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Columbia Basin Wildlife Area Management Plan

Public Review Draft

Washington Department of FISH and WILDLIFE

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During the course of preparing this plan, long-time wildlife area friend, volunteer, and Advisory Committee member Bill Warner passed away. Bill was a strong advocate for recreational opportunities such as flyfishing and waterfowl hunting, as well as youth hunting programs. He contributed in many ways to the wildlife area, including helping craft what is in this plan. He will be missed.

Cover photo: Banks Lake, Steamboat Rock, by Alan Bauer

Pothole's sunset
Photo by Alan L. Bauer

Columbia Basin Wildlife Area Management Plan

Kelly Susewind, Director, Washington Department of Fish and Wildlife

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Yellow-headed blackbird, Quincy Lakes
Photo Alan L. Bauer

Acronyms

ABA	Architectural Barriers Act
ADA	Americans with Disabilities Act
DNR	Washington State Department of Natural Resources
EIA	Ecological Integrity Assessment
EIM	Ecological Integrity Monitoring
ESA	Endangered Species Act
IPM	Integrated Pest Management
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
RCO	Washington State Recreation and Conservation Office
SEPA	State Environmental Policy Act
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
USBLM	United States Bureau of Land Management
USBR	United States Bureau of Reclamation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WAAC	Wildlife Area Advisory Committee
WDFW	Washington State Department of Fish and Wildlife
WHCW	Washington Wildlife Habitat Connectivity Working Group
WLA	Wildlife Area
WWRP	Washington Wildlife and Recreation Program

Executive Summary

The Columbia Basin Wildlife Area in Central Washington is one of the 33 wildlife areas managed by the Department of Fish and Wildlife (WDFW). The lands lie in the traditional territory of the škwáxčənəx^{w}, or the Moses-Columbia Indians. This unique landscape provides habitat for variety of waterfowl, birds of prey, reptiles, small game, mule deer, and many other species. People are drawn to the area for the exceptional waterfowl hunting, quality mule deer hunting, warmwater fishing, primitive camping, boating, birding, climbing, horseback riding and other outdoor activities. Managing for, and balancing the needs of fish, wildlife, and people on these public lands is essential to ensure the species thrive and people enjoy and support public lands.

The management plan includes descriptions of the 12 wildlife area units within the 192,591-acre wildlife area and highlights successful projects and recreation opportunities. The plan also describes WDFW's overall management approach within the wildlife area, information on resident species, habitats, hydrology, and geology, and how management will adapt with climate change.

The three main goals of this management plan are to: 1) manage and enhance the function and value of wetlands; 2) manage and enhance upland habitat; and 3) manage and improve the traditional and emerging recreation opportunities. Within these main categories, the management plan lays out specific objectives and output measures, and references implementation of other specific resources such as the weed management plan and wetland management guidance. Specific outputs are shown in the table below.

1) Manage and enhance the function and value of wetlands **2) Manage and enhance upland habitat**	Acres of wetland maintained and enhanced Acres of weeds treated Acres of Russian olive and phragmites treated Acres of shrubsteppe enhancement Acres of prescribed burns Acres of habitat enhanced for northern leopard frog Acres enhanced for pollinator Acres enhanced mule deer habitat
3) Manage and improve the traditional and emerging recreation opportunities	Development of comprehensive travel management plan Development of trails plan for Quincy Lakes Management of rock and ice climbing to protect birds of prey Development of target shooting range Development of campground at Frenchman's Coulee Improvement of kiosks and signage Redevelopment of boat launch Increased accessibility for people with disabilities

Implementation of the goals and objectives will improve wetland function in strategic areas, improve habitats to better support fish and wildlife, and improve recreational experiences. WDFW staff track progress on this work annually and provide public updates every two years.

Part I: Wildlife area management planning overview

Introduction and agency mission

Welcome to your fish and wildlife lands!

The Washington Department of Fish and Wildlife (WDFW) provides active management for more than one million acres of publicly owned land, most of which falls within 33 wildlife areas across the state (https://wdfw.wa.gov/about/wdfw-lands). These diverse lands contain nearly all species and habitats present in Washington. With the loss of natural habitat posing the single greatest threat to native fish and wildlife, these wildlife areas play a critical conservation role. The wildlife area management plan addresses aspects of resource management, highlights areas for public access, education, and stewardship, and aligns with statewide conservation goals.

Under state law, WDFW is charged with "preserving, protecting, and perpetuating" the state's fish and wildlife species, while also providing sustainable recreational opportunities that are compatible with fish and wildlife stewardship". In addition to protecting lands and water for habitat and people, WDFW manages land to preserve Washington's natural and cultural heritage, provide access for hunting, fishing, and wildlife-related recreation, and to foster outdoor experiences and exploration throughout the state. We do this to support the species and habitats of Washington to ensure they prosper, and for our collective enjoyment into the future.

An interdisciplinary team of WDFW staff members, including fish, habitat, and wildlife biologists, as well as enforcement, real estate, and management, and Bureau of Reclamation staff developed the Columbia Basin Wildlife Area Management Plan, along with public involvement. This included input from the local stakeholder-based Columbia Basin Wildlife Area Advisory Committee, tribes, public agencies, and interested people.

Planning framework, plan purpose and public participation

Framework

Management of wildlife areas is guided by WDFW's mission and strategic plan, as well as by state and federal laws. Each new plan is guided by the Wildlife Area Management Planning Framework (Framework), which summarizes the agency's mission, laws, policies, and approaches to management of fish and wildlife, as well as public use and recreation. To read the framework: (https://wdfw.wa.gov/publications/01810).

Plan purpose, organization, and public participation

The purpose of this management plan is to guide all management activities, including conservation and recreation, occurring on the Columbia Basin Wildlife Area for the next 10 years. Management goals, objectives, and performance measures are defined in the plan are consistent with WDFW's mission, and requirements associated with the funds used to purchase the wildlife area. The plan provides a clear vision of how these lands are managed for WDFW and the public. Objectives the plan depend on available budget, so budget reductions made during the life of this plan may delay implementation of some actions.

The plan is organized into three parts, plus an appendix. Part I) provides an overview of the wildlife area and success stories, which showcase conservation, restoration, and partnerships with volunteers; Part II) covers more details of the wildlife area and the goals, objectives, and performance measures for the

Climbers at Frenchmen Coulee
Photo by Alan L. Bauer

planning area; and Part III) contains environment information, wildlife species, and habitat management. The appendix contains background information, the weed management plan, and public comments.

For this plan, the public process included tribal and advisory committee engagement in the drafting of the plan, and solicitation of public comments through meetings, email, social media, and the WDFW website. Comments on the Final Draft Plan were solicited through the State Environmental Policy Act (SEPA) process. *After the public review, the Public Response Summary will be included in Appendix E.*

Welcome to the Columbia Basin Wildlife Area

Wildlife area vision

In the Columbia Basin Wildlife Area, habitat is conserved and strategically enhanced, and visitors enjoy recreational opportunities compatible with healthy habitat and fish and wildlife populations, including ample waterfowl and mule deer hunting, fishing, wildlife viewing, hiking, climbing, biking, horseback riding, and boating.

Introduction to the wildlife area

The Columbia Basin Wildlife Area is in Grant and Adams counties in Central Washington, and lies in the traditional territory of the Škwáxčənəx^{w}, or the Moses-Columbia. It consists of 13 units dominated by a shrubsteppe and grassland environment totaling 192,591 acres and is roughly bordered by the Columbia River to the north and west, extending south to Priest Rapids on the Columbia River. Wetland plant communities are present because of the creation of dams and subsequent irrigated agriculture.

Ice age floods, dams, an irrigation network, fire, and agriculture shaped this land. During the last ice age (18,000 to 12,000 years ago), an ice dam in front of the Glacial Lake Missoula broke. The resultant flood created the unique and varied features on the landscape including cliffs, talus slopes, and scablands.

Prior to European American colonization, the škwáxčənəx^{w}, whose name means "people of the bank," lived along the east bank of the Columbia River. The women made baskets, clothing, and meals, and the men made tools, hunted and fished, and later, worked with horses. In the springtime, families traveled to other areas to dig roots. When the United States government threatened to move Chief Moses and the people he represented to the Yakima Reservation, he strived to establish a reservation in his homeland in the Columbia Basin. While he ultimately agreed to a reservation north of his desired location, it proved to be short lived. Tribal members who wanted to remain in the new area were required to settle upon allotments and most others relocated to the Colville Reservation. For more information, see the Colville Tribes story map: https://colvilletribes.maps.arcgis.com/apps/MapJournal/index.html?appid=ac4721130e424df786eb06dbbb4a5880.

The Grand Coulee Dam, constructed in the 1930s, lead to the development of the Columbia Basin Irrigation Project in the 1950s (CBIP). The CBIP provides irrigation water to over 670,000 acres. The water is supplied by Grand Coulee Dam and Roosevelt Lake. Water is used multiple times once it enters the irrigation system, through runoff, collection in reservoirs, and reuse, before returning to the Columbia River. The CBIP also generates power, provides recreation opportunities, controls floods, and aids navigation (USBR 2016).

Acquisitions and land management agreements for the Columbia Basin Wildlife Area began in 1951 and continue to this day. The main purposes of the wildlife area are to protect and enhance habitat and provide public recreation. Although managed by WDFW, most of the wildlife area lands (69 percent) are owned by the United States Bureau of Reclamation (USBR). About 21 percent is owned by WDFW, and the remaining 10% owned by other agencies and entities and managed by WDFW. Most Columbia Basin Wildlife Area units are located throughout the Columbia Basin Irrigation Project except for Sprague Lake, located in NE Adams County.

Wildlife area description

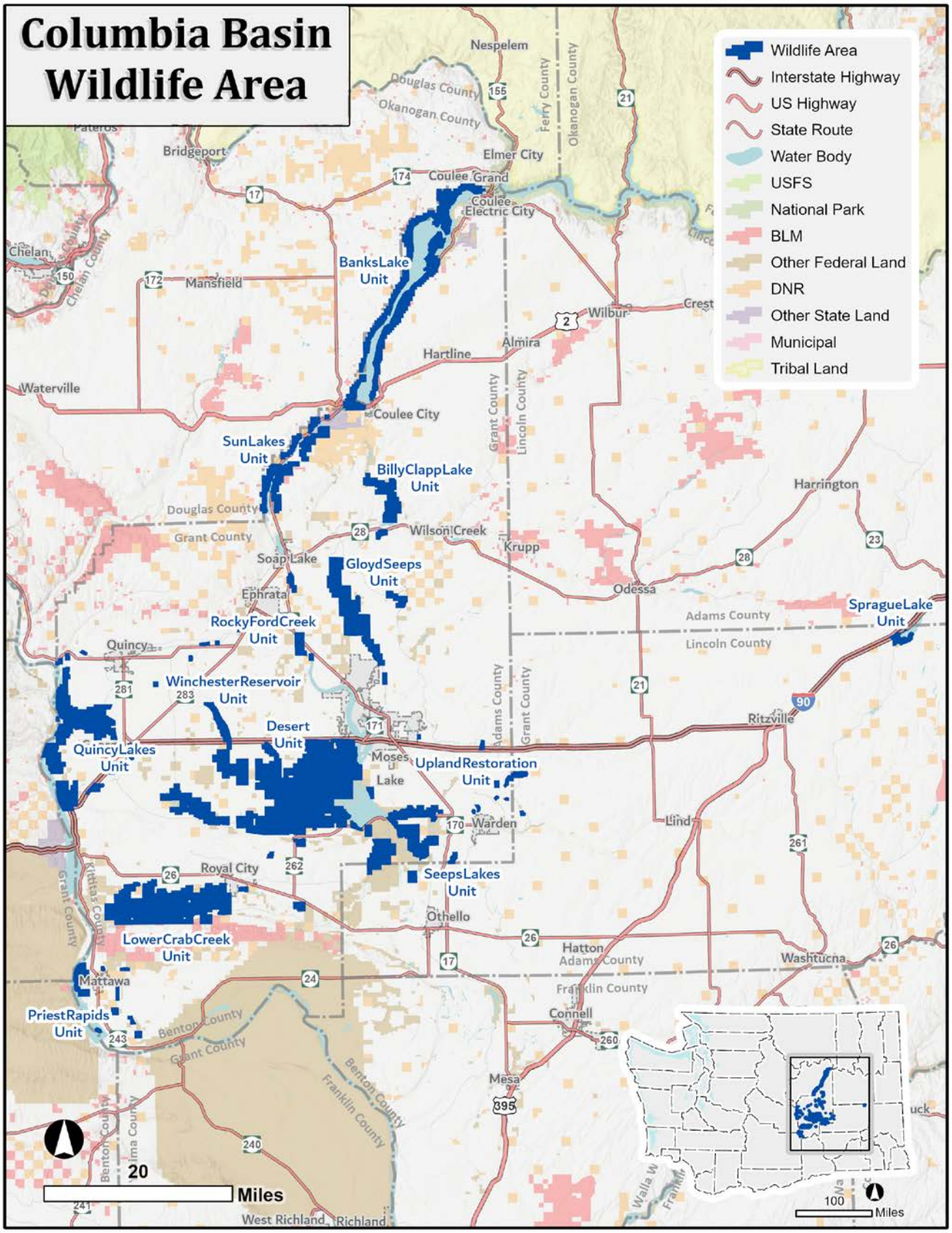
Columbia Basin Wildlife Area summary

Size	191,729 acres
Acquisition and agreement dates	1951 - 2020
Acquisition funding and agreement	National Park Service: *Land and Water Conservation Fund* US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program (PR); Dingell-Johnson Fish Restoration Program (DJ); North American Wetlands Conservation Program* WA Recreation and Conservation Office: *Aquatic Lands Enhancement Account, WA Wildlife and Recreation Program; Boating Facilities Program; Nonhighway and Off-Road Vehicle Activities Program; and State Bond Account* Private Grantor: *Private Donations* WA Dept. of Fish and Wildlife: *Wildlife Fund; State Migratory Waterfowl Fund* State of Washington: *Appropriations* Utility Districts*: Mitigation Funds*
Elevation range	489 - 2,426 feet
Recreational opportunities	Waterfowl, upland bird, pheasant, small game, and mule deer hunting; trout and warm water fishing; wildlife viewing; birding; camping; boating and water activities; walking, horseback riding, rock and ice climbing, and biking; outdoor education
Units	Banks Lake, Billy Clapp Lake, Desert, Gloyd Seeps, Lower Crab Creek, Priest Rapids, Quincy Lakes, Seep Lakes, Sprague Lake, Sun Lakes, Upland Restoration, Winchester Reservoir
Counties	Grant and Adams

During the planning process for this management plan, some of the units were combined, one unit split into two. The Potholes and Desert Units share an arbitrary border, and similar management objectives, so it made sense to combine them. The same is true of the Goose Lake and Seep Lakes units. Rocky Ford is a separate property from Gloyd Seeps. It is known by that name as a destination trout fishery, so the change was made to better communicate the recreation opportunity.

Previous Unit Names	New Unit Names
Potholes Unit	Desert Unit
Desert Unit	
Goose Lakes Unit	Seeps Lakes Unit
Seep Lakes Unit	
Gloyd Seeps Unit	Gloyd Seeps Unit
	Rocky Ford Creek Unit

Figure 1. Columbia Basin Wildlife Area Vicinity Map



Success stories

Improving wetlands for waterfowl habitat and hunting

Wetland habitat for wintering waterfowl and the prospects for waterfowl hunters has been greatly improved in the Winchester Reserve due to a partnership between WDFW and Ducks Unlimited. The Winchester Reserve, located in the Desert Unit, was established in 1982 to attract and redistribute an over-abundance of mallards in southern Washington. This is the most heavily used reserve in the wildlife area and is a focal area for wetland management, a priority for the wildlife area. Multiple wetlands north of the reserve had been heavily degraded by siltation and encroached by emergent vegetation (late successional habitat). Historically, these wetlands provided good waterfowl habitat and waterfowl hunting, but loss of open water and exposed shorelines to expanding stands of tall emergent vegetation had degraded them significantly and reduced this hunting opportunity. WDFW and Ducks Unlimited embarked on the North Winchester excavation project with funding from the Washington State Duck Stamp Program and the North American Wetlands Conservation Act to increase early successional wetland habitat. Annual plants dominate the early successional seral stage and are prolific seed producers, providing an important dietary component for migrating waterfowl.

In 2018, Ducks Unlimited hired a contractor to excavate 60 acres of wetlands on the west side of the wasteway, and the following year, 31 acres on the east side of the wasteway were excavated. Following excavation, wildlife area staff did some weed control and planted over 4,000 shrubs in the excavated areas to stabilize and revegetate the disturbed ground. As a result of these projects, about 328 acres of wetland were improved for waterfowl habitat and hunting opportunity. The removal of invasive Russian olive trees in 2021 resulted in an additional 97 acres of shoreline improvement.

Additionally, part of the funding for the project was used for upgrades and improvements to the water delivery system at the Winchester Regulated Access Area (WRAA) to the south of the reserve. Changes in the wasteway channel and declining seasonal water levels made it difficult to maintain high water levels in the WRAA project throughout the hunting season. In 2018, a new ditch was created to connect the Winchester Wasteway to the WRAA. The new ditch and the direct connection to flowing water improved the ability to fill the wetland areas and provide multiple hunting locations. Because the wasteway channel frequently changes and deposits sediment, armored crossings were constructed on the way to the new ditch to allow for access of equipment needed to maintain the ditch.

At a cost of about $900,000, the new and improved wetland habitat created by excavations, revegetation, removal of invasive trees, and improvement of water flow to the wetland through the new ditch, brought multiple benefits to migratory waterbirds and waterfowl hunters.

Frenchman Regulated Access expansion

In 2017, the Columbia Basin Wildlife Area and Ducks Unlimited partnered to complete the expansion of the Frenchman Ponds Regulated Access Area in the Desert Unit. Funds for the project came from the Washington State Duck Stamp and Print as well as the federal Pittman-Robertson funds.

The wetland expansion created four new islands in the original project area, added 30 acres of seasonal wetland, and improved floodwater connectivity to an additional 5 acres on the west side of the project. The islands provide prime loafing areas for waterfowl both on the fall and spring migration. To improve access and experience for users with disabilities, the pond bottom in front of the ADA/ABA blind in cell 5 was leveled, which makes setting and retrieving decoys easier and safer.

Burning for habitat

For centuries, managed fires have been used to control and improve habitat. WDFW continues to use prescribed fires to improve habitat today. A prescribed burn of 200 acres was conducted in 2021 to reduce weeds and expand open water to improve habitat for the state endangered northern leopard frog (*Rana pipiens*) and waterfowl.

Closely monitored burn on N. Potholes

Historically, prescribed fires were used on the Columbia Basin Wildlife Area as a vegetation management tool. Increased restrictions and oversight, coupled with staff limitations, made prescribed burning prohibitive. Without this management tool, WDFW's ability to effectively manage overgrown wetlands and manage non-native, aggressive phragmites with herbicide was greatly reduced.

That changed in 2016 when WDFW's statewide Prescribed Burn Team was created. Prescribed burning returned as a land management tool in the Columbia Basin Wildlife area in early 2021. Wildlife area staff worked with the prescribed burn team leader to design a burn plan that meets federal standards since most burning would occur on lands managed by WDFW but owned by the Bureau of Reclamation. Staff secured funding and facilitated environmental permitting and review, and received authorization to implement a burn. The burn was conducted in the Desert Unit in the North Potholes area in 2021 by the burn team leader, along with wildlife area staff and Grant County Fire District #3.

Northern leopard frog

WDFW lead briefing burn team

At the end of a long week of work by the crew, close to 200 acres of wetland habitat had been burned. The Columbia Basin Wildlife Area intends to expand the program across multiple units of the wildlife area in the future.

Delivering water to wetlands

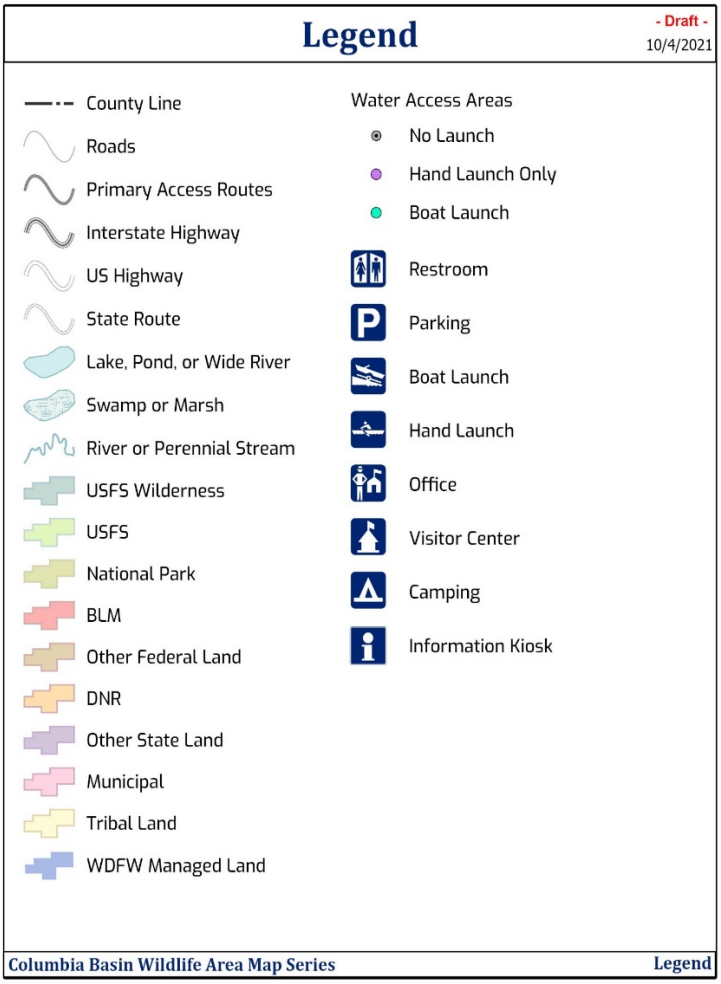
Maintenance of water delivery infrastructure has greatly improved wetland habitat in the Desert, Gloyd Seeps, and Quincy Lakes units thanks to a 2019 agreement between the Columbia Basin Wildlife Area, the US Bureau of Reclamation (USBR), and the Quincy Irrigation District.

Sedimentation and other environmental factors can reduce the capacity of wetland project delivery ditches and water control structures. When the capacity falls below a certain level, wetlands that depend on consistent flows become compromised. Under the 2019 agreement and with funding from USBR, the Quincy Irrigation District keeps the system clean and operating, maintaining water control structures in the Gloyd Seeps Unit, water control and delivery ditches at the Winchester Regulated Access Area, and ditches and overflows in the Quincy Lakes Unit. This benefits waterfowl and other species that depend on wetland habitat.

Wildlife area units

In the following section, there is a page for each unit of the wildlife area with accompanying map of the unit. Here is the map legend which applies to all the unit maps.

Columbia Basin Wildlife Area Map Legend



Columbia Basin Wildlife Area Unit descriptions

Banks Lake

Size	39,882 acres
Ownership	Most of the unit is WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1956, 2003
Acquisition funding	WA Recreation and Conservation Office: *Boating Facilities Program, State Bond Account* WA Dept. of Fish and Wildlife*: Wildlife Fund*
Management priorities	Waterfowl, wildlife-related recreation, fishing, and trailered boat access
Elevation range	1,515 – 2,426 feet
Recreational highlights	Fishing; waterfowl and upland bird hunting; wildlife viewing; camping; and water activities
County	Grant
Site access	Primary access is from Highway 155 north of Coulee City https://wdfw.wa.gov/places-to-go/wildlife-areas/banks-lake-wildlife-area-unit

The Banks Lake Unit is predominately land that surrounds Banks Lake proper. Banks Lake is a human-made reservoir for irrigation water in the Columbia Basin Irrigation project. It is formed by the North Dam near Grand Coulee and the Dry Falls Dam near Coulee City, and is filled with water from the Franklin D. Roosevelt Reservoir. Full pool occurs at 1570 feet and the reservoir typically operates between 1565 and 1570 feet with largest fluctuations during August and September. Most of the shoreline is ringed with basalt cliffs and talus slopes. The dry uplands have shallow soils and rocky outcrops with shrubsteppe habitat.

Banks Lake
Photo by Alan L. Bauer

This unit has a game reserve that was established in 1961. Managers release pheasants on the Dry Falls and Steamboat Rock portions of this unit, and other introduced and native upland game birds and small game occur. Some mule deer occur, though in relatively low numbers.

There are five boat launches and other access points for bank fishing opportunities. Several restrooms and campgrounds can be accessed from Highway 155. There is Americans with Disabilities (ADA) parking at Ankeny North, Ankeny South, and Million Dollar Mile North access sites.

Figure 2. Banks Lake North (map legend on page 13)

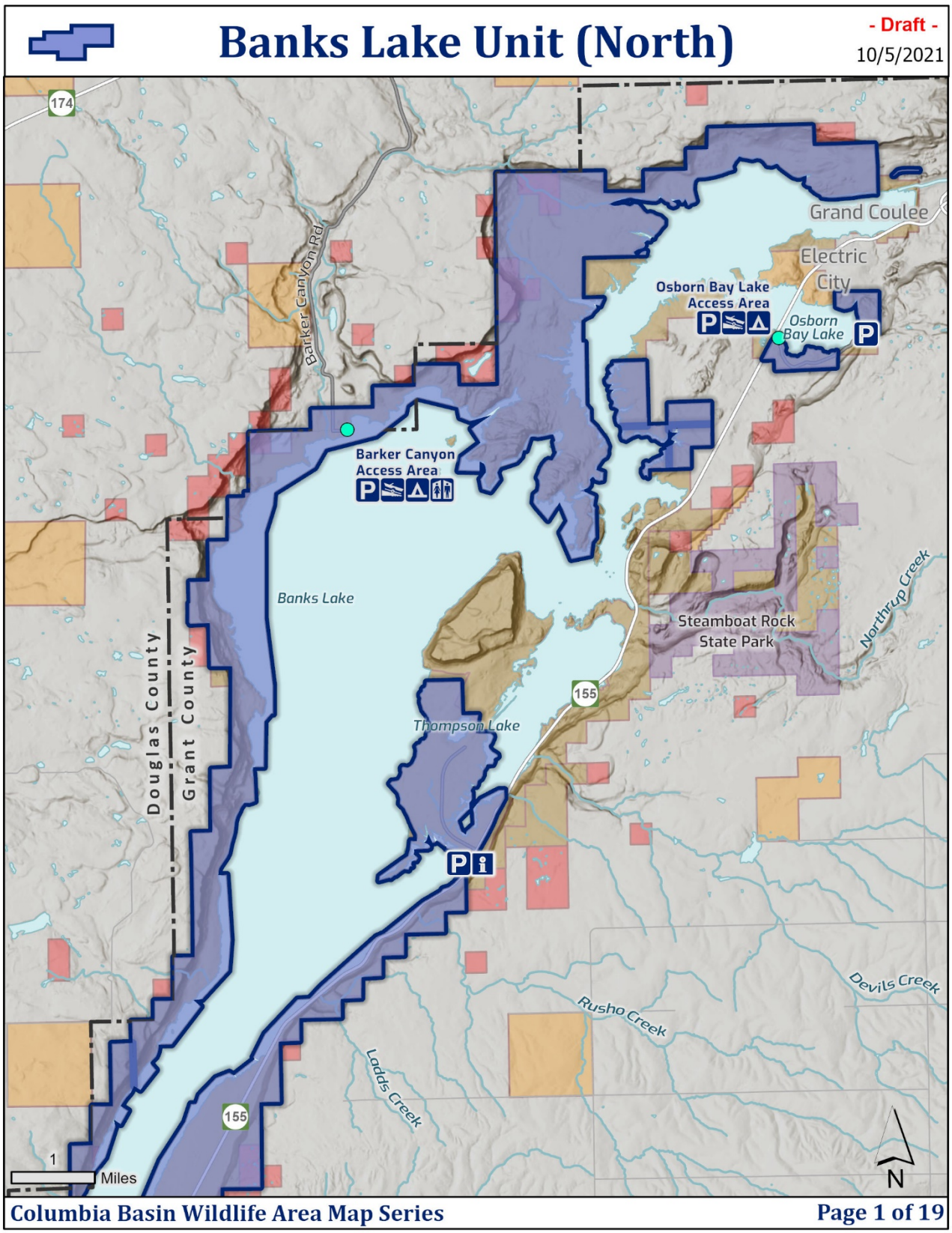
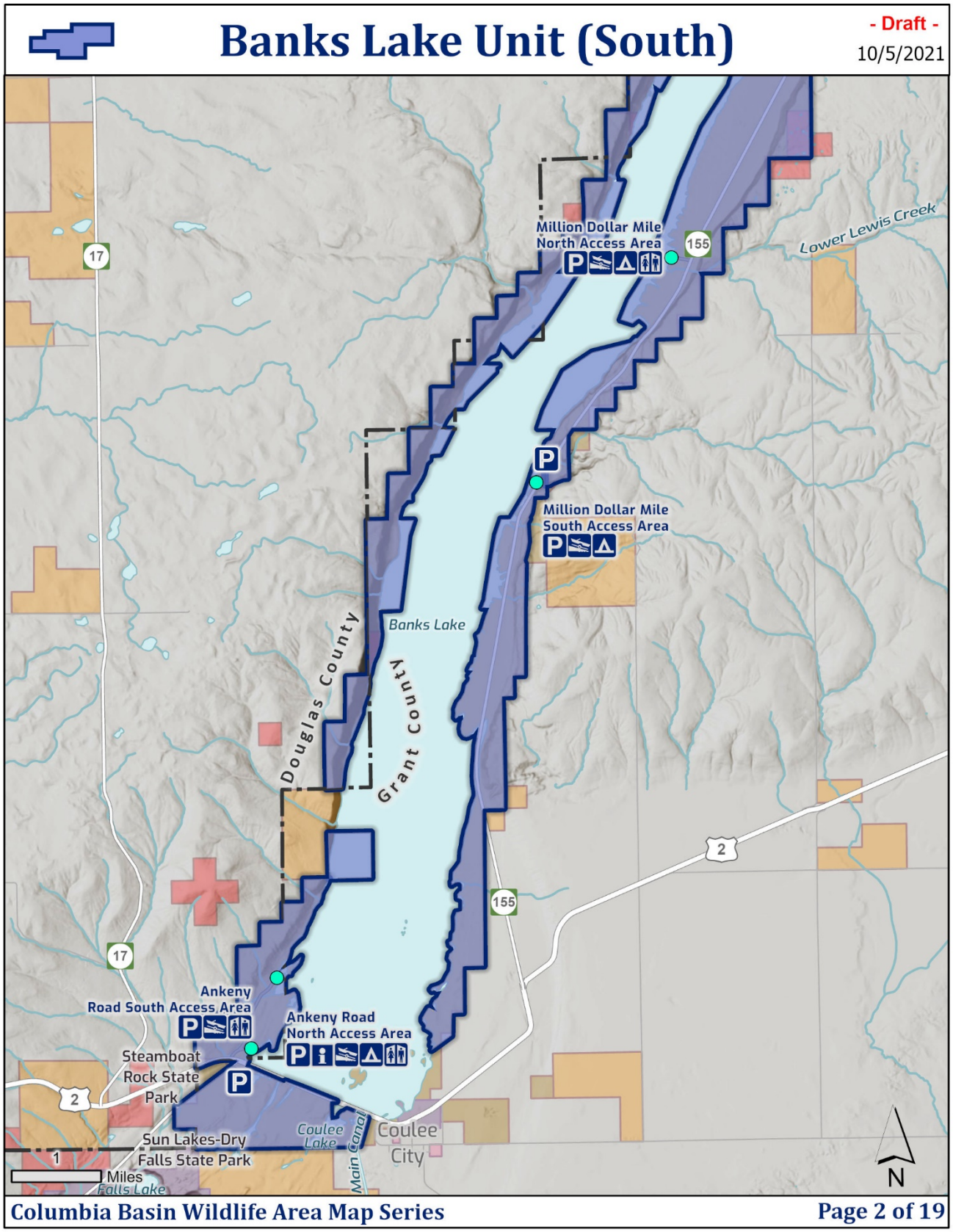


