts 2003).

The first homestead in the basin was built in 1864 by Phillip Mandel along the Little Laramie River. It also served as a stage station for the Overland Trail. Mandel sold replacement stock to travelers and later cut and sold hay to soldiers at Fort Sanders, which was established in 1866 just south of present-day Laramie and about 10 miles northeast of Hutton Lake Refuge. Until 1882, when the fort closed, it helped protect the early settlers and travelers in the basin during the many conflicts with Native Americans. The construction of the Union Pacific Railroad through the area in the late 1860s was one of the most influential events in the history of the region. The development of the railroad led to the growth of Laramie and was the catalyst for expanding the cattle and sheep ranching industries that are still present today.

The Service has a trust responsibility to Native American tribes that includes protection of tribal sovereignty and preservation of tribal culture and other trust resources. The Service does not now propose any project, activity, or program that would result in changes in the character of, or adversely affect, any historical cultural resource or archaeological site. When such undertakings are considered, the Service takes all necessary steps to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. The Service complies with Section 110 of the act by surveying, inventorying, and evaluating cultural resources

## 3.4 Socioeconomic Environment

Landownership, property taxes, public use, and wildlife-dependent recreational activities of the Laramie Plains are discussed in this section.

The proposed project area is located in Albany County, Wyoming, which has a population of 36,299 (U.S. Department of Commerce 2011). Most of the

population (30,816) lives in Laramie, the largest city in Albany County. Wyoming has a population of 563,626 (U.S. Department of Commerce 2011). Over a 10-year period (2000–2010), the population of Wyoming increased by 14.1 percent and the population of Albany County increased by 13.4 percent. In 2010, the county's population rose 6.8 percent or by 2,320 persons. Within this 10-year span, 84 percent of the growth was within the boundaries of the city of Laramie (see figure EA-10).

The economy of the project area is tied to the city of Laramie. The presence of the University of Wyoming strongly influences Albany County's occupational demographics, with 41 percent of the 2010 population working in management, professional, and related occupations (including education) see figure EA-11. Farming, fishing, and forestry account for 0.13 percent of the workforce, a reduction from 1.4 percent in 2006 (Wyoming Department of Workforce Services 2012) (see figure EA-11).

## Landownership

The agricultural trend within the Laramie Plains follows statewide trends. From 2002 to 2007, the number of farms in Albany County increased from 320 to 448, a 40-percent increase. Although the number of farms increased, the acreage being farmed decreased by 22 percent, indicating that while there are more farms, they are smaller in size (USDA 2007).

Wyoming ranks eighth among States in total acres (42.3 percent) owned by the Federal government (U.S. General Services Administration 2010). The State government owns 6 percent (3,854,800 acres) of all Wyoming lands.

## Property Taxes

Property taxes constitute the largest source of local government revenue (Urban Institute and Brookings Institution 2008) and are not expected to be substantially affected by conservation easements in the proposed WTCA. Property taxes are assessed based on the value of property. For most types of properties, county assessors use fair market value to calculate property tax liabilities; however, agricultural land is often assessed differently. In many States, the assessed value of agricultural land is calculated based on the productive value of the land rather than on the fair market value of the property.

The fair market value of a property is calculated by an appraisal. This value includes both the productive value of the land and any speculative value associated with the possibility of developing the land. Conservation easements reduce the fair market value of property by removing the speculative value associated with possible development; however, conservation easements generally do not affect the productive value of agricultural land.

Wyoming landowners now pay property taxes on their private lands to the counties. These taxes are based on a fair market value, and agricultural land is taxed based on the land's productive capability under normal conditions. Since most of the properties within the proposed project area are classified as agricultural land and any easements would allow private landowners to keep ownership, there will be little effect on the current property tax base for Albany County.

The buying of any fee-title lands will reduce the amount of property tax revenue collected by local governments because the Service is exempt from taxation on its property holdings. However, counties would qualify for reimbursement of some property

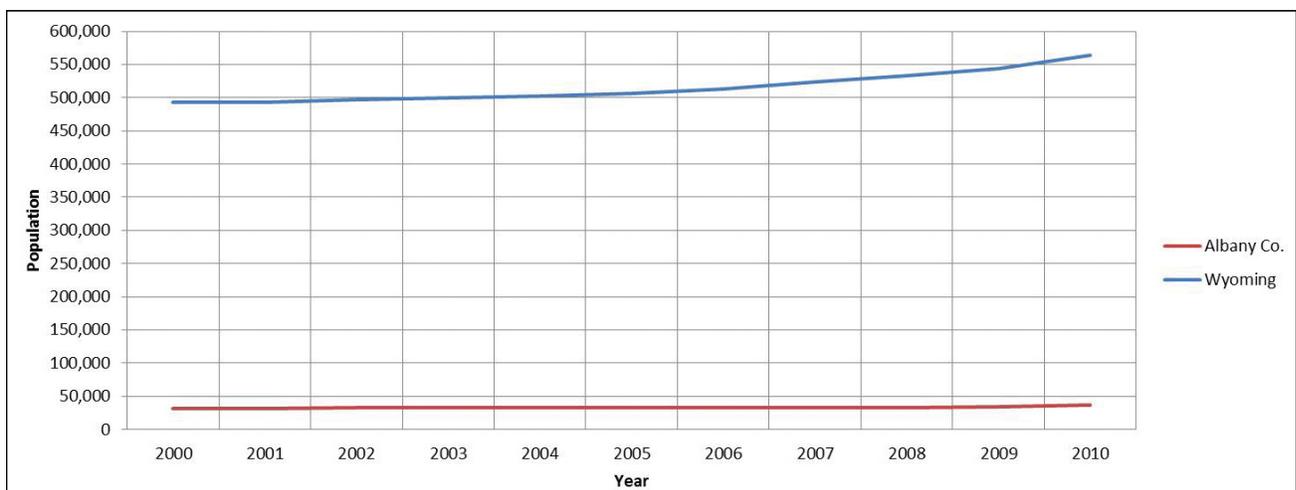
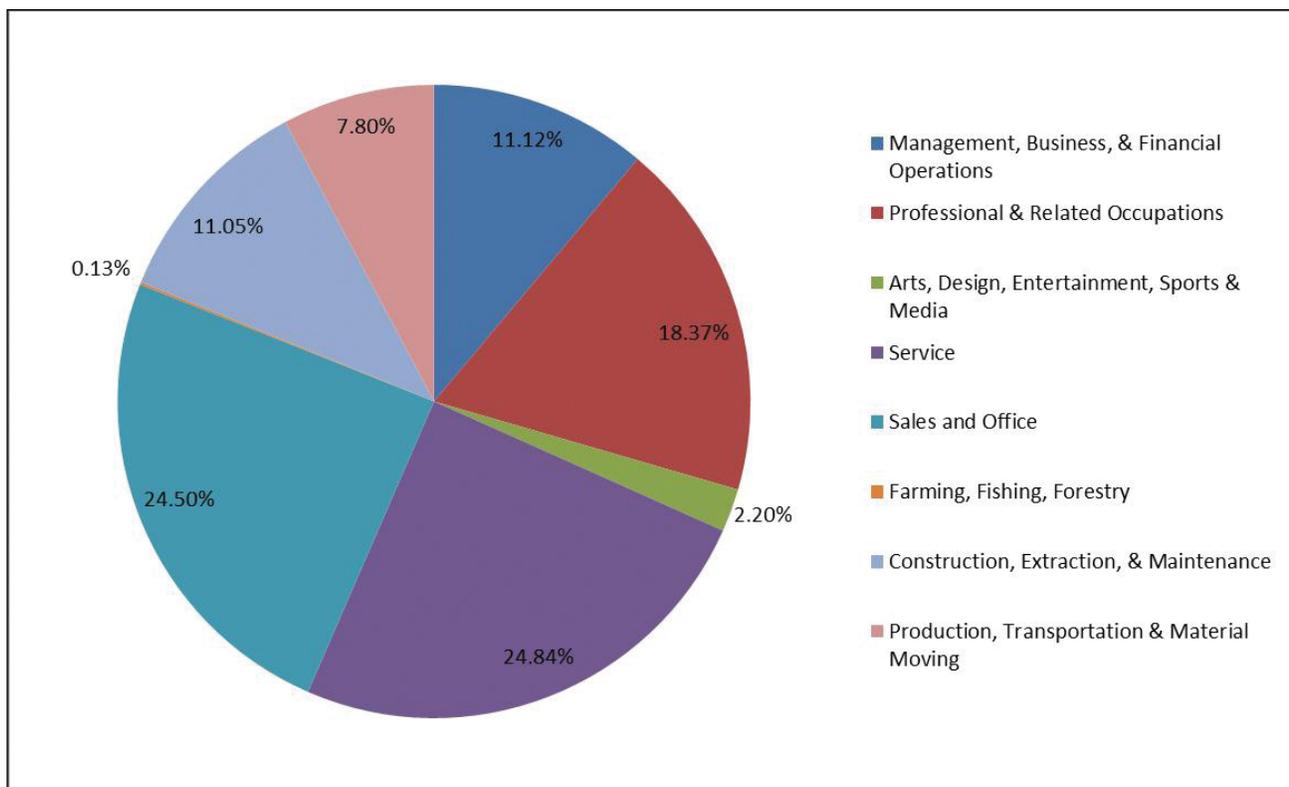


Figure EA-10. Change in population size in Albany County, Wyoming, from the 2000 census to the 2010 census.



**Figure EA-11. Employment distribution in Albany County, Wyoming, 2010.**

tax revenue through the Refuge Revenue Sharing Act of 1935, which allows the Service to make annual payments to local governments in areas where fee-title purchases have removed land from the tax rolls. Payments are based on the greater of 75 cents per acre or 0.75 percent of the fair market value. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be substantially less than the amount needed to fully provide the authorized level of payments. In fiscal year 2010, actual payments were 22 percent of authorized levels.

## Public Use and Wildlife-dependent Recreational Activities

Residents of and visitors to the Laramie Plains are attracted to the area, in part, by the abundance

of wildlife. This area offers many wildlife-dependent activities, including hunting, fishing, birding, and wildlife photography, which generate millions of dollars for the State's economy (Hulme et al. 2009).

In 2006, the WGF D estimated expenditures of \$107.7 million by resident and nonresident hunters pursuing the six big game species in the State: white-tailed deer, mule deer, moose, elk, bighorn sheep, and pronghorn. Resident hunters accounted for 67 percent of the total (Hulme et al. 2009). The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFWS 2008) found that in 2006, \$137.3 million was spent in Wyoming by both resident and nonresident hunters. Wildlife watchers, both residents and visitors, spent a total of \$394.9 million in the State of Wyoming that year as well (USFWS 2008).

# Draft Environmental Assessment

## Chapter 4—Environmental Consequences



Melanie Olds/FWS

*Rush Lake in winter at Hutton Lake National Wildlife Refuge.*

This chapter assesses the environmental impacts that are expected to occur from the implementation of each of the alternatives described in chapter 2. Environmental impacts are analyzed for each alternative and the issues are discussed in the same order as in chapter 2. Several aspects of environmental effects are evaluated, including whether the impacts are negative or beneficial, direct or indirect, or cumulative with actions independent of the proposed action. The duration of the effect, whether it is a short- or long-term effect, is also used in the evaluation of the environmental consequences. The amount of time that project implementation would require would depend on the availability of funding and the level of landowner interest. Alternative B would likely be a long-term process to fully implement.

### 4.1 Effects on the Physical Environment

The estimated effects of each alternative on mineral, soil, and water resources as well as on the Service's ability to address climate change are described below.

#### Alternative A (No Action)

Under the no-action alternative, future protection of lands that are not currently protected by the Ser-

vice would be limited to the efforts of other agencies and organizations in the area. The Service's role would be limited to programs, such as Partners for Fish and Wildlife, that provide financial and technical assistance to willing landowners interested in improving their lands for wildlife. No Land and Water Conservation Fund monies would be expended in the project area by the Service for further land protection other than within the approved acquisition boundaries of the existing refuge units. Some partnership opportunities would be lost because the Service would not have the ability to fully work cooperatively within the area. Development and associated habitat loss could continue on lands outside of existing protected areas. Environmental benefits provided by wetlands and other natural vegetation such as water filtration, sediment reduction, and carbon sequestration would be reduced in the long term. Water quality and quantity could decline over time in areas with the increase in various types of development.

Aquifers would receive more demand, resulting in potential degradation of the hydrology of some wetland areas. Important wildlife habitat would remain vulnerable to degradation through reallocation of surface water offsite that may change existing water management practices.

This alternative could also negatively affect local mitigation efforts by reducing options for conserving and storing carbon through land protection and habitat restoration. Carbon sequestration capabilities would be reduced with the increased development and disturbance of native vegetation that is likely to occur under the no-action alternative.

## Alternative B (Proposed Action)

Under the proposed action, the WTCA would provide additional protection of water resources in the Laramie Plains from increased nonpoint source pollution from residential subdivision, commercial development, and increased erosion as well as prevent the draining of wetlands on up to 33,299 acres of conservation easements and up to 10,000 acres of fee-title acquisition. Habitats that depend on the continuation of current water availability and management would receive some protection from degradation caused by substantial changes to water use.

The WTCA would not supersede existing third-party mineral rights and is therefore unlikely to affect mineral resources. If the mineral estate has not been severed from the surface estate, the easement may include restrictions on surface occupancy, but the Service would not, and cannot, prevent a mineral owner from accessing minerals on the property.

It is unlikely that the Service would pursue acquisition of interests in lands with outstanding surface mineral leases or rights because the associated destruction of surface vegetation and need for reclamation would diminish the wildlife value of such land.

## 4.2 Effects on the Biological Environment

This section describes the likely effects of the project on species and their habitats under alternatives A and B.

### Alternative A (No Action)

Under the no-action alternative, the Service's Partners for Fish and Wildlife program would continue to work cooperatively with landowners to voluntarily improve habitat on private land within the project area. Furthermore, habitat for wildlife would continue to be protected and restored through the ongoing efforts of agency partners and nongovernmental organizations, primarily through easement programs. However, because of the limited resources of these partners and nongovernmental organizations, available funding may not be enough to address the amount of landowner interest and need for habitat conservation in the area. Decreases in habitat quality and ecological resiliency because of land cover changes and associated fragmentation, introduction of exotic species, and construction of structures that are incompatible with habitat use by some wildlife would likely continue under the no-action alternative.

Habitat loss and fragmentation caused by development of land for commercial and residential use would negatively affect riverine, riparian, grassland, and shrubland habitat that many wildlife species use. Changes from natural land cover to agricultural crops, the spread of invasive species, or significant changes to irrigation regimes would likely further fragment wildlife habitat. The effects of fragmentation on wildlife have been well documented (Collinge 2009). Davies et al. (2011) found that exurban growth decreases native plant and animal diversity; increases the number of exotic species, including non-native predators; and restricts ecosystem management options, such as using fire, which is a historical disturbance.

All of these potential impacts, whether alone or in combination, could result in the further decline of

migratory birds, resident wildlife, and listed species. In particular, the no-action alternative would negatively affect the likelihood of recovery and potential delisting of the Wyoming toad. It is anticipated that recovery efforts would continue, but habitat protection and the success achieved with recent reintroduction efforts would be limited. Given that land conservation and protection are the primary actions identified in the recovery plan, it is unlikely that recovery of the Wyoming toad could occur if additional parcels of suitable riparian and wetland habitat are not protected and dedicated to the reintroduction and establishment of sustainable populations of the toad within its historical range.

Similarly, migratory birds that depend on available wetland and riparian habitats, such as canvasback, northern pintail, white-faced ibis, and black tern, would likely decline with the anticipated increase in land use change and reduction in water quality. The Laramie Plains is designated as an Important Bird Area by The National Audubon Society (2011) because of the number and variety of spring and fall migrant species; although this designation would probably not change, the Service would not be able to provide any further protection.

Although scientific predictions of future climate in the region differ, almost all indicate that water will become increasingly limited in the future (Arnell 1999). Therefore, increasing water conservation efforts now is a prudent investment toward preserving future wildlife and native habitats. One of the greatest ecological concerns about climate change is that species that are now adapted to specific environmental conditions will need to either shift their geographic ranges or adapt to new conditions. If these species become isolated from their preferred habitats, they could potentially become regionally extirpated or extinct (Loss et al. 2011). This alternative would likely result in negative effects on connectivity of wildlife habitat, the resiliency of the watershed, and the ability of the ecosystem to adapt to a changing climate and changing land uses.

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## Alternative B (Proposed Action)

Under the proposed action, the establishment of the WTCA would enable the Service to permanently protect up to 43,299 acres of vital wildlife habitat in addition to that which is already held in the Mortenson Lake and Hutton Lake Refuges. While there are several conservation initiatives by other agencies and private land trusts underway in the project area, the WTCA would strategically target habitats that are necessary for recovery of the Wyoming toad and

other federally listed species such as migratory birds and the black-footed ferret.

This alternative would allow Wyoming toad populations to be reintroduced in areas with suitable habitat that would supplement earlier reintroduction efforts at Mortenson Lake National Wildlife Refuge. The establishment of distinct populations would increase the chance of toads surviving the occurrence of a disease outbreak or other unpredictable event. Priority would be given to wetland areas, including riverine and riparian areas, that historically were the preferred habitat of the toad. Protection of riverine and riparian areas would benefit other species that depend on this habitat type, including little brown bat, willow flycatcher, yellow warbler, and deer. Riparian areas also provide travel corridors for a wide variety of other wildlife species.

The authority to purchase conservation easements and fee-title lands from willing sellers within the WTCA would help to make sure that several conservation goals, such as those listed in the Shirley Basin–Laramie Rivers Conservation Plan (Pocewicz and Lathrop 2008), could be met. Permanently protecting lands that link existing public and private conservation areas would significantly enhance the ecology of the Laramie Plains as a whole.

Species that are sensitive to vertical structures would be provided with greater protection through development restrictions that would make sure that intact habitats would continue to be available. Conservation through easements or fee-title purchases would lessen the negative impacts of the existing threats to wildlife populations by maintaining larger tracts of undeveloped land. This would have long-term positive effects on the connectivity and quality of wildlife habitat and ecological resiliency, which would benefit migratory birds, threatened and endangered species, and native plants within this area of the Laramie Plains.

By protecting habitat, reducing habitat fragmentation, and increasing connectivity between habitats, the proposed action would also help native species and ecosystems to adapt to a changing climate. Climate change mitigation efforts would be positively affected by this alternative because carbon sequestration that is now provided by native vegetation would be retained.

## 4.3 Effects on Cultural Resources

This section describes the likely effects of the project on the cultural resources in the area under alternatives A and B.

### Alternative A (No Action)

Under the no-action alternative, cultural resources on the lands within the proposed WTCA boundary would remain subject to State and local regulation and permitting. Some cultural resources could be adversely affected by activities such as development and road construction on lands that are outside of existing public and private conservation lands. Activities that do not require permits could contribute to the loss or damage of cultural resources, especially if resources have not yet been discovered.