Figure 3. Banks Lake South (map legend on page 13)



Billy Clapp Lake Unit

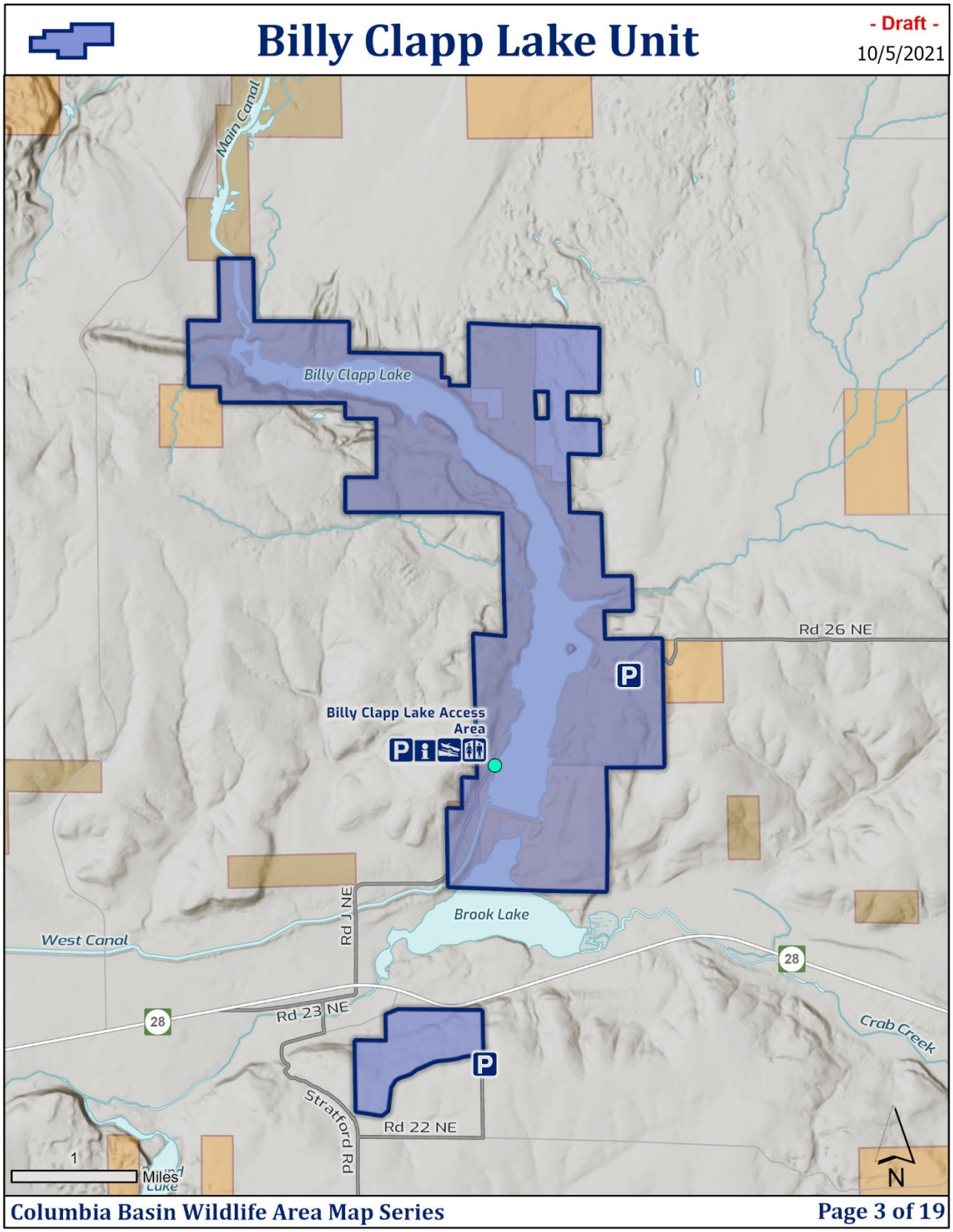
Size	3,404 acres
Ownership	Most of the unit is WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1954, 2003, 2016
Acquisition Funding	WA Dept. of Fish and Wildlife*: Wildlife Fund* Recreation and Conservation Office: *State Bond Account* Grant County: *Land Transfer* US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program*
Management priorities	Fishing, and trailered boat access
Elevation range	1,242 – 1,707 feet
Recreational highlights	Fishing, wildlife viewing, and water activities. Hunting access is limited due to reserve covering much of the unit.
County	Grant
Site access	Access from County Road J NE from Strafford Road https://wdfw.wa.gov/places-to-go/wildlife-areas/billy-clapp-lake-wildlife-area-unit

The Billy Clapp Lake Unit is a reservoir formed by a natural coulee dammed on the lower south end by the Pinto Dam. Water enters the upper end of the reservoir from the Main Canal and is split, depending on hydropower demand, between the Columbia Basin Hydropower project and Summer Falls. The reservoir is filled during April and remains full through October to serve irrigation canals. When full, water surface elevation varies about from about 1,330 feet -1,336 feet. Outside of irrigation season (early-November to early-March) water surface elevation drops below the boat ramp to about 1,315 feet, and trailered boat access is not available.

Basalt cliffs of varying heights encompass the reservoir. Most of the shoreline is steep and rocky and the uplands are a mix of gravelly soils and basalt outcroppings. Vegetation varies from cheatgrass or bunchgrass communities to native woody shrubs on talus slopes. The diverse habitats offered by the lake, basalt cliffs, talus slopes with native woody shrubs, and bunchgrass communities, offer opportunities to view a variety of wildlife, including neo-tropical migrants and waterfowl.

Most of the unit is within the Stratford Game Reserve, which is a combination of the original Stratford Game Reserve established in 1935 and the Billy Clapp Lake Reserve established in 1952. The unit includes a paved parking area, restroom, dock, and boat launch. An access area provides fishing and boating opportunities.

Figure 4. Billy Clapp Lake (map legend on page 13)



Desert Unit (and Potholes Reservoir)

Size	70,922 acres
Ownership	Combination of WDFW and WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1958, 2003
Acquisition funding	US National Park Service: *Land and Water Conservation Fund* WA Recreation and Conservation Office: *Boating Facilities Program; State Bond Account* State of Washington: *Legislative Appropriation* Power, dike and irrigation district: *Mitigation Funds*
Management priorities	Waterfowl, wildlife-related recreation, fishing, and trailered boat access
Elevation range	956 – 1,552 feet
Recreational opportunities	Fishing; waterfowl and upland bird hunting; deer hunting and quality mule deer hunting; wildlife viewing; and water activities
County	Grant
Site access	Many access points from multiple roads including SR17, Hwy 262 https://wdfw.wa.gov/places-to-go/wildlife-areas/columbia-basin-wildlife-area

Desert Unit, mule deer
Photo by Alan L. Bauer

The Desert Unit and Potholes Reservoir have been combined during this planning process under the Desert Unit name. This large landscape is located southwest of Moses Lake in Grant County in the Lower Crab Creek Watershed within the Columbia Plateau. Formed by the O'Sullivan Dam, the reservoir is part of the Columbia Basin Irrigation project. The dam caused the inundation of the sand dunes and created 100s of islands.

Typically, water surface elevation varies from a high of about 1,045 feet during early March and declines to a low of 1,027 feet during the first week of September at which time it begins to refill through the fall and winter months.

The Desert Unit is the lowest part of the Quincy Basin that once was filled with glacial floodwater. The natural basin now serves as a collector for irrigation water from upslope farmlands. Most of this water is collected in the Winchester and Frenchman Hills wasteways, which flow for miles through the unit and eventually empty into the southwestern part of Potholes Reservoir. Shrubsteppe, wetlands, and sand dune habitat offer opportunities to view a variety of wildlife, including mule deer, western grebe courtship displays, sandhill cranes, and American white pelican.

Potholes and Winchester Reservoirs are landmark destinations for both waterfowl enthusiasts and newcomers to the sport. Created in 1982, the Winchester, Frenchman Hills, and North Potholes game reserves enhance waterfowl hunting opportunities within the unit. There are several water access areas that provide access to waterfowl hunting, warm water and trout fishing, boating, and water activities. Hiking and birdwatching are popular. The unit is very accessible with developed parking areas, restrooms, and boat launches.

Figure 5. Desert Unit West (map legend on page 13)

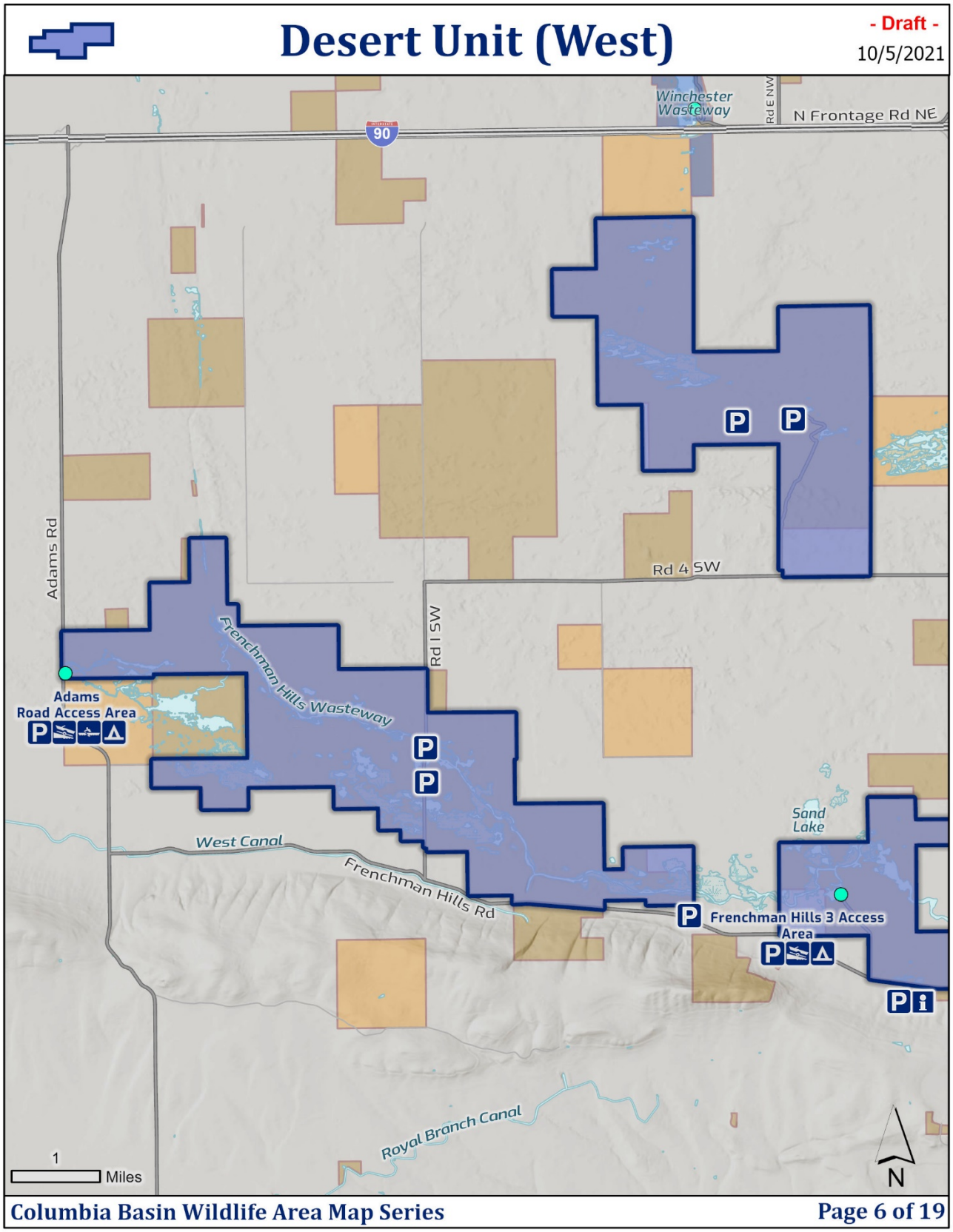


Figure 6. Desert Unit Central (map legend on page 13)

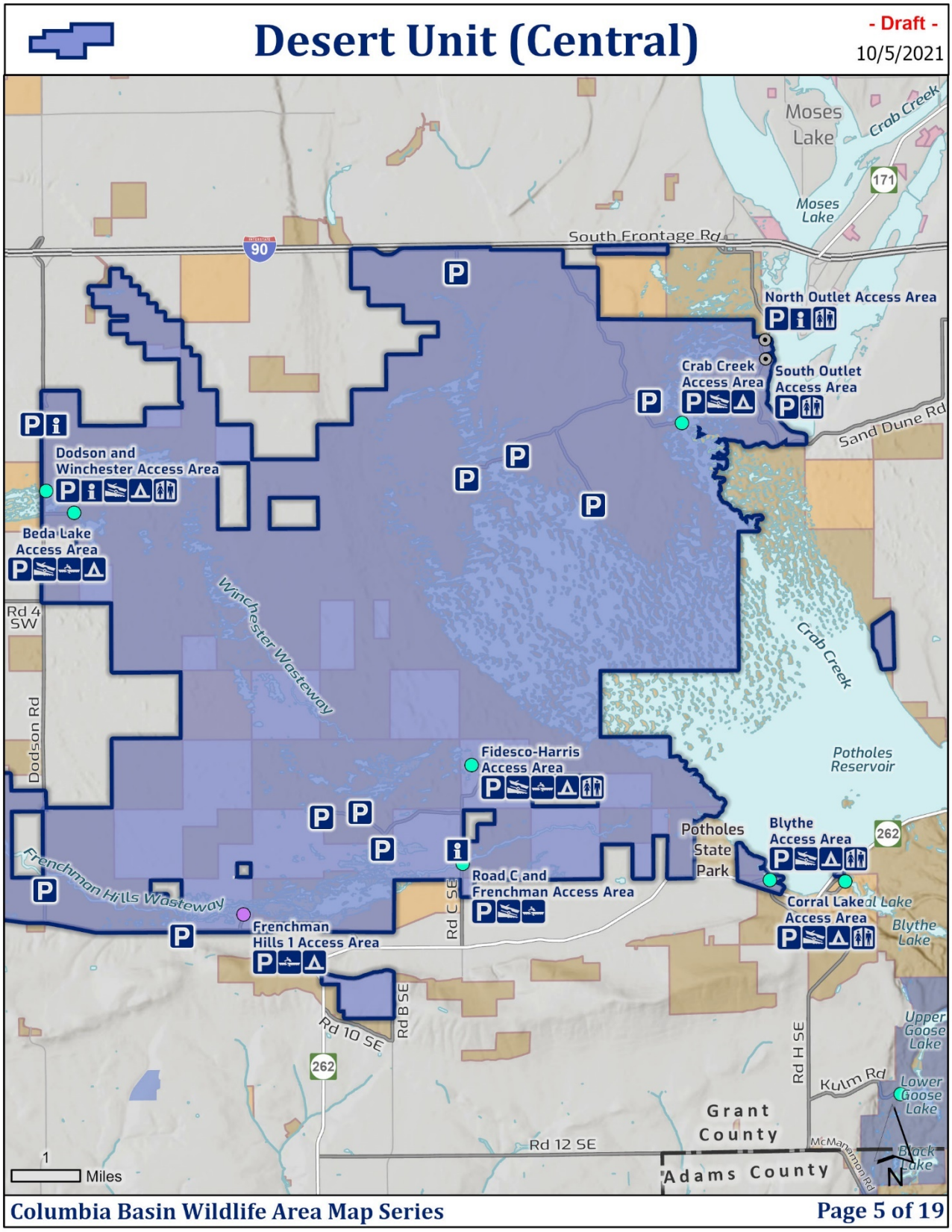
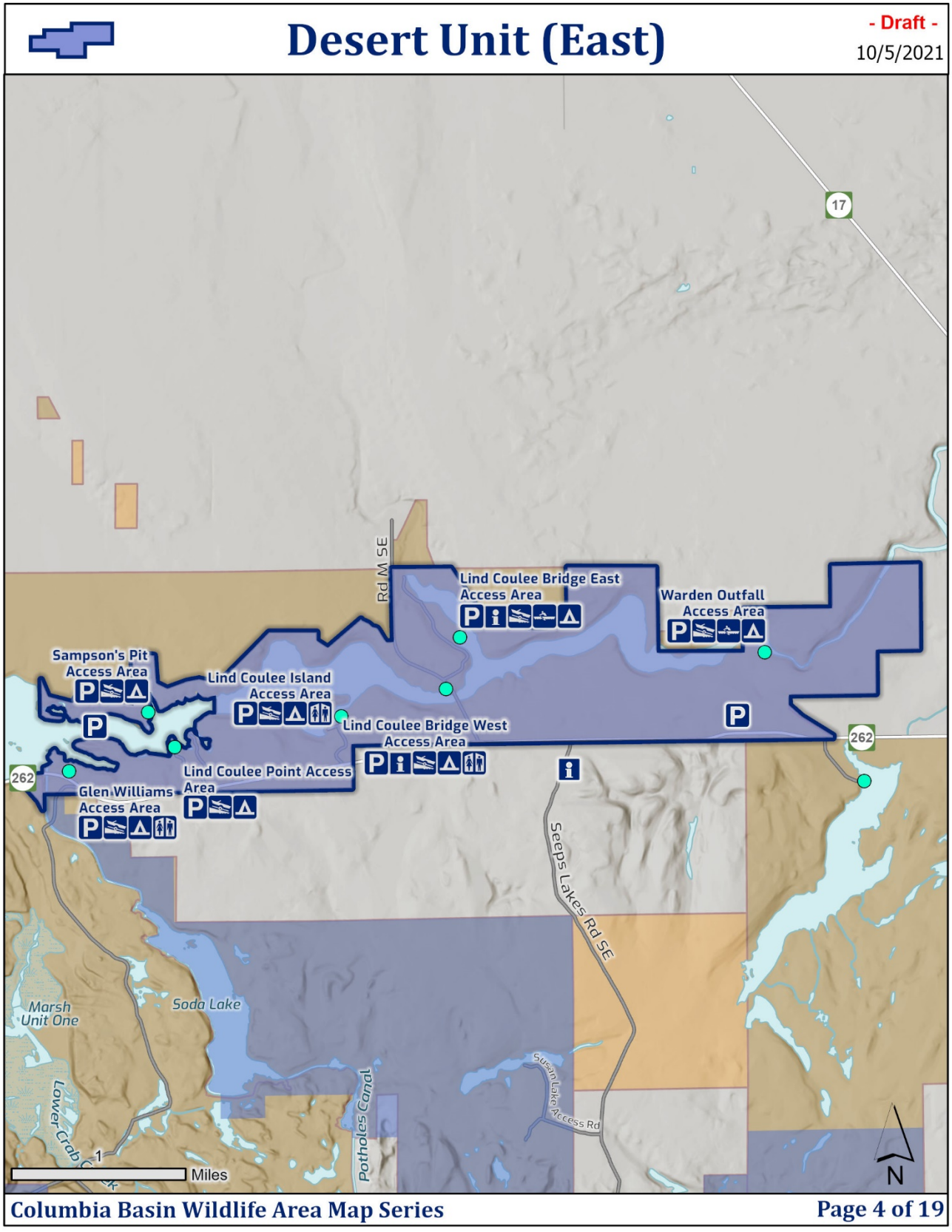


Figure 7. Desert Unit East (map legend on page 13)



Gloyd Seeps Unit

Size	12,405
Ownership	Combination of WDFW and WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1944, 1993, 2003
Acquisition funding	US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program (PR); North American Wetlands Conservation Program* US Army Corps of Engineers: *Snake River Mitigation Account* National Park Service: *Land and Water Conservation Fund* WA Dept. of Fish and Wildlife: *Wildlife Fund* Power, dike & irrigation districts: *Mitigation funds* WA Recreation and Conservation Office: *State Bond Account*
Management priorities	Fishing; waterfowl and upland bird hunting; deer hunting; wildlife viewing
Elevation range	1,050 – 1,345 feet
Recreational highlights	Waterfowl and upland bird hunting; deer hunting; wildlife viewing
County	Grant
Site access	County roads provide vehicle access to the unit from Stratford Road north of Moses Lake. There are several parking areas. https://wdfw.wa.gov/places-to-go/wildlife-areas/gloyd-seeps-wildlife-area-unit

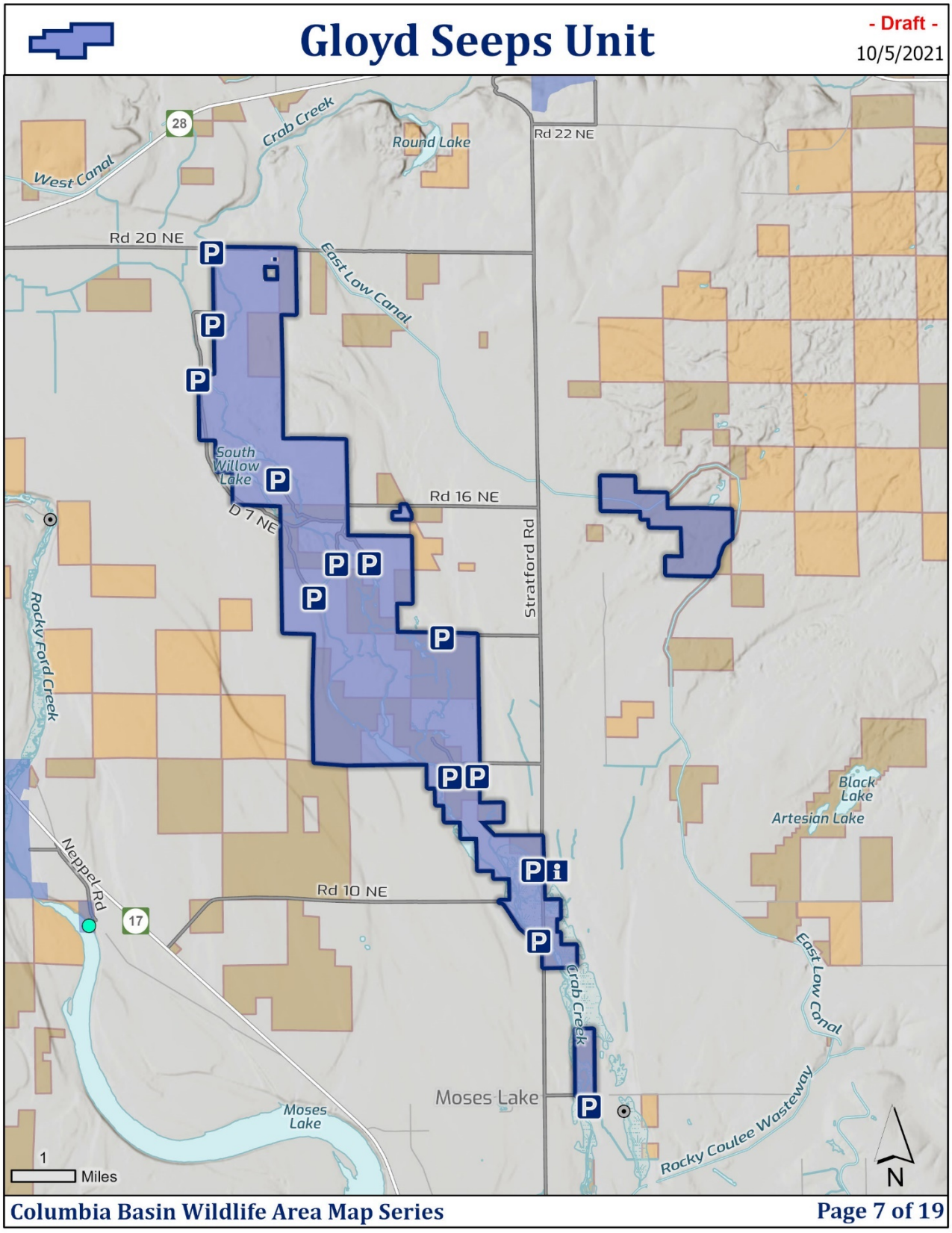
Great blue heron
Photo by Alan L. Bauer

Most of the Gloyd Seeps Unit lies along Crab Creek, midway between the towns of Moses Lake and Stratford in Grant County. The unit is composed of channeled scabland within the historic flood channels of Crab Creek. Numerous wetlands, ponds, and seeps are surrounded by shrubsteppe uplands of varying quality and basalt scablands. A history of fires has created grassland along most of the west side of Crab Creek.

An additional disconnected tract of land about three miles to the west was split from this unit during this planning process, and is now named the Rocky Ford Creek Unit. This administrative decision reflects differing management objectives and recreational values between the Gloyd Seeps and new Rocky Ford Creek Unit.

Gloyd Seeps Unit is a pheasant release site.

Figure 8. Gloyd Seeps (map legend on page 13)



Lower Crab Creek Unit

Size	24,597 acres
Ownership	Combination of WDFW and WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1953, 2003, 2020
Acquisition funding	US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program (PR)* US National Park Service: *Land and Water Conservation Fund* WA Dept. of Fish and Wildlife: *Wildlife Fund* Power, dike & irrigation districts: *Mitigation funds* WA Recreation and Conservation Office: *State Bond Account*
Management priorities	Upland birds, mule deer, hunting, wildlife-related recreation, fishing.
Elevation range	499 – 1558 feet
Recreational highlights	Fishing; waterfowl and upland bird hunting; deer hunting; wildlife viewing; and hiking
County	Grant
Site access	Lower Crab Creek Road off State Highway 243 https://wdfw.wa.gov/places-to-go/wildlife-areas/lower-crab-creek-wildlife-area-unit

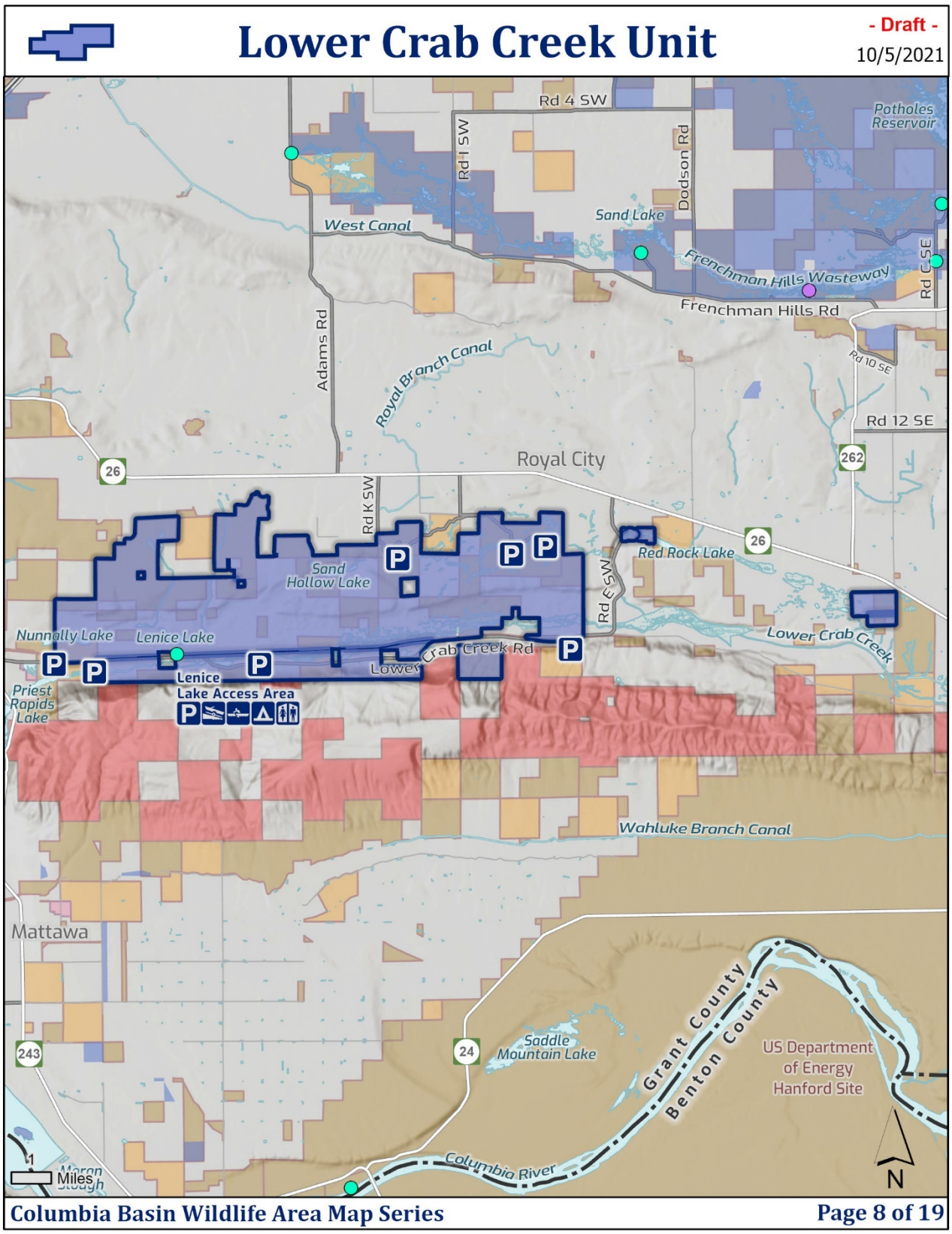
Lower Crab Creek
Photo by Alan L. Bauer

The Lower Crab Creek Unit is located southwest of Royal City in Grant County and lies within the valley of Lower Crab Creek along the north side of the Saddle Mountains. It occurs in both the Lower Crab Creek and Upper Columbia-Entiat watersheds. The unit consists of shrubsteppe, wetlands, and riparian areas. The seep ponds and uplands on the bench north of the creek provide a diverse habitat for many species of wildlife.

Unique plant communities include a black greasewood/alkali salt grass association, as well as other plant associations with black greasewood, big sagebrush-spiny hopsage, Sandberg's bluegrass, and Great Basin wild rye. A representative area of 150 acres of these plant communities is managed as a Natural Area Preserve (Appendix C).

Recreation opportunities include hunting, fishing, wildlife viewing, and hiking. The old railroad right-of-way (part of the Palouse to Cascades Trail) that traverses the length of this valley offers opportunities for hiking and biking, and on the west end of the unit, an adjacent Off-Road Vehicle Area is managed by the Department of Natural Resources for off-road enthusiasts.

Figure 9. Lower Crab Creek (map legend on page 13)



Priest Rapids Unit

Size	3,216 acres
Ownership	Combination of WDFW and WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1964, 2003, 2018
Acquisition funding	US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program (PR)* WA Dept. of Fish and Wildlife: *Wildlife Fund* Power, dike & irrigation districts: *Mitigation funds*
Management priorities	Waterfowl, upland birds, mule deer, hunting, wildlife-related recreation, fishing
Elevation range	489 – 963 feet
Recreational highlights	Fishing; waterfowl and upland bird hunting; and water activities
County	Grant
Site access	County Road 26 SW off Hwy 243 https://wdfw.wa.gov/places-to-go/wildlife-areas/priest-rapids-wildlife-area-unit

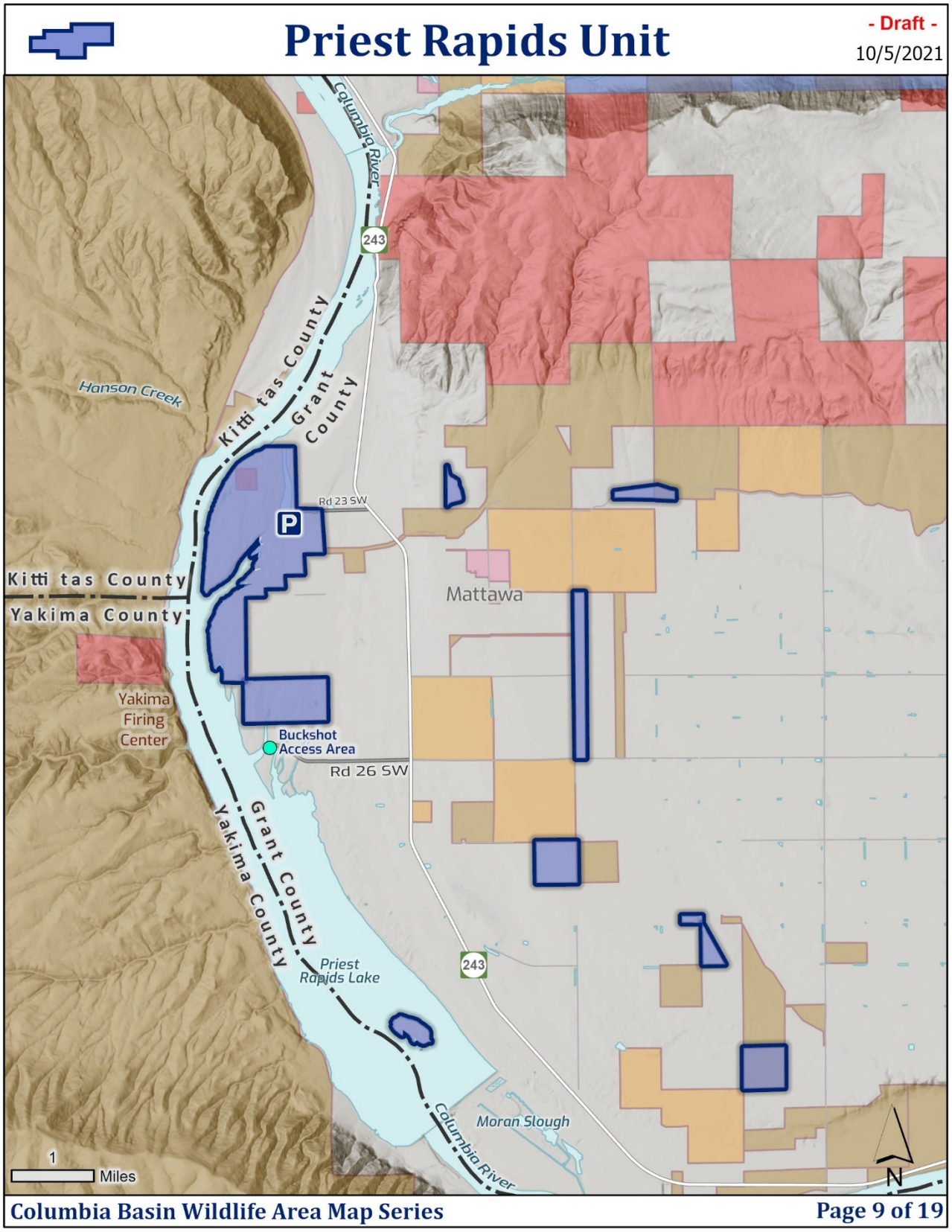
The Priest Rapids Unit lies along the east bank of the Columbia River south of Sentinel Gap in southern Grant County in the Upper Columbia-Priest Rapids Watershed. The land is relatively flat and during ancient glacial floods was intermittently under water, resulting in a thin layer of soil covering a mostly river cobble substrate. The acreage for this unit includes 548 upland acres, which include the Block 26 parcels, some of which are part of a commercial agricultural lease. (See page 29 for more information on Block 26). The unit can be accessed from county Road 26 SW off Highway 243.

Priest Rapids Unit
Photo by Alan L. Bauer

This unit is a mix of native habitats and agricultural fields that are managed to provide Canada goose brooding habitat adjacent to the Columbia River. This unit has three large peninsulas that create sheltered backwater pools. While the water level in the Priest Rapids Pool is subject to frequent and dramatic fluctuations, the riverbanks, shallow back water sloughs, and the ponds of the WB-48A Wasteway are fringed with willows, Russian olives, and other trees.

This is a pheasant release site. The area has a concrete boat ramp and outhouse which is managed by Grant County PUD.

Figure 10. Priest Rapids (map legend on page 13)



Quincy Lakes Unit

Size	17,299 acres
Ownership	Combination of WDFW-controlled DNR, and USBLM land, WDFW, and WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1951, 2003, 2020
Acquisition funding	US Fish and Wildlife Service: *Pittman-Robertson Wildlife Restoration Program (PR)* US National Park Service: *Land and Water Conservation Fund* WA Dept. of Fish and Wildlife: *Wildlife Fund* Power, dike & irrigation districts: *Mitigation funds* WA Recreation and Conservation Office: *State Bond Account; Boating Facilities* State of Washington: *Transfer of Land*
Management Priorities	Waterfowl, upland birds, mule deer, hunting, wildlife-related recreation, fishing.
Elevation range	573 – 1477 feet
Recreational highlights	Fishing; waterfowl and upland bird hunting; wildlife viewing; hiking; biking; horseback riding; geocaching; rock climbing; and camping.
County	Grant
Site access	The unit can be accessed from Highway 281 from Road 3 NW. There is a WDFW gravel access road at the west end of County Road 3 NW. The main access road through the Quincy Lakes Wildlife Area is closed to vehicles from Oct. 1 until March 1. Foot traffic is allowed year-round. https://wdfw.wa.gov/places-to-go/wildlife-areas/quincy-lakes-wildlife-area-unit

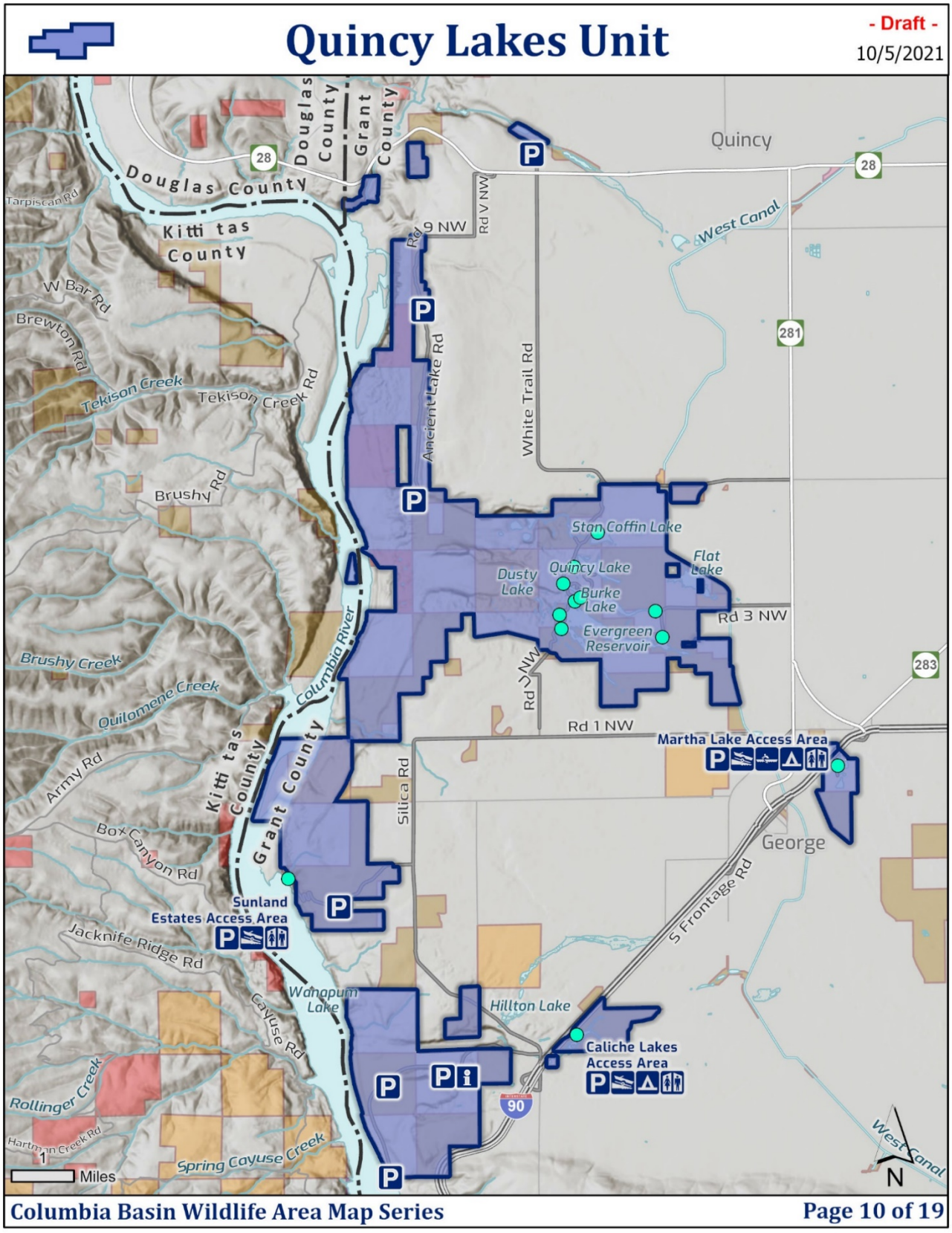
The Quincy Lakes Unit is located west of George in Grant County in both the Lower Crab Creek and Upper Columbia-Entiat watersheds. The main gate of the unit is closed to vehicles from October 1 until March 1. Foot traffic is allowed year-round.

Quincy Lakes Unit
Photo by Alan L. Bauer

The Quincy Lakes Unit has been shaped over time by lava flows, glacial floodwaters, erosion, and seepage from irrigation water. Visitors to this unit will experience towering 800-foot basalt cliffs, isolated mesas, stair stepped benches, box canyons, and potholes. Several of the potholes are filled with water that has seeped from the irrigation of the Quincy Basin farmlands upslope, adding important diversity to the unit's fish and wildlife habitat. Quincy Lakes is one of the most visited units on the wildlife area and is used by many groups. It is popular for mountain biking, trail running, hiking, water sports, early trout and warm water fishing. Because of the intensive use and profusion of trails in a fragile shrubsteppe environment, a travel management plan is being developed with input from a user advisory group.

Established in 1983 by WAC 220-416-070, this unit is adjacent to and partially within the Wanapum closure, where it is unlawful to hunt migratory waterfowl, coot, and snipe.

Figure 11. Quincy Lakes (map legend on page 13)



Rocky Ford Creek Unit

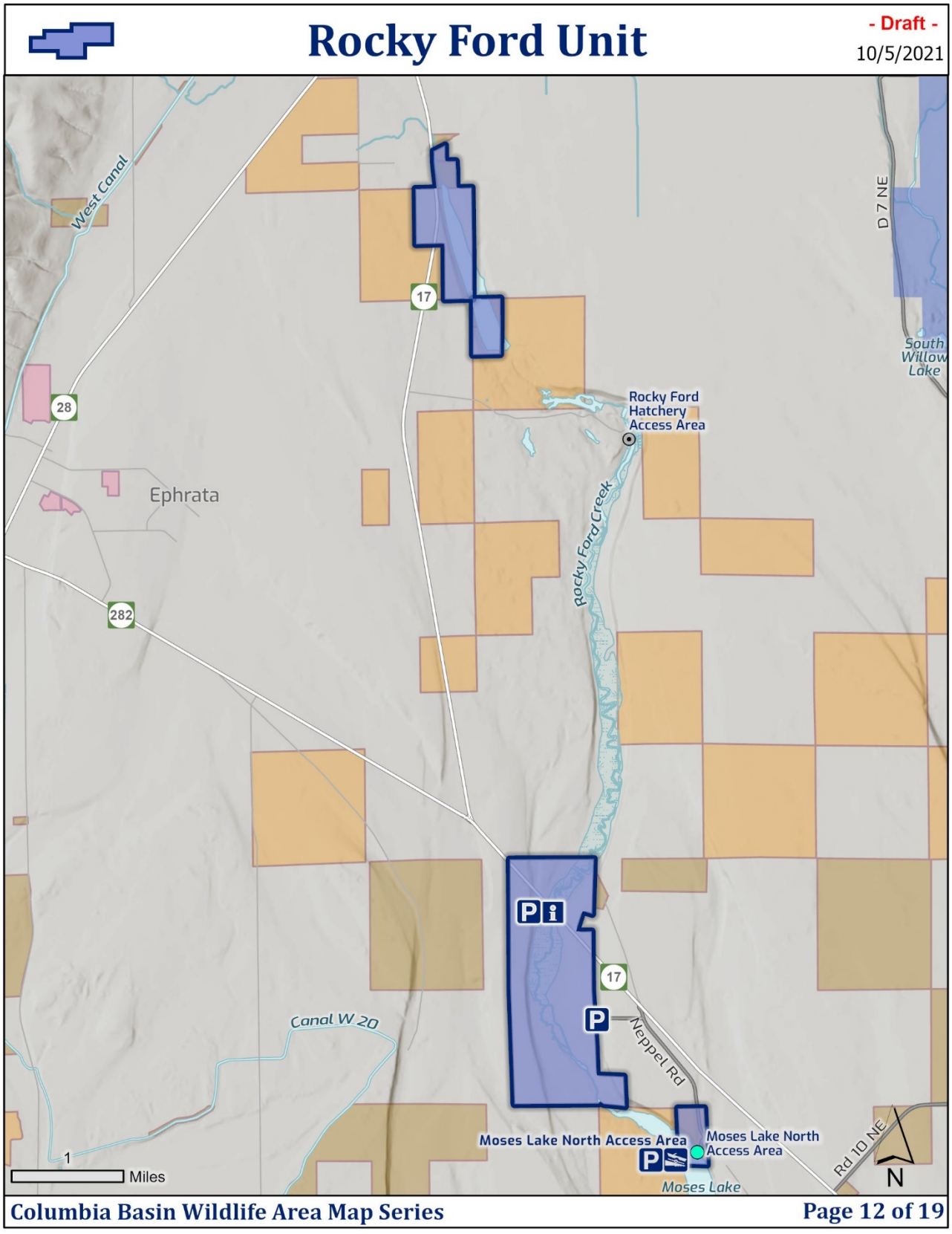
Size	1,700 acres
Ownership	Mostly WDFW
Acquisition and agreement dates	1965, 2020
Acquisition funding	US Fish and Wildlife Service: *North American Wetlands Conservation Program, Pittman-Robertson Wildlife Restoration Program (PR)* WA Dept. of Fish and Wildlife: *State Migratory Waterfowl Fund, Wildlife Fund* Power, dike and irrigation district: *Mitigation Funds* Recreation and Conservation Office*: Aquatic Lands Enhancement Account; Washington Wildlife and Recreation Program*
Management priorities	Waterfowl, fishing, boat launch
Elevation range	1,050 -1,150
Recreational highlights	Fishing; waterfowl and upland bird hunting; wildlife viewing
County	Grant
Site access	SR 17, Troutlodge Rd and Neppel Rd NE.

Coulee overlook at Rocky Ford
Photo by Alan L. Bauer

The lands within the Rocky Ford Creek Unit were formerly part of the Gloyd Seeps Unit. The unit was split out during this planning process due to unique recreational opportunities and management objectives. The properties were acquired for waterfowl and water access. The Rocky Ford Creek runs through the unit and empties into Moses Lake. The Rocky Ford Creek Unit is a popular destination for fly fishing because of its selective gear rules, larger trout, and year-round opportunity. The trout fishery on this unit occurs north of SR 17. This area offers upland bird and waterfowl hunting opportunities, and includes a reservable ADA accessible waterfowl hunting blind.

The southern end of the unit includes a boat launch for accessing Moses Lake. Ephrata Lake occurs at the north end of the unit; it is closed to fishing but offers great birding opportunities with its abundant waterfowl and shorebird populations.

Figure 12. Rocky Ford Creek (map legend on page 13)



Seep Lakes Unit

Size	8,497 acres
Ownership	WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1954, 2003, 2015
Acquisition funding	Transferred
Management priorities	Wildlife and recreation
Elevation range	699 – 1,250 feet
Recreational highlights	Hiking, hunting, fishing
Counties	Adams, Grant
Site access	The unit can be accessed from Highway 262 to the north and W. McManamon Road to the south. https://wdfw.wa.gov/places-to-go/wildlife-areas/seep-lakes-wildlife-area-unit

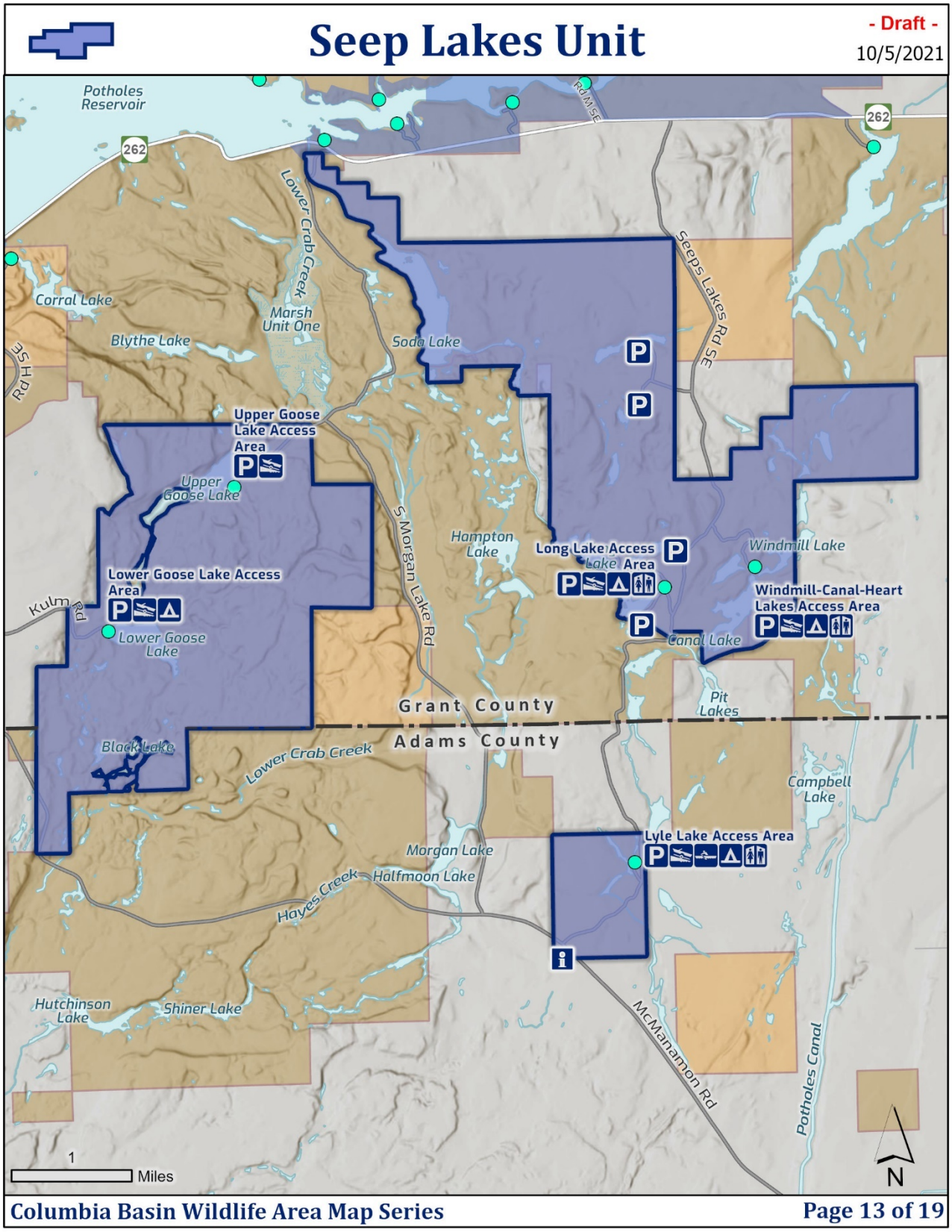
Visitors to the Seep Lakes Unit will experience rolling countryside with basalt outcroppings forming cliffs, mesas, box canyons and potholes. Many of the canyons and potholes are filled with water that has seeped southward from Potholes Reservoir.

The former Goose Lakes Unit has been merged with Seep Lakes because of proximity and similar management objectives. The Columbia National Wildlife Refuge runs between these units. The area formerly known as Goose Lakes is within the Drumheller Channeled Scablands. Two low rock dams built in the 1950s created Upper and Lower Goose lakes, each of which have boat access. There are many miles of graveled access roads as well as several boat launches, vault toilets, and parking areas primarily for public fishing.

Heart Lake in Seep Lakes Unit
Photo by Alan L. Bauer

Photo by Alan L. Bauer

Figure 13. Seep Lakes (map legend on page 13)



Sprague Lake Unit

Size	704 acres
Ownership	WDFW
Acquisition and agreement dates	1954, 2003
Acquisition funding	US Fish and Wildlife Service: *Dingell-Johnson Sport Fish Restoration Program* WA Dept. of Fish and Wildlife: *State Migratory Waterfowl Fund* WA Recreation and Conservation Office: *Aquatic Lands Enhancement Account; Boating Facilities Program; Nonhighway and Off-road Vehicle Activities Program*
Management priorities	Wildlife-related recreation, boat ramp
Elevation range	1,882 – 1,944 feet
Recreational highlights	Fishing; waterfowl and upland bird hunting; and wildlife viewing.
County	Adams
Site access	Danekas Road (Main Street) out of Sprague https://wdfw.wa.gov/places-to-go/wildlife-areas/sprague-lake-wildlife-area-unit

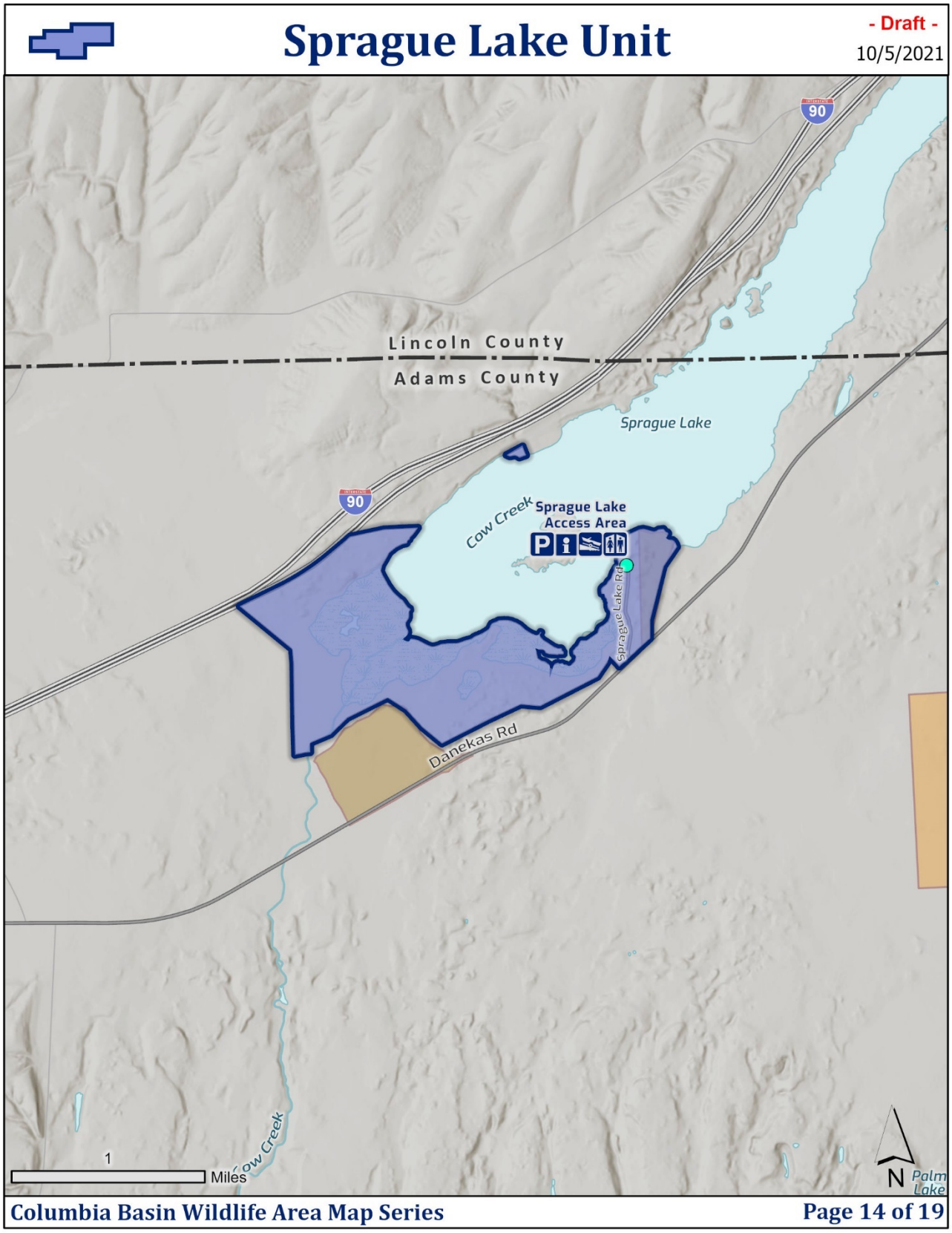
The Sprague Lake Unit is located about seven miles west of the city of Sprague in Adams County. It occurs in both the Upper Crab Creek and Palouse watersheds within the Columbia Plateau. Before its acquisition, upland habitats were historically grazed. The uplands are now protected under a Conservation Easement with the Hercules Ranch, and the wetlands are protected under the Wetlands Reserve Conservation Program.

Sprague Lake morning
Photo by Alan L. Bauer

This unit includes mainly wetlands with good riparian habitat along Sprague Lake, and uplands with big and stiff sagebrush, Sandberg bluegrass, and Great Basin wild rye. These habitats offer opportunities to view a variety of wildlife, including mule deer and songbirds.

The Sprague Lake water access area has a boat launch and ADA parking. The east end of the Sprague Lake Unit offers an interpretive trail, 1,000 feet of which is ADA compliant, with a kiosk, informational signs, and a gazebo covered viewing platform. This unit is within the Sprague Lake Game Reserve, established in 1969 (WAC 220-411-200).