### Alternative B (Proposed Action)

As a Federal agency, the Service must comply with many laws pertaining to cultural resources, including the National Historical Preservation Act (16 U.S.C. 470 et seq.; Public Law 89–665), the Archaeological Resources Protection Act of 1970 (16 USC 470aa–mm; Public Law 96–95) as amended, and the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.; Public Law 101–601). Although conservation easements would preclude or limit most forms of surface disturbance, these requirements would not apply to or be fully effective in protecting cultural resources on private lands with easements. However, the proposed action provides benefits to cultural resources when compared to the no-action alternative because easements would limit surface disturbance. On Federal fee-title lands, cultural resources would be fully protected.

## 4.4 Effects on the Socioeconomic Environment

This section describes the estimated effects of alternatives A and B on landownership, land use,

public use, development (including oil and gas, wind energy, and residential), and intact ecosystem values.

## Land Ownership and Land Use

### Alternative A (No Action)

Landownership would not be affected by the no-action alternative and land use would likely continue to follow observed patterns of increased residential and commercial development, resulting in further fragmentation of the landscape. Sustainable ranching opportunities would continue to be reduced if landowners begin to split tracts into smaller lots for development. However, landowners who subdivide could increase their revenue in the short-term by developing residential home sites or by selling land for commercial development, such as oil and gas.

The community would continue to lose open space, and the stunning views in the area would be diminished.

### Alternative B (Proposed Action)

There are many variables to consider when assessing the social and economic effects of buying conservation easements and fee-title lands because acquisition may span decades. The social and economic effects of the easements cannot be quantified in this analysis because of the uncertainty of such factors as the likelihood and timing of gaining easements or fee-title purchases, the availability of Service money, population growth, land values, and agricultural commodity prices. However, a qualitative assessment of some effects can be provided.

Under alternative B, the easement and fee-title programs would help preserve the aesthetics and open landscape of the Laramie Plains, as well as provide another option for landowners who want to maintain open space and historical land use. These programs would also conserve wildlife habitat and protect the land from surface disturbance, development, and fragmentation on lands within the WTCA boundary.

Conservation easements provide financial benefits for landowners that may enable them to preserve the natural and historical value of their ranch and open space lands, and to pass this legacy on to future generations. Besides keeping a cultural heritage, the preservation of farming and ranching operations can result in economic benefits to the local economy. Conservation easements can protect values associated with biodiversity and wildlife abundance, maintain

aesthetic beauty, and protect socially and culturally significant features of landscapes and livelihoods (Millennium Ecosystem Service Assessment 2005, Ehrlich and Ehrlich 1992, Daily et al. 1997).

Up to 10,000 acres could be purchased in fee title, which would then be removed from the Albany County tax rolls. Under Federal fee-title ownership, counties would qualify for reimbursement of some foregone property tax revenue through the Refuge Revenue Sharing Act of 1935, which allows the Service to make annual payments to local governments in areas where fee-title purchases have removed land from the tax rolls. Under provisions of the Refuge Revenue Sharing Act, payments are based on the greater of 75 cents per acre or 0.75 percent of the fair market value. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be substantially less than the amount needed to fully provide the authorized level of payments. In fiscal year 2013, actual Refuge Revenue Sharing payments were 25 percent of authorized levels on average.

Refuge lands could also provide grazing or haying opportunities, or both, which could be used as habitat management tools and which could provide an economic benefit to cooperators. Positive effects may occur from increased tourism, public wildlife viewing, fishing, and hunting opportunities on the areas near the existing refuges. Open space may also enhance property values on lands near the conservation area.

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## Public Use

This section describes the likely effects of the project on public use in the area under alternatives A and B.

### ***Alternative A (No Action)***

Under the no-action alternative, landowners would continue to control all access and public use on their lands.

### ***Alternative B (Proposed Action)***

Under the proposed action, landowners who enter into conservation easement agreements would continue to manage public access, including hunting access, to their property. Properties acquired in fee title would be closed to public access unless deemed compatible with Wyoming toad population recovery objectives. Upon achievement of recovery objectives and delisting of the toad, the management strategy would be reevaluated. Public access could be allowed

for wildlife-dependent uses that the Service determines to be compatible with the refuges' wildlife management objectives.

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## Development

This section describes the likely effects of the project on development in the area under alternatives A and B.

### ***Alternative A (No Action)***

Under the no-action alternative, increased infrastructure related to residential, oil, gas, and wind development in the Laramie Plains would likely result in the fragmentation of habitat now used by wildlife. Over the long term, these activities would likely result in the continuation, and possibly the acceleration, of the decline in wildlife populations in the project area.

Over time, subdivision and development would reduce tourism, hunting, and wildlife observation opportunities, resulting in diminished economic benefits associated with these activities to local communities.

With the anticipated increase in development, landowners and the surrounding communities would lose open space, and the wide-open views would be diminished.

### **Residential Development**

Rural development on exurban/rural lots (1.7 to 40 acres) has been growing at a rate of 10 to 15 percent per year, exceeding urban and suburban expansion rates (USDA 2006). This trend started in the 1960s, when demographers documented that for the first time in American history more people were leaving cities for rural areas than were making the return trip (Fuguitt 1985). Residential development and subdivisions not only fragment wildlife habitat, but they generally increase the costs to county governments that have to provide services to rural subdivisions.

### **Oil and Gas Exploration and Development**

Oil and gas development would continue to occur on private lands in the Laramie Plains. Protection of the surface estate would be governed by existing State regulations.

### **Wind Energy Development**

The lands within the project area would remain in private ownership and have no further Service restrictions. Landowners could potentially profit by allowing wind energy to be developed on their land.

## **Alternative B (Proposed Action)**

Under the proposed action, up to 43,299 acres could be protected by keeping various forms of development from fragmenting the habitat. Ongoing traditional agricultural uses such as livestock grazing and ranching would continue. This alternative would help protect open space and the rural lifestyle in the Laramie Plains.

### **Residential Development**

Preventing subdivision and residential development could decrease future tax revenues in a defined market area. However, protecting open space could actually provide a net savings to Albany County citizens when compared to the revenues generated and costs of services associated with residential development (Haggerty 1996). Not only could open space lands themselves increase in value, but nearby developed areas could also increase in value due to the recreational opportunities and views associated with nearby protected lands.

### **Oil and Gas Exploration and Development**

The proposed easement and fee-title programs would preclude oil and gas exploration and any other type of development requiring surface occupancy from occurring. Typically, conservation easements do not affect subsurface estates, such as oil and gas deposits, because the Service only acquires rights associated with surface ownership. In many places where the subsurface estate has been severed from surface ownership, the landowner does not own the subsurface rights and the easement or fee-title lands that the Service would acquire from the landowner would be junior to the subsurface rights.

For easements that have been put in place on land where the owner has not sold or leased the mineral or subsurface estate, the Service easement would be senior to any subsurface interests later acquired by a developer. Since development of the mineral estate could significantly affect the resources that the Service is attempting to protect, the Service would prohibit surface development and any minerals, oil, or gas would have to be accessed from off of the property.

### **Wind Energy Development**

The proposed easement and fee-title programs would enhance the protection of wildlife habitat from surface disturbance and development of wind energy infrastructure. Easement payments made to landowners would offset some of the potential revenue loss from the sale of wind energy development leases. The development of wind energy on neighboring lands that are not fee-title lands or do not have Service conservation easements would not be affected.

The potential for wind development within the Laramie Plains is rated moderate.

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## **Other Conservation Impacts**

### **Alternative A (No Action)**

Under the no-action alternative, the threat of fragmentation and lowered water quality will continue unabated. Landowners may continue to face economic pressures to subdivide their ranches and lease or sell parts of their property rights. Residential development will further fragment the Laramie Plains region, leaving fewer large parcels of intact habitat.

### **Alternative B (Proposed Action)**

Under the proposed action, existing wetland, riparian, grassland, and shrubland habitat would remain intact through fee title and conservation easement purchases. Because conservation easements would keep wildlife habitat intact on working lands, ecosystem services would be available for local residents (Millennium Ecosystem Service Assessment 2005). Ecosystem services such as pollination, water purification, nutrient cycling, carbon sequestration, soil conservation, and control of pest insects by birds are often unrecognized or are considered “free.” These services would not be provided in areas that have undergone residential or commercial development.

Conservation easements on private lands would strengthen habitat resiliency and provide opportunities for wildlife movement and adaptation for years to come.

## **4.5 Unavoidable Adverse Impacts**

Any adverse effects that may be unavoidable while carrying out alternatives A and B are described below.

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### **Alternative A (No Action)**

Under the no-action alternative, habitat degradation and fragmentation would be expected to become

more widespread in the project area. Some habitat protection would continue through existing authorities and funding.

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## Alternative B (Proposed Action)

No direct or indirect unavoidable adverse impacts to the biological or physical environment would result from the proposed action. The selection of an approved boundary and the concurrent authorization to obtain easements would not, by themselves, affect landownership or management activities by other agencies or organizations, or other aspects of the socioeconomic environment.

Fee-title acquisition would reduce taxes paid to the county by landowners. However, this would be partially offset by the Refuge Revenue Sharing program.

## 4.6 Irreversible and Irretrievable Commitments of Resources

Any commitments of resources that may be irreversible or irretrievable as a result of carrying out alternatives A and B are described below.

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## Alternative A (No Action)

There would be no commitment of resources by the Service if the no-action alternative is selected. The Service could still exercise its authority to acquire inholdings or other lands that would result in minor expansion of existing refuges, but it would not be obligated to do so.

The continued introduction of new residential and commercial infrastructure to the Laramie Plains would result in an irretrievable loss of habitat that may eventually lead to an irreversible loss or population decline of some wildlife species.

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## Alternative B (Proposed Action)

The establishment of the WTCA would not, in itself, constitute an irreversible or irretrievable commitment of resources. However, if interests in land were acquired through the use of the Land and

Water Conservation Fund or donations, the administration of the easement provisions or donated property would result in an irreversible and irretrievable commitment of resources. The monitoring of easements would represent a minor increase in overall Service costs borne by the Arapaho National Wildlife Refuge Complex.

## 4.7 Short-term Use versus Long-term Productivity

This section describes the short-term effects versus long-term productivity from the expected actions in alternatives A and B.

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## Alternative A (No Action)

Some habitat would be conserved through ongoing efforts of Service programs like Partners for Fish and Wildlife along with the efforts of other agencies and nonprofit partners. Loss of important wetland and upland habitats would be expected to continue at the current rates of development, resulting in long-term negative implications for the habitats in and the ecology of the Laramie Plains.

Ranches and agricultural lands could be sold to developers for short-term monetary gains, but the expected rates of development would have an adverse effect on the long-term biological and agricultural productivity of the area.

Over the long term, the costs to counties to sustain development in rural areas could be significant (see the “Landownership and Land Use” section above). Development of wind energy and oil and gas resources would provide short-term income gains, but would have a long-term adverse impact on the Laramie Plains ecosystem.

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## Alternative B (Proposed Action)

Under the proposed action, the ability of the Service to acquire perpetual conservation easements and limited fee-title acquisition would conserve important wetland and upland areas and reduce the long-term loss and fragmentation of important habitats that the Wyoming toad and a variety of wildlife species depend on for survival.

The proposed conservation area would help to preserve the long-term biological productivity of the

Laramie Plains wetland, riparian, and upland habitats; increase protection of endangered and threatened species; and maintain biological diversity.

The ability to sell conservation easements would provide an immediate short-term economic benefit to landowners who take part in the program while keeping the long-term agricultural heritage and productivity of the area.

These habitat types would be protected, both for the wildlife species that depend on them and so that future generations of Americans may enjoy them.

## 4.8 Cumulative Impacts

Cumulative impacts are defined by the National Environmental Policy Act as the impacts on the environment which result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7)

This section describes the cumulative impacts that could result from the combination of reasonably foreseeable actions with other biological and socioeconomic conditions, events, and developments.

### Past Actions

Past land protection efforts within the Laramie Plains have included the establishment of three national wildlife refuges: Bamforth (1,166 acres), Hutton Lake (1,928 acres), and Mortenson Lake (1,968 acres). The Partners for Fish and Wildlife program has worked with private landowners to restore or enhance habitat for wildlife. Organizations such as The Nature Conservancy and Wyoming Stock Growers Land Trust have also worked to conserve land in the area.

### Present Actions

The Service's proposed action to expand the number of acres in the Laramie Plains in fee title or in conservation easements would expand land acquisition authority in the area to 43,299 acres, and would potentially add another 10,000 acres to the Refuge System in fee title, and 33,299 acres in the form of conservation easements. Once approved, it would take some years for the program to begin to have a noticeable effect because the acquisition of fee title

and easements would depend on available funding and willing sellers.

## Reasonably Foreseeable Future Actions

Reasonably foreseeable actions are activities that are independent of the proposed action but could result in cumulative or additive effects when combined with the alternatives under consideration. Reasonably foreseeable actions are expected to occur regardless of which alternative is selected. Residential, oil and gas, and wind development; increased water demands; and future conservation efforts by a variety of organizations are the primary reasonably foreseeable actions that are anticipated in the Laramie Plains.

### Development

Population growth in the State of Wyoming is expected to continue to increase. Between 2000 and 2005, Wyoming ranked 31st in population growth, but from 2006 to 2007, Wyoming jumped to 9th in population growth (Hulme et al. 2009). From 1978 to 2007, total land in agriculture in Wyoming declined from 33.6 million acres to 30.2 million acres, a decrease of more than 10 percent. Albany County alone saw a 6-percent decrease in farm lands from 2002 to 2007 (USDA 2007). However, much of the residential growth in Wyoming is considered rural, with a housing density of one unit per 40 acres (Hulme et al. 2009). Increasingly, these exurban homes are often second homes. From 1990 to 2000, Wyoming saw a 30-percent increase in second home buying; 7.2 percent of total housing units in Albany County are second homes. People are drawn to the open space, abundant wildlife, and recreational opportunities that are available, but exurbanization leads to increased habitat fragmentation and a shift from traditional agriculture practices.

Wyoming ranked seventh in production of crude oil and second in the production of natural gas in 2010, with production occurring throughout the State (Petroleum Association of Wyoming 2012). Also, Wyoming ranks 10th in the nation in proven reserves of crude oil and second in proven reserves of natural gas. Proven reserves are the amount estimated to be recoverable from well-established or known reservoirs. Because of high proven reserves within the State and the increased nationwide need for oil and gas, development is likely to continue throughout the State.

Over 43 percent of Wyoming has the potential for development of wind energy (U.S. Department of Energy 2011). Wyoming ranks 10th in potential wind energy development, with 27.3 million acres (110,414.5 km<sup>2</sup>) of available land with an installed capacity of 552,072.6 megawatts and an annual generation of 1.9 million gigawatt-hours. Most of this potential is within the southeastern part of the State. Most of the land with potential for wind development would still be available under the proposed action.

### **Alternative A (No Action)**

Increased residential, oil and gas, and wind development in the Laramie Plains would likely result in the fragmentation of wetland, riparian, grassland, and shrubland habitats now used by wildlife. Over the long term, the combined effects of these activities would likely result in the continuation, and possibly the acceleration, of the decline in wildlife populations and may seriously affect the possible recovery of the Wyoming toad.

### **Alternative B (Proposed Action)**

The proposed action would provide long-term protection of up to 43,299 acres of wildlife habitat from the combined effects of various future development activities by precluding surface occupancy and the resultant habitat fragmentation and infrastructure for the benefit of the public and wildlife.

### **Other Conservation Efforts**

Ongoing efforts by a variety of organizations and agencies including The Nature Conservancy, Wyoming Stock Growers Land Trust, WGFD, and Partners for Fish and Wildlife have led to conservation of lands within the Laramie Plains. All these agencies and nongovernmental organizations have expressed interest in continuing conservation efforts. The Nature Conservancy has named the wetlands of the Laramie Plains as a conservation priority because of the large intact expanses of mixed-grass prairie and sagebrush steppe (Copeland et al. 2010).

### **Alternative A (No Action)**

Under the no-action alternative, current Service programs such as Partners for Fish and Wildlife would continue within the Laramie Plains region. The Service would continue to work cooperatively with landowners to voluntarily improve habitat on private land through various conservation means such as prescribed fire, range management systems, or native plantings. Besides Service programs, landowners also can work with various nongovernmental organizations and other government conservation initiatives. Under the no-action alternative, landowners would have fewer choices for protecting their lands through conservation easements. It would be unlikely that the acreage amount and type of habitat required for the recovery of the Wyoming toad would be successfully conserved.

### **Alternative B (Proposed Action)**

This action is important for the Service to meet several conservation objectives and is essential for meeting the Service's recovery objectives for the Wyoming toad (USFWS 2013). Ecological Services may pursue the development of a 10(j) rulemaking for the historic range of the Wyoming toad. Section 10(j) allows reintroduced "experimental non-essential populations" of endangered species to be managed as if they were threatened. Landowners can engage in lawful activities, such as recreation, forestry, and agriculture, and are relieved from liability for the unintentional take of a Wyoming toad. This would allow private landowners to continue to manage their lands with reintroduced toads. Federal lands and fee title lands acquired as part of the WTCA will be designated as essential populations, with full protection of an endangered species, and will not be subject to the 10(j) exemptions. The 10(j) rule would encompass only the toad's historic range within Albany County.



# Draft Environmental Assessment

## Chapter 5—Coordination and Environmental Review



FWS

*White-tailed prairie dog at Hutton Lake National Wildlife Refuge.*

This chapter describes how the Service coordinated with other entities and conducted environmental reviews of various aspects of the project proposal and analysis. If the proposed action is selected, further coordination and review will be needed.

### 5.1 Agency Coordination

The Service has discussed the proposal to establish the WTCA with interested stakeholders; landowners; conservation organizations; other Federal agencies; tribal, State, and county governments; and other interested groups and individuals.

The Service held internal scoping meetings and also had several informal conversations with landowners and other interested citizens to provide information and discuss the proposal. Information on the WTCA was made available to Albany County commissioners, and the commissioners signed a letter of support (appendix B) for the area identified in the preliminary project proposal.

At the Congressional level, Service staff has briefed Senators Enzi and Barasso and Representative Lummis's office in Cheyenne, Wyoming. The Service has also provided information about this project to four tribes.

Nongovernmental conservation groups are vital to the success of the proposed project. Service staff has coordinated with partner organizations such as The Nature Conservancy, Wyoming Stock Growers Land Trust, and Audubon Wyoming.

### 5.2 Contaminants and Hazardous Materials

The Service is required to invest in healthy lands. Surveys for contaminants would be conducted before any land interests are acquired. A level 1 pre-acquisition site assessment would be conducted on each individual tract before purchase of any land interests. Any suspected contaminant problems that

would require further surveys would be referred to a contaminants specialist located in the Service's Ecological Services office in Cheyenne, Wyoming

### 5.3 National Environmental Policy Act

The Service conducted this environmental analysis under the authority of and in compliance with the National Environmental Policy Act, which requires an evaluation of all reasonable alternatives that will meet stated objectives, and an assessment of the possible effects on the natural and human environment.

### 5.4 Environmental Assessment

This EA will be the basis for determining whether the implementation of the proposed project constitutes a major Federal action that would significantly affect the quality of the natural and human environments. National Environmental Policy Act planning for this EA involved other government agencies and the public in the identification of the issues and alternatives for the proposed project.