Figure 14. Sprague Lake (map legend on page 13)



Sun Lakes Unit

Size	**6,550 acres**
Ownership	WDFW-controlled through agreement with USFWS
Acquisition and agreement dates	1955, 1971
Acquisition funding	--
Management priorities	Fishing, wildlife-related recreation, boat ramp
Elevation range	1074 – 2403 feet
Recreational highlights	Fishing, waterfowl and upland bird hunting, wildlife viewing
County	Grant
Site access	The unit can be accessed from State Route 17 north of Soap Lake https://wdfw.wa.gov/places-to-go/wildlife-areas/sun-lakes-wildlife-area-unit

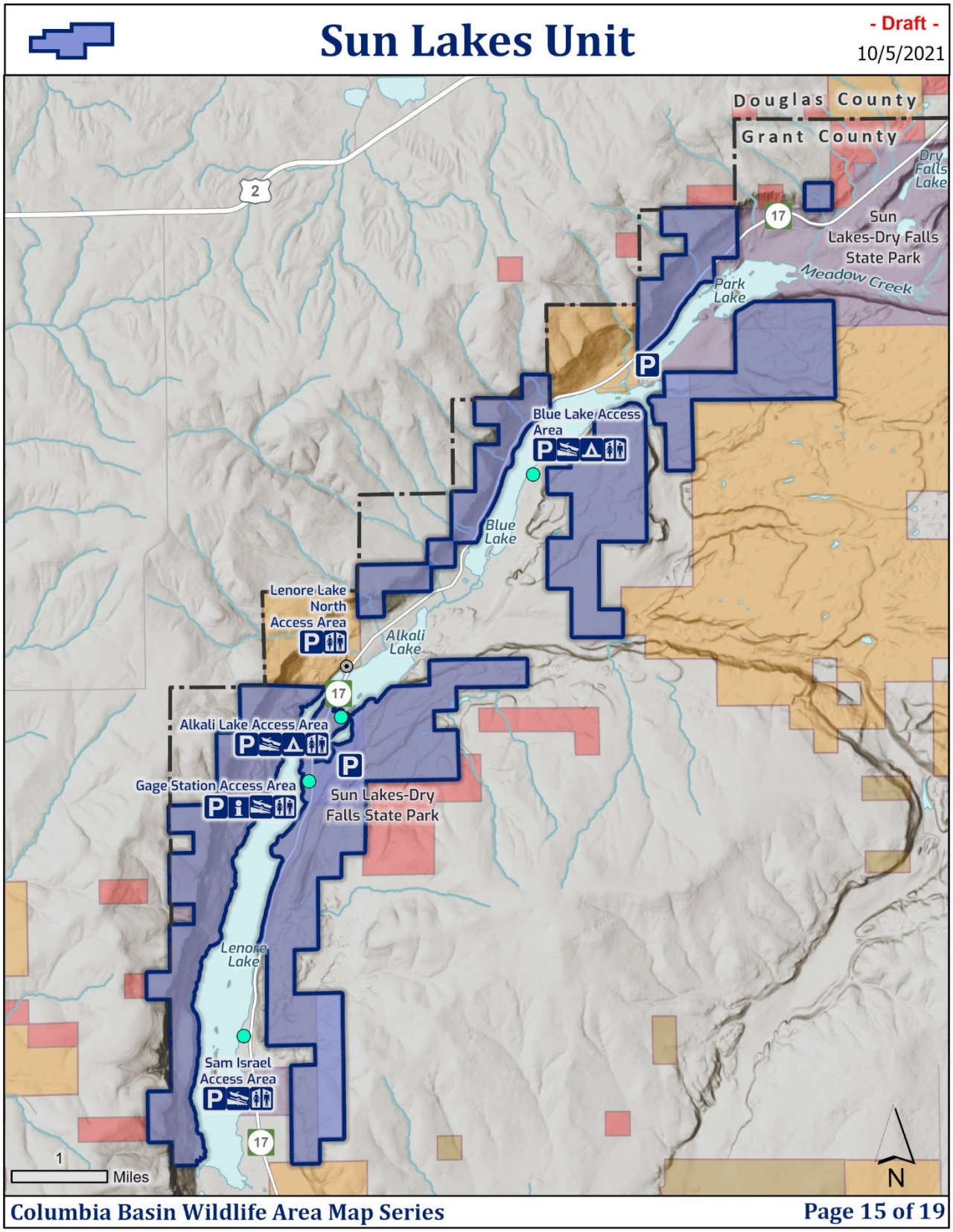
The Sun Lakes Unit abuts Sun Lakes State Park and parts of Park, Blue, Alkali, and Lenore Lakes. Historic glacial floods in this area scoured and carved away millions of cubic feet of lava leaving behind a deep and long coulee characterized by basalt cliffs, talus slopes, and bare rock. The numerous cliffs, stiff sagebrush/Sandberg bluegrass communities and some big sagebrush/bluebunch wheatgrass offer opportunities to view a variety of wildlife, including peregrine falcon. Park Lake and Blue Lake are popular locations for rainbow trout fishing, and Lenore Lake is a quality Lahontan cutthroat trout fishery.

Lake Lenore, Sun Lakes
Photo by Alan Bauer

Most of the acres within this unit came under WDFW control in the mid-1950s when the U.S. Bureau of Sport Fisheries (U.S. Fish & Wildlife Service) licensed the Lenore Lake National Wildlife Refuge to WDFW for management as the Lenore Game Range. Ownership of the Lenore lake bottom to the highwater line is claimed by the Department of Natural Resources.

There is one parking area with a boat ramp an outhouse on the south end of Alkali Lake; a parking area with a boat ramp and outhouse on Blue Lake; and two parking areas and outhouse on Lenore Lake.

Figure 15. Sun Lakes (map legend on page 13)



Upland Restoration Unit

Size	**1,300 acres**
Ownership	Mostly WDFW
Acquisition and agreement dates	1986, 2020
Acquisition funding	Private grantor: *Private donation* WA Recreation and Conservation Office: *Boating Facilities Program; WA Wildlife and Recreation Program*
Management priorities	Upland restoration
Elevation range	1,054 – 2,230 feet
Recreational highlights	Upland bird hunting
County	Grant
Site access	Six properties are located between Quincy and Ephrata off State Highway 28 West in Grant County. Two properties are within 12 miles southeast of Moses Lake: one off Road N NE, and another, north off US Interstate 90 and west of Road U NE. There are 11 properties near Warden, including one southwest of town, east off Coulee Corridor – Scenic Byway and two in Adams County. There is also one property 4 miles northeast of Royal City, north off Road 11.2 SW. https://wdfw.wa.gov/places-to-go/wildlife-areas/upland-restoration-wildlife-area-unit

Upland Restoration Unit
Photo by Alan L. Bauer

The Upland Restoration Unit is comprised of many scattered properties within the Columbia River watershed. They include former agricultural lands as well as upland and wetland habitat, and range in size from 10 to several hundred acres. These properties were purchased for small game, waterfowl, conservation of critical habitat, and upland restoration purposes.

There is upland bird and small game hunting on most parcels. Some parcels are not accessible by public road and/or may not have a public parking area. There are no restrooms.

Figure 16. Upland Restoration West (map legend on page 13)

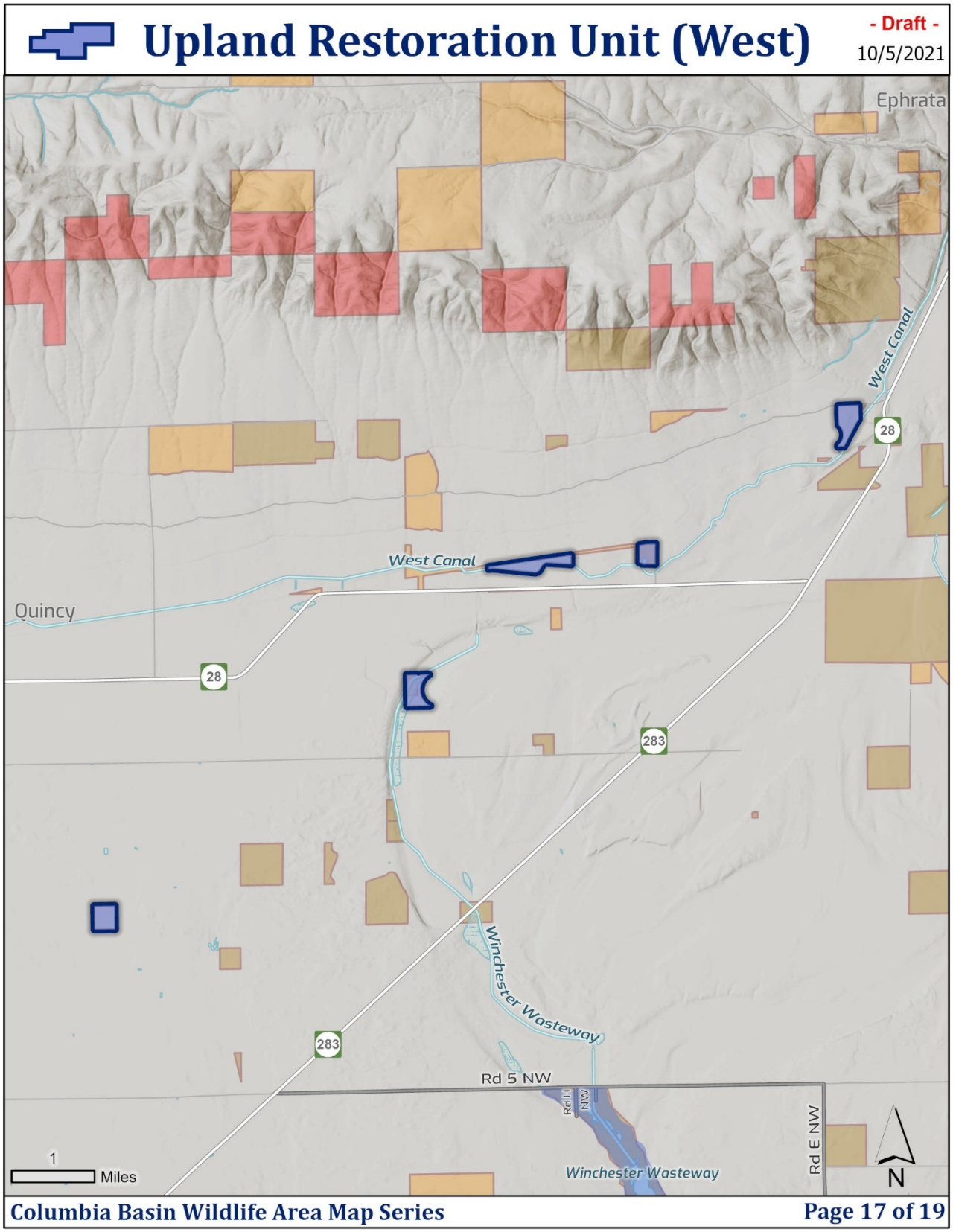


Figure 17. Upland Restoration Central (map legend on page 13)

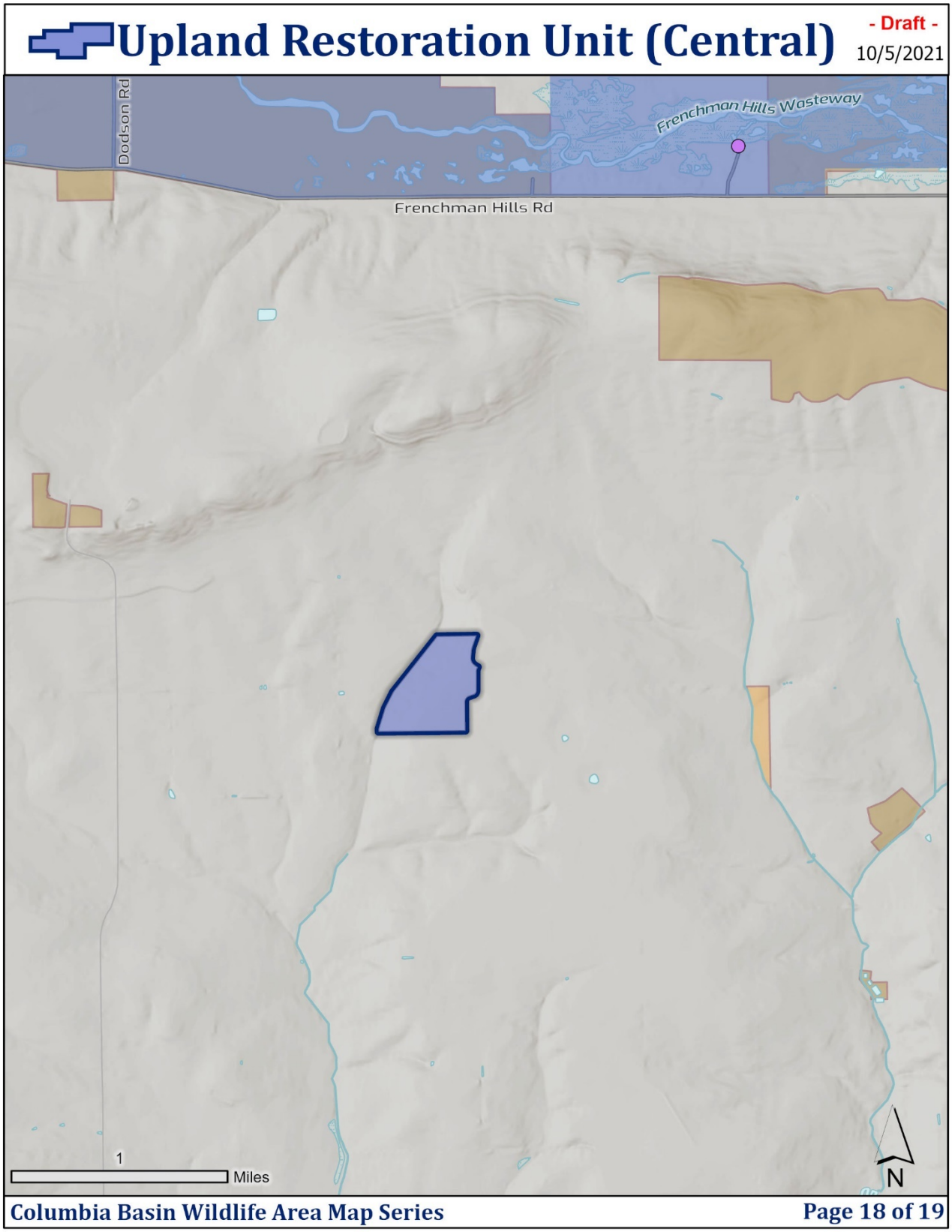
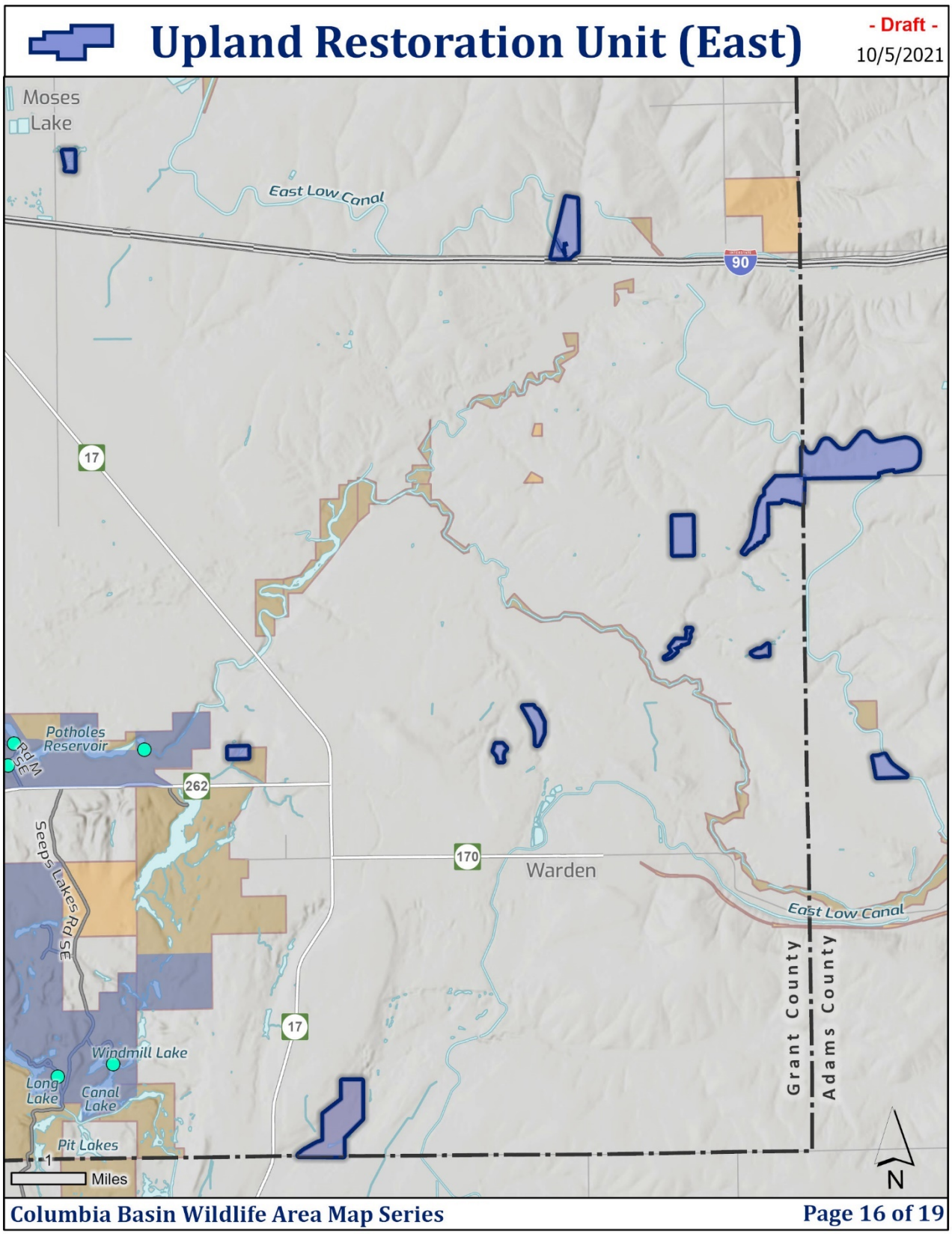


Figure 18. Upland Restoration East (map legend on page 13)



Winchester Reservoir Unit

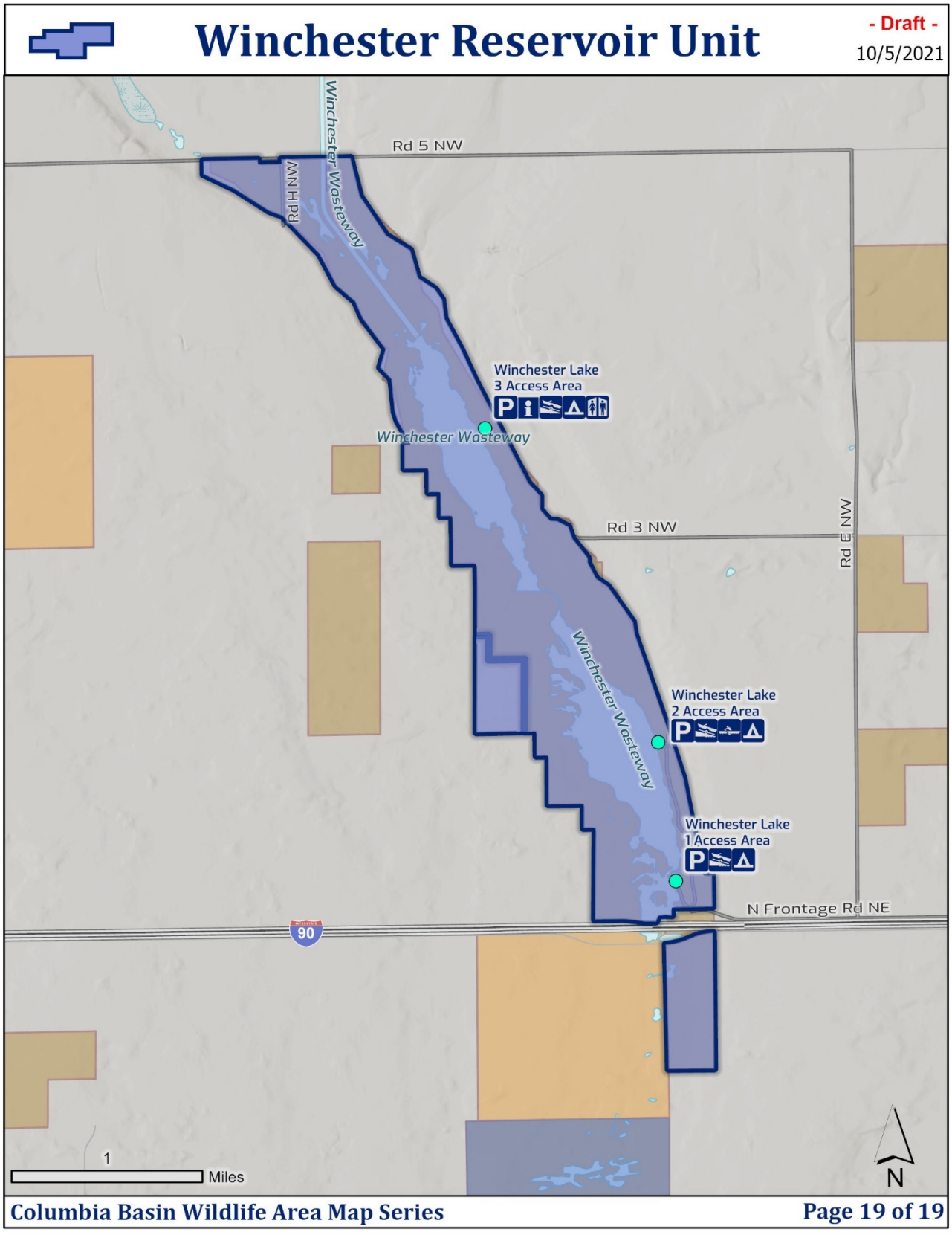
Size	**1,591 acres**
Ownership	WDFW-controlled land through a 25-year management agreement with USBR
Acquisition and agreement dates	1962, 2003
Acquisition funding	No specific funders assisted with the purchases
Management priorities	Fishing, boat launch
Elevation range	1,147 – 1,185 feet
Recreational opportunities	Fishing; waterfowl and upland bird hunting; and camping.
County	Grant
Site access	North Frontage Road off of the I-90 west Dodson Road exit (164). https://wdfw.wa.gov/places-to-go/wildlife-areas/winchester-reservoir-wildlife-area-unit

Winchester Reservoir Unit is located in Grant County just north of Interstate 90 east of George and includes a lake that is actually a wide spot in the Winchester Wasteway. Gravel boat launches are on the south and upper east sides of the lake. Most of the lake is surrounded by cattail and bulrush. The surrounding landscape is relatively flat. The uplands are a mix of tall wheatgrass or intermediate wheatgrass with big sage/bluebunch wheatgrass in some areas.

Winchester Lake has several water access areas which provide access for warm-water fishing.

Western meadowlark, Winchester Reservoir
Photo by Alan L. Bauer

Figure 19. **Winchester Reservoir** (map legend on page 13)



Part II: Wildlife area management and planning

Land Ownership and agreements

The wildlife area is managed by WDFW under a variety of instruments, including agreements, deeds, leases, and easements (Table 1). Acquisition details for each unit are found in the unit pages of this document.

Table 1: Wildlife area land instruments

Acres	Instrument
40,890	Deeded acres (owned by WDFW)
134,105	Owned by USBR and managed by WDFW under an agreement
12,296	Owned by other agencies and entities managed by WDFW under agreement
3,734	Leased from DNR
191,729	TOTAL

Agreements

Under an agreement with the Bureau of Reclamation (USBR), WDFW manages about 134,105 acres, or almost 70% of the wildlife area, across multiple units. Some of the units are all USBR land. WDFW also manages land under contract with USFWS and USBLM. These lands are managed for wildlife habitat and recreation.

Deeded land

About 25% of the wildlife area is owned by WDFW, about half of which WDFW purchased to acquire inholdings and parcels adjacent to public lands. This strategic approach was intended to support landscape level conservation and provide opportunities for public recreation. The primary funders for the deeded land include: WA Recreation and Conservation Office (*State Bond Account*); WA Dept. of Fish and Wildlife (*Wildlife Fund*); National Park Service (*Land and Water Conservation Fund*); and US Fish and Wildlife Service (*Pittman-Robertson Wildlife Restoration Program*).

Photo by Rich Finger

Leases and permits

WDFW leases land from other entities and manages it under the wildlife area. About 3,734 acres are leased from the Department of Natural Resources. Leasing DNR land allows WDFW to broaden conservation benefits and preserves public access for recreation.

Agricultural leases

Agriculture is an integral part of the management practices on the wildlife area. All agricultural leases are intended to provide benefit to wildlife or habitat while still providing an opportunity for the local agriculture industry. The Columbia Basin Wildlife Area manages ten agricultural leases totaling 776 acres. Beneficial practices may include increasing food and cover for birds and adjusting the harvest schedule so it is more compatible with needs of wildlife. Because irrigation is needed in the Columbia Basin for agriculture, each lease on the wildlife area also has an associated water assessment. Water is delivered to the various agricultural leases by one of three irrigation districts: Quincy Columbia Basin Irrigation District, East Columbia Basin Irrigation District, and South Columbia Basin Irrigation District.

Leases are negotiated and designed to meet needs of the agency, wildlife, the farmer, and the community. Practices to maintain pollinator habitat on WDFW owned and managed agricultural and grazing lands is implemented where practicable. Agricultural leases on the wildlife area fall into three main categories: encroachments, revenue generation, and working landscapes. Encroachments are very small acreages in very specific areas and provide a mechanism to mitigate for encroachment by requiring wildlife habitat enhancements.

Revenue generating leases occur under a specific agreement with the US Bureau of Reclamation (USBR) referred to as the Block 26 lease. The revenue generated from this lease goes directly back into management of the lease and other wildlife area lands. Additionally, this lease is managed to attract waterfowl by emphasizing cereal grain production. Waste residues provide energetic resources for migrating waterfowl and hunters get a unique opportunity to field hunt ducks and geese on public land. The agreement includes two irrigatable circles of about 237 acres, and several smaller non-agricultural parcels.

The working landscapes type leases are remnants of the upland restoration program and are continued because of their value to wildlife and habitat. The few that where not part of the upland restoration program are administered like the others in this category. An example is the Buckshot lease on the Priest Rapids Unit which provides waterfowl habitat, forage, and recreational hunting opportunities, all within a working landscape.

Grazing permits

Grazing is allowed under certain conditions on the wildlife area, subject to specific grazing management plans, and in accordance with WAC 220-500-200 and the Fish and Wildlife Commission Policy C-6003, Domestic Livestock Grazing on Department Lands. There are six grazing permits within the Desert Unit and one within the Banks Lake Unit, totaling about 11,200 acres.

Easements

Easements are a right held by an entity other than the underlying fee title landowner to cross or otherwise use a portion of the land for a specified purpose. There are 39 easements on the Columbia Basin Wildlife Area. Nineteen of these easements are granted by WDFW to utilities, other agencies, and individuals to use or cross the land for a variety of purposes. WDFW holds twelve easements mainly for access to department land and for constructing and maintaining roads. These have been granted by other agencies, a railroad, and private parties.

Temporary use permits

WDFW permits commercial and group activities on wildlife areas. Non-commercial group activities of 30 participants or more must have a permit. For commercial operators, such climbing, hunting, and fishing guides, a fee-based permit is required to operate on the wildlife area. The wildlife area issues on the average

about 40 permits per year for recreation events, commercial use such as guides and filming, as well as scientific and education permits.

Water use

The wildlife area manages about 30 different water allotments with three irrigation districts (Quincy-Columbia, East Columbia and South Columbia Basin) and the USBR that cover more than 1,000 acres. These allotments are used for flooding habitat for waterfowl, shorebirds, and other wildlife found in the wetlands, watering trees and shrubs for wildlife habitat, and irrigation water for the agricultural leases within the wildlife area. Many of these allotments are associated with properties purchased for the upland restoration program and are maintained in the interest of preserving the value of the property and future potential habitat.

Management setting

Administration

The Columbia Basin Wildlife Area is in WDFW Region 2. Day-to-day management of the wildlife area is the responsibility of staff based out of the Moses Lake headquarters. Wildlife Area personnel consist of one full-time Wildlife Area Manager, two Assistant Wildlife Area Managers, and one Natural Resource Specialist. There is also a full-time Washington Conservation Corps crew under a 3-year contract. Many water access sites occur within the Wildlife Area and are managed by Water Access staff out of the Ephrata Regional Office.

Wildlife surveys and wetland development projects are often led or conducted by other agency staff and/or conservation partners in coordination with wildlife area staff.

Operating funds

Operating funds to manage the wildlife area come from four main sources: USFWS Pittman Robertson Act, WDFW state funds, USBR (Soil & Moisture Conservation, Block 26 lease revenues), and revenues from the Gorge Amphitheater land use agreement with Live Nation. Mitigation funds from the Bonneville Power Administration support the Frenchman Regulated Access Area (TD-1) and Harris Ponds Project (TD-2), of 415 and 191 acres, respectively.

Harrowing at Frenchman's Regulated Access
Photo by Chattan McPherson

Facilities and maintenance

Activities on WDFW lands include managing recreation, maintaining fences, roads, trails, wetlands, signs, camping areas, water access areas, facilities, performing weed control, rehabilitating vegetation, and monitoring the results of management activities. The goal is to ensure wildlife area facilities and infrastructure are safe and remain in good working order over time.

The wildlife area has a few buildings and facilities. There is an old residence and outbuildings that are slated for demolition. The Lower Crab Creek Unit has a barn and shed associated with an agricultural lease. The

Lind Coulee area of the Desert Unit has a half-acre graveled compound with a shed. The Upland Restoration Unit has a gravel parking lot, pumphouse, overhang, and office/shop.