## 5.5 Distribution and Availability

Copies of the draft EA (with the associated draft LPP in the same volume) were sent to Federal and State legislative delegations, tribes, agencies, landowners, private groups, and other interested individuals. Copies of the document are available from the following offices and contacts:

Arapaho National Wildlife Refuge Complex  
953 County Road 32  
Walden, CO 80480  
970 / 723 8202

U.S. Fish and Wildlife Service  
Region 6, Division of Refuge Planning  
Branch of Land Protection Planning  
P.O. Box 25486–DFC  
Denver, CO 80225  
303 / 236 4345  
303 / 236 4792 fax  
[www.fws.gov/mountain-prairie/planning/lpp/wy/htl\\_mrl/htl\\_mrl.html](http://www.fws.gov/mountain-prairie/planning/lpp/wy/htl_mrl/htl_mrl.html)

# Draft Land Protection Plan

## Chapter 1—Introduction and Project Description



FWS

*A prairie dog colony in the uplands at Hutton Lake National Wildlife Refuge.*

### 1.1 Introduction

The draft EA that was completed by the U.S. Fish and Wildlife Service (the Service or USFWS) during the planning process considered several alternatives, and two of them were selected for further analysis. Alternative A, the no-action alternative, considers the consequences of not doing anything beyond current actions at Mortenson Lake and Hutton Lake National Wildlife Refuges. Alternative B considers the positive and negative consequences of purchasing limited fee-title land and conservation easements and establishing the WTCA (see figure LPP-1 for a map of the proposed project area).

### 1.2 Project Description

The Laramie Plains is an isolated mountain basin once covered by wetlands, riparian corridors, meadows, shrublands, and native prairie. In the spring, snow melt would fill streams and waterways as well as many shallow depressions scattered throughout the valley. These wetlands provided an oasis of food and rest for thousands of waterfowl and shorebirds

making their northward migration to their breeding grounds. Linear riparian corridors bordered the Big and Little Laramie Rivers and their tributaries, supporting scattered woodlands of cottonwoods and willows. The relatively fine soils and low annual precipitation kept the uplands in short mixed-grass prairie with scattered patches of shrubland. The Wyoming toad, a species endemic to the Laramie Plains, was once a common sight. Waterfowl, shorebirds, and grassland birds would dominate the skies, with raptors following the migration. Many mammals that depended heavily on white-tailed prairie dogs for prey and burrow habitats also lived in the area, including the swift fox and the black-footed ferret. Big game herds, including the American bison, once occupied almost all parts of the basin.

Today, the landscape has changed. Some wetlands have been filled or drained, others have been altered, and new wetlands in the form of flood-irrigated fields have been created. Only 4 percent of existing wetlands within the Laramie Plains are protected (Cope land et al. 2010a). Much of the water in the area is managed to support various human needs such as residential use, hay and crop production, and recreation. The strong ranching culture in the area has kept many of the habitats of the basin from being converted to other uses and left much of the region's biodiversity intact. There are growing concerns that

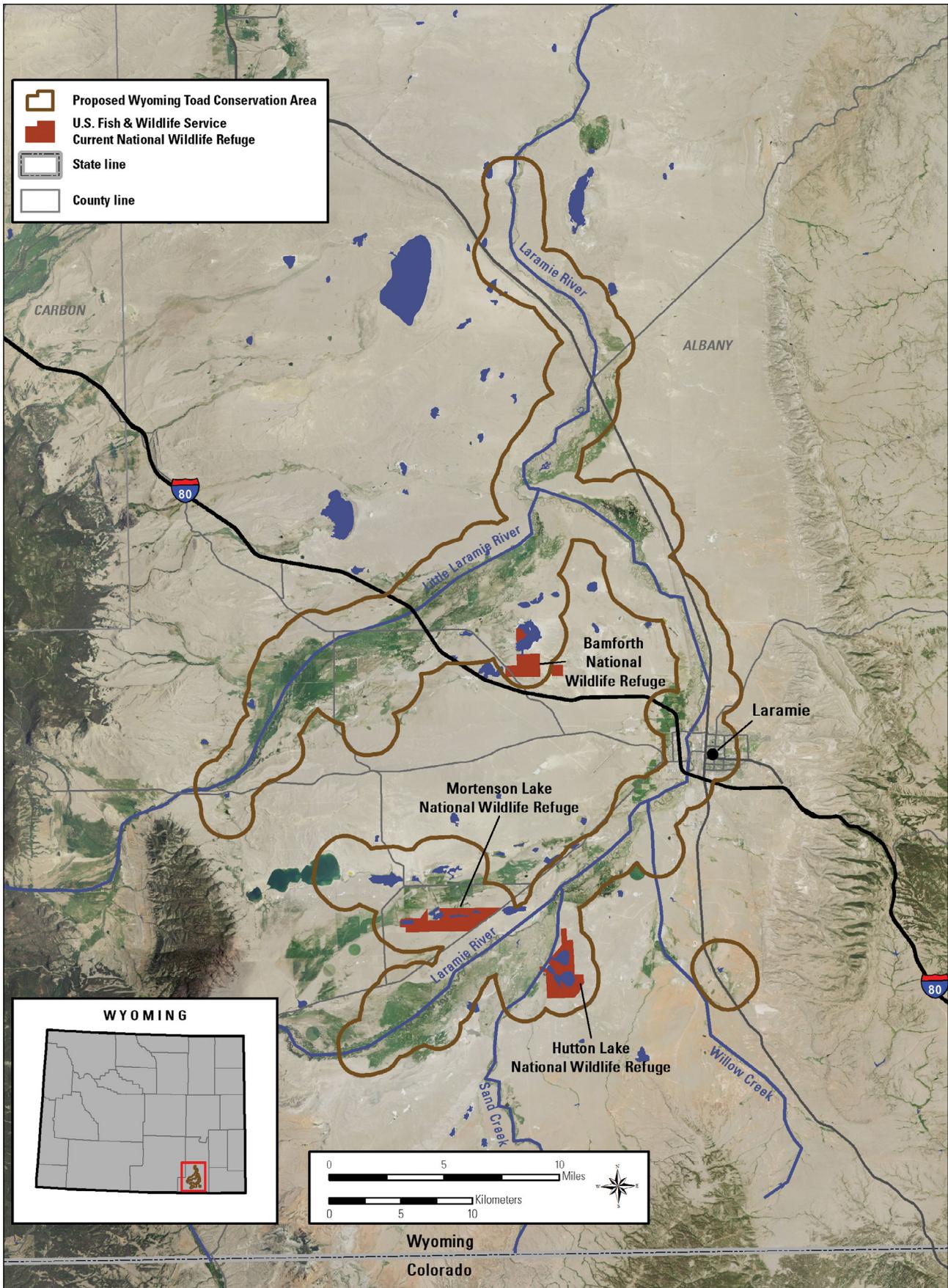


Figure LPP-1. Map of the Wyoming Toad Conservation Area in Wyoming.

a significant increase in residential development threatens the remaining natural character of this landscape, in particular the habitats and species that make the Laramie Plains regionally important for biological diversity. Rural development on exurban lots has been growing at a rate of 10 to 15 percent a year (USDA 2006). Such development will likely diminish the future value of these important biological resources and working landscapes.

Once the western fringe of the range for many short mixed-grass prairie species, the Laramie Plains has increased in relative habitat value because of habitat loss, fragmentation, and conversion of native prairie to cropland elsewhere in the Great Plains. Because of the relatively large, intact ecosystem still available, the basin has become crucial habitat for many species. Without increased conservation measures to protect upland habitat from degradation and conversion to other uses, species that now depend on the high-elevation prairie as a last remaining refuge would be vulnerable. The remaining wetlands play a vital role in providing resting and feeding areas for the thousands of migratory birds that continue to use the central flyway each spring and fall. However, increased sedimentation, nutrient runoff, salinization, and decreased water runoff jeopardize the functions and values of these wetlands. Similarly, riparian corridors are also affected by sedimentation, nutrient runoff, decreased water runoff, and stream channelization, which affect fisheries and other aquatic species, such as the endangered Wyoming toad. With decreasing water quality and natural water flow in the rivers and remaining wetlands, the recovery of the Wyoming toad could be impaired.

While increased human activity in the Laramie Plains has generally reduced habitat and wildlife populations, there have been some compensating effects. For example, irrigated hay meadows provide nesting cover for waterfowl. Some of the same flood-irrigated meadows may also hold water longer during the summer months, helping to retain higher late-summer flows in the surrounding rivers. Large ranches in the basin also provide large blocks of habitat that benefit wildlife.

The entire footprint of this project would be located in south-central Albany County, Wyoming, and would encompass three existing refuges: Bamforth, Mortenson Lake, and Hutton Lake National Wildlife Refuges. The WTCA would focus on the protection of wetlands, riparian corridors, and open landscapes with the objective of conserving land through the acquisition of up to 33,299 acres of voluntary conservation easements and up to 10,000 acres in fee-title acquisition from willing sellers only (table LPP-1).

**Table LPP-1. Summary of current and proposed acreage for the proposed Wyoming Toad Conservation Area, Wyoming.**

<i>National wildlife refuge</i>	<i>Executive boundary acres</i>	<i>Acquired acres</i>	<i>In-holding acres</i>
Mortenson Lake	2,500	1,927	573
Hutton Lake	1,968	1,968	0
Bamforth	1,166	1,166	0
		<i>Proposed fee title acres</i>	<i>Proposed conservation easement acres</i>
Proposed project area	43,299	Up to 10,000	Up to 33,299
Project boundary total acres	47,200		

Acquisition of fee-title lands from willing sellers would be prioritized based on specific criteria that would help with meeting the criteria of the Wyoming Toad Draft Revised Recovery Plan (USFWS 2014). These criteria are meant to contribute to the recovery and eventual delisting of the Wyoming toad. The Wyoming Toad Draft Revised Recovery Plan (USFWS 2014) calls for the establishment of five independent, self-sustaining populations, all within the toad's historical range. Furthermore, these five populations should be distributed across at least two basic habitat types: rivers and associated floodplains (lotic habitats) and ponds and lakes (lentic habitats). To accomplish this goal, other lands need to be acquired within the Wyoming toad's historical range to reintroduce and conserve its populations in perpetuity. Management practices on fee-title lands could include prescribed fire, livestock grazing with periodic resting of pastures, exclusion of nonnative fish, invasive species control, and disease management. A compatible use study would be conducted to determine if any property acquired in fee title could be opened up for public use.

Conservation easements would be bought from willing sellers on parcels that contain habitat suitable to support conservation efforts. Easement acquisitions would focus on the protection of wetlands and riparian corridors for Federal trust species (migratory birds and threatened and endangered species). Lands protected via easements would remain in private ownership and could continue to be grazed,

hayed, farmed, or otherwise managed in accordance with current practices. However, subdivision and development would be restricted and subject to stipulations agreed on by the landowners and the Service. Furthermore, easements may include stipulations related to exercising water rights, which could be changed only if the proposed changes would be beneficial to wildlife. Easement terms would be negotiated with each individual landowner interested in a conservation easement. The WTCA project, in conjunction with other conservation efforts in the region, would help to keep unfragmented blocks of wetland, grassland, and shrubland habitat. The WTCA would complement the conservation efforts of land trusts and entities such as The Nature Conservancy, Wyoming Stock Growers Land Trust, WGF, and NRCS (see figure LPP-2).

### 1.3 Purpose of the Wyoming Toad Conservation Area

The purpose of the WTCA is to protect the endangered Wyoming toad and other Federal trust species and provide strategic habitat conservation measures that are necessary to maintain, conserve, restore, protect, and enhance the native ecological communities within the Laramie Plains. Native habitats that make up the Laramie Plains, including wetlands, riparian areas, shrublands, and short mixed-grass prairie, are important for a variety of wildlife species. The wetlands and riparian habitats function as important breeding, foraging, and nesting areas for large populations of migratory shorebirds, waterfowl, and neotropical passerines, and is also the historical range of the endemic endangered Wyoming toad. The uplands, which are covered with shrubs and short mixed-grass prairie, are home to white-tailed prairie dogs, pronghorn, and many grassland birds, such as mountain plover and McCown's longspur. Land acquisition (fee-title and easement) and management of the WTCA will focus on protecting those habitats that complement and connect to existing protected areas, along with protecting lands in perpetuity for the recovery of the Wyoming toad.

### Vision for the WTCA

Nestled between the Snowy and Laramie mountain ranges, the Laramie Plains is a semiarid, high-elevation basin that was once the western fringe of many species' ranges; due to habitat loss on the Great

Plains and the largely intact ecosystem still available within the basin, the Laramie Plains has become crucial habitat for many species.

Among them, the endemic Wyoming toad, found only in the Laramie Plains, now stands at the precipice of extinction. With additional research and habitat protection, the toad has the ability to once again become a common sight. The mosaic landscape of wetlands, grasslands, and shrublands will continue to support a multitude of diverse wildlife species as well as provide abundant outdoor recreation opportunities to visitors. The WTCA fosters a collaborative effort between numerous partners to conserve the valuable natural resources of the Laramie Plains into the future and will be a model of cooperative conservation between private, State, and Federal partners shaping a common vision for the area related to conservation, agriculture, and open space.

### Purpose of the Existing National Wildlife Refuges

Bamforth National Wildlife Refuge was established in 1932 by Executive Order 5783 to provide breeding grounds for birds and other wildlife.

Hutton Lake National Wildlife Refuge was established by Executive order 5782 in 1932. The purpose of the refuge is to provide "a refuge and breeding ground for birds and wild animals."

Mortenson Lake National Wildlife Refuge was established in 1993 to protect the Wyoming toad's last known population. The Wyoming toad was listed as an endangered species in 1984. The population at Mortenson Lake was found in 1987. The purpose of the refuge is "to conserve fish or wildlife which are listed as endangered species or threatened species."

### 1.4 Issues Identified and Selected for Analysis

Please see discussion of Issues Identified and Selected for Analysis in section 1 of the draft EA in this volume.

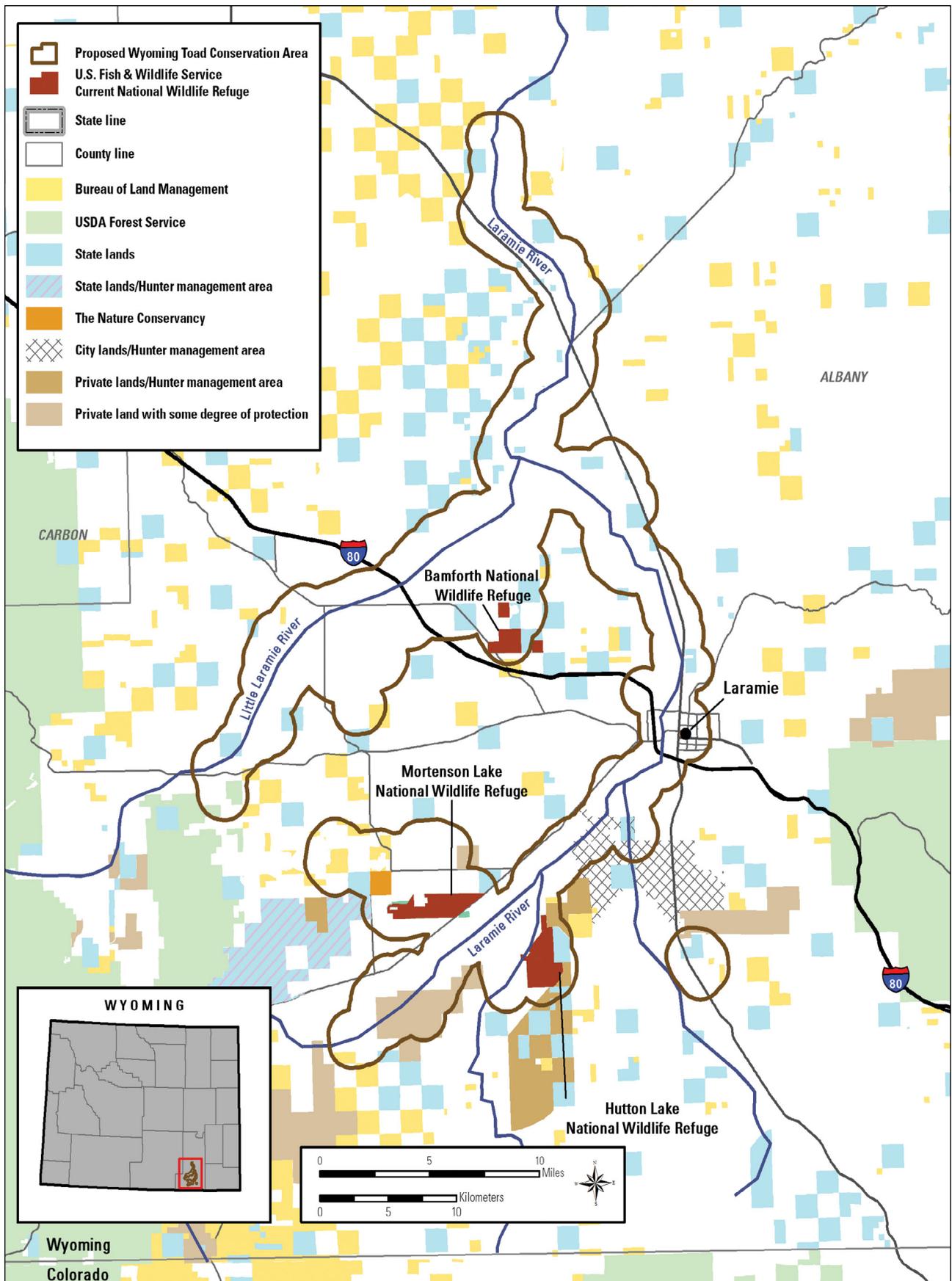


Figure LPP-2. Protected Lands in the Laramie Plains in Wyoming.

## 1.5 Public Review of and Comments on the Draft Environmental Assessment and Land Protection Plan

This section will be provided following analysis of public comments on the draft EA and LPP.

## 1.6 National Wildlife Refuge System and Authorities

Please see a discussion of the Refuge System and authorities in section 1 of the draft EA in this volume.

## 1.7 Related Actions and Activities

Please see a discussion of Related Actions and Activities in section 1 of the draft EA in this volume.

## 1.8 Habitat Protection and the Easement Acquisition Process

Following the approval of a project boundary, habitat protection will occur through conservation easements and limited fee-title acquisition. It is the Service's long-established policy to acquire the minimum interest in land from willing sellers that is necessary to achieve habitat protection goals.

The acquisition authorities for fee-title and easement lands within the proposed WTCA boundary are the U.S. Fish and Wildlife Act of 1956 (16 U.S.C. 742a–j) and the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–ee), as amended. Land would be acquired primarily through Land and Water Conservation Fund monies generated primarily from oil and gas leases on the Outer Continental Shelf, motorboat fuel tax revenues, and the sale of surplus Federal property. The Service

could also buy land with Federal Duck Stamp revenue from the Migratory Bird Hunting and Conservation Stamp Act of 1934, other funds that meet fish and wildlife conservation purposes as identified by Congress, or donations from nonprofit organizations.