The wildlife area has a 400-mile boundary, and a good portion has fencing in various conditions. There are about 100 miles of interior fence. Both boundary and interior fencing is repaired or replaced when it is necessary for wildlife area management objectives. Fencing is removed when it no longer serves a purpose, is derelict, or is dangerous for wildlife. This plan includes an objective for removing derelict fencing.

There are multiple Americans with Disabilities Act (ADA) and Federal Architectural Barriers Act (ABA) compliant facilities throughout the wildlife area and access areas. See the unit pages for details.

Road and trail management

The wildlife area has over 214 miles of road, which includes 97 miles of public road. There are 118 miles of service road (which is open for non-motorized/non-vehicle use), with 34 miles open for foot traffic only. There are also 58 miles undesignated road that is not open to legal travel.

A travel management plan will be developed to manage motorized and non-motorized travel on the wildlife area. The goal of the travel plan is to improve user experiences while protecting environmental and cultural resources. A travel management plan will allow WDFW and managing partners to engage in a formal public process which will inventory and legitimize the road network and improve communication with the public on camping and road use rules.

Local land use designation

The 13 units of the Columbia Basin Wildlife Area are primarily in Grant County, with parts in Adams county. Development is guided by comprehensive plans and shoreline management plans.

Grant County

Grant County Shoreline Management Plan
https://www.grantcountywa.gov/242/Shoreline-Master-Program

Grant County Comprehensive Plan
https://www.grantcountywa.gov/DocumentCenter/View/447/Grant-County-Comprehensive-Plan-PDF

Development in the uplands, as well as on smaller streams and lakes is further regulated by Grant County's Unified Development Code (Chapter 24.08 – Critical Areas and Cultural Resource Lands):
https://www.grantcountywa.gov/DocumentCenter/View/591/Chapter-2408--Critical-Areas-and-Cultural-Resource-Lands-PDF.

Adams County

Adams County Comprehensive Plan
https://www.co.adams.wa.us/document_center/Building/Adams%20County%20Comprehensive%20Plan.pdf

Adams County Shoreline Master Program
https://www.co.adams.wa.us/departments/building_and_planning/shoreline_master_program.php

Development in the uplands, as well as on smaller streams and lakes is further regulated by the Adams County Development Code (Chapter 18.06 – Critical Areas and Resource Lands):
https://www.codepublishing.com/WA/AdamsCounty/#!/AdamsCounty18/AdamsCounty1806.html#18.06

Enforcement

WDFW enforcement officers with general authority peace officer status in Washington provide enforcement on the wildlife areas. WDFW officer duties include enforcement, education, partnerships, and community involvement.

Officers are responsible for enforcement of all fish, wildlife, and habitat laws under Title 77 RCW. They enforce boating, off-road vehicle laws, and illegal drug growing and manufacturing, and littering and dumping. Officers work closely with emergency management agencies and play an important role in emergency management statewide.

Recurring public conduct issues on the Columbia Basin include vandalism, littering and garbage dumping, and unauthorized target shooting. As part of this plan, WDFW will take actions to improve safety and security, explore options of increasing citizen involvement in reporting illegal activities, and help manage travel in the wildlife area. The wildlife area staff will continue to encourage hunters and all other users to report suspicious or illegal behavior, and things that the managers should know about. Report illegal or dangerous activity to WDFW Enforcement at 1-877-933-9847, or 911 if you observe poaching in progress.

Cultural resources

WDFW stewards not only fish and wildlife, but also the waters and lands that sustain those resources, and a host of other natural and cultural resources. Cultural resources are evidence of Pre Contact Native American or historic activity. Cultural resources can include archaeological materials and sites, structures, landscapes, and objects of importance to a culture or community for scientific, traditional, religious, or other reasons.

As part of our shared heritage, cultural resources are unique and irreplaceable. WDFW considers the effect that land management policy may have on cultural resources, especially when ground disturbance is anticipated through various projects and practices within the Columbia Basin Wildlife Management Area. Administrative decisions ultimately reflect differing management objectives, tribal and public consultation, cultural and recreational values, resource protection, and other concerns.

Cultural resources management (CRM) is governed by agency policy, and state and federal laws. WDFW's Cultural Resources Specialists (CRS) have developed guidelines for meeting policy and regulatory requirements and ensuring appropriate management of cultural resources. WDFW coordinates and consults with a broad array of interested parties, promotes heritage education, and provides CRM expertise to external partners.

WDFW communicates, coordinates, and consults with Tribes when WDFW actions and decisions may affect Tribal interests. Tribal consultation is distinct from the WDFW public participation and community involvement processes, such as Fish and Wildlife Commission meetings, rulemaking hearings, SEPA public comment periods, etc. WDFW's Tribal consultation procedures are guided by internal policy, Washington Governor's Centennial Accord and Millennium Agreement, and specific processes determined via consultation to meet the needs and practices of Tribes with reserved interests within Washington State. Tribal consultation occurs before WDFW public meetings, workshops, or formal stakeholder engagement processes, to allow WDFW and interested Tribes the opportunity to thoughtfully consider respective interests and perspectives, before a decision is made, or an action taken.

CRS who help with project management include tribal liaisons, ethnographers, archaeologists, anthropologists, historians, and architectural historians. WDFW has a team of in-house specialists, but also

employs CRM consulting firms to manage the volume of review needed to remain in compliance with CRM regulations.

CRS evaluate and implement practices to protect and preserve cultural resources on WDFW lands. They lead or guide consultation with the Department of Archaeology and Historic Preservation (DAHP) and affected Tribes. WDFW's CRS also work with wildlife area and program managers to provide relevant historical information and recommendations for appropriate management practices around cultural resources.

WDFW projects are conducted in a wide variety of regulatory contexts which are determined by project location, project type, and/or project funding sources. All state and federally funded projects are required to undergo review to identify the potential for impacts to cultural resources. Initial research for these reviews includes a review of existing documentation including historic maps and photographs, diaries, journals, legal documents, and archaeological site information curated by DAHP. This "first look" is followed by consultation with affected Tribes and DAHP. WDFW may also coordinate project review with project stakeholders, which can include local landowners, project proponents, and others.

Archival research, consultation, and coordination may be followed by fieldwork, during which the project location is surveyed for unrecorded cultural resources or to assess the condition of known archaeological sites and/or historic structures. It is at this phase of review that archaeological sites and historic buildings are formally recorded. The results of this research is collected in a report, which is then shared with WDFW's consulting parties for review and comment. Reviewers include DAHP and local tribal governments, but can also include stakeholders, regulatory agencies, and funding sources. The results of research and consultation conducted during project planning and implementation are used to inform project design and any future development or management plans.

Research and studies

WDFW supports independent studies that support wildlife area objectives. Table 2 provides an outline of past and current studies. A few of these are wildlife area-specific, but most address a broader geography.

Table 2: Research and studies

Description	Date	Researcher
Waterfowl Breeding Population Survey		Kyle Spragens, Matt Wilson
Washington Ground Squirrel Surveys in Adams, Douglas, and Grant Counties, Washington, 2004	2007	Rich Finger, Gary J. Wiles, Jim Tabor, Eric Cummins
Invertebrate study?	2016	Chattan McPherson
Nesting Raptors on the Banks Lake Unit, Columbia Basin Wildlife Area and Associations with Rock and Ice Rock Climbing (*WLA-specific*)	2020	James W. Watson, Robert G. Fischer

Recreation

Recreation overview

Quincy Lakes
Alan L. Bauer

WDFW wildlife areas provide fishing, hunting, and wildlife-related recreation, consistent with the agency's mission and with the funding sources for each property (Table 3) WDFW may place limitations on activities to protect resources, preserve quality of experiences and infrastructure, and address safety issues.

Providing recreation is one of the primary management objectives of the Columbia Basin Wildlife Area, along with managing habitat for wildlife. All state wildlife areas are governed by the agency's Public Conduct Rules https://wdfw.wa.gov/about/wdfw-lands/public-conduct), and may also have local requirements tailored to the area and its natural features, habitats and species.

Hunting (waterfowl, pheasant, upland bird, small game, mule deer) and fishing (warmwater, trout, and some salmon/steelhead) are popular on the wildlife area. The most prolific resident big game species is Rocky Mountain mule deer, which can be found on all wildlife area units. Additionally, the wildlife area has one of the most sought after limited entry mule deer hunting opportunities in the state, GMU 290 – Desert.

There are hundreds of lakes and ponds that offer diverse angling opportunities. Banks Lake, Billy Clapp Lake, and Potholes Reservoir are the three largest lakes on the wildlife area and offer opportunities to catch a wide array of warm-water gamefish as well as trout and kokanee salmon. Lakes on the wildlife area are managed under one of three management scenarios: trout only, warmwater, or mixed species.

Trout-only waters are stocked in fall or spring with some combination of rainbow trout, brown trout, tiger trout and eastern brook trout. Mixed species lakes contain populations of warmwater species (typically bass, bluegill and crappie) and are stocked with rainbow trout. Warmwater managed lakes are not stocked . Warmwater fish present in the Columbia Basin were introduced in the early to mid-1900s by the Unites States Fish Commission, Washington Department of Game, and illegal stockings done by the public. The only warmwater gamefish stocked by WDFW currently are tiger musky and channel catfish.

Between 40-50 lakes are stocked with trout annually on the wildlife area. Most trout lakes are managed under statewide general regulations which allow anglers to retain up to five trout per day with no minimum size. A smaller number of trout lakes are managed as 'quality' waters. Regulations on quality waters require anglers to use a single, barbless hook on all baits. Anglers may retain one trout, at least 18 inches, per day.

With the abundance of lakes and the Potholes Reservoir, water sports are also popular, along with camping, wildlife viewing, hiking, and rock climbing.

Quincy Lakes trails planning

The Quincy Lakes Unit is extremely popular for hiking, mountain biking, horseback riding, geocaching, and rock climbing. This low-elevation recreation area is the first to open-up from winter snowmelt, making it a popular spring destination. Visitors come from all over the state and other states as well. Each year, permits are issued for bicycle races, running events, orienteering, outdoor leadership schools, and other group

gatherings. Miles of trails have been created by users making illegal paths through the fragile shrubsteppe landscape. A stakeholder process is being convened to designate and manage trails in a sustainable way.

Game Reserves

Within the footprint of the Columbia Basin Wildlife Area, there are six game reserves (WAC 220-411) and one migratory bird hunting closure. Three of reserves are in the Desert Unit (Winchester, Frenchman, North Potholes) and one each in the Sprague Lake, Banks Lake, and Billy Clapp Unit. The migratory bird hunting closure occurs on the Columbia River immediately adjacent to the Quincy Lakes Unit. All hunting and trapping is prohibited within the boundaries of a game reserve. Game reserves were established to provide a location for migrating waterfowl to rest undisturbed. Because they have this resting place, reserves often hold large numbers of ducks and geese and support surrounding hunting opportunities. In the Desert Unit, all three reserves have regulated access areas for hunting adjacent to them. Two of the reserves have intensively managed wetland projects in proximity which provide additional habitat and hunting opportunity near these large concentrations of waterfowl. While geared at providing a resting area for waterfowl, many other game species such as mule deer and ring-necked pheasants take advantage of both the habitat and lack of disturbance the reserves offer.

Regulated Access Areas

Three locations on the wildlife area are managed as regulated access waterfowl hunting areas. All three are adjacent to game reserves and are managed to provide improved wetland habitat and a better hunter experience. Two of the three include intensively managed wetland projects that have extensive water control infrastructure allowing WDFW to manipulate water conditions in these wetlands. These two wetlands are also generally planted with desirable waterfowl forage on an annual basis. At all three locations, hunter access is limited to reduce hunter density and improve the experience. The three regulated access areas are Frenchman Ponds, Winchester Ponds, in the Desert Unit and North Potholes.

Desert Unit waterfowl
Photo by Alan L. Bauer

Table 3: Recreational highlights on Columbia Basin Wildlife Area

Wildlife Area Unit	Primary hunting and fishing opportunities	Other recreational activities	Restrictions / opportunities	Parking and other facilities
Banks Lake	Waterfowl Upland birds Small game Pheasant release site* Mule deer Trout Warmwater species	Camping Boating Swimming Wildlife viewing Rock and ice climbing	Includes Banks Lake Game Reserve **	Parking area Restroom ADA parking areas and restrooms 5 boat launches Designated campground
Billy Clapp Lake	Trout Kokanee Warmwater species	Boating Swimming Wildlife viewing	Includes Stratford Game Reserve**	Paved parking area Restroom Dock Boat Launch - concrete
Desert (and Potholes)	Waterfowl Upland bird Mule Deer Trout Warmwater species	Camping Wildlife viewing Boating Swimming	Includes Frenchman Hills Wasteway, N. Potholes, and Winchester Game Reserves** Includes Winchester Ponds, Frenchman Ponds, and N. Potholes Regulated Access Areas	Several parking areas Restrooms Boat launches and ramps Two ADA access areas
Gloyd Seeps	Waterfowl Pheasant	Wildlife viewing	Hunter Education Pheasant clinic site Pheasant site*(*youth season and general season opener)*	Several parking areas No restrooms
Lower Crab Creek	Pheasant Trout Warmwater species	Wildlife viewing	Includes Lower Crab Creek Natural Area Preserve Pheasant release site*	Parking area Restrooms
Priest Rapids	ADA goose hunting Pheasant Salmon/steelhead	Wildlife viewing	Pheasant release site*	Parking area Restroom Boat launch - concrete
Quincy Lakes	Waterfowl Pheasant Trout Warmwater species	Camping Mountain biking Trail running Hiking Rock climbing Geocaching Boating Swimming	Migratory bird closure (on the Columbia) - It is unlawful to hunt migratory waterfowl, coot, and snipe Pheasant release site* (*only partial restriction* The main access road through this unit is closed to vehicles from Oct. 1 through Feb. 28.	Several parking areas Restrooms Boat launch - concrete Campground
Rocky Ford	Waterfowl Trout	Wildlife viewing Geocaching		Parking areas

Wildlife Area Unit	Primary hunting and fishing opportunities	Other recreational activities	Restrictions / opportunities	Parking and other facilities
Seep Lakes (and Goose Lakes)	Waterfowl Mule deer Trout Warmwater species	Camping Boating Wildlife viewing Geological features		Several parking areas Restrooms Boat ramps
Sprague Lake	Trout Warmwater species	Wildlife viewing	Includes Sprague Lake Game Reserve**	2 parking areas Restroom Boat ramp Covered viewing platform Interpretive trail (1000' ADA)
Sun Lakes	Chukar Mule deer Trout/Kokanee	Wildlife viewing		Parking areas Boat ramps
Winchester Reservoir	Waterfowl Warmwater species	Camping		Parking area Restroom

* To protect other wildlife species including waterfowl and raptors, **nontoxic shot is required for all upland bird, dove and band-tailed pigeon hunting on all pheasant release sites statewide.** If you hunt any of these release sites, you may use only approved nontoxic shot (either in shotshells or as loose shot for muzzleloading).
** No hunting or trapping on game reserves

Boating and fishing on Sun Lakes
Photo by Alan L. Bauer

Water access areas

WDFW manages more than 500 water access areas throughout the state for recreation associated primarily with boating and fishing. There are 58 access areas associated with the Columbia Basin Wildlife Area, and they are a big draw to visitors. Providing and maintaining this access is on-going.

Bank Lake boat ramp
Photo by Alan L. Bauer

Three recent redevelopment projects are underway at the time of this plan. At Blue Lake, improvements include a boarding float, paved ADA parking and replacement of chain link fence. At Burke Lake, redevelopment includes replacement of the boat launch, and when funding issues are resolved, paving the parking lot and installing a new boarding float. At Lind Coulee, improvements include replacing part of the ramp, installing next CXT vault toilets and installing an accessible platform.

Two new projects area planned and funded during this planning period. At Glen Williams on the Potholes, two boat launches will be replaced, a loading float, three vault toilets, and ADA loading platform will be installed. The parking area will be paved, and signage installed. At Million Dollar on Banks Lake, the entrance road and parking area will be paved, and parking/camping areas graveled. A CXT toilet, ADA loading platform, and concrete launch will be installed.

Information on access locations can be found at https://wdfw.wa.gov/places-to-go/water-access-sites.

Lake Lenore, Sun Lakes Unit
Photo by Alan L. Bauer

Volunteering and stewardship

The Columbia Basin Wildlife Area has benefited from long-term participation of a few groups and individuals who volunteer on a variety of projects to support the agency's conservation and recreation objectives. The Washington Waterfowlers Association and Pheasants Forever frequently volunteer on habitat enhancement and plantings and waterfowl blind maintenance. Many individuals have also contributed their time to help with maintenance on the wildlife area.

An objective of this plan is to strengthen and continue to expand these partnerships and uncover more opportunities for interested parties to volunteer. WDFW staff will explore new opportunities and partnerships at the wildlife area that highlight the educational and nature-based opportunities that the area could provide.

Pheasants Forever planting project
Photo by Rich Finger, WDFW

Wildlife area goals, objectives, and monitoring

Goals, objectives and performance measures

This plan sets management priorities for the Columbia Basin Wildlife Area for the next 10 years. The goals, objectives, and performance measures in this plan were developed by an interdisciplinary team of regional and headquarters staff, with input from the Wildlife Area Advisory Committee, tribes, the public, and other agency staff. The plan goals, objectives, and performance measures will be reviewed and updated every two years. Some of the objectives listed in this plan are not yet fully funded.

Table 4 lists the goals, objectives, and performance measures of the plan. Staff considered how projected changes in climate could impact the resources of the wildlife area and took note of opportunities that may help to mitigate or prepare for those impacts.

Monitoring and adaptive management

Wildlife area objectives will be evaluated and updated annually with input from the wildlife area advisory committee and regional district team. The update reports progress on goals and objectives and identifies any new actions to meet plan goals. Every two years, WLA staff prepare a summary of management highlights and new issues published on the agency website. Further, over the term of the plan (10 years), the agency will evaluate the funding level required to maintain the capacity needed to successfully manage the wildlife area.

Sunrise on Park Lake
Photo by Alan L. Bauer

Table 4: Columbia Basin Wildlife Area goals, objectives, and performance measures

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
Goal 1. Maintain or improve the ecological integrity of priority systems and sites				
1A. Improve post-fire habitat enhancement response in frequently burned areas and other areas of concern.	All	1. Needs statement developed by 2022 (Y/N) 2. Partnerships established by 2023 (Y/N) 3. Post-fire enhancement plan developed by 2024 (Y/N)	Lands Operations Manager *WLA Manager*	- Develop needs statement. - Identify partners (BLM, DNR, etc.) to carry message forward and prepare. - Identify cultural resources concerns. - Modify for WLA-specific BOR/NEPA process improvement - Cultural resources surveys broadly done - Prioritize most valuable habitat (CR list) - Coordinate with Diversity
1B. Conduct weed control measures to maintain access and decrease fires, maintain legal compliance, and improve habitat.	All	1. Number of acres treated annually 2. Annual weed control report produced (Y/N)	WLA Manager	- Manage weeds through IPM. - Complete annual reporting requirements, including acres treated (residual, other ground treatments, and aerial). - Respond to weed control needs after fires or other largescale disturbances as funding allows.
1C. Implement sustainable Russian olive removal.	Desert Lower Crab Creek Gloyd Seeps	1. Acres of Russian olive removed annually 2. Acres of Russian olive control (sprayed) maintained annually	WLA Manager	- Consult on cultural resources compliance issues. - Consult with WDFW foresters. - Stay within our capacity to monitor and maintain. - Implement removal. - Consider Integrated Vegetation Management. - Consider mapping Russian olive locations. - Consider other conservation objectives when planning Russian

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				olive removal (such as cover for deer and other species).
1D. Enhance shrubsteppe/grassland habitat (such as dense nesting cover) as funding and staff time allow.	Gloyd Seeps, Desert Seep Lakes Upland Rest. Rest. Other units as appropriate	1. Resources acquired for staff and materials 2. Acres of enhancements implemented 3. Acres of enhancements maintained	WLA Manager *District Wildlife Biologist*	- Identify priority areas. - Acquire funding for materials, permitting, and cultural resources. - Identify challenges to enhancement such as fire, weeds, agriculture. - Identify long term O&M funding and staff capacity
1E. Develop Coordinated Resource Management Plan for Sun Lakes Unit by 2025.	Sun Lakes	1. Coordinated Resource Management Plan developed (Y/N)	WLA Manager *Lands Operations Manager* *Range ecologist*	- Initiate CRM and engage with multiple partners, tribes, and Conservation District. - Develop Plan. - Implement Plan. - Coordinate with WAAC.
Goal 2. Maintain or increase wetland value and function				
2A. Implement wetland management which is focused on enhancements and also includes development of new wetlands on the wildlife area.	Desert Gloyd Seeps Lower Crab Creek Other units as needed	1. Number of acres maintained or enhanced routinely (what was done): a. weed control b. supplement planting and harrowing c. tall emergent controls 2. Number of acres restored annually a. burned b. excavated	WLA Manager *Wetland Specialist* *District Wildlife Biologist*	- Prioritize areas for restoration. - Identify funding sources. - Maintain partnerships with BOR and Quincy Irrigation District. - Adapt to changing water issues and maintain functionality of projects. - Remove obstructions from infrastructure. - Coordinate with Habitat Program on plan development. - Utilize moist-soil management techniques to increase natural food sources and improve overall wetland value. - Incorporate planted crops when practical to provide additional food and cover resources.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				- Manipulate water levels, as much as possible, to provide optimum recreational opportunities. - Plan in advance for cultural resources review for activities that disturb ground.
2B. Maintain open water and conveyance.	Desert Gloyd Lower Crab Creek Winchester	1. Acres of phragmites and other tall emergent vegetation treated annually, and acres affected.	WLA Manager	- Manage Soil and moisture conservation budget (BOR Funding) -Reconnaissance areas for treatment (geared toward BOR and WDFW needs (phragmites). - Implement treatments.
2C. Continue feasibility study of Artesian and Black Lake wetland project.	BOR land	1. Feasibility study completed (Y/N)	Habitat Program *WLA Manager* *District Wildlife Biologist*	- Secure environmental and cultural compliance - Support operations of future test feeds. - Coordinate with tribes on cultural resources work to protect resources and survey and test areas
2D. Implement prescribed burn plan for managing vegetation and improving wetland habitat. Expand on burn plan to include additional areas.	All	1. Funding secured (Y/N) 2. Number of prescribed burns conducted 3. Acres of emergent vegetation treated 4. Amount of additional acreage added to burn plan	WLA Manager *Burn Team Leader* *District Wildlife Biologist*	- Coordinate with BOR and fire districts on burn plan. - Work with permitting agencies to get permits. - Treatment to reduce emergent vegetation.
Goal 3. Achieve species diversity at levels consistent with healthy ecosystems.				
3A. Conduct survey for Species of Greatest Conservation Need in	All	1. Number of species surveys completed every 5 years	Diversity Division	- Coordinate district priorities with Olympia Diversity staff annually.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
coordination with the Diversity Division.			*District Wildlife Biologist*	- Contribute to Observations database.
3B. Enhance northern leopard frog habitat, through burning, spraying, and fish removal. Identify opportunities to expand the population.	North Potholes Reservoir	1. Acres of habitat enhanced 2. Acres of wetlands treated for fish removal.	District Wildlife Biologist *WLA Manager*	-Seek additional funding opportunities to expand treatment area. -Assist with planning reintroduction efforts.
3C. Continue to support Washington ground squirrel conservation efforts.	Seep Lakes Gloyd Seeps Banks Lake Sun Lakes Lower Crab Creek Quincy Lakes	1. Habitat managed in coordination with District Bio (Y/N) 2. Ground squirrel colony locations monitored (Y/N)	District Wildlife Biologist *WLA Manager*	- Provide habitat management support for reintroduction. - Work with BOR on permit; CR permitting.
3D. Monitor waterfowl populations during spring migration annually.	Frenchmen RAA	1. Annual monitoring completed (Y/N)	District Wildlife Biologist *Wetland Specialist*	- Specific to BPA project only to meet funding requirements. - Work with District Bio to manage and analyze data gathered by camera trapping.
3E. Identify and implement opportunities to enhance monarch butterfly, bumble bees, and other pollinator habitat by 2024.	Lower Crab Creek Other units as applicable	1. Funding identified for Lower Crab Creek enhancements (Y/N) 2. Number of areas assessed for pollinator habitat 3. Number of areas enhanced for pollinator habitat	Diversity *District Wildlife Biologist* *WLA Manager*	- Conduct assessment of pollinator habitat. - Develop action plan to enhance habitat. Determine which areas to plant shrubs, forbs, and native wildflowers. - Allow milkweed to grown during the time period it supports Monarchs. - Work with Diversity Division to provide guidance or action plan on habitat enhancement actions. - Identify pollinator plots. Consider partnering with Pheasants 4 Ever and schools.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
3F. Develop a strategy to conserve striped whipsnake.	Lower Crab Creek Wanapum area	1. Population assessment conducted (Y/N) 2. Conservation strategy developed (Y/N)	Diversity Division District Wildlife Biologist	- Continue to engage with BOR to identify funding for acquisition and O&M for whipsnake recovery in the Wanapum area. - Implement test plot for cheatgrass control on western end of Lower Crab Creek to benefit whipsnakes.
3G. Reduce impacts to large grebes by supporting Office of Columbia River mitigation efforts.	Banks Lake	1. Grebe management area established in conjunction with BOR (Y/N) 2. Efficacy of management tools such as no-wake zone or floating nest platforms scoped (Y/N).	District Wildlife Biologist *WLA Manager*	- Continue to support Office of Columbia River efforts to mitigate for grebe impacts associated with Banks Lake drawdown.
3H. Improve habitat for wintering mule deer.	Desert Gloyd Seeps Banks Lake	1. Maps of bitterbrush habitat developed and shared with FPDs and BLM (Y/N) 2. Number of bitterbrush stands enhanced or developed 3. Inventory of derelict fence done (Y/N) 4. Feet of derelict fence removed	WLA Manager *District Wildlife Biologist*	- Protect bitterbrush habitat – develop maps of protection areas to share with Fire Protection Districts and BLM. - Enhance and establish bitterbrush stands and other winter food sources. - Inventory and remove derelict fence.
3I. Enhance habitat at Upland Restoration sites.	Upland Restoration sites (LCA unit)	1. Funding sources for enhancement identified (Y/N) 2. Parcels evaluated for easements and funding strings (Y/N) 3. Number of habitat enhancement projects completed	WLA Manager	- Enhance upland habitat at LCA unit. - Identify funding sources for enhancements. - Evaluate parcels for easements and funding strings. - Plan in advance for cultural resources review of activities that disturb ground.
3J. Reduce the impact of rock climbing on nesting raptors by actively managing rock climbing.	Frenchmen Coulee Banks Lake Coulee Corridor Billy Clapp Lake	1. Survey of nesting raptors completed (Y/N) 2. Season of use established (Y/N)	WLA Manager *Division Archaeologist* *District Wildlife Biologist*	- Consult with climbers on routes. - Identify currently used climbing areas. - Identify nesting sites to protect. - Designate open/closed areas to climbing.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				- Survey for cultural resources - Support designations with land use rules. - Plan in advance for cultural resources review for activities that disturb ground.
3K. Use drone technology for reconnaissance and surveys to reduce need for flights, reduce staff risk, reduce cost, and increase efficiency.	All	1. Number of missions flown 2. Staff trained and certified (Y/N)	WLA Manager *District Wildlife Biologist*	- Train and certify staff - Identify management needs
Goal 4. Enhance recreational experience through site development.				
4A. Maintain parking areas and roadways.	All	1. Number of parking areas maintained. 2. Number of parking areas upgraded. 3. Miles of roadway maintained with residual chemical control 4. Miles of roadway graded	WLA Manager *Water Access Manager* *CAMP*	- Place barrier rock. - Repair fences and gates. - Coordinate road grading. - Maintain roads and parking areas using chemical and mechanical methods. - Maintain restrooms and collect trash.
4B. Continue to improve recreational experience, user expectations, and support of the wildlife area by providing information such as on the web, at kiosks, in maps, brochures, and directional signage.	All	1. Number of kiosks installed or improved 2. Number of signs installed 3. Website content updated as new information is available, at least annually (Y/N) 4. Participation in WDFW Recreation Planning to create land use rules (Y/N)	WLA Manager *Water Access Manager* *Recreation Planning Team* *Public Affairs* *Enforcement*	- Signs, kiosks, multi-lingual signage, etc., needs to be coordinated at agency level for consistency and standards. - When appropriate, WLA staff will: - Coordinate with other WLAs engaged in similar pursuit. Coordination should occur at statewide level (i.e. sign committee to provide consistency and standards). - Keep website current. - Construct/erect kiosks and informational signs for all access points, trailheads and parking areas as staff time and funding allows.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				- Provide multi-lingual interpretive materials when appropriate. - Where applicable consider interpretive signage that describes species, habitat types, unique features, restoration projects. - Consider heritage/cultural information and, where appropriate geologic and Ice age flood information. - Install signs as staff time and funding allows. - Informed by Lands Showcase work, develop positive information messages (not all focused on what you can't do). - Work with local DOT for adding directional signs on appropriate highways and byways. - Participate in recreation planning to ensure WLA interests are heard.
4C. Improve target shooting opportunities by establishing target shooting range at Lake Lenore and Lower Crab Creek, and explore North Potholes opportunity.	Sun Lakes Desert Lower Crab Creek	1. Number of improvements made 2. Number of ranges established	WLA Manager	- Work with stakeholders on improvements and range establishment. - Provide outreach and education when applicable via FB and enforcement contacts, as well as through the WAAC. - Include fire abatement and garbage control measures.
4D. Develop designated trail networks in high use areas, and decommission some user-built trails.	Quincy Lakes	1. Multiple user groups involved in developing trail network (Y/N) 2. Trail system designated (Y/N) 3. Maintenance plan developed (Y/N)	WLA Manager *Lands Operations Manager*	- Confer with interested parties from multiple user groups. - Assess current trails and determine ones to designate and ones to decommission.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				- Work with advisory committee and users to develop and assess trails and develop official trails. - Create maps and post on kiosks and online. - Work with users to develop maintenance plan. - Plan in advance for cultural resources review for activities that disturb ground. - Implement the inadvertent discovery plan and use in case cultural resources are encountered during trail maintenance.
4E. Develop a Campground at Frenchman's Coulee.	Quincy Lakes	1. Partnerships formed (Y/N) 2. RCO grant submitted (Y/N) 3. Campground constructed (Y/N)	WLA Manager *Water Access Manager*	- Identify grant programs and other sources of funding for campground development (possibly Title 28 – if on BOR land). - Partner with climbing and other groups interested in the campground. - Conduct cultural resource survey in advance of campground development. - Plan in advance for cultural resources review for activities that disturb ground.
4F. Develop criteria to manage commercial and group use while protecting the resource and other users.	All	1. Criteria developed for managing commercial uses or group use (Y/N)	WLA Manager *Water Access Manager* *Lands Operations Manager*	- Develop criteria on how to approve or deny requests for permits. - Develop criteria to cap events and attendees.
4G. Complete the expansion of Frenchman's Regulated Access Area.	Desert	1. Reserve boundary signage installed (Y/N) 2. Russian olive treatment completed (Y/N) 3. Special access hunting sites established (Y/N)	WLA Manager *District Wildlife Biologist* *Wetlands specialist* *Public Affairs*	- Work with Game Division on including special hunting sites in pamphlet. - Work with PAO to announce changes and new opportunities.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
Goal 5. Improve fishing opportunities				
5A. Assess potential to improve lakes and stock with fish (trout and/or warm water) by 2024.		1. Assessment completed (Y/N)	Fish Biologist	- Conduct a survey to identify possible fisheries. - Use creel anglers and report catch.
5B. Improve fishing opportunities by managing aquatic weeds in stocked lakes.		1. Number of weed control measures implemented	Fish Biologist *Statewide WLA Weed Manager*	- Collaborate with Fish Program on weed control efforts. - Work with the Fish Program's fish stocking program - With Fish Program, evaluate other lakes/ponds/wetlands for potential stocking efforts.
Goal 6. Improve access and other recreation opportunities				
6A. Identify and secure easements where needed	Desert Seep Lakes Rocky Ford Creek Sun Lakes	1. Number of formal access agreements in place or being pursued.	Real Estate *WLA Manager* *Water Access Manager*	- Work with landowners and neighbors on agreements. - Work with Real Estate - Identify funding. - Identify stakeholders and gain support
6B. Develop a list of prioritized inholdings to acquire.	Desert Gloyd Quincy Lakes	1. Prioritized list developed (Y/N) 2. Identify potential funding for acquisition (Y/N)	Lands Operations Manager WLA Manager *Real Estate*	- Involve District Team. - Identify partners. - Identify next steps on potential acquisitions.
6C. Assess WLA for restroom facilities that need to be improved or replaced or added, including ADA accessibility, by 2022.	All Ancient Lakes in particular	1. Restroom facility list developed (Y/N) 2. Funding sources identified (Y/N)	Water Access Manager *WLA Manager*	- Determine high recreation use areas for restroom locations. - Identify partners. - Coordinate with BOR. - Identify funding sources for new .and improved ADA restrooms. - Seek O&M. - Plan for cultural resource survey in advance of improvements.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
				- Plan in advance for cultural resources review for activities that disturb ground
6D. Maintain and enhance water access sites.	North Million Dollar Billy Clapp Burke and Blue Lakes	1. Glen Williams access area redevelopment completed (Y/N) 2. Million Dollar North access area redevelopment completed (Y/N) 3. Number of additional sites enhanced	Water Access Manager *WLA Manager*	- Develop guidance. Include launches, restrooms, ADA compliance. - Coordinate with BOR on condition assessment for boat launches. - Make facilities compliant. - Provide good distribution across Columbia Basin. - Develop list of needs for Water Access areas.
6E. Develop a guidance document on managing ADA opportunities and provide ADA information to the public.	All	1. Guidance document developed (Y/N) 2. Guidance document implemented (Y/N)	WLA Manager *Water Access Manager* *ADA Access Coordinator*	- Coordinate with BOR. -Develop an inventory of ADA hunting opportunities (blinds, available service roads, etc.). -Identify ADA compliance issues. - Designate criteria for ADA use (# of participants allowed at one time, seasonal restrictions, etc.).
6F. Improve access to ADA blinds.	All	1. Number of blinds moved, enhanced, or established.	WLA Manager	- Explore possibility of ADA blind at Gloyd Seeps. - Enhance existing blinds by brushing, moving, or renovating. - Establish new blinds where funding, environmental and cultural compliance, and site conditions allow.
6G. Manage road usage to improve waterfowl hunting.	Potholes (Desert) Winchester Reservoir	1. Seasonal closure on Winchester Reservoir implemented (Y/N) 2. Seasonal closure on Powerline Road *(that comes in from the east*) of Desert Unit implemented (Y/N)	WLA Manager	- Coordinate with BOR. - Federal Public Notice requirements. - Public Access Management process (WDFW).