The basic considerations in determining whether land should be acquired through an easement or fee-title purchase include the biological significance of the area, existing and anticipated threats to wildlife resources, and landowner interest in the project. The buying of fee-title lands or conservation easements would occur with willing sellers only and would be subject to available funding. The social and economic impacts of conservation easements and fee-title acquisition are shown in table LPP-2.

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## Conservation Easements

An easement is a conservation tool that has been extensively employed by the Service and other organizations. Easements are bought from willing sellers and they involve the acquisition of specific property rights, such as the right to subdivide or develop certain types of new infrastructure, while all other rights are kept by the property owner. Easements tend to be a cost-effective means of habitat conservation that is acceptable to landowners, particularly in areas where current agricultural land use practices are consistent with wildlife resource protection.

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## Fee-title Acquisition

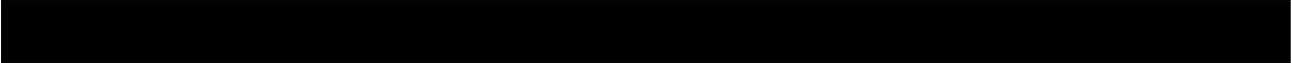
Fee-title acquisition will be limited to lands that can be bought from willing sellers in areas that would facilitate Wyoming toad recovery and promote the reintroduction of toads onto the land. Fee-title acquisition could triple or quadruple the cost of land conservation and add significant increases to Service management costs compared to conservation easements. Up to 10,000 acres is targeted for potential fee-title acquisition because this is the estimated acreage necessary to help meet the recovery objectives for the Wyoming toad that are outlined in the recovery plan (USFWS 2013).

**Table LPP-2. Social, economic, and biological effects of conservation easements and fee-title acquisitions for the proposed Wyoming Toad Conservation Area, Wyoming.**

<i>Issue</i>	<i>Conservation easements</i>	<i>Fee-title acquisitions</i>
Conservation value	<ul style="list-style-type: none"> <li>■ Wyoming toad recovery efforts would be supported with a tool that is preferred over fee title by many local partners.</li> <li>■ Used in combination with fee title, easements would ensure the maximum likelihood of achieving the recovery of the Wyoming toad.</li> <li>■ Habitat for migratory birds, pronghorn, and deer would be preserved.</li> </ul>	<ul style="list-style-type: none"> <li>■ Fee-title lands are essential to meeting the recovery goals for the Wyoming toad.</li> <li>■ The conservation value of fee-title lands may be greater than easement lands because the Service's ability to control habitat management would be increased.</li> </ul>
Effects on local communities	<ul style="list-style-type: none"> <li>■ The public would enjoy increased biodiversity, recreational quality, and hunting opportunities on nearby publicly accessible refuges and other public lands.</li> <li>■ Neighboring property values may increase.</li> <li>■ Traditional and historical ranching and farming landscapes would be preserved.</li> <li>■ Open space would be preserved.</li> </ul>	<ul style="list-style-type: none"> <li>■ Same as for easements except traditional and historical ranching and farming practices may not be preserved at the same level.</li> <li>■ Positive economic impacts may also result from increased Service habitat improvement expenditures injected into the local economy.</li> <li>■ Possible increase in refuge visitation and associated impacts of visitor spending in the local economy. However, neighbors and other public may be affected by increased visitation to refuge lands.</li> <li>■ Preservation of open space.</li> </ul>
Landowner compensation	<ul style="list-style-type: none"> <li>■ Landowners would be compensated for the fair market value of the easement.</li> <li>■ Easements would reduce the fair market value of the property.</li> <li>■ Easements would help keep land in agriculture.</li> <li>■ Landowners would keep the majority of use rights, but would forfeit their right to develop or subdivide the land. Other possible restrictions include development of vertical structures and diversion or sale of water rights.</li> </ul>	<ul style="list-style-type: none"> <li>■ Landowners would be compensated for the fair market value of the land.</li> <li>■ Landowners would forfeit all rights of ownership and turn ownership of the property over to the Service.</li> <li>■ Fee-title acquisition, for willing sellers, would meet landowner's long-term conservation objectives for their land.</li> </ul>
Effects on local government net revenue	<ul style="list-style-type: none"> <li>■ No changes to property tax revenues would be expected for agricultural lands.</li> <li>■ Other government revenues, such as personal income tax, may be changed throughout the region.</li> <li>■ Land protection through conservation easements could result in reduced future service costs for local governments and municipalities.</li> <li>■ Nearby land values may increase because of open views.</li> </ul>	<ul style="list-style-type: none"> <li>■ The Service does not pay property taxes on land it owns; thus, county tax revenue would decline.</li> <li>■ Lost property tax revenues would be partially replaced with Refuge Revenue Sharing payments.</li> </ul>

Source: Adapted from Thomas et al. 2012





# **Draft Land Protection Plan**

## **Chapter 2—Area Description and Resources**

Please see a detailed description of the WTCA and the resources that could potentially be affected by its establishment in chapter 3 of the draft EA in this volume.



# Draft Land Protection Plan

## Chapter 3—Threats to and Status of Resources



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*Prairie dog burrows and open patches of ground create habitat for several species, including mountain plover.*

### 3.1 Threats to Resources

In the Laramie Plains, as with much of the West, communities tend to be located near riparian areas. Planning for expected development and other land use changes is needed for conserving wildlife habitat in the area. The Wyoming toad, along with an estimated 90 percent of the total wildlife species and 70 percent of bird species in Wyoming (Nicholoff 2003), uses wetlands and riparian habitats either daily or seasonally.

#### Development

Population growth in the State of Wyoming is expected to continue. Between 2000 and 2005, Wyoming ranked 31st in population growth, but from 2006 to 2007, Wyoming jumped to ninth in population growth (Hulme et al. 2009). From 1978 to 2007, total land in agriculture in Wyoming declined from 33.6 million acres to 30.2 million acres, a decrease of more than 10 percent. Albany County alone saw a

6-percent decrease in farm lands from 2002 to 2007 (USDA 2007). However, much of the residential growth in Wyoming is considered rural, with a housing density of 1 unit per 40 acres (Hulme et al. 2009). Increasingly, these exurban homes are often second homes. From 1990 to 2000, Wyoming saw a 30-percent increase in second home buying, and 7.2 percent of total housing units in Albany County are second homes. People are drawn to the open space, abundant wildlife, and recreational opportunities that are available, but exurbanization leads to increased habitat fragmentation and a shift from traditional agriculture practices.

Wyoming ranked seventh in production of crude oil and second in the production of natural gas in 2010, with production occurring throughout the State (Petroleum Association of Wyoming 2012). Also, Wyoming ranks 10th in the nation in proven reserves of crude oil and second in proven reserves of natural gas. Proven reserves are the amount estimated to be recoverable from well-established or known reservoirs. Because of high proven reserves within the State and the increased nationwide need for energy, oil and gas development is likely to continue throughout the State.

Over 43 percent of Wyoming has the potential for development of wind energy (U.S. Department of Energy 2011). Wyoming ranks 10th in potential wind energy development, with 27.3 million acres (42,631.28 square miles) of available land with an installed capacity of 552,072.6 megawatts and an annual generation of 1.9 million gigawatt-hours. Most of this potential is within the southeast part of the State. Most of the land with potential for wind development would still be available under the proposed action.

## Fragmentation

Changes in land cover resulting from residential development, energy development, and roads not only cause a loss of habitat, they also fragment remaining habitat. There is a robust body of literature on the effects of habitat fragmentation that has been summarized by Collinge (2009). Countless manipulative and observational studies have shown that habitat area and connectivity between similar habitats are important at all trophic levels ranging from soil decomposers (Rantalainen et al. 2005) to passerine birds (Telleria and Santos 1995). Corridors between fragments promote use of, and persistence in, those habitats by migratory birds (Haas 2002), large carnivores (Shepherd and Whittington 2006, Tremblay 2001), and ungulates (Tremblay 2001) that are native to the WTCA. Perhaps the most obvious way to protect migration routes as well as valuable habitat in the WTCA is to focus on the conservation of the

riparian corridors that cross and connect existing protected areas. This action would protect wildlife movement corridors for seasonal migration as well as colonization following large-scale disturbances or environmental change.

## Invasive Species

Increased human disturbance associated with development has also been shown to negatively affect adjoining habitat because of the introduction and establishment of invasive plant species. Invasive plants can have many detrimental effects, including displacement of native vegetation, alteration of nutrient cycling and soil chemistry, alteration of hydrology, increased erosion, and changes in fire regimes (Dukes and Mooney 2004). Collectively, such changes can have severe negative effects on wildlife habitat, such as reducing the quality of nesting and foraging areas.

Another invasive species that is threatening the Wyoming toad and other amphibian populations in the Laramie Plains is chytrid fungus. Mortality caused by this fungus has been documented in the Wyoming toad population at Mortenson Lake Refuge and is generally thought to be one of the main causes of the toad's decline. Other diseases such as "white-nose syndrome" in bats and chronic wasting disease in cervids may also threaten the wildlife in the Laramie Plains, although these diseases have not been documented in the area to date.



*High flow event on the Big Laramie River.*

## Water Use

The Laramie River and its tributaries are the primary source of water in the area. Because the open plains receive little precipitation, most surface and ground water is a result of snowpack runoff from the surrounding mountains. The potential for wetland management, creation, and restoration is constrained by the applicable provisions of State water law. Water can be appropriated and applied only to a beneficial use recognized by the State of Wyoming, and though a considerable number of water rights have been approved by the Wyoming State Engineers Office, there is no formal list of approved or defined beneficial uses in Wyoming (Wyoming Joint Venture Steering Committee 2010). Without formal recognition of wildlife habitat creation, maintenance, enhancement, or management as a beneficial use in the State of Wyoming, the rulings for water appropriation can be inconsistent and can lead to wetland habitat loss that would directly affect wetland-dependent wildlife populations. As fragmentation increases, remaining habitats become geographically isolated and wildlife populations with limited dispersal abilities may potentially become genetically and spatially isolated.

## Climate Change

Climate change has become one of the paramount conservation issues and management challenges. The term “climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (Parry et al. 2007). The term “climate change” refers to a change in the mean or variability of one or more measures of climate (such as temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is because of natural variability, human activity, or both (Parry et al. 2007). Various types of climate change can have direct or indirect effects on species. These effects may be positive, neutral, or negative, and may change over time, resulting in different effects on species and associated habitats (Parry et al. 2007).

Mountain ecosystems in the western United States are expected to be especially sensitive to climate change. Data shows that many places in the Rocky Mountains have experienced three times the global average temperature increase over the past century. The magnitude of warming in the northern Rocky Mountains has been particularly significant,

as shown by an 8-day advance in the appearance of spring phenological indicators since the 1930s (Cayan et al. 2001). The hydrologic regime in the northern Rockies has also changed in response to the shift in global climate, and is projected to experience further changes (Bartlein et al. 1997, Cayan et al. 2001, Stewart et al. 2004). Under global climate change scenarios, the mountainous areas of northwest Wyoming may eventually experience milder, warmer, wetter winters and drier summers (Bartlein et al. 1997). Furthermore, the pattern of snowmelt runoff may change, with a reduction in spring snowmelt (Cayan et al. 2001) and an earlier peak runoff (Stewart et al. 2004), resulting in relatively lower annual discharge during spring and summer.

There is no available information on the potential threats of climate change on the Wyoming toad, and there is no evidence of direct effects to the species at this time (USFWS 2013). Many species that are already listed as endangered or threatened may be particularly vulnerable to changes in climate; it is also recognized that, for some listed species, the likely effects may be positive or neutral. However, some studies have predicted that amphibians will be even more susceptible to climate change than bird or mammal populations because of their physiology; dependence on microhabitats and predictable hydrological regimes; limited dispersal abilities (Blaustein et al. 1994); and susceptibility to diseases that may be intensified by climate change (Pounds et al. 2006). Some models predict substantially larger changes in amphibian populations than in birds or mammals, based primarily on potential future range contractions and expansions. This multitude of projected impacts could exacerbate the current population declines of many amphibian species (Stuart et al. 2004). Many wetland and riparian habitats, such as those found within the proposed boundary of the conservation area, are dependent on snowmelt from surrounding high-mountain ecosystems and are therefore expected to be more acutely affected by changes in runoff amount, timing, and quality than other habitats (Parry et al. 2007). Because the snowpack in high-elevation montane ecosystems directly affects the phenology of lower elevation watersheds, species associated with these systems may be more acutely affected than species in more temperate ecotypes.

For amphibians and reptiles, the timing of key ecological events is influenced by environmental conditions such as air and water temperatures and precipitation patterns. The timing of breeding, egg laying, metamorphosis, dispersal, and migration may shift in response to higher temperatures and changes in rainfall (Beebee 1995). As temperatures warm and the water in aquatic habitats becomes more variable, amphibians are likely to experience lower rates of

survival to metamorphosis. Temperatures outside of their thermal optima can also cause physiological stresses (Gibbons et al. 2000). Because of their affinities to aquatic habitats and their small size, amphibians typically have relatively small home ranges and low dispersal rates (Duellman and Trueb 1994, Wells 2007), making them more vulnerable to changes in their environment. The Wyoming toad, in particular, is a glacial relict that is adapted to a cool montane climate with a reliably high spring runoff. As climate change shifts temperature and hydrologic profiles beyond their historical ranges of variability, it is reasonable to assume that the Wyoming toad will experience population stress.

Migratory waterbirds are similarly adapted to a particular range of climate-related habitat conditions, including the timing and amount of water provided by runoff as well as the phenology of plant emergence and growth. Again, as climate change causes these conditions to shift outside of their historical ranges of variability, populations of wetland and riparian birds are likely to be stressed in novel ways.

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## **Adaptation, Mitigation, and Engagement**

The Service's strategic response to climate change involves three core strategies: adaptation, mitigation, and engagement (USFWS 2009). As the climate changes, the abundance and distribution of wildlife and fish will also change in response to changing habitat conditions. Some species will adapt successfully to a warming world, many will struggle, and others will disappear.

The exact changes in temperature and precipitation that the Laramie Plains will experience are unknown. Equally unknown are the responses of wildlife and habitats to these changes. For example, some species will be more vulnerable to climate change than others. To help fish and other wildlife species adapt, keeping large areas of intact wetlands, robust riparian corridors, and open spaces will become increasingly important. The project area provides an anticipatory, rather than a reactive, response.

Forests, grasslands, wetlands, and soils have a large influence on atmospheric levels of carbon dioxide. Carbon sequestration forms one of the key elements of mitigation. The World Resources Institute estimates that, of the global stock of carbon in terrestrial ecosystems, grasslands store approximately 34 percent, forests store approximately 39 percent, and agro-ecosystems store approximately 17 percent

of the total (White et al. 2000). It is as important to protect existing carbon stores from further degradation as it is to sequester atmospheric carbon.

Historically, the destruction of wetlands through land use changes has had the largest effects on carbon fluxes and the resulting radiative forcing of North American wetlands. Radiative forcing is the measure of the amount that the Earth's energy budget is out of balance. The primary effects have been a reduction in the ability of the wetlands to sequester carbon (a small to moderate increase in radiative forcing), oxidation of their soil carbon reserves on drainage (a small increase in radiative forcing), and reduction in methane emissions (a small to large decrease in radiative forcing). It is uncertain how global changes will affect the carbon pools and fluxes of North American wetlands (Bridgham et al. 2006). The WTCA project could secure the carbon already stored within the soils of the Laramie Plains by preventing the conversion of native vegetation to various types of development and thus preventing the carbon liberation that accompanies ground-disturbing development.

Engagement involves cooperation, communication, and partnerships to address the conservation challenges presented by climate change (USFWS 2009). The WTCA serves as a model for engagement by working with landowners, nongovernmental organizations, State agencies, and Federal agencies.

One of the key recommendations that came from a climate change workshop that was held by The Nature Conservancy was to coordinate management of shared resources. Given that some regions are experiencing warming more rapidly than others, natural resource managers would benefit by coordinating their activities with others who are managing common resources. Regional and coordinated management of shared habitat may be the only way to make sure that some habitat can be kept in a resilient state while other habitat transitions to a different state (Robles and Enquist 2010).

Taking action on these recommendations will be crucial for achieving conservation and management goals in the face of a changing climate. Reduced snowpack in the mountains combined with earlier seasonal melting caused by rising temperatures may increase the intensity and length of late summer droughts and reduce the availability of water, especially in the western United States. Finding enough water is becoming an increasingly difficult challenge for western fish and wildlife species. Spring is arriving earlier, and plants and animals are being found farther and farther north of their historical ranges in the U.S. Wildlife biologists are concerned that this will mean some migratory species may not arrive in their breeding habitats when, or where, their particular food sources are available.

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## **Effects of the Wyoming Toad Conservation Area on the Natural and Human Environment**

For a thorough discussion of the effects of the proposed easement and fee-title acquisition program, see section 4 of the draft EA in this volume.



# Draft Land Protection Plan

## Chapter 4—Project Implementation



Sarah Armstrong/FWS

*Wyoming toad*

### 4.1 Land Protection Options

During development of the alternatives for this project, the Service considered the following land protection options:

- county zoning
- various configurations of project boundaries (much larger or smaller areas)
- Safe Harbor Act agreements only
- easements only
- fee title only

The above protection options were found to be unable to meet the purpose, need, or objectives of the proposed Wyoming Toad Conservation Area, and therefore were not considered further in the draft EA.

### No-action Alternative

Under the no-action alternative, Refuge System conservation efforts would continue on existing refuge units according to establishment purposes and as outlined in the Comprehensive Conservation Plan. Habitat and species management and restoration would continue on lands owned by the Service to help meet the needs of migratory birds and endangered species. Existing habitat enhancement and restoration projects on private lands such as water developments, grazing systems, wetland protection, and grassland management would continue through cooperative efforts between private landowners and various conservation programs administered by the Service or other nongovernmental organizations like The Nature Conservancy and Wyoming Stock Growers Land Trust.

Under this alternative, management tools (easements or fee title) that landowners within the boundary could have chosen to carry out on their land to help them with habitat preservation would not be available from the Service. This could lead to further fragmentation of the landscape, residential and commercial development, and other uses of the land that are not compatible with wildlife conservation.

The no-action alternative would likely cause further declines in the quality and health of local natural resources and the overall ecosystem. It would negatively affect the recovery and eventual delisting of the Wyoming toad. It would be anticipated that recovery efforts would continue at the limited pace and minimal success of recent efforts. Without multiple parcels of suitable habitat dedicated to the establishment of sustainable populations of the toad within its historical range, it would be unlikely that the Wyoming toad would ever fully recover.

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## **Conservation Easements and Limited Fee-title Acquisition (Proposed Action)**

It is the Service's long-established policy to acquire the minimum interest in land from willing sellers that is necessary to achieve habitat protection goals. Under the proposed action, the Service seeks to protect up to 33,299 acres through conservation easements within the Laramie Plains. The Service would seek to strategically buy conservation easements on privately owned lands that provide potentially valuable wildlife habitat. The easements would provide perpetual protection of habitat for Federal trust species (migratory birds and threatened and endangered species) by restricting some types of future development. Development for residential, commercial, or industrial purposes such as energy and aggregate extraction; alteration of the natural topography; and conversion of native wetlands, riparian areas, shrublands, and grasslands to cropland would be prohibited. Conservation easements would also prohibit the draining, filling, or leveling of wetlands.

The Service would also work to strategically protect wetland habitat for the reintroduction and establishment of up to five independent, self-sustaining populations of Wyoming toads that would be perpetually protected through fee-title purchase from willing sellers.

Acquisition of fee-title lands, from willing sellers only, would be prioritized based on specific criteria that would help with meeting the criteria of the Wyoming Toad Draft Revised Recovery Plan (USFWS

2014). These criteria are meant to contribute to the recovery and delisting of the Wyoming toad. The Wyoming Toad Draft Revised Recovery Plan (USFWS 2014) calls for the establishment of five independent, self-sustaining populations within the historical range of the Wyoming toad for the toad to be delisted. Furthermore, these five populations should be distributed across at least two basic habitat types: rivers and associated floodplains (lotic habitats) and ponds and lakes (lentic habitats). To accomplish this goal, more lands that are managed to conserve the species within its historical range will be necessary to secure habitat for toad reintroduction and to protect established Wyoming toad populations in perpetuity. Management practices on fee-title lands could include using prescribed fire, livestock grazing with periodic resting of pastures, nonnative fish exclusions, invasive species control, and disease management. Using a combination of conservation easements and up to 10,000 acres of fee-title lands would ensure the maximum likelihood of achieving the recovery of the Wyoming toad. A compatible use study would be conducted to determine if the area could be opened up for public use on any property acquired in fee title.

### **Priority Areas**

Areas considered for fee-title and conservation easements within the project area will be prioritized based on the biological needs of the Wyoming toad, habitat quality, the threat of development, and connectivity with other protected lands (see figure LPP-2 in chapter 1 of this draft LPP). Other Federal trust species (migratory birds as well as threatened and endangered species) and resident species may also benefit from habitat conservation in the project area.

The acreage totals for fee-title acquisition and conservation easements are based in part on the amount of available habitat and the land needed to effectively carry out desired conservation efforts throughout the historical range of the Wyoming toad.

### **Management**

All land enrolled in conservation easements would remain in private ownership, so property taxes and land management, within the guidelines of the easements, would remain the responsibility of the landowner. Public access would remain under the control of the landowner. Service staff from Arapaho NWR, which is near Walden, Colorado, would be responsible for monitoring and administering all easements. Monitoring would include periodically reviewing compliance with easement requirements through site visits and correspondence with landowners or their

designees. Photographs of the property would be taken at the time the easements are established to document baseline conditions.

The land bought through fee-title agreements would be managed cooperatively by staff at the Arapaho NWR near Walden, Colorado, and the staff at the Wyoming Ecological Services Office in Cheyenne, Wyoming. They now cooperatively manage Mortenson Lake NWR for the benefit of the endangered Wyoming toad. They would be responsible for monitoring and administering the newly acquired lands according to the Service's legal mandates and policies. They will also continue to work with private landowners, researchers, and all other partners on the recovery team for the Wyoming toad.

## 4.2 Project Objectives and Actions

The objectives of establishing the WTCA are to:

- acquire and permanently protect wetland and riparian habitat to support Wyoming toad recovery and promote the establishment of multiple viable toad populations;
- support the recovery and conservation of other Federal trust species that may occur in the WTCA;
- protect, conserve, maintain, and enhance key migratory bird stopovers and breeding areas that serve as important feeding, resting, and nesting habitat for waterfowl, shorebirds, and neotropical migrants; and
- promote ecological resiliency by connecting public and private conservation lands, conserving existing habitats, and working with willing private landowners who are interested in common goals.

## 4.3 Easement Terms and Requirements

The Service has successfully used easements in many projects, and the language and guidelines that have been written for previous projects would contribute substantially to the drafting of the WTCA

easement language. Given the Service's conservation goals in the WTCA, the easements will be drafted with standard language to preclude subdivision and development, as well as to protect existing wetlands from being drained or filled.

In addition, because of the scarcity of water resources on the Laramie Plains, there may be additional provisions about water use. The types of wetland and associated upland habitats in which the Service is interested are largely supported by current water use practices. Easements may include a stipulation that changes in water use cannot adversely affect the quality of habitats or species that the WTCA seeks to protect, and that water rights now used on a property under easement could not be sold or transferred for use on other properties unless such a transfer was deemed to be beneficial to wildlife.

All the land under easement remains in private ownership. Property taxes and land management, including control of noxious weeds and other invasive plants, remain the responsibility of the landowner. Control of public access to the land also remains under control of the landowner.

## 4.4 Contaminants or Hazardous Materials

The Service is required to invest in healthy lands. Surveys for contaminants would be conducted before any land interests are acquired. A level 1 pre-acquisition site assessment would be conducted on each individual tract before the purchase of any land interests. Any suspected contaminant problems that would require further surveys would be referred to a contaminant specialist located in the Service's Ecological Services office in Cheyenne, Wyoming.

## 4.5 Acquisition Funding

The Service would acquire fee-title and conservation easement lands in the WTCA primarily through the use of Land and Water Conservation Fund monies generated primarily from oil and gas leases on the Outer Continental Shelf, motorboat fuel tax revenues, and the sale of surplus Federal property. The Service could also buy land through the use of Federal Duck Stamp revenue from the Migratory Bird Hunting and Conservation Stamp Act of 1934, other monies that meet fish and wildlife conservation pur-

poses as identified by Congress, or donations from nonprofit organizations.

The WTCA project area has several other government and nongovernmental organizations with overlapping conservation objectives. In the development of the WTCA, we have set priorities for land acquisition by the Service, but this document may also guide acquisitions for conservation by the NRCS's Wetland Reserve Program, The Nature Conservancy, and Wyoming Stock Growers Land Trust, among others.

## 4.6 Ecosystem Management and Landscape Conservation

To help with carrying out the project, the Service will use the expertise of the landscape conservation

cooperative (LCC), which is responsible for delivering applied science to inform resource management decisions on landscape-scale issues such as climate change. Each landscape conservation cooperative is a partnership that has individuals from State and Federal governments, nongovernmental organizations, and universities. Planning across agency jurisdictions and boundaries is necessary to make sure that conservation happens at the scale necessary to ensure that wildlife can adapt, migrate, and colonize new areas in response to environmental change.

The proposed conservation area is located within the Great Northern LCC, which includes portions of Colorado, Idaho, Montana, Utah, and Wyoming in the United States and parts of Alberta and British Columbia in Canada (figure LPP-3). While the scale of the proposed conservation area is relatively small compared to extent of the Great Northern LCC, the proposed project fits with three of the conservation goals in the Great Northern LCC Strategic Conser-

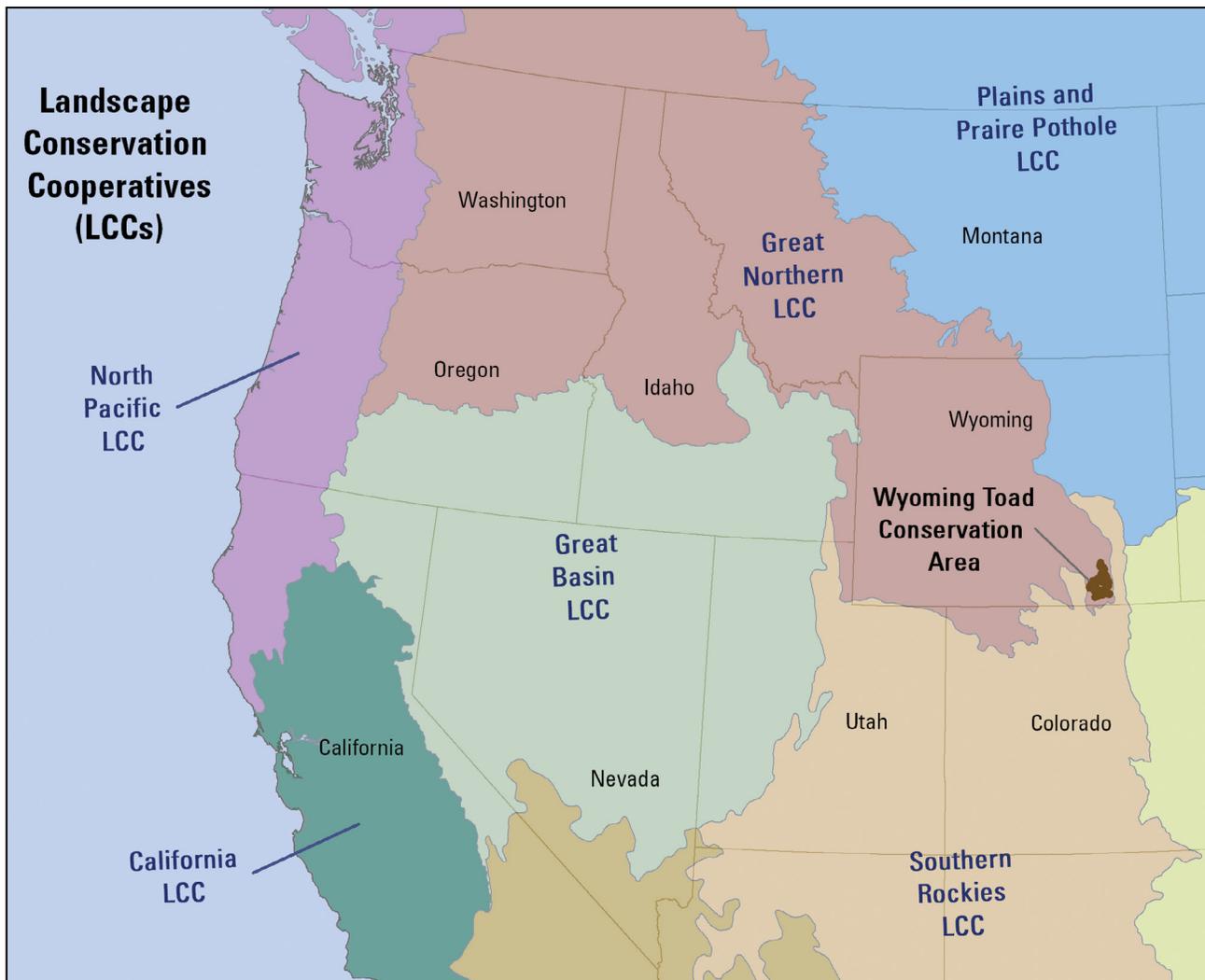


Figure LPP-3. Great Northern Landscape Conservation Cooperative.

vation Framework (2012). These goals are to maintain large, intact landscapes or naturally functioning terrestrial and aquatic community assemblages; to conserve a permeable landscape with connectivity across aquatic and terrestrial ecosystems, including species movement, migration, dispersal, life history, and biophysical process; and to maintain hydrologic regimes that support native or desirable aquatic plant and animal communities in still and moving water systems.

The existing conservation partnerships and earlier conservation efforts in this region of Wyoming have greatly contributed to the sustainability of imperiled species such as Wyoming toad, greater sage-grouse, and Canada lynx as well as migratory birds throughout the region. For example, the Service has collaborated with other Federal agencies including the Bureau of Land Management, U.S. Department of Agriculture's Animal and Plant Health Inspection Service and the NRCS, Environmental Protection Agency, and U.S. Geological Survey; State agencies including WGF; and nongovernmental organizations including the Laramie Rivers Conservation District, The Nature Conservancy, and The Aquarium and Zoo Association, to keep, protect, or restore habitats and populations of the Wyoming toad within the proposed WTCA. These science and management partnerships could provide the necessary framework for designing and carrying out future conservation strategies to achieve population and habitat goals for the restoration of the Wyoming toad. Ultimately, the Great Northern LCC will contribute to strategic habitat conservation, land acquisition prioritization, partnership development, and landscape-level planning within one of the most intact and functional ecosystems in the United States.

The Secretary of the Interior recently outlined the importance of LCCs as a response to climate change (USFWS 2010). The WTCA would link existing protected land held by the Bureau of Land Management, U.S. Forest Service, and the State of Wyoming.

These cooperatives will continue to grow as a means of delivering strategic habitat conservation. The Service and the U.S. Geological Survey signed a memorandum of understanding to strengthen the relationship between science and management in landscape-level conservation.

## Strategic Habitat Conservation

The WTCA would apply the strategic habitat conservation framework as outlined in the National Ecological Assessment Team Report (2006). Strategic

habitat conservation involves an ongoing cycle of biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-based research. It is also the process by which the Service continues to develop and apply science-based management to improve the capability of ecosystems to support populations of priority species at desired levels. Also, strategic habitat conservation provides the framework by which the Service develops and applies science to address landscape-level factors that limit populations.

The U.S. Fish and Wildlife Service, Region 6 Refuges Program has and will continue to coordinate with the Wyoming Ecological Services Field Office and the Wyoming Natural Diversity Database located at University of Wyoming, the Zone Biologist and Region 6 Inventory and Monitoring Coordinator, and science support staff in Fort Collins, Colorado, to provide support for the biological planning, conservation design, conservation delivery, and monitoring and research elements of strategic habitat conservation necessary to carry out the WTCA project. This LPP addresses the five key elements of strategic habitat conservation:

- biological planning (setting targets)
- conservation design (developing a plan to meet the goals)
- conservation delivery (implementing the plan)
- monitoring and adaptive management (measuring success and improving results)
- research (increasing our understanding)

## 4.7 Biological Planning

Biological planning requires the identification of priority species, development of population objectives, and identification of landscape-level limiting factors that keep the populations of priority trust species below desired levels. To decide which habitat resources are the most important to conserve for the long-term sustainability of wildlife populations, a prioritization strategy is needed. The Service has evaluated the conservation priorities and concerns in a number of regional plans, including the North American Waterfowl Management Plan, the Intermountain West Joint Venture's Waterbird and Shorebird Plans, the Partners in Flight plans, the Wyoming State Wildlife Action Plan, the Comprehensive Conservation Plan for the Laramie Plains refuges, and the Wyoming Toad Draft Revised Recovery Plan. Based on these plans and input from other partners, initial biological planning uses one

focal species to model the distribution and habitat needs of a larger group of wildlife species with similar needs. This information would also be used to set priorities for Service conservation efforts within the proposed project area.

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## Protection Priorities

The Service and its partners recognize the tremendous opportunity within the Laramie Plains to expand existing blocks of conservation lands, including lands protected under fee-title or easement ownership by the Federal government and conservation-oriented nongovernmental organizations. There is considerable interest by landowners in an additional conservation effort within the proposed conservation area.

In applying conservation ecology, focal species have been used as a practical bridge between single- and multiple-species approaches to wildlife conservation and management prioritization. By focusing our limited resources on a species that represents a host of other species or habitat, we can achieve maximum conservation impact. The Service, in consultation with nongovernmental organization partners, will use the Wyoming toad to model the distribution and habitat needs of a larger group of wildlife species with similar requirements. This focal species was chosen with the knowledge that there are gaps in the existing data and that the habitat in the project area is likely to evolve over time in the face of both natural and human-caused change. As new data becomes available or conditions change to the point that this conservation strategy is no longer effective, biological planning will be revisited and adaptive management applied.

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## Focal Species

The Wyoming toad, *Anaxyrus (Bufo) baxteri*, which is the focal species for the project, has already been the subject of detailed habitat mapping within the State of Wyoming by the Wyoming Natural Diversity Database in a collaborative project to help the WGFD refine estimates of range and distribution for the State Wildlife Action Plan. The procedures used in generating these models are commonly used within wildlife modeling studies. The environmental characteristics of locations where species have been documented to occur were then statistically extrapolated to identify other areas that are potentially suitable for occupation (Keinath et al. 2010).

The Wyoming toad, *Anaxyrus (Bufo) baxteri*, was first described in 1946 by Dr. George T. Baxter. The toad is thought to be a glacial relict. The toad once flourished in the Laramie Plains, but in the 1970s the population dramatically declined, and by the 1980s, individuals were extremely rare (Baxter and Stromberg 1980, Stromberg 1981, Vankirk 1980, Baxter and Meyer 1982, Baxter and Stone 1985, Lewis et al. 1985). The species was federally listed as endangered in 1984 under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). In 1993, under the authority of the Endangered Species Act, the Mortenson Lake National Wildlife Refuge was established for the protection of the species' last known population.

The historical distribution of the Wyoming toad, based on scientific records from Dr. George Baxter and Ronald Beiswenger's research, includes the floodplain ponds and small seepage lakes associated with the Big and Little Laramie Rivers as well as other wetlands within the shortgrass communities of the Laramie Plains in Albany County, Wyoming. Current distribution is limited to Mortenson Lake National Wildlife Refuge and one nearby Safe Harbor Act site. There are very few Wyoming toads thought to be in the wild and approximately 500 in captivity, and the low population alone makes the species vulnerable. Another major threat to the Wyoming toad is infectious disease, including the amphibian *Batrachochytrium dendrobatidis (Bd)* fungus, which has been linked to amphibian declines worldwide (Berger et al. 1998). *Bd* was documented in wild Wyoming toads from Mortenson Lake in 2000 and in 2001 (USFWS 2013). The other severe threat to the Wyoming toad discussed in the draft recovery plan is the lack of perpetually protected habitat. The proposed action directly addresses this severe threat to the Wyoming toad by protecting habitat that is needed for recovery goals to be met and that is important for the future of Wyoming toad conservation.

Little is known about the habitat requirements for the Wyoming toad, but the current thought is that the toad historically occurred in rivers and associated floodplains (lotic habitats) of the Big and Little Laramie Rivers and nearby ponds and lakes (lentic habitats). Ongoing research supported by the Service and a multitude of public and private partners on the Wyoming toad recovery team is focused on practical aspects of Wyoming toad recovery, such as defining optimal habitat for the early stages (egg, tadpole, and metamorph) of the toad's life cycle in terms of thermal regimes, and devising optimal early stage rearing pens that will optimize the survival of released tadpoles. As well as conducting research on *Bd* and the use of outdoor microcosms to prepare toads for release into the wild, all of the previous and ongoing

research went into the biological planning for this proposed project.

The goal for the Wyoming toad is to restore multiple self-sustaining populations within the historical range and habitat and subsequently downlist and eventually delist the toad. The Wyoming Toad Draft Revised Recovery Plan (USFWS 2014) outlines the population objectives that must be met for the toad to be downlisted from endangered to threatened and the additional criteria that must be met for the toad to be delisted entirely.

The Wyoming toad represents a larger group of species that occupy wetland, floodplain, and riparian habitat. These species include waterbirds, such as Wilson's phalarope, white-faced ibis, canvasback, and northern pintail, as well as riparian species, such as little brown bat and willow flycatcher (Nicholoff 2003, Griscom et al. 2012).

## 4.8 Conservation Design

Conceptual and quantitative models have been developed to help predict key habitat for the Wyoming toad and to aid in the initial conservation design and delivery efforts. As new information becomes available, the models would be updated throughout the implementation of this project.