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
6H. Create a prioritized list of water access site developments and improvements.	All sites with water access Billy Clapp Lake Blue Lake	1. Prioritized list developed (Y/N)	WLA Manager	-Coordinate with BOR dive team on their assessment of Banks Lake sites. -Assess needs at water access sites. - Cultural resource survey may be required in advance of improvements. - Plan in advance for cultural resources review for activities that disturb ground.
6.I. Develop and implement a Travel Management Plan	All	1. Pre-consultation scoping with tribal partners completed (Y/N) 2. Grant funding acquired from federal lands program (FHWA) 3. NEPA compliance (Y/N) 4. Travel Management Plan completed (Y/N)	Land Operations Manger WLA Manager	-Partner with BOR to develop travel plan - Conduct public process to develop plan - Include user groups in plan development - Apply for grants through Federal Highway Administration (FHWA)
Goal 7. Offer multiple and varied opportunities for stakeholder participation & engagement.				
7A. Coordinate and maintain a Wildlife Area Advisory Committee at least twice per year.	All	1. Number of meeting(s) per year	WLA Manager	- Draft agenda with attention to group interest and time constraints. - Hold meeting and collect group comments and recommendations for consideration relative to future management actions (proposed or ongoing). - Include meeting notes in wildlife area website.
7B. Continue to recruit new hunters and offer hunter education opportunities.	All	1. Number or recruitment actions 2. Number of hunter education opportunities offered	District Wildlife Biologist *Hunter Education*	- Develop or distribute hunter recruitment information. - Recruit at appropriate events. - Offer hunter education.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
7C. Work with local community tourism associations to communicate opportunities and benefits on the wildlife area.	All	1. Number of contacts made 2. Number of publications reviewed 3. Number of wildlife area stories told	Lands Operations Manager *Wildlife Area Manager*	- Build relationships with city tourism, chambers, promoters - Consider developing brochures
Goal 8. Maintain productive and positive working relationships with local jurisdictions, community, neighbors, lessees, and permittees.				
8A. Continue working on the 25-year management agreement (expires in 2028) with BOR (2027).	All BOR lands	1. Participation continued in BOR/WDFW quarterly coordination meetings (Y/N) 2. 25-year agreement revised (Y/N)	Real Estate, *Lands Division Manager* *Wildlife RPM* *Lands Ops Manager,* *WLA Manager*	- Wildlife area manager, lands operation manager and wildlife regional program manager, Lands Division Manager meet with BOR staff to negotiate MOU.
Goal 9. Identify reliable sources of funding				
9A. Continue to work with BOR on operations and maintenance budget, securing adequate, sustainable funding, and reporting, and ensuring obligations are met.	BOR lands	1. Annual meeting to discuss S&MC funding conducted (Y/N) 2. Annual updates to SOW completed (Y/N) 3. Federal Real Property Report completed (Y/N) 4. Recreation Use Data Report completed (Y/N) 5. Title 28 funding pursued (Y/N) 6. Additional capacity funding pursued (Y/N)	Lands Operations Manager *Wildlife Area Manager*	- Determine adequate operations and maintenance budget. - Work with BOR on securing adequate funding. - Fulfill mitigation obligations. - Monitor use where possible.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
9B. Plan implementation of highest priority Goals and Objectives, as resources allow, during January District Team meetings.	All	1. Plan implementation discussed at District Team Meeting (Y/N) 2. Plan priorities documented (Y/N)	WLA Manager *District Team*	- Coordinate with staff involved in planning and with actions in the plan.
9C. Update 100% of fire suppression contracts with FPDs by 2023.	All	1. Percentage of fire suppression contracts updated	Lands Operations Manager Real Estate *WLA Manager*	- Implement phased approach
Goal 10. Maintain productive and positive working relationships with tribes.				
10A. Work with the Confederated Tribes of the Colville Reservation, the Yakama Nation, and the Wanapum Tribe to ensure the plan's management objectives of fish and wildlife are achieved while providing opportunities for the exercise of treaty, trust, and other reserved rights.	All	1. CTC, Yakama Nation, and Wanapum Tribe invited to discuss wildlife area plan management objectives and mutual concerns for wildlife resources (Y/N)	WLA Manager *Lands Operations Manager,* *Wildlife Program Manager,* *Region 2 Director*	- Respond to inquiries from tribes on management actions.
10B. Protect tribal treaty, trust, and other reserved rights and carefully evaluate and consider impacts to traditional hunting and gathering sites. Discuss mutual concerns for wildlife resources with the Tribes.	All	1. For management actions that could affect them, tribal treaty, trust, and other reserved rights are considered and evaluated (Y/N) 2. For management actions that could affect them, tribe is consulted (Y/N)	WLA Manager *Lands Operations Manager,* *Wildlife Program Manager,* *Region 2 Director*	- For management actions that could affect tribal interests, consider and evaluate impacts. - Follow SEPA and NEPA, and cultural resources processes - Consult with Cultural resources
Goal 11. Maintain safe, highly functional, and cost-effective administration facilities and equipment.				

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
11A. Remove derelict structures.	Desert	1. Number of derelict structures removed	WLA Manager *Archeologist*	- Consult with WDFW archeologist before removal for proper procedures. - Maintain on Capital Project List until completed.
11.B. Improve efficiency in Cultural Resources compliance for the WLA	All	1. Cultural resources plan for WLA developed (Y/N)	WLA Manager *Archeologist*	- Work with managers to build capacity for cultural resources - Coordinate with archeology staff - Work towards inventorying cultural resources on CBWLA lands for management and planning purposes (for federal lands falls under Federal Section 110).
11C. Determine importance of maintaining DNR leases and decide which leases to continue.	All with DNR leases	1. Review leases with District Team prior to renewing the leases 2. Determination made on which leases to continue	WLA Manager *District Wildlife Biologist*	- Work with RES and others on benefit of leases - Consult with District Team the WAAC - Document local knowledge
11D. Maintain and upgrade water control structures as necessary.	Desert Gloyd	1. Number of structures inspected 2. Replacement/upgrade at Desert and Gloyd Units (Y/N)	WLA Manager	- Coordinate with Ducks Unlimited when possible. - Seek grants and additional funding from other sources
11E. Annually inspect 30 miles of fencing and all gates; repair, replace, and remove as needed and as funding allows.	All	1. Miles of fencing inspected, repaired, and removed 2. Number of gates inspected and repaired 3. Title 28 obligations met.	WLA Manager	- Prioritize replacement of old fence. - Complete repairs as needed. - Submit Capital Funding requests for replacement of old fence. - Meet Title 28 obligations.
11.F. Update wildlife area facility information in centralized database annually.	All	1. Central facilities database updated annually (Y/N)	WLA Manager *Water Access manager*	- Use agency facility inventory tool to update facilities information.
11.F. Review and update information on the wildlife area web pages as needed or annually.	All	1. Wildlife area web pages reviewed and updated annually (Y/N)	WLA Manager *Water Access Manager*	- Keep information available to the public on the web pages current.

Goal / Objective	Units	Output measure	WDFW lead and support	Tasks
Future desired objectives				
Acquire equipment necessary to mechanically control vegetation in wetlands.	*Desert, Gloyd*	*1. Funding source identified (Y/N)* *2. Equipment acquired (Y/N)*	*WLA Manager* *Wetland Specialist*	*-Continue to engage with Bureau of Reclamation to seek opportunities for additional capacity funding, or other sources.* *-Apply for Duck Stamp and Print funding.*

Part III: Species and habitat management

Physical characteristics

Geology and soils

The Ice Age floods shaped the geography of the Columbia Basin and left behind many spectacular erosional features such as the cliffs of the Grand Coulee in the north, the alluvial fan of deposited fertile soils, and the channeled scablands (https://iafi.org).

The geology and soils of the wildlife vary widely. The most common soils tend to be shallow, well drained, and steep. Generally, cliffs and talus slopes are common. Channeled scablands characterize several of the units, others have sand dunes, and some contain high quality irrigable soils. Wetlands, caused by irrigation seepage and return flows, with developing organic soils, are interspersed.

The following soils descriptions are excerpts from the Soil Survey of Grant County (SCS 1984) and the Soil Survey of Adams County (SCS 1967).

Cliff and talus slopes surround the northern parts of Banks Lake, with soils in the Bakeoven-Anders-Benco association occupying the hillsides, ridgetops, benches, and terraces. Bakeoven soils are on ridgetops, hillsides, and benches, and are very shallow and well drained. The surface layer is very cobbly loam and subsoil gravelly loam. Slope is 0-55 percent. Depth to basalt ranges from 4 to 12 inches. Anders soils are moderately deep and well drained and on benches. Slope is 0-10 percent. The surface layer and the upper part of the subsoil are silt loam, and the lower gravelly silt loam. Depth to basalt ranges from 20 to 40 inches. Benco soils are very deep and well drained and on terraces. They formed in gravelly glacial outwash that is mixed with loess in the upper part. Slope is 0-15 percent. The surface layer is stony loam, and the subsoil is very gravelly loam. The substratum to a depth of 60 inches or more is extremely gravelly coarse sand.

Southern Banks Lake, Billy Clapp, and Sun Lakes Units also have numerous cliffs and talus slopes, soils on the hillsides, ridgetops, benches and terraces within these units are mostly of the Bakeoven-Roloff association. (See above for Bakeoven description). Roloff soils are moderately deep and well drained and are on benches and hillsides. Slope is 0-25 percent. These soils are silt loam. Depth to basalt ranges from 20 to 40 inches.

The Quincy, Seep Lakes, and Gloyd Seeps units are characterized by channeled scablands, with the Starbuck-Bakeoven-Prosser associated soils occupying the benches, hillsides and ridgetops.

Starbuck soils are shallow and well drained and are on benches, hillsides, and ridgetops. They formed in loess and in material derived from basalt. Slope is 0-65 percent. The surface layer is very fine sandy loam, and the subsoil is silt loam. Depth to basalt ranges from 12 to 20 inches.

Prosser soils are moderately deep and well drained and are on benches and hillsides. Slope is 0-45 percent. The soils are a very fine sandy loam. Depth to basalt ranges from 20 to 40 inches.

Most of the Lower Crab Creek Unit is covered with Schawana soil. Schawana soils are shallow and somewhat excessively drained and are on benches and hillsides. They formed in eolian deposits and in material derived from basalt. The surface layer is cobbly loamy fine sand and underlying material is gravelly very fine sandy loam. Basalt is at a depth of about 12 inches. Depth to basalt ranges from 8 to 20 inches.

The Potholes, Desert and Winchester Reservoir Units are primarily Quincy fine sand, with 2-15 percent slopes. This very deep, somewhat excessively drained soil is on dunes and terraces. It formed in sand derived from mixed sources. Permeability of this soil is rapid. Runoff is slow, and the hazard of water erosion is slight, and the hazard of soil blowing is very high. (WDFW 2006)

Hydrology

The Columbia Basin Irrigation Project (CBIP) was developed following the completion of the Grand Coulee Dam in 1942 and the Banks Lake Equalizing Reservoir in 1951. The Pump-generating Plant at the Grand Coulee Dam pumps Columbia River water to supply Banks Lake and this "feed water" is then routed through a series of canals, reservoirs and wasteways to irrigate the Columbia Basin. Greater than 671,000 acres of land are irrigated in the basin, and the number of ponds, lakes and reservoirs quadrupled from 35 to greater than 140 since project development (USBR 2013). The CBIP changed agricultural practices, recreational opportunities, wildlife habitat, and overall land use of the Columbia Basin dramatically.

The Grand Coulee and Crab Creek watersheds impact the Columbia Basin Wildlife Area; the Crab Creek watershed has the primary influence to wildlife area lands and drains approximately 13,200 square miles (Wagner et al. 2004). Historically, Gloyd Springs and Rocky Ford Creek were the only perennial water sources feeding Crab Creek (WDFW 2006) and thus in the northern portion of the Gloyd Seeps, Crab Creek was ephemeral, flowing only during runoff events[1]. In the central portion of Gloyd Seeps, irrigation return flows and springs influenced by irrigation cause Crab Creek to become perennial. Irrigation return flows from drains and wasteways within the Desert, Frenchman, Potholes and Winchester units of the wildlife area feed Potholes Reservoir. From the O'Sullivan Dam on Potholes Reservoir, Crab Creek flows perennially through the Columbia National Wildlife Refuge and the Lower Crab Creek Unit to the Columbia River.

Most of the wetlands in the wildlife area are impacted by CBIP water delivery, and active water level management enhances approximately 550 acres of wetland habitat. It is important to note that all wetlands associated with CBIP water delivery are impacted by the USBR operating regime. This creates uncertainty for wetland planning because factors such as timing, rates, levels, and unanticipated shut-offs are outside of the control of wildlife area managers.

Although the Columbia Basin had far fewer wetlands prior to the CBIP, the original wetlands functioned naturally by recharging during fall and winter rains and spring snowmelt and gradually receding during the summer (WDFW 2006). Natural wetlands are dynamic and typically experience wet-dry cycles, and this periodic drying is critical for maintaining wetland productivity and habitat value (Fredrickson 2015; DU 2005). The irrigation-influenced wetlands within the wildlife area have a relatively consistent hydroperiod through the growing season, and this stability can compromise wetland function and accelerate issues such as invasive species, sedimentation, and succession (Fredrickson 2015 and DU 2005).

[1]Once the Potholes Supplemental Feed Route is fully operational, USBR will divert water through the Crab Creek Channel at a base flow of 100 cfs, with spring flows (April 1 – June 30) of up to 500cfs (USBR 2007). Over 1,000 new wetland habitat acres in the Gloyd Seeps Unit of the CBWA will be created by this project (USBR 2007

Climate

The Columbia Basin Wildlife Area lies near the geographic center of Washington State. The Cascade Range and the Rocky Mountains influence the climate in the Columbia Basin. The Rocky Mountains shield the Columbia Basin from the severe winter storms moving southward across Canada, while the Cascade Range

forms a barrier to the easterly movement of moist air from over the ocean. Some of the air from each of these sources does reach Grant and Adams Counties. Summers are warm or hot. Summer precipitation occurs mainly as brief showers or short, intense thunderstorms. Average annual precipitation ranges from approximately eight inches in the western units (near Quincy) to approximately 11 inches in the eastern units (near Moses Lake). Annual average snowfall across the wildlife area is about 28 inches in the west and 21 in the east. Average daily temperatures range from a high of 87 ° F in the west and 89° F in July in the east. Average lows are between 21° F in the west to 23° F in December in the east. (US Climate Data 2020).

Ecological systems

Classifying and inventorying habitats provides a useful tool to prioritize them for conservation action. The Washington Department of Natural Resources' Natural Heritage Program guide classifies the ecological systems of Washington State (DNR, 2015). The guide uses the Ecological Systems and the U.S. National Vegetation Classification schemes to classify the ecosystems and vegetation types (**http://file.dnr.wa.gov/publications/amp_nh_ecosystems_guide.pdf**).

Shrubsteppe

The shrubsteppe is an arid ecosystem found in Eastern Washington and other western states, and is one of Washington's most diverse ecosystems. Shrubsteppe landscapes are rolling grassy plains or "steppe". Big sagebrush is the most widespread shrub, but there are also other types of sagebrush and antelope bitterbrush. There also is a variety of grasses including bluebunch wheatgrass, Sandberg bluegrass, and Idaho fescue. Some species are dependent on the shrubsteppe habitat. The shrubsteppe dependent species that may be found on the wildlife area include the greater sage-grouse, Columbian sharp-tailed grouse, ferruginous hawk, burrowing owl, short-eared owl, sagebrush sparrow, sage thrasher, sagebrush lizard, side-blotched lizard, pygmy horned lizard, striped whipsnake, northern leopard frog, tiger salamander, pygmy short-horned lizard, and pygmy rabbit.

The Inter-Mountain Basins Big Sagebrush Steppe is an ecological system that covers about 51,000 acres or 27% of the wildlife area, and is present in every unit.

An estimated 80 percent of ten million-acres of historic shrubsteppe has been lost or degraded, making protection of these areas critical. What shrubsteppe remains is largely fragmented by development and agriculture, making it challenging for species such as the sage thrasher and sagebrush sparrow. Fire also ravages the shrubsteppe regularly necessitating regular replanting. In a 2021 a budget bill proviso provided $3.85 million ($2.35 million general fund and 41.5 million capital funds) to WDFW for actions that support wildlife habitat and private landowners in shrubsteppe communities affected by 2020 wildfires.

Dunes

Almost 20,000 acres are classified as Inter-Mountain Basins Active and Stabilized Dune. This system occurs in the Columbia Plateau in Eastern Washington and in the inter-mountain basins of the west. Wind and a continual supply of shifting sands are necessary for dune dynamics. This system is unvegetated to moderately vegetated, relative to the amount of rainfall and temperature, and stress from wind and shifting sands. Patchy grasslands or shrublands are the most common, and multiple plant associations can occur.

Washington inland sand dunes have declined about 76% from the 1970s. Threats to the inland sand dunes are stabilization by invasive species, agriculture, irrigation, and off-road vehicle use, among other things.

Riparian areas

Riparian areas are along streams, rivers, and waterways, and contain both water and land ecosystems. This interaction creates an environment that is critical to the survival and existence of land-based and aquatic species. Riparian areas are a critical resource as they directly benefit numerous wildlife species, including many on the wildlife area. In the Columbia Basin, riparian vegetation often has a distinct transition with nearby uplands. Trees and shrubs that require more moisture are confined to these riparian systems, which typically get their water from shallow groundwater or from intermittent soil saturation. Common trees in these systems include black cottonwood, white alder, and quaking aspen. Common shrubs include willow, red osier dogwood, snowberry, and mock orange.

Riparian areas prove critical stop-over habitat for migratory birds. Within arid landscapes such as on the wildlife area, they are especially important. Riparian corridors in the wildlife are a result of the Columbia Basin Irrigation Project and have an unnatural hydrology which favors highly invasive weed species such as common reed, purple loosestrife, and Russian olive on a large scale. The aggressive nature of these weed species makes restoration very expensive, and the benefits are likely to be short-lived because invasive species will rapidly re-invade and require chemical control which threatens the restored habitat.

Riparian areas tend to have a more moderated temperature than the surrounding areas, and provide respite for wildlife. Many animals use riparian areas during hot summer months because water and dense vegetation make a cooler environment. Many migratory birds, frogs, and salamanders that are sensitive to extreme temperatures use these cooler areas.

Riparian areas provide thermal cover for species such as the greater sage-grouse and Columbian sharp-tailed grouse. Riparian areas also serve as major corridors for large migratory species such as deer and as shorter movement corridors for smaller mammals and amphibians.

Ecological Systems of Concern

Information about the rarity or potential risk of elimination of ecosystems can help prioritize and guide conservation and/or management actions toward those ecosystems that are of most concern. Conservation status ranks have been established in a 1-5 range: 1=Critically imperiled; 2=Imperiled; 3=Vulnerable; 4=Apparently secure; and 5=Secure.

In the Columbia Basin Wildlife Area, a review of satellite data identified nine ecological systems that are critically imperiled or imperiled (Table 5). This is coarse data shows the estimated acreage of these imperiled systems at about 92,050 acres, which is about 48% of the wildlife area. About 27% of the total land of the wildlife area is classified as Inter-Mountain Basins Big Sagebrush Steppe, which is imperiled.

Appendix A contains the list of Species of Greatest Conservation Need (SGCN) believed to be present on the wildlife area and their relationships with ecological systems of concern.

Table 5: Ecological systems of concern on the Columbia Basin Wildlife Area (Rocchio 2015)

This table is the rough estimate of critically imperiled and imperiled ecosystems on the Columbia Basin Wildlife Area. This is satellite imagery data and not measure on the ground. It is provided here to provide a general sense of the types of imperiled ecosystems.

Ecological system of concern / *status*	**Rough Estimated Acres**	**Vegetation Description** (Ecological Systems of Washington State. A Guide to Identification. Rocchio, 2015)	**SGCN closely and generally associated on this wildlife area** (SWAP 2015)
Inter-Mountain Basins Big Sagebrush Steppe *Imperiled*	50,000	This system is grassland with shrubs. Shrubs are dominated by *Artemisia* spp., and/or *Purshia tridentata* in an open to moderately dense shrub layer and with at least 25% total perennial herbaceous cover. The natural fire regime of this ecological system maintains a patchy distribution of shrubs, so the general aspect is that of grassland. *P. tridentata* is present almost always in association with tree cover, not out in the open.	American badger*, black-tailed jackrabbit, hoary bat, Merriam's shrew, pygmy rabbit*, silver-haired bat, Townsend's big-eared bat, Washington ground squirrel, white-tailed jackrabbit, burrowing owl*, cinnamon teal, ferruginous hawk*, golden eagle, greater sage-grouse*, loggerhead shrike, peregrine falcon, sage thrasher*, sagebrush sparrow*, Columbian sharp-tailed grouse*, short-eared owl, northern leopard frog*, tiger salamander, desert nightsnake, sagebrush lizard*, pygmy short-horned lizard*, side-blotched lizard, striped whipsnake*
Inter-Mountain Basins Active and Stabilized Dune *Critically imperiled*	19,000	Sand dunes in sub-arid to semi-arid regions support vegetation if wind stress is not too great. Species occupying these environments are often adapted to shifting, coarse-textured substrates (usually quartz sand) and form patchy or open grasslands, shrublands or steppe, and occasionally woodlands. This system includes multiple plant associations that represent a range of conditions from sparse (<20%) to moderate (> 60%) vegetation cover and are often found together in fine scale spatial mosaics. Plant species composition often relates to the degree of sand stabilization / vegetation cover and position on a particular dune. *Psoralidium lanceolatum*, an herb and *Achnatherum hymenoides*, a bunchgrass typically dominate the initial stages of stabilization and are also commonly found on dunes with a wide range of stabilization. Where dunes have overridden or partially covered "normal" soil, *Pseudoroegneria spicata*, *Poa secunda* or other shrub steppe species are often present.	ferruginous hawk*, short-eared owl, northern leopard frog*, desert nightsnake, sagebrush lizard*, pygmy short-horned lizard*, side-blotched lizard*, striped whipsnake*

Ecological system of concern / *status*	**Rough Estimated Acres**	**Vegetation Description** (Ecological Systems of Washington State. A Guide to Identification. Rocchio, 2015)	**SGCN closely and generally associated on this wildlife area** (SWAP 2015)
Columbia Basin Foothill Riparian Woodland and Shrubland *Critically imperiled*	7,800	Low-elevation riparian system found along the mainstem of the Columbia River and associated major tributaries on the periphery of the mountains surrounding the Columbia River Basin at and below lower tree line. Found in low-elevation canyons and draws, on floodplains, or in steep-sided canyons, in narrow V-shaped valleys with rocky substrates.	hoary bat, silver-haired bat, Townsend's big-eared bat, bald eagle, Columbian sharp-tailed grouse*, ferruginous hawk, golden eagle, loggerhead shrike, Columbia spotted frog, northern leopard frog*, sharp-tailed snake*
Columbia Plateau Steppe and Grassland *Imperiled*	7,200	Extensive grasslands, not grass-dominated patches within sagebrush shrubsteppe ecological system, dominated by perennial bunch grasses and forbs, sometimes with a sparse shrub layer. Often forms a landscape mosaic with the Columbia Plateau Shrubland ecological system. Very little exposed bare ground due to mosses and lichens carpeting the area between plants, comprising a biological soil crust that is a very important characteristic in this ecological system.	american badger*, black-tailed jackrabbit, hoary bat, Merriam's shrew, silver-haired bat, Townsend's big-eared bat, Washington ground squirrel, white-tailed jackrabbit, burrowing owl, cinnamon teal, ferruginous hawk*, golden eagle, greater sage-grouse*, loggerhead shrike, sage thrasher*, sagebrush sparrow, Columbian sharp-tailed grouse*, short-eared owl, Columbia spotted frog, northern leopard frog*, tiger salamander, desert nightsnake
Columbia Basin Foothill and Canyon Dry Grassland *Critically imperiled*	2,200	Foothill herbaceous vegetation found on steep open slopes, in the canyons and valleys of the Columbia Basin, particularly along the Snake River canyon, the lower foothill slopes of the Blue Mountains, and along the main stem of the Columbia River. Settings are primarily long, steep slopes of 328 feet to well over 1,300 feet, and slope failure is a common process.	American badger, white-tailed jackrabbit, Washington ground squirrel, Townsend's big-eared bat, silver-haired bat, Merriam's shrew, hoary bat, bald eagle, loggerhead shrike, short-eared owl, peregrine falcon, Columbian sharp-tailed grouse*, ferruginous hawk*, burrowing owl, golden eagle*, Columbia spotted frog, desert nightsnake, sideblotched lizard, tiger salamander
Inter-Mountain Basins Semi-Desert Shrub Steppe *Critically imperiled*	1,500	This semi-arid shrubsteppe is typically an open shrub to moderately dense woody layer and a strong graminoid layer (>25% cover but rarely closed). The woody layer is often a mixture of shrubs and dwarf-shrubs, although it may be dominated by a single shrub species. Characteristic species include *Grayia spinose* or *Krascheninnikovia lanata* with *Ericameria nauseosa*. *Artemisia*	pygmy rabbit, Townsend's big-eared bat, Washington ground squirrel, burrowing owl*, ferruginous hawk*, golden eagle, greater sage-grouse*, loggerhead shrike, short-eared owl, cinnamon teal

Ecological system of concern / *status*	**Rough Estimated Acres**	**Vegetation Description** (Ecological Systems of Washington State. A Guide to Identification. Rocchio, 2015)	**SGCN closely and generally associated on this wildlife area** (SWAP 2015)
		tridentata may be present but typically does not dominate although it will increase with disturbance.	
Inter-Mountain Basins Alkaline Closed Depression *Imperiled*	890	These depressions are moderately to densely covered by salt-tolerant and halophytic species such as *Distichlis spicata*, *Carex praegracilis*, *C. douglasii*, *Argentina anserina*, *Puccinellia lemmonii, Poa secunda, Muhlenbergia spp., Leymus triticoides* (= *Elymus triticoides*), *Schoenoplectus maritimus, Schoenoplectus americanus, Spartina gracilis, and Triglochin maritima. Schoenoplectus acutus,* typically without Typha latifolia due to its lower salt tolerance, can establish where flooding occurs for three or more months. Eleocharis palustris can occur in areas inundated for 1 to 3 months. *Distichlis spicata* and *Juncus balticus* are almost always present in seasonally saturated soils. Amphiscirpus nevadensis sometimes occurs. *Leymus cinereus* typically forms a band of vegetation at the transition zone with upland shrub-steppe vegetation.	pygmy rabbit, Townsend's big-eared bat, Washington ground squirrel, burrowing owl*, ferruginous hawk*, golden eagle, greater sage-grouse*, loggerhead shrike, short-eared owl, cinnamon teal
North American Arid West Emergent Marsh Freshwater Emergent Wetland – (NWI) *Imperiled*	9,268 This data is from the US FWS National Wetland Inventory	Hydrophytic vegetation dominates these wetlands. Common emergent and floating vegetation includes *Scirpus microcarpus, Schoenoplectus acutus, S. tabernaemontani, Typha latifolia, Juncus spp., Potamogeton spp., Polygonum spp.*, and *Nuphar lutea ssp. polysepala*. This ecological system also includes aquatic bed communities of relatively deep water with submerged or floating-leaved plants (*Lemna, Potamogeton,* and *Brasenia*) and submergent and floating plants (*Myriophyllum, Ceratophyllum*, and *Elodea*). Species diversity is usually low due to the dense monocultures formed by many of the dominant species.	hoary bat, Kincaid's meadow vole* silver-haired bat, Townsend's big-eared bat, American white pelican, bald eagle, Barrow's goldeneye, cinnamon teal*, peregrine falcon, Columbia spotted frog, northern leopard frog*, tiger salamander*
Inter-Mountain Basins Greasewood Flat *Critically imperiled*	6	This system appears as an open to moderately dense shrubland dominated or co-dominated by *Sarcobatus vermiculatus*. It usually occurs as a mosaic of multiple plant associations. There may be interspersed patches *of Distichlis spicata* throughout the site. Other shrubs that may be present to co-dominant, listed in order of decreasing	American badger, black-tailed jackrabbit, hoary bat, silver-haired bat, burrowing owl, golden eagle, greater sage-grouse*, loggerhead shrike, short-eared owl

Ecological system of concern / *status*	Rough Estimated Acres	**Vegetation Description** (Ecological Systems of Washington State. A Guide to Identification. Rocchio, 2015)	**SGCN closely and generally associated on this wildlife area** (SWAP 2015)
		tolerance of a high water table or high salinity, are *Krascheninnikovia lanata, Grayia spinosa, Ericameria nauseosa*, and *Artemisia tridentata ssp. tridentata.* The herbaceous layer, when present, is usually dominated by graminoids, in order of decreasing tolerance of a high water table or high salinity, such as *Distichlis spicata, Puccinellia spp., Eleocharis palustris, Leymus cinereus,* and *Pascopyrum smithii.*	

* SGCN is closely associated with this ecological system

Habitat connectivity

The Columbia Basin Wildlife Area's 13 units range in size from about less than 700 to over 63,000 acres, stretching from Banks Lake to Priest Rapids, over 125 miles. WDFW-managed land is with private lands mainly in agriculture, and other public lands. The survival of fish and wildlife depends in part on the ability to move through the environment to find food and reproduce and having connections or corridors is crucial. The degree to which land protection and condition supports this is called habitat connectivity. Development, including buildings, recreation, agriculture, power facilities, roads, and rails, impact the ability of species to move through the landscape.