The Wyoming toad, like many species, requires more than one type of habitat during its life history. Although historically the toad has lived in close association with rivers and floodplains near Laramie, some specific information about the toad's life history is still unknown. It has been found that different habitats around Mortenson Lake are associated with breeding, tadpole production, toadlet growth, and hibernation during early summer and in winter. The WTCA would help maintain connectivity between the different types of habitat required by the Wyoming toad.

### Focal Species Model

Prior to the 1950s and 1960s, the Wyoming toad was dispersed throughout the entire Big and Little Laramie floodplains. A variety of information and data sources were used to determine a project boundary for the WTCA that could meet the objectives for recovery of the Wyoming toad. Formal documentation of this historical range is limited to verbal accounts by area residents.

Occurrence data (from 1939 to present day) were made available through the Wyoming Natural Diver-

sity Database (WYNDD) at the University of Wyoming. The data are derived from a combination of population observations, specimen sampling information, surveys, and paper maps from a wide variety of researchers and Wyoming toad observers (WYNDD 2013). A large amount of the information, known as the "Baxter Historic Area Polygons," came from George Baxter, Ron Beiswenger, and Bill Gern. The information for the polygons was collected after a noticeable decline in the Wyoming toad population in the early 1970s. Archival data were documented as either hand-drawn polygons or individual researcher-collected points on reference maps which were digitized into an electronic format. When converting the paper data to digitized data, WYNDD established a precision error determination to account for historic map quality or potential scale errors on these archived maps. All data with a precision error over 800 meters (0.5 mile) were eliminated from inclusion in the project area development.

Modern data were plotted using GPS coordinates collected by observers. The occurrence information typically represents spring and summer observations associated with the presence of egg masses, tadpoles, young of the year, observed adults, or breeding vocalization. In order to ensure that Wyoming toads' year-round habitat needs were being met, including the need for upland hibernacula, the occurrence data were buffered by 1 mile (see figure LPP-4). The basis for the 1-mile buffer on both polygons and points is supported by a 2011 telemetry study conducted by the Wyoming Ecological Services Field Office that tracked several toads originating at Mortenson Lake; at least one individual migrated just over 1 mile from breeding habitat to its chosen hibernaculum (USFWS 2012b).

The Wyoming toad was never observed upstream from Sodergreen Lake on the Big Laramie River. The upper limit of Wyoming toad habitat on the Little Laramie River is less precisely located somewhere below Highway 130 and the lower end of the Vee Bar Ranch. Upstream from these locations, the shape, pattern, and profile of the two rivers suggests a change in stream type and habitat that is undesirable to the Wyoming toad. Upstream habitat has a higher gradient, lower water temperatures, higher bed load transport capability, and a narrower floodplain. The Baxter Historic Area Polygons (buffered by 1 mile) were used to generate the upper reach limitations on both rivers (see figure LPP-4). Upper reaches on the rivers were clipped to the Baxter Historic Area Polygons (buffered by 1 mile).

The downstream extent of the historic Wyoming toad range below the confluence of the two rivers has not been determined. Changes in stream classification are also limited but available data could potentially be explored in the future. The buffered Baxter

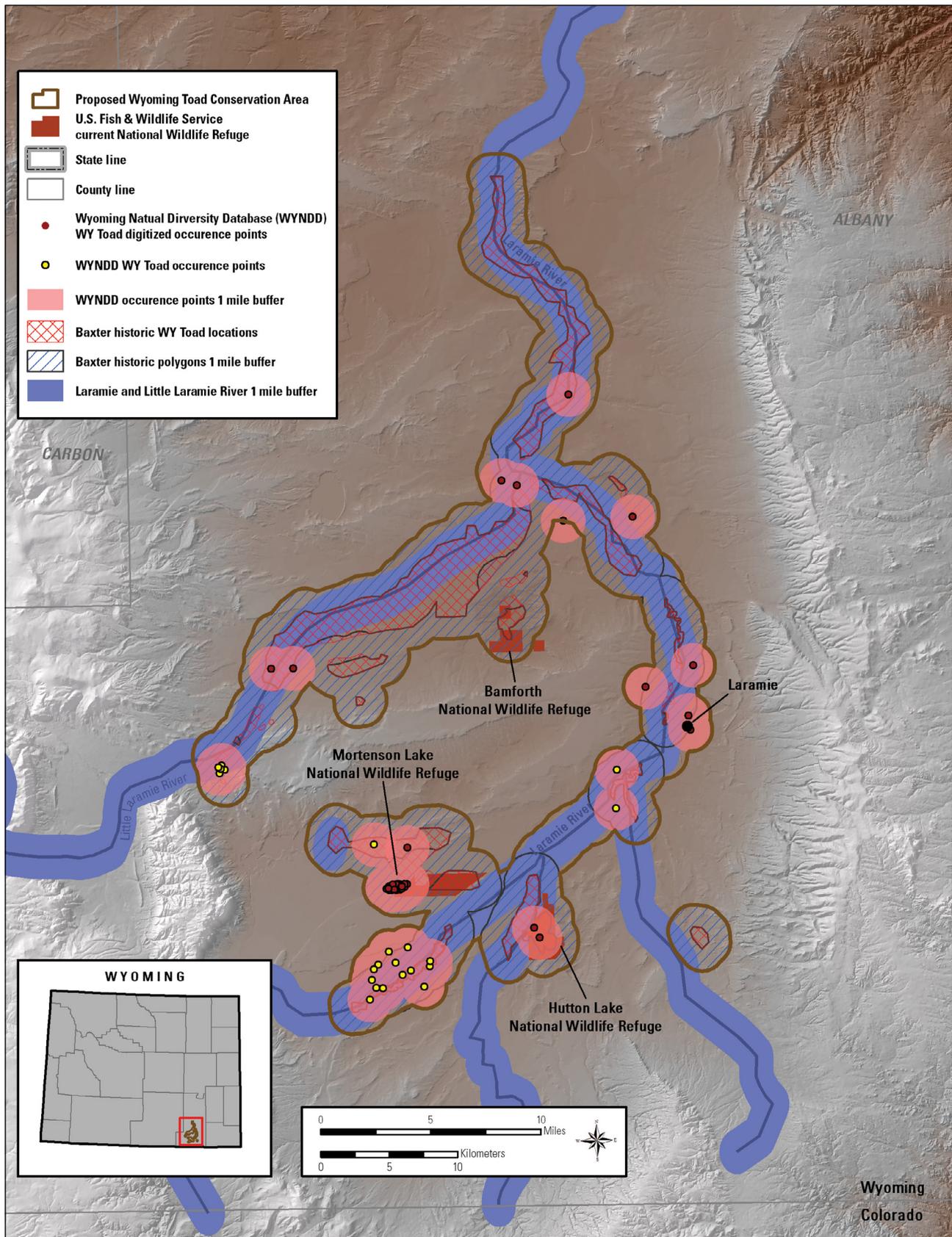


Figure LPP-4. Wyoming toad predicted habitat and historical range based on Dr. George Baxter and Ronald E. Beiswenger’s paper maps displaying locations and field notes digitized by the Service.

Historic Area Polygons, which are the best available source of information, were selected to represent the downstream extent of WTCA project boundary.

These locations, in combination with historical location records and field notes, were used to create a digital map. The second mapping layer is a model produced by the WYNDD based on geo-referenced records of documented field observations that were collected, quality-checked, and compiled into a central database. Each observation record was then attributed with the values of multiple environmental variables such as elevation, mean annual precipitation, and landcover type as measured at the observation site. The measurements for all observation records were then summarized by a multivariate modeling algorithm (Phillips et al. 2006) that predicted the subset of environments out of all of the multivariate environments in the study area that were potentially occupied by the Wyoming toad. The model presented here is the spatial expressions of those models; that is, it shows all environments similar to the environments at points of known occurrence. This gives the predicted distribution based on the current known toad distribution. Because this model is based on the current distribution, there are limitations in the range of values for the model predicting the probability of occurrence. The predicted areas with a medium and high probability of occurrence are represented in figure LPP-4 along with the results from the Wyoming Gap Analysis (Merrill 1996) for the Wyoming toad.

## Priority Categories

The proposed WTCA has been classified into conservation priority categories based on the expected importance of habitat in providing for the recovery of the Wyoming toad using modeling results from WYNDD data and historical Wyoming toad habitat (see figure LPP-5).

- **High Conservation Rank—First Priority Area:** The area of highest priority includes any area that falls within the Baxter Polygons (without a buffer) and each point of occurrence (buffered to 800 meters). Individual observation points were buffered by 800 meters, which is the limit of precision error determined by WYNDD. These areas could provide the year-round habitat required by toads including lentic and lotic wetlands, as well as upland areas used for hibernation.
- **Medium Conservation Rank—Second Priority Area:** The area of second-highest priority includes key wetland and riparian habitat and associated uplands, identified as predicted habitat for the Wyoming toad by WYNDD's Model for the Assessment of Wildlife Vulnerability to Energy Development (AWVED) which was developed by WYNDD for terrestrial vertebrate Species of Conservation Need, as identified in Wyoming Game and Fish Department's State Wildlife Action Plan (WGFD 2010). This area has been identified as having a medium to high "probability of occurrence" according to the AWVED.

The remaining habitats within the Area of Interest Boundary are included to ease the delineation of the Area of Interest. The remaining areas may also include habitats associated with other Federal trust species. The historic habitat requirements of the toad in and around river floodplains are poorly understood today. As specific knowledge about the toad's life history, impacts of climate change, and disease management increases, prioritization of habitat conservation areas within the WTCA will change.

## 4.9 Integrated Conservation Delivery

Staff members from Arapaho Refuge Complex and the Ecological Services Office in Cheyenne have worked with a wide variety of agencies, nongovernmental organizations, and private landowners on wildlife conservation issues and opportunities. Partners for Fish and Wildlife biologists have worked with landowners on habitat restoration projects and in developing partnerships that provide the foundation for a successful easement program. The ongoing involvement of the Partners for Fish and Wildlife program as well as the many partner organizations and agencies will be essential for the effective delivery of a sustainable conservation program. Application of the strategic habitat conservation framework will build on existing partnerships while also supporting the development of new partnerships for conserving habitats throughout the Laramie Plains. The proposed WTCA would serve as a model for engagement in that it would work with landowners, nongovernmental organizations, State agencies, and Federal agencies.

## Landscape Prioritization

The land protection priorities map (figure LPP-5) is useful for deciding where in the landscape the key habitats are for the Wyoming toad. This map informs decision makers about which areas would provide the most effective conservation returns overall. Besides the presence or absence of habitat for the Wyoming toad, it is important to take into account issues such as connectivity, cost, and unequal conservation need.

## Evaluation of Easement and Fee-title Potential

The relative importance of any potential easement or fee-title purchase will be decided by the amount and quality of Wyoming toad habitat on the parcel. The prioritization modeling and ranking criteria described above will be used by Service staff and realty specialists to objectively evaluate and prioritize individual tracts of land.

### 4.10 Monitoring Adaptive Management and Research

Strategic habitat conservation requires an effective monitoring program to make sure that conservation efforts are resulting in net positive benefit for the Wyoming toad. The land protection prioritization map (figure LPP-5) is primarily a guide for effective fee-title and easement acquisition from interested landowners. Population monitoring will help to guarantee the efficacy of the program; if populations of Wyoming toad continue to decline within the project area, then further literature review, targeted research, or both can be applied to adjust conservation planning for the WTCA. As understanding of the functional relationships between the priority species and habitat increases, the Service would adapt its land acquisition strategies to better meet the needs of the Wyoming toad. Some of the monitoring phase of strategic habitat conservation can be carried out by Refuge staff with help from the Service Inventory and Monitoring Initiative, as well as the Ecological Services Office in Cheyenne, Wyoming. However, it is important to recognize that similar monitoring will be carried out by partner agencies, and communication among these agencies is crucial for effective monitoring in the face of limited staff and financial

resources. Furthermore, Service staff should work with regional academic institutions to facilitate basic and applied research while addressing research gaps. Specifically, monitoring and research should include:

- developing, improving, and assessing models for the Wyoming toad. Existing models have a great degree of uncertainty regarding limiting factors. Data from continuing surveys will be evaluated and incorporated into spatial models. Further data will be collected to evaluate assumptions used in the modeling process and assessments will be adjusted accordingly. These methods will provide an estimate of the population response of the Wyoming toad on project and non-project lands;
- evaluating assumptions and addressing uncertainties found through the biological planning, conservation design, and conservation delivery elements of strategic habitat conservation will be conducted by the Service in cooperation with partners such as nongovernmental organizations and universities;
- assessing the contribution of land protection toward meeting the Wyoming toad population recovery goals. This will allow the Service and conservation partners to evaluate the contribution of the WTCA to meeting population goals and refine conservation delivery to guarantee maximum effectiveness;
- determining how changing environmental conditions may influence the effectiveness of this conservation design as increased evaporation, socially and economically driven changes in water use, and evolution of the type and timing of precipitation and runoff influence the hydrology of the WTCA.

### 4.11 Socioeconomic Considerations

Please see the discussion of socioeconomic considerations in section 3.4 of the draft EA in this volume.

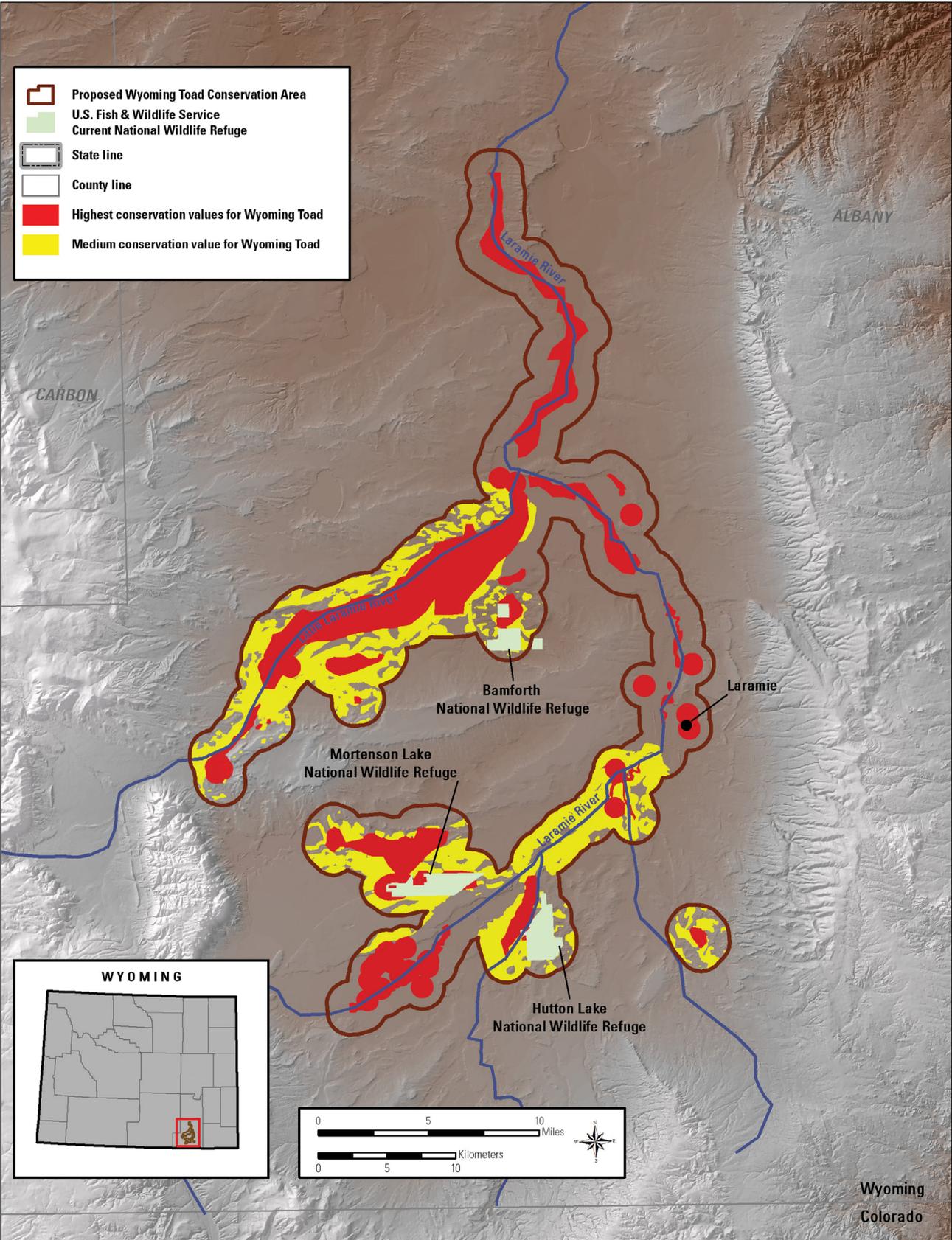


Figure LPP-5. Land protection priorities within the boundary of the proposed Wyoming Toad Conservation Area, Wyoming.

## 4.12 Public Involvement and Coordination

Public scoping meetings are to be held in Laramie, Wyoming, in fall 2014 to discuss the draft EA and LPP for this project.

## 4.13 Distribution and Availability

Copies of the draft EA and LPP were sent to Federal and State legislative delegations, tribes, agen-

cies, landowners, private groups, and other interested individuals. Copies of the document are available from the following offices and contacts:

Arapaho National Wildlife Refuge Complex  
953 County Road 32  
Walden, CO 80480  
970 / 723 8202

U.S. Fish and Wildlife Service  
Region 6, Division of Refuge Planning  
Branch of Land Protection Planning  
P.O. Box 25486–DFC  
Denver, CO 80225  
303 / 236 4345  
303 / 236 4792 fax  
[www.fws.gov/mountain-prairie/planning/lpp/wy/html\\_mrl/html\\_mrl.html](http://www.fws.gov/mountain-prairie/planning/lpp/wy/html_mrl/html_mrl.html)

# Glossary

**alternative**—A reasonable way to solve a problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (The Fish and Wildlife Service Manual, 602 FW 1.5).

**amphibian**—A class of cold-blooded vertebrates, including frogs, toads, and salamanders.

**biological diversity, also biodiversity**—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (The Fish and Wildlife Service Manual, 052 FW 1.12B). The National Wildlife Refuge System's focus is on indigenous species, biotic communities, and ecological processes.

**cervid**—All members of the family Cervidae and hybrids, including deer, elk, moose, caribou, reindeer, and related species.

**comprehensive conservation plan**—A document that describes the desired future conditions of the refuge and guides long-range management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (The Fish and Wildlife Service Manual, 602 FW 1.5).

**conservation easement**—A legally enforceable encumbrance or transfer of property rights to a government agency or land trust for the purposes of conservation. Rights transferred could include discretion to subdivide or develop land, to change current land use practices, and to sever water rights, or other rights, and are specified by a contract between the landowner and the conservation entity.

**cultural resources**—The remains of sites, structures, or objects used by people in the past.

**ecological resiliency**—The ability to absorb disturbances, to be changed, and then to reorganize and still have the same identity, that is, keep the same basic structure and ways of functioning. A resilient system is forgiving of external shocks; a disturbance is unlikely to affect the whole. A resilient habitat (1) sustains many species of plants and animals and a highly variable structural composition; (2) is asymmetric; (3) exempli-

fies biological integrity, biological diversity, and environmental health; and (4) adapts to climate

**ecosystem**—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries, and their sizes and ecological complexity vary.

**endangered species**—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant part of its range.

**Endangered Species Act**—A U.S. law passed by Congress in 1973 with the purpose of protecting and recovering imperiled species and the ecosystems on which they depend.

**endemic species**—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited.

**environmental assessment (EA)**—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose of and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**extinction**—The complete disappearance of a species from the earth; no longer existing.

**Federal trust species**—All species for which the Federal Government has primary jurisdiction, including species Federally listed as endangered or threatened, migratory birds, anadromous fish, and certain marine mammals.

**fragmentation**—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

**focal species**—A single species that is used as a representative of many species which occupy a simi-

lar habitat and which are vulnerable to similar threats.

**habitat**—Suite of existing environmental conditions needed by an organism for survival and reproduction; the place where an organism typically lives and grows.

**inholding**—Non-Service land owned by private parties, other agencies, or other groups that is within the executive boundary of a National Wildlife Refuge.

**invasive plant**—A species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.

**land protection plan (LPP)**—A document needed by USFWS policy before the establishment of new units of the National Wildlife Refuge System, or major expansions of existing units.

**landscape conservation cooperative (LCC)**—A public-private partnership intended to facilitate cross-political boundary conservation in the face of a changing environment through application of science.

**migration**—Regular extensive, seasonal movements of animals between their breeding regions and their wintering regions; to travel from one region or climate to another for feeding, breeding, or wintering.

**migratory birds**—Birds that follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

**mission**—Succinct statement of purpose or reason for being.

**mitigation**—Measure designed to counteract an environmental impact or to make an impact less severe.

**monitoring**—The process of collecting information to track changes of selected parameters over time.  
**national wildlife refuge**—A designated area of land or water, or an interest in land or water within the National Wildlife Refuge System, but not including coordination areas; a complete listing of all units of the Refuge System is in the current Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.

**National Wildlife Refuge System (Refuge System)**—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; and wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

**National Wildlife Refuge System Improvement Act of 1997**—Sets the mission and the administrative policy for all refuges in the Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and fitness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining appropriateness, fitness, and compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a comprehensive conservation plan for each refuge by the year 2012. This act amended parts of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**nongovernmental organization**—Any group that is not made up of Federal, State, tribal, county, city, town, local, or other governmental entities.

**objective**—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work, derived from goals and providing the basis for selecting management strategies. Objectives should be able to be achieved and time specific and should be stated quantitatively to the extent possible. If objectives cannot be stated quantitatively, they may be stated qualitatively (The Fish and Wildlife Service Manual, 602 FW 1.5).

**proposed action**—The alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management).

**public**—Individuals, organizations, and groups; officials of Federal, State, and local government agencies; Native American tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have shown an interest in Service issues and those who do or do not realize that Service decisions may affect them.

**public involvement**—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

**purpose of the refuge**—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memoran-

dum establishing authorization or expanding a refuge, a refuge unit, or a refuge subunit (The Fish and Wildlife Service Manual, 602 FW 1.5).

**raptor**—A carnivorous bird such as a hawk, a falcon, or a vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).

**Region 6**—An administrative unit of the Service known as the Mountain-Prairie Region, which covers eight States: Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming

**restoration**—Management emphasis designed to move ecosystems to desired conditions and processes, such as healthy upland habitats and aquatic systems.

**Service**—United States Fish and Wildlife Service

**shorebird**—Any of a suborder (Charadrii) of birds which includes plovers and sandpipers.

**strategic habitat conservation**—An iterative adaptive management framework designed to make sure

that decision making and management within the Service is science-based. Consists of four stages: biological planning, conservation design, delivery of conservation action, and monitoring and research.

**threatened species**—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant part of their range.

**vision statement**—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (The Fish and Wildlife Service Manual, 602 FW 1.5).

**waterfowl**—A category of birds that consists of ducks, geese, and swans.

**watershed**—The region draining into a river, a river system, or a body of water.



# Appendix A

## *List of Preparers and Contributors*

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<i>Contributor's name</i>	<i>Project leader</i>	<i>Work unit</i>
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# Appendix B

## Letter of Support



**COUNTY OF ALBANY**  
525 GRAND AVE ROOM 105 · LARAMIE, WYOMING 82070  
(307) 721-2541 · FAX (307) 721-2544  
COMMISSIONERS@CO.ALBANY.WY.US

November 15, 2011

Ms. Ann Timberman, Refuge Manager  
Arapaho NWR Complex  
PO Box 457  
953 Jackson County Road #32  
Walden, CO 80480-0457

Dear Ann:

As the Albany County Commissioners, we are responding to the recent conversation regarding the development of a conservation project (Expansion of Mortenson Lake-Hutton Lake NWRs) in Albany County, Wyoming. The purpose of this project is to conserve lands for wildlife and open space, as well as keep land for agriculture use.

Working cooperatively, on a willing-buyer/willing-seller basis, primarily on conservation easements, will help preserve the open spaces in our County, as well as keep lands in agriculture and on the tax rolls. Selected, limited fee title acquisition will also help conserve wildlife and help meet recovery objectives for the endangered Wyoming toad. De-listing any species demonstrates healthy lands and waters as well as removing the onus of the Endangered Species Act on private landowners. We support these efforts with the caveat that all transactions are willing sellers. We also encourage the Service to explore ways to interact with other partners (i.e. WYSGALT; TNC; Audubon; Laramie Rivers Conservation District; etc.) working on conservation efforts in Albany County.

Due to increased development pressures in Albany County and a desire on the part of the County Commissioners to support the protection of open space, as well as support private landowners in personal decisions, we support pursuing this project.

If you have any questions/concerns, please feel free to contact me.

Sincerely,

Handwritten signature of Tim Sullivan in blue ink.

Tim Sullivan  
Commissioner Chair

Handwritten signature of Tim Chesnut in blue ink.

Tim Chesnut  
Commissioner

Handwritten signature of Jerry M. Kennedy in blue ink.

Jerry M. Kennedy  
Commissioner

TIM CHESNUT  
COMMISSIONER

TIM SULLIVAN  
COMMISSIONER CHAIRMAN

JERRY M. KENNEDY  
COMMISSIONER



# Appendix C

## Species Lists

The following species have been documented, or potentially occur, within the proposed Wyoming Toad Conservation Area.

### C.1 List of Plant Species

These are the plant species found within the proposed Wyoming Toad Conservation Area.

<i>Scientific name</i>	<i>Common name</i>
<b>AMARANTHACEAE</b>	<b>PIGWEED FAMILY</b>
<i>Atriplex gardneri</i>	Gardner's saltbush
<i>Atriplex micrantha</i>	Two-scale saltbush
<i>Kochia scoparia</i>	Fireweed
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Salicornia rubra</i>	Red swampfire
<i>Salsola australis</i>	Common Russian thistle
<i>Salsola collina</i>	Slender Russian thistle
<i>Salsola kali</i>	Prickly Russian thistle
<i>Suaeda calceoliformis</i>	Pursh seepweed
<i>Suaeda nigra</i>	Bush seepweed
<b>AMARYLLIDACEAE</b>	<b>AMARYLLIS FAMILY</b>
<i>Allium textile</i>	Textile onion
<b>APIACEAE</b>	<b>PARSLEY FAMILY</b>
<i>Cicuta douglasii</i>	Western water hemlock
<i>Lomatium orientale</i>	Northern Idaho biscuitroot
<i>Musineon divaricatum</i>	Leafy wildparsley
<i>Sium suave</i>	Hemlock waterparsnip
<i>Asclepiadaceae</i>	Milkweed family
<i>Asclepias hallii</i>	Hall's milkweed
<i>Asclepias speciosa</i>	Showy milkweed
<b>ASPARAGACEAE</b>	<b>ASPARAGUS FAMILY</b>
<i>Yucca glauca</i>	Soapweed yucca
<b>ASTERACEAE</b>	<b>SUNFLOWER FAMILY</b>
<i>Achillea millefolium</i>	Common yarrow
<i>Agoseris glauca</i>	Pale agoseris

<i>Scientific name</i>	<i>Common name</i>
<i>Almutaster pauciflorus</i>	Alkali marsh aster
<i>Antennaria microphylla</i>	Rocky mountain pussytoes
<i>Antennaria rosea</i>	Rosy pussytoes
<i>Artemisia cana</i>	Silver sagebrush
<i>Artemisia frigida</i>	Prairie sagewort
<i>Artemisia ludoviciana</i>	White sagebrush
<i>Artemisia tridentata vaseyana</i>	Mountain big sagebrush
<i>Artemisia tridentata wyomingensis</i>	Wyoming big sagebrush
<i>Carduus nutans</i>	Musk thistle
<i>Chrysothamnus viscidiflorus</i>	Douglas rabbitbrush
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium canescens</i>	Prairie thistle
<i>Conyza canadensis</i>	Canada horseweed
<i>Crepis runcinata</i>	Fiddleleaf hawkbeard
<i>Dieteria bigelovii</i>	Bigelow tansyaster
<i>Dieteria canescens</i>	Hoary tansyaster
<i>Ericameria nauseosa</i>	Rubber rabbitbrush
<i>Erigeron lonchophyllus</i>	Spearleaf fleabane
<i>Erigeron nematophyllus</i>	Needleleaf fleabane
<i>Erigeron pumilus</i>	Shaggy fleabane
<i>Grindelia squarrosa</i>	Curlycup gumweed
<i>Grindelia subalpina</i>	Subalpine gumweed
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Helenium autumnale</i>	Mountain sneezeweed
<i>Helianthus nuttallii</i>	Nuttall's sunflower
<i>Heterotheca subaxillaris</i>	Camphorweed
<i>Heterotheca villosa</i>	Hairy false goldaster
<i>Iva axillaris</i>	Povertyweed
<i>Lygodesmia juncea</i>	Rush skeletonplant
<i>Packera pauciflora</i>	Alpine groundsel
<i>Pyrrcoma lanceolata</i>	Lanceleaf goldenweed
<i>Senecio hydrophiloides</i>	Tall groundsel
<i>Senecio spartioides</i>	Broom groundsel
<i>Senecio integerrimus</i>	Lambstongue ragwort
<i>Sonchus arvensis</i>	Field sowthistle
<i>Sonchus palustris</i>	Marsh sowthistle

<i>Scientific name</i>	<i>Common name</i>
<i>Stenotus armerioides</i>	Thrift mock goldenweed
<i>Symphotrichum ascendens</i>	Western aster
<i>Symphotrichum falcatum</i>	White prairie aster
<i>Taraxacum officinale</i>	Common dandelion
<i>Tetradymia canescens</i>	Spineless horsebrush
<i>Tetranervis acaulis</i>	Stemless four-nerve daisy
<i>Townsendia hookeri</i>	Hooker's townsend daisy
<i>Tragopogon dubius</i>	Yellow salsify
<i>Xanthisma spinulosum</i>	Lacy tansyaster
<i>Xylorhiza glabriuscula</i>	Smooth woodyaster
BORAGINACEAE	BORAGE FAMILY
<i>Cryptantha thyrsoflora</i>	Calcareous cryptantha
<i>Cryptantha virgata</i>	Miner's candle
<i>Heliotropium curassavicum</i>	Seaside heliotrope
<i>Lappula occidentalis</i>	Flatspine stickseed
<i>Lappula squarrosa</i>	European stickseed
<i>Lithospermum incisum</i>	Narrowleaf stoneseed
BRASSICACEAE	MUSTARD FAMILY
<i>Alyssum desertorum</i>	Desert madwort
<i>Boechera retrofracta</i>	Second rockcress
<i>Camelina microcarpa</i>	Littlepod false flax
<i>Chorispora tenella</i>	Crossflower
<i>Descurainia pinnata</i>	Western tansymustard
<i>Descurainia sophia</i>	Flaxweed tansymustard
<i>Erysimum asperum</i>	Western wallflower
<i>Erysimum capitatum</i>	Sand dune wallflower
<i>Erysimum inconspicuum</i>	Shy wallflower
<i>Erysimum repandum</i>	Spreading wallflower
<i>Lepidium alyssoides</i>	Mesa pepperwort
<i>Lepidium appelianum</i>	Hairy whitetop
<i>Lepidium densiflorum</i>	Common pepperweed
<i>Lepidium montanum</i>	Mountain pepperweed
<i>Lepidium perfoliatum</i>	Clasping pepperweed
<i>Physaria ludoviciana</i>	Foothill bladderpod
<i>Physaria montana</i>	Mountain bladderpod
<i>Rorippa sinuata</i>	Spreading yellowcress
<i>Sisymbrium linifolium</i>	Flaxleaf plainsmustard
<i>Thelypodium integrifolium</i>	Entireleaved thelypody
<i>Thlaspi arvense</i>	Field pennycress
CACTACEAE	CACTUS FAMILY
<i>Escobaria vivipara</i>	Spinystar
<i>Opuntia polyacantha</i>	Plains pricklypear

<i>Scientific name</i>	<i>Common name</i>
<i>Pediocactus simpsonii</i>	Simpson hedgehog cactus
CARYOPHYLLACEAE	PINK FAMILY
<i>Eremogone hookeri</i>	Hooker's sandwort
<i>Paronychia sessiliflora</i>	Creeping nailwort
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Chenopodium atrovirens</i>	Dark goosefoot
<i>Chenopodium rubrum</i>	Red goosefoot
CLEOMACEAE	CLEOME FAMILY
<i>Peritoma serrulata</i>	Rocky Mountain beeplant
CYPERACEAE	SEDGE FAMILY
<i>Amphiscirpus nevadensis</i>	Nevada bulrush
<i>Bolboschoenus maritimus</i>	Cosmopolitan bulrush
<i>Carex duriuscula</i>	Needleleaf sedge
<i>Carex nebrascensis</i>	Nebraska sedge
<i>Carex praegracilis</i>	Clustered field sedge
<i>Eleocharis fallax</i>	Creeping spikerush
<i>Eleocharis macrostachya</i>	Pale spikerush
<i>Schoenoplectus americanus</i>	American bulrush
<i>Schoenoplectus lacustris</i>	Lakeshore bulrush
<i>Schoenoplectus pungens</i>	Common threesquare
<i>Schoenoplectus tabernaemontani</i>	Softstem bulrush
EQUISETACEAE	HORESETAIL FAMILY
<i>Equisetum laevigatum</i>	Smooth horsetail
FABACEAE	PEA FAMILY
<i>Astragalus agrestis</i>	Purple milkvetch
<i>Astragalus bisulcatus</i>	Two-grooved milkvetch
<i>Astragalus bodinii</i>	Bodin's milkvetch
<i>Astragalus crassicaarpus</i>	Groundplum milkvetch
<i>Astragalus missouriensis</i>	Missouri milkvetch
<i>Astragalus pectinatus</i>	Narrowleaf milkvetch
<i>Astragalus spatulatus</i>	Tufted milkvetch
<i>Astragalus tridactylicus</i>	Foothill milkvetch
<i>Glycyrrhiza lepidota</i>	American licorice
<i>Melilotus albus</i>	White sweetclover
<i>Melilotus officinalis</i>	Yellow sweetclover
<i>Oxytropis deflexa</i>	Nodding locoweed
<i>Trifolium hybridum</i>	Alsike clover
<i>Trifolium repens</i>	White clover
GENTIANACEAE	GENTIAN FAMILY
<i>Gentianella amarella</i>	Autumn dwarf gentian
<i>Lomatogonium rotatum</i>	Marsh felwort
GROSSULARIACEAE	GOOSEBERRY FAMILY
<i>Ribes aureum</i>	Golden currant

<i>Scientific name</i>	<i>Common name</i>
IRDACEAE	IRIS FAMILY
<i>Iris missouriensis</i>	Rocky mountain iris
<i>Sisyrinchium implicatum</i>	Blue-eyed grass
<i>Sisyrinchium pallidum</i>	Pale blue-eyed grass
JUNCACEAE	RUSH FAMILY
<i>Juncus arcticus</i>	Arctic rush
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus compressus</i>	Roundfruit rush
<i>Juncus longistylis</i>	Longstyle rush
<i>Juncus nevadensis</i>	Sierra rush
<i>Juncus nodosus</i>	Knotted rush
<i>Juncus torreyi</i>	Torrey rush
JUNCAGINACEAE	ARROWGRASS FAMILY
<i>Triglochin maritima</i>	Common bog arrowgrass
<i>Triglochin palustris</i>	Marsh arrowgrass
LAMIACEAE	MINT FAMILY
<i>Mentha arvensis</i>	Wild mint
<i>Scutellaria galericulata</i>	Marsh skullcap
LINACEAE	FLAX FAMILY
<i>Linum lewisii</i>	Prairie flax
MALVACEAE	MALLOW FAMILY
<i>Sphaeralcea coccinea</i>	Scarlet globemallow
MELANTHIACEAE	FALSE HELLEBORE FAMILY
<i>Toxicoscordion venenosum</i>	Meadow deathcamas
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
<i>Mirabilis linearis</i>	Narrowleaf four o'clock
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Epilobium ciliatum</i>	Fringed willowherb
<i>Epilobium palustre</i>	Marsh willowherb
<i>Gaura coccinea</i>	Scarlet beeblossom
<i>Oenothera coronopifolia</i>	Crownleaf evening primrose
ORCHIDACEAE	ORCHID FAMILY
<i>Platanthera hyperborea</i>	Northern bogorchid
OROBANCHACEAE	BROOMRAPE FAMILY
<i>Orobanche fasciculata</i>	Clustered broomrape
<i>Orobanche ludoviciana</i>	Louisiana broomrape
<i>Orthocarpus luteus</i>	Yellow owl's-clover
<i>Pedicularis crenulata</i>	Meadow lousewort
PHRYMACEAE	PHRYMAS FAMILY
<i>Mimulus glabratus</i>	Roundleaf monkeyflower
<i>Mimulus guttatus</i>	Common monkeyflower
PLANTAGINACEAE	PLANTAIN FAMILY