Key wildlife habitat connectivity linkage networks at the statewide level and the Columbia Plateau level were derived by the Washington Wildlife Habitat Connectivity Working Group (WHCWG 2010, 2012) from two modeling approaches: focal species and landscape integrity. The focal species approach identified important habitat areas and the best linkages between the habitat areas for wildlife focal species to move through. Focal species were carefully selected to represent the connectivity needs of a broader assemblage of wildlife (WHCWG 2010). For more background information on the Washington Wildlife Habitat Connectivity Working Group analysis and data, follow this link: http://waconnected.org/.

The best linkages provided the least resistance to movement between habitat areas for that animal in that area. Some of the linkages may not be comprised of ideal habitat, but provide opportunities for movement through a human-modified landscape. After reviewing the Columbia Plateau Connectivity Analysis, the Columbia Basin Wildlife Area contains core habitat or supports connectivity for the following focal species included in the analysis : mule deer, badger, beaver, tiger salamander, black-tailed jackrabbit and white-tailed jackrabbit, western rattlesnake, and Washington ground squirrel.

Habitat connectivity management priorities for the Columbia Basin Wildlife Area include actions that will improve the core habitat and linkages for these species. These focal species require different ranges of movement. Mule deer are a more wide-ranging species capable of significant movement events covering many miles. Generally, greater movement events are seasonal in nature, but they can be in response to fire or other disturbances. Badger can travel long distances. Beaver can travel long distances in close association with waterways. The black-tailed and white-tailed jackrabbit can move moderate distances with movements

of several miles possible. Rattlesnake, tiger salamander, and ground squirrels move shorter distances, so their populations are more susceptible to isolation.

Development of structures, road construction, development along moist habitats, fencing and increased traffic in sensitive locations reduce landscape permeability and overall connectivity. Habitat connectivity modeling informs management decisions on the wildlife area. Habitat restoration and management projects will seek to maintain or improve linkages between habitat blocks on the Columbia Basin Wildlife Area.

The Columbia River and its tributaries have been central to the region's culture and economy for thousands of years. Flowing about 1,240 miles from its source in the Canadian Rockies to mouth at the Pacific Ocean at Astoria, Oregon, it provides a diversity of habitat and migratory corridor for many species of anadromous from freshwater to salt. Dams and reservoirs and other human activities have altered the river's ability to sustain large populations of wildlife, especially salmon.

Species management

The Columbia Basin Wildlife area supports a variety of game and non-game (diversity) fish and wildlife species. Of the species that could be expected to appear on the wildlife area, there are multiple State Candidate, SGCN species, and PHS species (Table 6). See page 75 for information on plants.

Burrowing Owl, Rocky Ford Unit
Photo by Alan L. Bauer

Consistent with WDFW's mission, the agency manages species on the wildlife area for two primary purposes: conservation and protection to manage sustainable populations and provision of recreational and commercial opportunities. The agency carries out this mission according to state and federal laws (including the Endangered Species Act or ESA) and funding requirements which direct many management activities. Management actions may be influenced by collaborative work undertaken with other conservation organizations, tribal governments, land trusts, academic research programs, and even the specific interests of volunteers if they fit within WDFW's mission, budget and wildlife area goals.

Table 6: Species conservation status

State and federal conservation status, WDFW Priority Habitats and Species (PHS) and SGCN criteria and priority areas that may occur on the Columbia Basin Wildlife Area

Common Name	Scientific Name	Federal Status State Status SGCN, PHS	General Distribution or Potential Wildlife Area Unit
MAMMALS			
Bat roosting concentrations of big-brown bat, myotis bat, pallid bat	*Eptesicus fuscus,* Myotis spp.*, Antorzous pallidus*	SGCN, PHS	Banks Lake, Sun Lakes, Lower Crab Creek, Priest Raids, Billy Clap Lake
Hoary bat	*Lasiurus cinereus*	SGCN	Banks Lake, Sun Lakes, Quincy Lakes
Keen's myotis	*Myotis keenii*	SGCN	Banks Lake, Sun Lakes, Quincy Lakes
Silver-haired bat	*Lasionycteris noctivagans*	SGCN	Banks Lake, Sun Lakes, Quincy Lakes
Townsend's big-eared bat	*Corynorhinus townsendii*	SC, SGCN, PHS	Banks Lake, Sun Lakes, Quincy Lakes
Black-tailed jackrabbit	*Lepus californicus*	SC, SGCN, PHS	Lower Crab Creek
White-tailed jackrabbit	*Lepus townsendii*	SC, SGCN, PHS	Banks Lake, Billy Clapp Lake (Desert?)
Pygmy rabbit	Brachylagus idahoensis	FE, SE, SGCN, PHS	Douglas County, which borders the wildlife area
Washington ground squirrel	*Urocitellus washingtoni*	SC, SGCN, PHS	Banks Lake, Seep Lakes; low in other units
Kincaid's meadow vole	*Microtus pennsylvanicus kincaidi*	SGCN, PHS	Low in all units
American badger	*Taxidea taxus*	SGCN	Banks Lake, Sun Lakes, Gloyd Seeps, Seep Lakes
Merriam's shrew	*Sorex merriami*	SGCN, PHS	Low in all units
Rocky Mountain mule deer	*Odocoileus hemionus*	PHS	Banks Lake, Sun Lakes, Desert, Gloyd Seeps, Lower Crab Creek, Sprague Lake
BIRDS			
E WA breeding occurrences of: Phalaropes Stilts and Avocets	*Rcurvirostridae, phalaropidae*	PHS	Gloyd Seeps, Desert, Seep Lakes, Lower Crab Creek
Waterfowl concentrations	*(Anatidae - excluding Canada geese in urban areas)*	PHS	Banks Lake, Desert, Gloyd Seeps, Lower Crab Creek, Quincy Lakes, Rocky Ford, Sprague Lake, Sun Lakes, Winchester
Cavity-nesting ducks: Wood duck, Barrow's goldeneye, common goldeneye, bufflehead, hooded merganser	*Aix sponsa, Bucephala islandica, Bucephala clangula, Bucephala albeola, Lophodytes cucullatus*	PHS	Banks Lake, Desert, Gloyd Seeps, Lower Crab Creek, Rocky Ford, Sun Lakes
E WA breeding terns	*Sternidae*	PHS	Banks Lake, Sun Lakes, Desert, Lower Crab Creek, Sprague Lake

Common Name	Scientific Name	Federal Status State Status SGCN, PHS	General Distribution or Potential Wildlife Area Unit
E WA breeding concentrations of: Grebes, Cormorants	*Podicipedidae,Phalacrocoracidae*	PHS	Banks Lake, Desert, Lower Crab Creek, Sprague Lake
American white pelican	*Pelecanus erythrorhynchos*	SE, SGCN, PHS	Desert, Gloyd Seeps, Quicky Lakes, Seep Lakes, Priest Rapids
Clark's grebe	*Aechmophorus clarkii*	SC, SGCN, PHS	Desert, Banks Lake
Tundra swan	*Cygnus columbianus*	PHS	Desert, Banks Lake, Gloyd Seeps, Lower Crab Creek, Priest Rapids, Quincy Lakes, Rocky Ford, Seep Lakes, Sprague Lake, Winchester
Black-crowned night-heron	*Nycticorax nycticorax*	PHS	Desert, Lower Crab Creek, Priest Rapids, Sprague Lake
Great blue heron	*Ardea herodias*	PHS	Desert, Lower Crab Creek, Gloyd Seeps, Seep Lakes, Priest Rapids, Sprague Lake, Sun Lakes, Banks Lake
Western grebe	*Aechmophorus occidentalis*	SC, SGCN, PHS	Desert, Banks Lake, Winchester Reservoir
Red-necked grebe	*Podiceps grisegena*	SCGN	Low in all units
Sandhill crane (lesser)	*Grus canadensis*	SE, PHS	Desert, Seep Lakes, Lower Crab Creek, low in Banks Lake, Gloyd Seeps, Quincy Lakes
Cinnamon teal	*Anas cyanoptera*	SGCN	Desert, Gloyd Seeps, Quincy Lakes, Winchester Lake, Sept Lakes, Lower Crab Creek
Barrow's goldeneye	*Bucephala islandica*	SGCN	Sun Lakes, Desert, Sprague Lake; low in all other units
Black scoter	*Melanitta nigra*		Low in all units
Surf scoter	*Melanitta perspicillata*		Low in all units
White-winged scoter	*Melanitta fusca*		Low in all units
Common loon	*Gavia immer*	SS	Sun Lakes
Bald eagle	*Haliaeetus leucocephalus*	SGCN	Banks Lake, Sun Lakes, Quincy Lakes, Desert, Lower Crab Creek, Gloyd Seeps, Winchester Lake, Priest Rapids, Sprague Lake
Golden eagle	*Aquila chrysaetos*	SC, SGCN, PHS	Banks Lake, Sun Lakes, Quincy Lakes, Billy Clapp Lake
Ferruginous hawk	*Buteo regalis*	SE, SGCN, PHS	Seep Lakes, Lower Crab Creek, Sprague Lake
Peregrine falcon	*Falco peregrinus*	PHS	Banks Lake, Billy Clapp Lake, Sun Lakes
Burrowing owl	*Athene cunicularia*	SC, SGCN, PHS	Rocky Ford, Quincy Lakes
Prairie falcon	*Falco mexicanus*	SGCN, PHS	Banks Lake, Sun Lakes Quincy Lakes, Billy Clapp Lake; low in all others
Loggerhead shrike	*Lanius ludovicianus*	SC, SGCN, PHS	Lower Crab Creek
Chukar	*Alectoris chukar*	PHS	Banks Lake, Sun Lakes, Lower Crab Creek, Billy Clapp Lake

Common Name	Scientific Name	Federal Status State Status SGCN, PHS	General Distribution or Potential Wildlife Area Unit
Greater sage-grouse	*Centrocercus urophasianus*	SE, SGCN, PHS	Douglas County, which borders the wildlife area
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	SE, PHS	Douglas County, which borders the wildlife area
Ring-necked pheasant	*Phasianus colchicus*	PHS	Gloyd Seeps, Desert, Quincy Lakes, Winchester Lake, Banks Lake, Priest Rapids, Rock Ford Creek, Upland Restoration, Lower Crab Creek, Sprague Lake; low in all other units
Purple martin	*Progne subis arboricola*		Low in all units
Yellow-billed cuckoo	*Coccyzus americanus*	FT, SE, PHS	Low in Desert and Lower Crab Creek
Oregon vesper sparrow	*(Pooecetes gramineus affinis*	SE	All units
Sage thrasher	*Oreoscoptes montanus*	SC, SGCN, PHS	Banks Lake, Quincy Lakes, Sun Lakes, Gloyd Seeps, Lower Crab Creek, Billy Clapp Lake
Sagebrush sparrow	*Artemisiospiza nevadensis*	SC, SGCN, PHS	Banks Lake, Quincy Lakes, Sun Lakes, Gloyd Seeps, Lower Crab Creek, Billy Clapp Lake
AMPHIBIANS			
Tiger Salamander	*Ambystoma tigrinum*	SGCN	Winchester, Desert, Seep Lakes, Lower Crab Creek
Columbia spotted frog	*Rana luteiventris*	SC, SGCN, PHS	Banks Lake
Northern leopard frog	*Rana pipiens*	SE, SGCN, PHS	Desert, Lower Crab Creek, Gloyd Seeps
REPTILES			
Nightsnake	*Hypsiglena torquata*	SGCN	Low in all units
Striped whipsnake	*Masticophis taeniatus*	SC, SGCN, PHS	Priest Rapids; low in Quincy Lakes, Desert, Seep Lakes, Lower Crab Creek
Sagebrush lizard	*Sceloporus graciosus*	SC, SGCN, PHS	Desert
Pygmy horned lizard	*Phrynosoma douglasii*	SGCN	Desert, Seep Lakes, Billy Clapp
Side-blotched lizard	*ta stansburiana*	SGCN	Low in all units
INVERTEBRATES			
Silver-bordered fritillary	*Boloria selene atrocostalis*	SC, SGCN, PHS	?????
Yuma skipper	*Ochlodes yuma*	SC, PHS	Sun Lakes
Dragonfly: Columbia clubtail	*Gomphurus lynnae*	SC, SGCN, PHS	???
Monarch butterfly	*Danaus plexippus*	FC	Lower Crab Creek, ????

Abbreviations:
State endangered (SE), State threatened (ST), State Candidate for listing (SC), State Sensitive (SS), Species of Greatest Conservation Need (SGCN), Priority Habitats and Species (PHS)
Federal endangered (FE), Federal threatened (FT), Federal candidate (FC), Federal species of concern (FSC)
PHS Criteria: 1: State listed candidate species; 2: Vulnerable aggregations; 3: Species of recreational, commercial, or tribal importance.

Game species overview and management

WDFW's 2015-2021 Game Management Plan (http://wdfw.wa.gov/publications/01676/) details management objectives and goals for Washington's game species. The overall goals support sustaining populations and providing recreational opportunities.

The wildlife area units offer a variety of habitats for many of the game species throughout the year. During winter months in particular, wildlife area units provide critical thermal cover, browse, and roosting habitat which is limited throughout much of the agriculturally dominated landscape.

Within the wildlife area, habitat management actions help support populations and improve recreational opportunities for game species. These actions include invasive weed control, moist soil management, agricultural leases for forage and cover, shrubby habitat plots, food plots, habitat rehabilitation, pheasant releases for hunting, wildlife surveys, and supporting research efforts.

Most of the wildlife area is open to hunting, but there are restrictions for game reserves. Hunting season dates and harvest restrictions are species-specific and vary regionally, with seasons and regulations evaluated and updated each year. Species populations receiving greater hunting pressure are monitored more intensely than those with lower participation rates, therefore season changes may occur more frequently for those more heavily utilized species. The specific regulations pertaining to individual species and hunting seasons are found on WDFW's website (http://wdfw.wa.gov/hunting/regulations/). Additional information on harvest history and population status are located in WDFW Game Harvest Reports (https://wdfw.wa.gov/hunting/management/game-harvest) and the Hunting Prospects published annually for District 4 and District 8: (https://wdfw.wa.gov/hunting/prospects/).

The Columbia Basin Wildlife Area units fall into the following Game Management Units (GMUs):

272 – Beezley Hills (Northern Grant County)
278 – Wahluke (Southern Grant County)
284 – Ritzville (Adams County)
290 – Desert (Central Grant County)

Game species

Mule Deer (*Odocoileus hemionus*)
Mule deer on the Columbia Basin Wildlife Area are year-round residents and are most associated with shrubsteppe habitat. Mule deer are a generalist species and will utilize other habitats found on or adjacent to Columbia Basin Wildlife Area units, including wetlands, agricultural fields, and grasslands. All mule deer residing on the wildlife area are managed by WDFW as part of the Columbia Plateau Mule Deer Management Zone. Surveys are conducted annually to assess the population. Mule deer within GMU 290 – Desert are managed somewhat differently because this population is largely non-migratory. Due to that behavior, WDFW can provide a limited entry "Quality Hunting" opportunity that offers older aged deer. The Washington State Mule Deer Management Plan (https://wdfw.wa.gov/publications/01755/) provides background information on the natural history, biology, and status of mule deer herds, describes current management issues, and establishes objectives and strategies to guide future management.
Mule deer management on the wildlife area mainly involves habitat improvement which includes weed control, shrub planting, shrubsteppe restoration, agricultural lease management, fence removal, restoration after wildfires (when funds are available), and bitterbrush protection and planting. There are other activities

that WDFW staff conduct on an annual basis that benefit the public's enjoyment and appreciation including sign maintenance, maintaining road access, maintaining access sites, and maintaining restroom facilities.

Wildlife area staff will continue to work to remove decommissioned fences and continue to improve habitat for mule deer. Additionally, wildlife area staff will work with district biologists to secure funding to improve habitat and identify critical areas that will improve mule deer populations throughout the wildlife area.

Waterfowl

Waterfowl are likely the most sought-after group of species on the Columbia Basin Wildlife Area. The wildlife area provides some of the best public lands hunting opportunities in Washington. The location of the wildlife area provides very attractive habitat and foraging opportunities to migrating and breeding waterfowl.

The primary breeding species on the wildlife area include mallard, gadwall, wood duck, and teal. Small numbers of redhead, ring-necked ducks, mergansers, goldeneyes, wigeon, Canada goose, and other species likely nest as well. During migration, the full variety of western inland waterfowl can be found. Columbia Basin Wildlife Area has also five game reserves (Winchester, North Potholes, Frenchman, Banks Lake, and Stratford) that are intended to provide refuge to migrating waterfowl and keep those birds in the area to increase hunting opportunities.

Wetland management on the wildlife area is extensive and is intended to benefit waterfowl and other wetland obligate species. Due to an artificial hydrology, invasive vegetation, and sedimentation from soils blown off disked fields, the overall state of many wetlands could be largely categorized as degraded, but wildlife area staff and district staff work to counter degradation by continuing to funds through Washington State Duck Stamp and leveraged those funds to secure additional North American Wetland Conservation Act (NAWCA) grants for wetland projects. Wildlife Area staff intensively manage two wetland projects that provide regulated hunting to reduce hunter numbers and increase hunter satisfaction. There is a third regulated hunting area that is more passively managed due to a lack of water control, but the goals are the same. Additionally, WDFW staff have worked to improve nesting habitat throughout the wildlife area and have established, and annually maintain, over 50 mallard nesting tubes to improve nesting success.

More information on waterfowl hunting can be found at: (https://wdfw.wa.gov/hunting/regulations/migratory-waterfowl-upland-game).

Upland Game Birds

Upland game birds can be found on all units of the wildlife area. California quail, ring-necked pheasant, and mourning dove are the most abundant upland game birds, but there are also gray partridge and chukars in some units. Habitat plots, food plots, and agriculture lease management are the primary strategies employed to enhance upland bird populations. Wildlife area staff have recently been working to improve habitat for upland birds by enhancing nesting cover and improving brood rearing habitat.

There are designated pheasant release sites at some of the wildlife area units. Pheasants are released prior to the youth and general pheasant seasons and sporadically throughout the season to increase hunter opportunity. The birds released are all males, and the purpose is solely to increase harvest. More information on upland game birds and hunting can be found at: https://wdfw.wa.gov/hunting/regulations/migratory-waterfowl-upland-game.

Non-Game (diversity) species overview and management

The Columbia Basin Wildlife Area protects critical wildlife habitat in a region that has been heavily converted to agriculture, but there are several critical habitat types that are preserved on the wildlife area (see Appendix A. for a list of priority habitats).

Species occurrence data is limited for many species groups on the wildlife area because few extensive surveys have been conducted. Typically, data are collected via incidental observations. All species and habitats listed under PHS are a priority for the Columbia Basin Wildlife Area, but there are limited resources to devote across a multitude of species. To compensate for the lack of resources, WDFW staff take a holistic approach when planning habitat enhancements and restoration by ensuring that proposed actions benefit the greatest number of species.

Non-game (diversity) species

Northern leopard frogs (*Lithobates pipiens*)

Northern leopard frogs are listed as a State Endangered species. The last known population of northern leopard frogs in Washington are in the Desert Unit of the Columbia Basin Wildlife Area within the Crab Creek drainage. This species has experienced range-wide declines due to loss and fragmentation of critical habitat, disturbances, and introduction of non-native species throughout the western states and Canada. Historically, northern leopard frogs were found throughout eastern Washington. Seventeen occupied sites were recognized throughout the Columbia, Crab Creek, Pend Oreille, Snake, Spokane, and Walla Walla river drainages (Germaine and Hayes 2007). Recent efforts have focused on determining the feasibility of translocations, determining the status of the existing population, and improve habitat conditions. Future work will continue to investigate limiting factors, improve quality of wetland habitats, investigate other historic populations and continue translocation efforts to establish other populations.

Striped whipsnakes (*Masticophis taeniatus*)

Striped whipsnakes are a State Candidate species. They reach the northern limit of their geographic range in Washington, and evidence indicates the species was never common (Hallock 2006). Based on the number of recorded sightings, they are the rarest snake in the state. Most of the known occupied areas occur on lands managed by WDFW and USBR. Much of the potential habitat for this species has been converted to agriculture or inundated by reservoirs (Hallock 2006).

Striped whipsnakes utilize communal dens (hibernacula) for winter dormancy. This behavior allows individuals to cluster and survive freezing winter temperatures. They have high fidelity to hibernacula, returning to it each year to winter (Woodbury et al. 1951). Identification and protection of hibernacula sites is essential for the conservation of this species.

Whipsnakes are elusive and have proven difficult to find even where they are known to occur. However, searching for shed skins eliminates many of the difficulties associated with locating individuals and is currently the only method that seems time and cost effective. WDFW has continued to conduct these surveys during most years at the occupied sites to monitor the populations. Numbers of shed skins found has remained small but relatively consistent from year to year (L. Hallock, unpublished data). Extensive surveying has not been conducted, however, additional resources dedicated to surveys and land conservation should be sought to ensure adequate protections.

Monarch butterfly (*Danaus plexippus)*
The monarch is a species whose decline has led to a petition for listing by the USFWS. The decline of the species may be linked to habitat loss, systemic pesticides, and habitat destruction on wintering grounds. The species requires milkweed plants to complete their lifecycle. Given the overall conservation concerns for this species, the relative abundance of milkweed throughout the wildlife area, and high historic concentrations of monarchs in the Lower Crab Creek unit, wildlife area staff actively manage lands to benefit monarchs. Management actions include removal of noxious weeds, maintaining milkweed patches, protecting critical areas and fire restoration. On December 15, 2020, the USFWS announced that listing the monarch as endangered or threatened under the Endangered Species Act is warranted, but precluded by higher priority listing actions. The monarch is now a candidate under the Endangered Species Act and the status will be reviewed annually until a listing decision is made.

Washington ground squirrels (*Urocitellus washingtoni*)
Washington ground squirrels are a protected species in Washington as well as a State Candidate species. There are colonies scattered throughout the wildlife area with greatest concentrations occurring in the Seep Lakes Unit, but there are known colonies in the Banks Lake, Gloyd Seeps, Lower Crab Creek and Quincy Lakes. Other colonies potentially occur in other areas or units of the wildlife area but are not well documented. The species can be hard to detect as they are active mostly from February through June and otherwise estivate (hibernate) to avoid the hot dry summer and cold winter. Often more easily heard than seen, the very high-pitched thin whistle call is inaudible to many. Habitat includes shrubsteppe sites, usually with some sagebrush component.


Washington Ground Squirrel
Photo by Alan L. Bauer

Current management for Washington ground squirrels on the wildlife area primarily focus on weed control and protection of known colonies. However, when funding becomes available there are plans to enhance and connect small colonies within the Seep Lakes unit. Additionally, if funds become available efforts will be made to augment existing populations and establish new colonies via translocation.

Cliff nesting raptors
Raptor management is quite complex on Columbia Basin Wildlife Area, and includes four PHS species - golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), prairie falcon (*Falco mexicanus*) and peregrine falcon (*Falco peregrinus*). Other species are present that nest on cliff sides including red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo swainsoni*). The primary concern for these species is the impacts that are posed by rock climbing. Since about 2010, rock climbing has become an increasingly popular recreational activity in several units of the wildlife area. Wildlife area staff have worked with climbing groups to identify occupied areas, to close or restrict climbing seasonally, and identify areas with the potential for conflicts with nesting raptors. A study was conducted on nesting raptors on the Banks Lake Unit and associated rock-climbing activities (Watson 2020) to help manage this interaction.

Golden eagles occur on the Banks Lake, Sun Lakes, Quincy Lakes, Billy Clapp Lake units.
Ferruginous hawks occur on the Seep Lakes, Lower Crab Creek, Sprague Lake units.
Prairie falcon occur on the Banks Lake, Sun Lakes Quincy Lakes, Billy Clapp Lake units.

Peregrine falcon occur on the Banks Lake, Sun Lakes, and Billy Clapp Lake units.

Bats

Five bat Species of Greatest Conservation Need (SGCN) are likely present in the vicinity of the wildlife area, but there aren't good data to support this. These include Townsend's big eared bat (State Candidate), spotted bat, hoary bat, silver-haired bat, and Keen's myotis. The data for bats on any unit of the wildlife area is extremely limited, but there is an effort planned to determine species presence at the Quincy Lakes Unit. In the future, as time and funding allow, additional efforts will be made to collect other data to determine what areas are occupied by different bat species.

Fish species overview and management

Every one of the 13 units of the Columbia Basin Wildlife Area provides some type of recreational fishing opportunity. Except for the Priest Rapids Unit on the Columbia River, there are no anadromous fisheries in the unit. Nearly all the fishing opportunity is either non-native warmwater species – primarily bass, bluegill and black crappie, stocked trout (rainbow, tiger, brown, brook) - or some combination of those. The Lower Crab Creek unit of the wildlife area supports stray steelhead and a small number of spawning fall Chinook salmon.

Fish species

A total of 41 distinct species can be found within the Columbia Basin Wildlife Area: 20 native and 13 non-native. The most common species found in lakes are nonnative largemouth bass, yellow perch, black crappie, bluegill, and common carp. Most native fishes found in the wildlife area are not sought after by anglers. The exceptions being salmon, rainbow trout, burbot, and lake whitefish. Table 7 lists all known species, origin, status, and the management unit where they have been documented.