<i>Scientific name</i>	<i>Common name</i>
<i>Hippuris vulgaris</i>	Common mare's tail
<i>Penstemon angustifolius</i>	Broadbeard beardtongue
<i>Penstemon laricifolius</i>	Larchleaf beardtongue
<i>Plantago eriopoda</i>	Redwood plantain
POACEAE	GRASS FAMILY
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Agropyron cristatum</i>	Crested wheatgrass
<i>Agropyron desertorum</i>	Desert wheatgrass
<i>Agrostis stolonifera</i>	Creeping bentgrass
<i>Alopecurus arundinaceus</i>	Creeping meadow foxtail
<i>Bouteloua gracilis</i>	Blue grama
<i>Bromus tectorum</i>	Cheatgrass
<i>Calamagrostis stricta</i>	Narrowspike reedgrass
<i>Deschampsia caespitosa</i>	Tufted hairgrass
<i>Distichlis spicata</i>	Saltgrass
<i>Elymus elymoides</i>	Squirreltail
<i>Elymus macrourus</i>	Thickspike wheatgrass
<i>Elymus trachycaulus</i>	Slender wheatgrass
<i>Hesperostipa comata</i>	Needle and thread
<i>Hordeum jubatum</i>	Foxtail barley
<i>Koeleria macrantha</i>	Prairie junegrass
<i>Leymus cinereus</i>	Basin wildrye
<i>Leymus simplex</i>	Alkali wildrye
<i>Muhlenbergia filiformis</i>	Pullup muhly
<i>Pascopyrum smithii</i>	Western wheatgrass
<i>Phleum pratense</i>	Common timothy
<i>Poa cusickii</i>	Cusick's bluegrass
<i>Poa fendleriana</i>	Muttongrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Poa secunda</i>	Sandberg bluegrass
<i>Poa trivialis</i>	Rough bluegrass
<i>Psathyrostachys juncea</i>	Russian wildrye
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass
<i>Puccinellia nuttalliana</i>	Nuttall's alkaligrass
<i>Sporobolus airoides</i>	Alkali sacaton
<i>Sporobolus cryptandrus</i>	Sand dropseed
POLEMONIACEAE	PHLOX FAMILY
<i>Ipomopsis spicata</i>	Spiked ipomopsis
<i>Leptodactylon pungens</i>	Granite prickly phlox
<i>Phlox hoodii</i>	Hood's phlox
POLYGONACEAE	KNOTWEED FAMILY
<i>Eriogonum brevicaulis</i>	Shortstem buckwheat
<i>Eriogonum effusum</i>	Spreading buckwheat
<i>Eriogonum flavum</i>	Alpine golden buckwheat

<i>Scientific name</i>	<i>Common name</i>
<i>Eriogonum ovalifolium</i>	Cushion buckwheat
<i>Eriogonum umbellatum</i>	Sulphur flower buckwheat
<i>Polygonum aviculare</i>	Prostrate knotweed
<i>Polygonum ramosissimum</i>	Bushy knotweed
<i>Rumex crispus</i>	Curly dock
<i>Rumex hymenosepalus</i>	Canaigre dock
<i>Rumex maritimus</i>	Golden dock
<i>Rumex triangulivalvis</i>	White willow dock
POTAMOGETONACEAE	PONDWEED FAMILY
<i>Stuckenia filiformis</i>	Fineleaf pondweed
<i>Stuckenia pectinata</i>	Sago pondweed
PRIMULACEAE	PRIMROSE FAMILY
<i>Glaux maritima</i>	Sea milkwort
<i>Primula incana</i>	Silvery primrose
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Delphinium geyeri</i>	Geyer's larkspur
<i>Ranunculus cymbalaria</i>	Alkali buttercup
ROSACEAE	ROSE FAMILY
<i>Amelanchier utahensis</i>	Utah serviceberry
<i>Argentina anserina</i>	Silverweed cinquefoil
<i>Potentilla bipinnatifida</i>	Tansy cinquefoil
<i>Potentilla pensylvanica</i>	Pennsylvania cinquefoil
<i>Potentilla plattensis</i>	Platte cinquefoil
<i>Rosa woodsii</i>	Wood's rose
SALICACEAE	WILLOW FAMILY
<i>Populus angustifolia</i>	Narrowleaf cottonwood
<i>Populus tremuloides</i>	Quaking aspen
<i>Salix planifolia</i>	Plainleaf willow
SANTALACEAE	SANDALWOOD FAMILY
<i>Comandra umbellata</i>	Bastard toadflax
SARCOBATAEAE	GREASEWOOD FAMILY
<i>Sarcobatus vermiculatus</i>	Greasewood
SAXIFRAGACEAE	SAXIFRAGE FAMILY
<i>Parnassia palustris</i>	Marsh grass of Parnassus
TAMARICACEAE	TAMARISK FAMILY
<i>Tamarix ramosissima</i>	Saltcedar
VALERIANACEAE	VALERIAN FAMILY
<i>Valeriana edulis</i>	Tobacco root
VIOLACEAE	VIOLET FAMILY
<i>Viola nuttallii</i>	Nuttall violet

## C.2 List of Bird Species

These are the bird species found within the proposed Wyoming Toad Conservation Area.

<i>Scientific name</i>	<i>Common name</i>
GEESE, DUCKS, and SWANS	
<i>Chen caerulescens</i>	Snow goose
<i>Branta canadensis</i>	Canada goose
<i>Cygnus columbianus</i>	Tundra swan
<i>Aix sponsa</i>	Wood duck
<i>Anas strepera</i>	Gadwall
<i>Anas americana</i>	American wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas discors</i>	Blue-winged teal
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas clypeata</i>	Northern shoveler
<i>Anas acuta</i>	Northern pintail
<i>Anas carolinensis</i>	Green-winged teal
<i>Aythya valisineria</i>	Canvasback
<i>Aythya americana</i>	Redhead
<i>Aythya collaris</i>	Ring-necked duck
<i>Aythya marila</i>	Greater scaup
<i>Aythya affinis</i>	Lesser scaup
<i>Melanitta perspicillata</i>	Surf scoter
<i>Melanitta deglandi</i>	White-winged scoter
<i>Bucephala albeola</i>	Bufflehead
<i>Bucephala clangula</i>	Common goldeneye
<i>Bucephala islandica</i>	Barrow's goldeneye
<i>Lophodytes cucullatus</i>	Hooded merganser
<i>Mergus merganser</i>	Common merganser
<i>Mergus serrator</i>	Red-breasted merganser
<i>Oxyura jamaicensis</i>	Ruddy duck
LOONS	
<i>Gavia immer</i>	Common loon
GREBES	
<i>Podilymbus podiceps</i>	Pied-billed grebe
<i>Podiceps auritus</i>	Horned grebe
<i>Podiceps grisegena</i>	Red-necked grebe
<i>Podiceps nigricollis</i>	Eared grebe
<i>Aechmophorus occidentalis</i>	Western grebe
<i>Aechmophorus clarkii</i>	Clark's grebe
PELICANS	
<i>Pelecanus erythrorhynchos</i>	American white pelican

<i>Scientific name</i>	<i>Common name</i>
CORMORANTS	
<i>Phalacrocorax auritus</i>	Double-crested cormorant
BITTERNS, HERONS, and EGRETS	
<i>Botaurus lentiginosus</i>	American bittern
<i>Ardea herodias</i>	Great blue heron
<i>Egretta thula</i>	Snowy egret
<i>Bubulcus ibis</i>	Cattle egret
<i>Nycticorax nycticorax</i>	Black-crowned night-heron
IBISES	
<i>Plegadis chihi</i>	White-faced ibis
NEW WORLD VULTURES	
<i>Cathartes aura</i>	Turkey vulture
HAWKS, KITES, and EAGLES	
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Circus cyaneus</i>	Northern harrier
<i>Accipiter striatus</i>	Sharp-shinned hawk
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Accipiter gentilis</i>	Northern goshawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo regalis</i>	Ferruginous hawk
<i>Buteo lagopus</i>	Rough-legged hawk
<i>Aquila chrysaetos</i>	Golden eagle
FALCONS	
<i>Falco sparverius</i>	American kestrel
<i>Falco columbarius</i>	Merlin
<i>Falco peregrinus</i>	Peregrine falcon
<i>Falco mexicanus</i>	Prairie falcon
RAILS, GALLINULES, and COOTS	
<i>Rallus limicola</i>	Virginia rail
<i>Porzana carolina</i>	Sora
<i>Fulica americana</i>	American coot
CRANES	
<i>Grus canadensis</i>	Sandhill crane
PLOVERS	
<i>Charadrius semipalmatus</i>	Semipalmated plover
<i>Charadrius vociferus</i>	Killdeer
<i>Charadrius montanus</i>	Mountain plover
STILTS and AVOCETS	
<i>Himantopus mexicanus</i>	Black-necked stilt
<i>Recurvirostra americana</i>	American avocet
SANDPIPERS and PHALAROPES	
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa flavipes</i>	Lesser yellowlegs

<i>Scientific name</i>	<i>Common name</i>
<i>Tringa solitaria</i>	Solitary sandpiper
<i>Tringa semipalmata</i>	Willet
<i>Actitis macularia</i>	Spotted sandpiper
<i>Numenius phaeopus</i>	Whimbrel
<i>Numenius americanus</i>	Long-billed curlew
<i>Limosa fedoa</i>	Marbled godwit
<i>Calidris alba</i>	Sanderling
<i>Calidris pusilla</i>	Semipalmated sandpiper
<i>Calidris mauri</i>	Western sandpiper
<i>Calidris minutilla</i>	Least sandpiper
<i>Calidris bairdii</i>	Baird's sandpiper
<i>Calidris melanotos</i>	Pectoral sandpiper
<i>Calidris alpina</i>	Dunlin
<i>Calidris himantopus</i>	Stilt sandpiper
<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
<i>Gallinago delicata</i>	Wilson's snipe
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>Phalaropus lobatus</i>	Red-necked phalarope
GULLS and TERNS	
<i>Larus pipixcan</i>	Franklin's gull
<i>Larus philadelphia</i>	Bonaparte's gull
<i>Larus delawarensis</i>	Ring-billed gull
<i>Larus californicus</i>	California gull
<i>Larus argentatus</i>	Herring gull
<i>Hydroprogne caspia</i>	Caspian tern
<i>Sterna hirundo</i>	Common tern
<i>Sterna forsteri</i>	Forster's tern
<i>Chlidonias niger</i>	Black tern
PIGEONS and DOVES	
<i>Columba livia</i>	Rock pigeon
<i>Zenaida macroura</i>	Mourning dove
CUCKOOS	
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo
TYPICAL OWLS	
<i>Bubo virginianus</i>	Great horned owl
<i>Bubo scandiacus</i>	Snowy owl
<i>Athene cunicularia</i>	Burrowing owl
<i>Asio otus</i>	Long-eared owl
<i>Asio flammeus</i>	Short-eared owl
NIGHTHAWKS and NIGHTJARS	
<i>Chordeiles minor</i>	Common nighthawk
<i>Phalaenoptilus nuttallii</i>	Common poorwill
HUMMINGBIRDS	

<i>Scientific name</i>	<i>Common name</i>
<i>Selasphorus platycercus</i>	Broad-tailed hummingbird
<i>Selasphorus rufus</i>	Rufous hummingbird
KINGFISHERS	
<i>Megasceryle alcyon</i>	Belted kingfisher
WOODPECKERS	
<i>Picoides pubescens</i>	Downy woodpecker
<i>Colaptes auratus</i>	Northern flicker
TYRANT FLYCATCHERS	
<i>Empidonax traillii</i>	Willow flycatcher
<i>Sayornis saya</i>	Say's phoebe
<i>Tyrannus verticalis</i>	Western kingbird
<i>Tyrannus tyrannus</i>	Eastern kingbird
SHRIKES	
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Lanius excubitor</i>	Northern shrike
CROWS, JAYS, and MAGPIES	
<i>Pica hudsonia</i>	Black-billed magpie
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven
LARKS	
<i>Eremophila alpestris</i>	Horned lark
SWALLOWS	
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Riparia riparia</i>	Bank swallow
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Hirundo rustica</i>	Barn swallow
CHICKADEES and TITMICE	
<i>Poecile atricapilla</i>	Black-capped chickadee
<i>Poecile gambeli</i>	Mountain chickadee
NUTHATCHES and CREEPERS	
<i>Sitta canadensis</i>	Red-breasted nuthatch
<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Certhia americana</i>	Brown creeper
WRENS	
<i>Salpinctes obsoletus</i>	Rock wren
<i>Troglodytes aedon</i>	House wren
<i>Cistothorus palustris</i>	Marsh wren
THRUSHES	
<i>Sialia currucoides</i>	Mountain bluebird
<i>Catharus guttatus</i>	Hermit thrush
<i>Turdus migratorius</i>	American robin
MIMIC THRUSHES	

<i>Scientific name</i>	<i>Common name</i>
<i>Dumetella carolinensis</i>	Gray catbird
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Toxostoma rufum</i>	Brown thrasher
STARLINGS	
<i>Sturnus vulgaris</i>	European starling
PIPITS	
<i>Anthus rubescens</i>	American pipit
WAXWINGS	
<i>Bombycilla garrulus</i>	Bohemian waxwing
<i>Bombycilla cedrorum</i>	Cedar waxwing
WOOD WARBLERS	
<i>Dendroica petechia</i>	Yellow warbler
<i>Dendroica coronata</i>	Yellow-rumped warbler
<i>Dendroica nigrescens</i>	Black-throated gray warbler
<i>Oporornis tolmiei</i>	MacGillivray's warbler
<i>Geothlypis trichas</i>	Common yellowthroat
TANAGERS	
<i>Piranga ludoviciana</i>	Western tanager
SPARROWS and TOWHEES	
<i>Pipilo chlorurus</i>	Green-tailed towhee
<i>Pipilo maculatus</i>	Spotted towhee
<i>Spizella arborea</i>	American tree sparrow
<i>Spizella passerina</i>	Chipping sparrow
<i>Spizella pallid</i>	Clay-colored sparrow
<i>Spizella breweri</i>	Brewer's sparrow
<i>Spizella pusilla</i>	Field sparrow
<i>Poocetes gramineus</i>	Vesper sparrow
<i>Chondestes grammacus</i>	Lark sparrow
<i>Amphispiza belli</i>	Sage sparrow
<i>Calamospiza melanocorys</i>	Lark bunting
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Ammodramus savannarum</i>	Grasshopper sparrow
<i>Melospiza melodia</i>	Song sparrow
<i>Melospiza lincolnii</i>	Lincoln's sparrow
<i>Zonotrichia leucophrys</i>	White-crowned sparrow
<i>Calcarius mccownii</i>	McCown's longspur
<i>Calcarius lapponicus</i>	Lapland longspur
<i>Calcarius ornatus</i>	Chestnut-collared longspur
<i>Plectrophenax nivalis</i>	Snow bunting
CARDINALS, GROSBEAKS, and ALLIES	
<i>Spiza americana</i>	Dickcissel
BLACKBIRDS and ORIOLES	

<i>Scientific name</i>	<i>Common name</i>
<i>Dolichonyx oryzivorus</i>	Bobolink
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Sturnella neglecta</i>	Western meadowlark
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Quiscalus quiscula</i>	Common grackle
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Icterus bullockii</i>	Bullock's oriole
FINCHES	
<i>Leucosticte tephrocotis</i>	Gray-crowned rosy finch
<i>Leucosticte atrata</i>	Black rosy finch
<i>Leucosticte australis</i>	Brown-capped rosy finch
<i>Carpodacus mexicanus</i>	House finch
<i>Acanthis flammea</i>	Common redpoll
<i>Spinus pinus</i>	Pine siskin
<i>Carduelis psaltria</i>	Lesser goldfinch
<i>Carduelis tristis</i>	American goldfinch
<i>Coccothraustes vespertinus</i>	Evening grosbeak
OLD WORLD SPARROWS	
<i>Passer domesticus</i>	House sparrow

### C.3 List of Amphibian and Reptile Species

These are the amphibian and reptile species found within the proposed Wyoming Toad Conservation Area.

<i>Scientific name</i>	<i>Common name</i>
<i>Ambystoma tigrinum</i>	Tiger salamander
<i>Anaxyrus baxteri</i>	Wyoming toad
<i>Pseudacris maculata</i>	Boreal chorus frog
<i>Lithobates pipiens</i>	Northern leopard frog
<i>Phrynosoma hernandesi</i>	Short-horned lizard
<i>Pituophis catenifer</i>	Gopher snake
<i>Thamnophis elegans vagrans</i>	Intermountain wandering gartersnake
<i>Crotalus viridis</i>	Prairie rattlesnake

### C.4 List of Mammal Species

These are the mammal species found within the proposed Wyoming Toad Conservation Area.

<i>Scientific name</i>	<i>Common name</i>
ORDER ARTIODACTYLA	HOOVED ANIMALS
<i>Antilocapra americana</i>	Pronghorn
<i>Cervus elaphus</i>	Elk
<i>Odocoileus hemionus</i>	Mule deer
<i>Odocoileus virginianus</i>	White-tailed deer
ORDER CARNIVORA	PREDATORS
<i>Canis latrans</i>	Coyote
<i>Lutra canadensis</i>	River otter
<i>Lynx rufus</i>	Bobcat
<i>Mephitis mephitis</i>	Striped skunk
<i>Mustela frenata</i>	Long-tailed weasel
<i>Mustela nigripes</i>	Black-footed ferret
<i>Mustela vison</i>	Mink
<i>Procyon lotor</i>	Raccoon
<i>Puma concolor</i>	Mountain lion
<i>Taxidea taxus</i>	American badger
<i>Ursus americanus</i>	Black bear
<i>Vulpes velox</i>	Swift fox
<i>Vulpes vulpes</i>	Red fox
ORDER CHIROPTERA	BATS
<i>Eptesicus fuscus</i>	Big brown bat
<i>Myotis ciliolabrum</i>	Western Small-footed myotis
<i>Myotis lucifugus</i>	Little brown bat
ORDER INSECTIVORA	SHREWS and MOLES
<i>Sorex cinereus</i>	Masked shrew
<i>Sorex palustris</i>	Water shrew
ORDER LAGOMORPHA	PIKA, RABBITS, and HARES
<i>Lepus townsendii</i>	White-tailed jack rabbit
<i>Sylvilagus audubonii</i>	Desert cottontail
<i>Sylvilagus floridanus</i>	Eastern cottontail
ORDER RODENTIA	RODENTS
<i>Castor canadensis</i>	Beaver
<i>Cynomys leucurus</i>	White-tailed prairie dog
<i>Dipodomys ordii</i>	Ord's kangaroo rat
<i>Erethizon dorsatum</i>	Porcupine
<i>Lemmiscus curtatus</i>	Sagebrush vole
<i>Microtus longicaudus</i>	Long-tailed vole
<i>Microtus montanus</i>	Montane vole
<i>Microtus ochrogaster</i>	Prairie vole

<i>Scientific name</i>	<i>Common name</i>
<i>Microtus pennsylvanicus</i>	Meadow vole
<i>Ondatra zibethicus</i>	Muskrat
<i>Onychomys leucogaster</i>	Northern grasshopper mouse
<i>Perognathus fasciatus</i>	Olive-backed pocket mouse
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Reithrodontomys montanus</i>	Plains harvest mouse
<i>Spermophilus elegans</i>	Wyoming ground squirrel
<i>Spermophilus tridecemlineatus</i>	Thirteen-lined ground squirrel
<i>Tamias minimus</i>	Least chipmunk
<i>Thomomys talpoides</i>	Northern pocket gopher
<i>Zapus hudsonius preblei</i>	Preble's meadow jumping mouse

## C.5 List of Fish Species

These are the fish species found within the proposed Wyoming Toad Conservation Area.

<i>Scientific name</i>	<i>Common name</i>
<i>Etheostoma exile</i>	Iowa darter
<i>Luxilus cornutus</i>	Common shiner
<i>Nocomis biguttatus</i>	Hornyhead chub
<i>Phenacobius mirabilis</i>	Suckermouth minnow

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