Table 7: Fish species on the Columbia Basin Wildlife Area

Common Name	Scientific Name	Origin	Wildlife Area Unit or Lake
Black Bullhead	*Ameiurus melas*	Nonnative	Banks Lake, Billy Clapp Lake, Desert
Black Crappie	*Pomoxis nigromaculatus*	Nonnative	Banks Lake, Gloyd Seeps, Desert, Quincy Lakes, Seep Lakes, Goose Lake, Winchester Lake, Lower Crab Creek
Bluegill	*Lepomis macrochirus*	Nonnative	Banks Lake, Gloyd Seeps, Desert, Quincy Lakes, Seep Lakes, Goose Lake, Winchester Lake, Lower Crab Creek
Brown Bullhead	*Ameiurus nebulosus*	Nonnative	Banks Lake, Sun Lakes, Desert, Goose Lake, Billy Clapp Lake
Brown Trout	*Salmo trutta*	Nonnative	Sun Lakes, Quincy Lake, Desert, Lower Crab Creek
Brook Trout	*Salvelinus fontinalis*	Nonnative	Sun Lakes, Quincy Lake, Desert, Lower Crab Creek
Burbot	*Lota lota*	Native	Banks Lake, Desert, Billy Clapp Lake, Sprague Lake
Bridgelip Sucker	*Catostomus columbianus*	Native	Banks Lake, Gloyd Seeps, Desert, Quincy Lakes, Seep Lakes, Goose Lake, Lower Crab Creek, Billy Clapp Lake
Channel Catfish	*Ictalurus punctatus*	Nonnative	Quincy Lake, Desert
Chinook salmon sp/su/fall	*Oncorhynchus tshawytscha*	Native	Lower Crab Creek, Priest Rapids
Chiselmouth	*Acrocheilus alutaceus*	Native	Banks Lake, Gloyd Seeps, Desert, Lower Crab Creek, Priest Rapids, Billy Clapp Lake

Common Name	Scientific Name	Origin	Wildlife Area Unit or Lake
Coho salmon	*Oncorhynchus kisutch*	Native	Priest Rapids
Common carp	*Cyprinus carpio*	Nonnative	Banks Lake, Seep Lakes, Sprague Lake, Gloyd Seeps, Goose Lake, Winchester Lake, Desert, Lower Crab creek, Priest Rapids, Billy Clapp lake, and Sprague Lake
Grass pickerel	*Esox americanus vermiculatus*	Nonnative	Sprague Lake
Kokanee salmon	*Oncorhynchus nerka*	Native	Banks Lake, Sun Lakes, Billy Clapp Lake
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	Nonnative	Sun Lakes, Sprague Lake
Lake whitefish	*Coregonus clupeaformis*	Nonnative	Banks Lake
Largemouth bass	*Micropterus salmoides*	Nonnative	ALL
Largescale sucker	*Catostomus macrocheilus*	Native	Banks Lake, Gloyd Seeps, Desert, Goose Lake, Lower Crab Creek, Billy Clapp Lake
Longnose dace	*Rhinichthys cataractae*	Native	Priest Rapids
Longnose sucker	*Catostomus catostomus*	Native	Banks Lake, Gloyd Seeps, Desert, Goose Lake, Lower Crab Creek, Billy Clapp Lake
Mountain whitefish	*Prosopium williamsoni*	Native	Banks Lake, Lower Crab Creek, Priest Rapids, Bill Clapp Lake
Northern pikeminnow	*Ptychocheilus oregonensis*	Native	Banks Lake, Gloyd Seeps, Desert, Lower Crab Creek, Billy Clapp Lake, Priest Rapids
Pacific lamprey (FSC, SGCN)	*Entosphenus tridentatus*	Native	Priest Rapids
Peamouth	*Mylocheilus caurinus*	Native	Banks Lake, Gloyd Seeps, Desert, Lower Crab Creek, Billy Clapp Lake, Priest Rapids
Pumpkinseed	*Lepomis gibbosus*	Nonnative	Banks Lake, Sun Lakes, Gloyd Seeps, Quincy Lakes, Winchester Lake, Sprague Lake, Seep Lake, Goose Lake, Desert, Lower Crab Creek, Billy Clapp Lake
Rainbow trout	*Oncorhynchus mykiss*	Native	ALL
Redside shiner	*Richardsonius balteatus*	Native	Lower Crab Creek, Priest Rapids
Sculpin	*Cottus* (various species)	Native	ALL
Smallmouth bass	*Micropterus dolomieu*	Nonnative	Banks Lake, Sun Lakes, Goose Lake, Desert, Lower Crab Creek, Billy Clapp Lake, Priest Lake
Sockeye salmon	*Oncorhynchus nerka*	Native	Priest Rapids
Speckled dace	*Rhinichthys osculus*	Native	Lower Crab Creek, Priest Rapids
Steelhead	*Oncorhynchus mykiss*	Native	Banks Lake, Lower Crab Creek, Priest Rapids
Tench	*Tinca tinca*	Nonnative	Desert, Sprague
Tiger musky	*Esox masquinongy x Esox lucius*	Nonnative	Quincy Lake
Tiger trout	*Salmo trutta x Salvelinus fontinalis*	Nonnative	Seep Lakes, Quincy Lakes, Desert, Sun Lakes
3-spine stickleback	*Gasterosteus aculeatus*	Native	Priest Rapids
Walleye	*Sander vitreus*	Nonnative	Banks Lake, Desert, Goose Lake, Lower Crab Creek, Priest Rapids, Billy Clapp Lake
White sturgeon	*Acipenser transmontanus*		Desert, Priest Rapids
Yellow bullhead	*Ameiurus natalis*	Nonnative	Banks Lake, Sun Lake, Goose Lake, Billy Clapp Lake

Common Name	Scientific Name	Origin	Wildlife Area Unit or Lake
Yellow perch	*Perca flavescens*	Nonnative	Banks Lake, Sun Lakes, Gloyd Seeps, Lake, Goose Lake, Quincy Lake, Winchester Lake, Desert, Sprague Lake, Lower Crab Creek, Billy Clapp

Fish management

Inland lakes

Fish communities in the lakes on the wildlife area are relatively stable and require very little active management. One of the most consistent concerns for fish managers is illegal introductions of fishes into lakes. This often disrupts fish community stability and can result in the loss of an important fishery.

Lakes managed for warmwater fishing are managed under general statewide regulations. Managers attempt to balance predator-prey ratios to ensure a quality fishing experience for multiple species. The WDFW Warmwater Program is tasked with surveying and making management recommendations for these waters. Lakes managed for trout fishing opportunities are managed under one of three management scenarios of production, quality, or opportunity.

Production trout fisheries are open during spring and summer with the goal of high angler catch rates of three to four fish per angler. These lakes are stocked with fingerling trout with the hope that these fish will grow to 11 to 13 inches in their first year. Approximately 20% of the opening day catch is carryover (2-year-old) trout with approximately 80% being the previous year's fingerling plant.

Quality trout fisheries are managed to provide anglers the opportunity to catch large trout rather than many trout. Anglers may retain one fish at least 18 inches per day; however, most anglers on these waters practice catch and release.

Opportunity waters are open year-round and provide anglers the opportunity to catch fish at any time. These waters are managed to provide anglers the opportunity to catch limits of fish that may be a bit smaller than in other lakes.

Habitat management

Habitat management activities occur on Columbia Basin Wildlife Area, such as wetland management, weed management, fire management, and habitat restoration, as well as conservation.

Conservation

Conservation of natural resources is a core mission of WDFW and a driver for habitat rehabilitation and enhancement on the wildlife area. Active wetland management enhances foraging habitat for migratory birds and other wildlife. Rehabilitation of burned or disturbed areas, and invasive species control, helps to maintain habitat suitability for wildlife.

Riparian areas and wetlands in the wildlife area are threatened by wetland succession and invasive plants such as common reed. An aggressive aerial herbicide program maintains semi-marsh conditions with a mosaic of shoreline vegetation and loafing areas, while facilitating water flow for agricultural uses. These habitat conditions are important to Northern leopard frog, waterfowl, and shorebirds.

The wildlife area consists of scattered, variable-sized parcels spread out over a landscape of mixed ownership and land use. Landscape level planning considers neighboring habitat types, threats, stressors, and opportunities, with a goal of long-term sustainability for habitat, wildlife, and recreational interests. As part of the planning process, staff have identified priority areas for habitat rehabilitation in the Goals and Objectives section

Northern leopard frog
Photo by Rich Finger, WDFW

Hunting reserves are strategically placed throughout the wildlife area to provide sanctuary for migrating waterfowl and other game species. They are found at Banks Lake, Billy Clapp Lake, Desert, Quincy Lakes, and Sprague Lake units. In addition to prohibiting hunting, the North Potholes Reserve also prohibits all public entry during the nesting season of colonial nesting waterbirds, such as herons, egrets, and cormorants.

Part of Lower Crab Creek is a designated Natural Area Preserve (NAP), which has an example of black greasewood/alkali saltgrass associations, as well as big sagebrush-spiny hopsage/Sandberg's bluegrass community. NAPs are designated to preserve areas of land or water which have retained their natural character or are examples of flora, fauna, or features of interest that are important to preserve.

Priority Plant Species

The Columbia Plateau is the largest of the nine ecoregions in Washington state. At 13.9 million acres, it is also the hottest and driest. It is underlain by basalt that has weathered into deep productive soils (DNR 2021). The scouring by massive flooding events during the last ice age created a complex topography of scablands, rolling hills, dry coulees, and the deeply entrenched Columbia River. Shallow soil habitats are common in areas affected by these floods. The Columbia River has been altered by a series of large dams and reservoirs and the resulting irrigation water has transformed much of the area into vast agricultural fields.

There are 1,956 total taxa of rare and unique vascular plants in the Columbia Plateau ecoregion, the second highest number of all the ecoregions. It is also the second highest with 1,387 native plants, and at 134 has the highest number of special concern plants.

The Columbia Plateau is undergoing significant changes that will affect the long-term persistence of both rare and common native species. From 1992 to 2016, grassland and herbaceous cover, row crops and developed open space have increased in area within the Columbia Plateau, while the cover of shrubby species and barren ground have declined (DNR 2020). Much of this change is the result of conversion of natural lands to crops or wildfires replacing shrub cover with weedy grasses and forbs. Table 8 lists the plant species of conservation concern and status, and the units where they may be found. DNR's Natural Heritage Program conducted a climate vulnerability assessment for selected Washington rare plant species (DNR 2020). Those species in the table that have a Highly Vulnerable or Moderately Vulnerable score are in bold.

Table 8: Plant species of conservation concern (Washington Natural Heritage Program)

Species	Common Name Additional name	Heritage Rank*	State Rank*	WA Status	Units
Allium constrictum	constricted Douglas' onion	G2/G3	S2S3	Sensitive	Banks Lake
Astragalus geyeri var. geyeri	Geyer's milkvetch	G4T4	S1	Threatened	Lower Crab Creek
Carex vallicola	valley sedge	G5	S2	Sensitive	Banks Lake
Corispermum villosum	hairy bug seed	G4?	S2	Sensitive	Lower Crab Creek
Cryptantha leucophaea **	gray cryptantha	G2G3	S2S3	Sensitive	Lower Crab Creek, Desert, Priest Rapids, Quincy Lakes
Cryptantha scoparia	miner's candle desert cryptantha	G4?	S2?	Sensitive	Quincy Lakes
Cryptantha spiculifera **	Snake River cryptantha Bristly cryptantha	G4?	S1	Sensitive	Lower Crab Creek
Eatonella nivea	white eatonella	G4G5	S1	Threatened	Quincy Lakes Priest Rapids
Eleocharis rostellata	beaked spike-rush walking spike-rush	G5	S2	Sensitive	Priest Rapids
Eremogone franklinii var. thompsonii	Thompson's sandwort	G4T2Q	S2	Sensitive	Desert
Eremothera pygmaea	dwarf evening-primrose dwarf mooncup	G3	S3	Sensitive	
Erigeron piperianus	Piper's daisy	G3	S3	Sensitive	Quincy Lakes
Erythranthe suksdorfii	Suksdorf's monkeyflower	G3	S2	Sensitive	Seep Lakes
Hackelia hispida var. disjuncta	sagebrush stickseed rough stickseed	G4T3	S2S3	Sensitive	Quincy Lakes Sun Lakes
Juncus uncialis	Inch-high rush	G3G4	S2	Sensitive	Banks Lake
Lipocarpha aristulata	halfchaff awned sedge	G5?	S1	Threatened	Priest Rapids
Lomatium tuberosum **	Hoover's desert-parsley Tuberous biscuitroot	G5?	S2S3	Threatened	Lower Crab Creek
Oxytropis campestris var. wanapum **	Wanapum crazyweed	G5T1	S1	Endangered	Lower Crab Creek
Pediocactus nigrispinus **	Snowball cactus Dark spineballl cactus	G4	S2	Sensitive	Quincy Lakes

*Global (G) and state (S) ranking and trinomial (T): 1-criticially imperiled; 2-imperiled; 3-vulnerabe to extirpation or extinction; 4-apparently secure; 5-widespread, abundant and secure. Q and ? = questionable

**Moderately Vulnerable to climate change (DNR 2020-04)

Wetland management and enhancement

The Columbia Basin Wildlife Area provides 34,500 acres of wetland habitat which supplements agricultural waste grain to create conditions necessary to support large concentrations of mallards, pintails, and Canada geese, and other waterfowl species. Managing wetland habitats in mixed successional stages is a priority for the wildlife area. A team approach, involving district Wildlife Program staff and a partnership with Ducks Unlimited, is used to implement wetland projects for the benefit of waterfowl, wetland obligate species, and recreational opportunities. Staff have developed draft wetland management guidance to support management activities, focus efforts, enhance efficiency, aid grant proposal development, and improve communication among stakeholders.

Wetlands in the wildlife area provide critical habitat for waterfowl and other wetland obligate species. Threats such as wetland succession, sedimentation, human-altered hydro-period, and invasive species make management of these wetland projects a complex and challenging process. Intensive management is required to maintain functional and productive wetland habitat. Wildlife area wetlands function primarily as wintering and migration staging areas for a variety of waterfowl species but were once important breeding areas as well. The wetlands provide valuable waterfowl hunting and viewing opportunities for recreationists and help support local economies. Loss of wetland functionality and productivity limits the value of the habitat for waterfowl, which can result in decreased waterfowl use and recreational opportunity. Because this is largely a landscape-level issue, a well-planned approach is necessary to address the threats to wildlife area wetlands and promote healthy and functional wetlands for migratory and breeding waterfowl use.

Key wetland management objectives include:

- Maintain or enhance early successional wetland habitats
- Maintain and enhance nesting cover near wetlands with reduced fish populations and relatively low rates of pesticide applications
- Reduce or maintain level of non-native emergent vegetation along wasteways and wetland shorelines receiving a high degree of recreational use
- Maintain or improve habitat conditions for Species of Greatest Conservation Need, including State Endangered wetland obligate species such as northern leopard frogs and sandhill cranes
- Secure and/or renew necessary permitting to allow wetland management activities and projects to continue, expand, or be developed

Fire history and response

Periodic fires, both human-caused and natural, affect all habitat types in the Columbia Basin Wildlife Area (Table 8). Wildfire response and suppression is handled in a variety of ways depending on where the fire is on the wildlife area. See Appendix D for fire response information.

WDFW contracts with many fire districts for fire protection on WDFW-owned lands that fall within each fire districts boundary. The USBR contracts with the United State Bureau of Land Management (USBLM) for fire suppression on USBR lands. USFWS provides fire protection on some of the lands they own that are managed by WDFW. If a fire grows outside the capacity of the local districts to suppress, then state-wide mobilization of resources is often required. Once a request is made, available state and federal resources can respond to the fire.

Post-Fire shrubsteppe rehabilitation

For fires that occur in the shrubsteppe, post-fire restoration funds are available. In 2018, the Quincy Lake fire burned the east side of the Quincy Lakes Unit and neighboring private lands. Over 2,300 acres of wildlife area lands burned in less than 24 hours. The fire burned mostly intact shrubsteppe habitat, creating a hot, fast-moving fire that consumed vegetation and left a barren landscape in its wake.

Cheatgrass encroachment is a major issue on the wildlife area in upland habitats and cheatgrass colonization is accelerated in burned areas. Often cheatgrass revegetates as a monoculture, blanketing areas and leading to an accelerated fire cycle that favors cheatgrass and degrades the quality of the habitat for wildlife. Because of these concerns the, the Columbia Basin Wildlife Area applied for fire rehabilitation funding for the Quincy Lakes fire and was successful in securing funding through WDFW.

Following the Quincy Lakes fire, a helicopter spray company was contracted to broadcast a pre-emergent herbicide on much of the Quincy Lakes burn scar to gauge effectiveness of treatments and to suppress germination of cheatgrass and weed species.

In the spring of 2019, the treatment area was evaluated for effectiveness of herbicides. Private lands adjacent to the treatment area were not treated, and provided a control to assess the effect of the herbicide. Less cheatgrass and non-desirable plants were present in the treatment area, and native forbs and grasses were observed. The wildlife area continues to monitor this location to determine if there is long-term cheatgrass suppression from this treatment. The Columbia Basin Wildlife area continues to hone the fire rehabilitation methodology and techniques as new herbicides and technology become available. This is likely the best opportunity to break the cheatgrass cycle and rehabilitate shrubsteppe habitat in the basin.

Table 8: Fire history– fires greater than 50 acres from 2000 - 2020

Fire Name / Unit	Year	Acres Burned
Red Mountain / Quincy Lakes	2000	359
Simm's Corner / Banks Lake	2007	3,631
Smyrna Bench / Lower Crab Creek	2007	1,425
Seep Lakes	2008	3,143
Timm's Bros / Banks Lake	2008	1,901
Barker Canyon / Banks Lake	2012	74,167
Upper Goose Lake	2012	10,032
Lower Crab Creek	2015	---
Whitehall / Sun Lakes	2016	2,021
Sun Lakes	2017	3,271
Sun Lakes	2018	849
Grass Valley / Banks Lake	2018	2,063
Buckshot / Priest Rapids	2018	76,817
Quincy Lakes	2018	908
Ancient lakes / Quincy Lakes	2018	2,325
Dodson Road / Desert	2018	73
Lower Crab Creek	2019	131
Seep Lakes	2019	20,189

Prescribed fire

Prescribed fire or prescribed burning are terms used for a management technique where fires are intentionally started and controlled to manage habitat. Prescribed burning is used to keep habitats healthy, reducing the danger and impact of wildfire in those areas. Sometimes prescribed burning is used to control weeds and open encroached wetlands. WDFW's Burn Team works with wildlife area managers, local fire districts, and others to develop and execute planned burns. The Columbia Basin Wildlife has benefited from prescribed fire in recent years.

Weed management

Weeds are managed to establish and maintain diverse native wetland plant communities that support fish and wildlife populations. Weed management must meet legal obligations and reduce the likelihood of spread of noxious weeds to adjacent private lands. Invasive plants and noxious weeds can infest high quality native plant communities and convert them to low quality monocultures that reduce wildlife value. The weed management plan (Appendix B) identifies species and management practices to control weeds. Weeds of primary concern on the wildlife area include Russian olive (*Elaeagnus angustifolia*), purple loosestrife (*Lythrum salicaria*), and non-native reeds. Russian olive are widespread throughout the riparian areas of the wildlife area, and have been a nuisance issue since the mid-1890s. Although some wildlife species utilize cover and fruit provided by this invasive species, its prolific and aggressive growth can outcompete more valuable native trees and shrubs such as cottonwood, willows, golden currant, and wild rose.

Although not a native species on the wildlife, purple loosestrife is one of a few late-blooming local flowers and provides a valuable nectar source to pollinators including bees and the Monarch butterfly, a Washington

species of greatest conservation need. The benefits of this plant are taken into consideration in our integrated pest management program, where Monarch butterfly conservation is a priority.

The non-native reed phragmites (*Phragmites australis*) is an aggressive invader and displaces native species that provide forage for wildlife. It is found in sites that hold water, typically wetlands

Climate change approach

Projected changes in climate will affect the resources of the Columbia Basin Wildlife Area, and there are opportunities to mitigate or prepare for those effects. This work is consistent with the 2017 WDFW policy "Addressing the Risks of Climate Change", which states that WDFW will manage its operations and assets to better understand, mitigate, and adapt to impacts of climate change.

Projected climate change impacts

Warmer temperatures are predicted for the Pacific Northwest due to increased greenhouse gases. Anticipated impacts include warmer winters (3-6 degrees within 15 years) and dryer summers (Climate Impacts Group 2013). For summer months, a majority of models project decreases in precipitation, with the average declining 16% by the 2080s. A majority of models project increases in winter precipitation, with an average value reaching over 9% by 2080 (Mote and Salathé 2009).

Areas burned by wildlife fires will increase with hotter and drier summers. The area burned by fire in the Columbia River Basin is projected to triple by the 2040s relative to median for 1916-2006 (Littell et al. 2010, 2012). Wildfire suppression costs already have increased as fire seasons have grown longer. The frequency, size, and severity of wildfires has increased due to changing climatic conditions, drought, fuel buildups, insect and disease infestations, invasive species, and other factors.

Large declines of shrublands will occur under future climate conditions, based on vegetation models of in eastern Washington and Oregon (Neilson et al. 2005; Rogers et al. 2011). Shrubs will largely be replaced by woodland and forest vegetation. Grassland and shrubland systems may be affected if invasive species spread (Dennehy et al. 2011).

Impacts to wildlife area resources and potential adaptation

The wetlands in the Columbia Basin Wildlife Area depend on irrigation water, and for this reason, they may be more resilient than other "natural" wetlands in the region. Subsequently, the ecological significance of these wetlands could potentially grow over time if wetlands dependent on natural seeps and springs become less productive. However, agricultural practices are becoming more water efficient, which leads to less irrigation water for the wetlands in the wildlife area. Climate change may force additional efficiencies and may impact the water availability for habitat needs. Crop selection may need to change to adapt to increasing drought, heat, and wildfires.

Prioritization of where to restore or develop new wetlands, or improve upland habitat, should be done from an understanding of how future conditions may change. For example, the UW Climate Impacts Group recently conducted a study on climate change impacts on Columbia Basin wetlands, and studies such as these should be consulted as new initiatives are developed.

Species of concern with high vulnerability to climate change

Species of Greatest Conservation Need (SGCN) potentially on the Columbia Basin Wildlife Area have been ranked by the climate vulnerability assessment to have a moderate-high vulnerability to climate change, and with high confidence in the data. These include hoary bat, silver-haired bat, Kincaid's meadow vole, Washington ground squirrel, greater sage grouse, sage thrasher, sagebrush sparrow, tiger salamander, Columbia spotted frog, norther leopard frog, and silver-bordered fritillary. Only SGCN were considered in this assessment and it does not include climate sensitivities for other species that may be associated with the wildlife area. See Appendix A for terrestrial SCGN and relationship to ecological systems of concern.

Table 9: Species of greatest conservation need with high - moderate vulnerability and high – moderate confidence (WDFW 2015)

Species of greatest conservation need	Overall Vulner-ability	Summary of sensitivity	Summary of exposure
Keen's myotis (*Climate watch species*)	Moderate -high	Keen's Myotis has a specialist's diet and its sensitivity is therefore tightly linked to both the timing and abundance of its prey. This species does not migrate, which makes it very sensitive to changes in microclimate, especially during winter hibernation; changes in temperature that drive the timing and length of winter hibernation could result in a mismatch in timing of insect prey availability and emergence from hibernation. It has a small geographic distribution; however, field identification of this species is difficult because of strong similarities with the Western Long-eared Myotis, making statements about distribution, population size, and trends less certain. Cooler temperatures may energetically stress this species.	- Increased temperatures
Townsend's big-eared bat	Moderate -high	Townsend's big-eared bats are found throughout much of the western U.S.; the species' distribution appears to be tightly linked to the presence of suitable roosting habitat and hibernacula located near foraging habitat. Roosting habitat selection is driven by temperatures within structures; in Washington, this habitat includes lava tube caves, mines, old buildings, bridges, and concrete bunkers. Increased temperatures may therefore reduce the availability of suitable hibernacula, forcing this species to move out of its current range to higher elevations or latitudes. Approximately 90% of the Townsend's Big-eared Bat's diet is composed of moths, making this species sensitive to prey availability (e.g. pesticides used to control outbreaks of moths). Altered disturbance regimes such as fire and drought that can destroy habitat will likely negatively impact this species. Changes in precipitation that limit water availability directly or result in a decrease of prey could negatively affect this species. In arid regions, periods of drought near maternity sites could affect reproductive output.	- Increased temperatures - Changes in precipitation - Altered fire regimes - Drought
Barrow's goldeneye	Moderate - high	Barrow's Goldeneye dependence on specific nesting, breeding, and wintering sites significantly increases this species' sensitivity to climate change. Disturbances such as fire could result in nesting tree loss, and changes in water chemistry (e.g. dissolved oxygen, pH) or temperature may lead to declines in food availability (e.g. mussels, aquatic insects, crustaceans, clams, etc.). Diminished snowpack that leads to wetland drying could also impact this species.	- Altered fire regimes - Declines in pH and dissolved oxygen - Reduced snowpack

Species of greatest conservation need	Overall Vulner-ability	Summary of sensitivity	Summary of exposure
Greater sage grouse (*Closely associated with shrubsteppe*)	Moderate -high	Greater Sage-grouse may exhibit some physiological sensitivity to drought conditions, which could result in decreased nest success and/or reduced chick survival. However, their overall sensitivity will be higher due to habitat and foraging requirements. Changes that reduce the availability and quality of sagebrush habitat (e.g. increased temperatures, drought and/or moisture stress, altered fire regimes), which Greater Sage-grouse depend on for forage, nesting, and broodrearing, will adversely impact this species.	- Drought and/or moisture stress - Increased temperatures - Altered fire regimes
Sage thrasher (*Closely associated with shrubsteppe*)	Moderate -high	As sagebrush obligates, Sage Thrashers are sensitive to climate changes that affect the extent of sagebrush habitat. Increasing fire frequencies, which are perpetuated by invasive species (e.g. cheatgrass), may reduce breeding habitat. Invasive species also degrade foraging opportunities in the sagebrush understory. Warming temperatures, precipitation variability, and drought are also likely to contribute to reductions in sagebrush habitat, negatively affecting Sage Thrasher reproduction and foraging.	- Increased invasive weeds - Altered fire regimes - Increased temperatures - Changes in precipitation - Drought
Sagebrush sparrow (*Closely associated with shrubsteppe*)	Moderate -high	Very limited information is available regarding sensitivity of Sagebrush Sparrows to climate change, particularly in Washington, and particularly due to recent taxonomic separation from Bell's Sparrow. However, as sagebrush obligates that require relatively intact and undisturbed sage for breeding, Sagebrush Sparrows are likely vulnerable to any climate changes that affect the extent, quality, and connectivity of sagebrush habitats. Increasing fire frequencies (due to climate change and perpetuated by invasive species, e.g. cheatgrass), warming temperatures, precipitation variability, and drought are likely to contribute to reductions in sagebrush habitat, negatively affecting this species. Sagebrush Sparrows may also be physiologically sensitive to warming temperatures; they avoid nesting on hot southwest aspects, and position nests to maintain airflow (which is hypothesized to ameliorate high temperatures during nesting periods).	- Increased invasive weeds - Altered fire regimes - Increased temperatures - Changes in precipitation - Drought
Tiger salamander (*Climate watch species*)	Moderate -high/ high	Little information exists regarding sensitivity of the Tiger Salamander to climate change, particularly in Washington. This species likely exhibits sensitivity to warmer and drier conditions that reduce aquatic breeding habitat, lead to desiccation, and/or result in an inability to move. Warmer temperatures and a decrease in total annual precipitation (including snow), as well as an increase in drought, has led to wetland desiccation and significant population declines in Yellowstone National Park. Timing of reproduction may also be affected by increasing temperatures.	- Increased temperatures - Changes in precipitation and/or reduced snowpack - Drought
Columbia spotted frog	Moderate -high/	Though there is very limited information available regarding the sensitivity of the Columbia Spotted Frog to climate change, their main sensitivity is likely to stem from any climate-induced changes in their pond and stream breeding habitat. If streams and ponds become drier, this could limit available breeding and juvenile habitat for this species, particularly for juveniles who are unable to travel long distances to more suitable habitat. Changes in precipitation patterns could also affect the Columbia Spotted Frog through alterations in breeding timing, egg survival, and availability of prey. However, predicted	-Changes in precipitation (rain and snow) - Altered hydrology

Species of greatest conservation need	Overall Vulner-ability	Summary of sensitivity	Summary of exposure
		increases in temperature and milder winters may positively impact this species, as studies have shown that warmer and less severe winters are linked to increases in survival and breeding probability.	
Northern leopard frog	Moderate -high	There is very limited information available regarding the sensitivity of Northern Leopard Frogs to climate change. They may experience some sensitivity to potential increases in temperature, which could lead to earlier timing of mating and breeding. Their sensitivity will be increased by potential climate-induced changes in their pond habitat. Adults need deep water, seasonal ponds, and wetlands for breeding habitat, and potential warmer and drier conditions could lead to declines in available breeding habitat. Drier conditions could even lead to localized population extinctions if breeding ponds become too shallow or disappear completely.	- Increased temperatures - Changes in precipitation - Altered hydrology
Columbia clubtail	Moderate - high	Although very little information is available, Columbia Clubtail sensitivity is likely driven by water temperature, air temperature, and altered flow regimes (summer low flows and winter flooding). Eggs are laid in water, and after hatching, larvae burrow and overwinter in river mud. Water temperature influences emergence timing, while warmer air temperatures influence adult flight times, affecting foraging and energy demands. Reduced summer streamflow can exacerbate increasing water temperatures and effects on clubtail aquatic eggs and larvae. In addition, lower streamflows may strand eggs or larvae, causing mortality via desiccation. Increased winter flooding that enhances scour and/or that causes significant sedimentation may reduce larval survival.	- Increased air and water temperatures - Altered flow regimes(low summer flows and increased winter flooding)

Shrubsteppe habitat and species associations

Over 50,000 acres of wildlife area are in a shrubsteppe system which is classified as imperiled (see Table 6-Ecological systems of concern).

Shrubsteppe systems are sensitive to changes in precipitation and soil moisture, temperature, drought, and altered wildfire regimes. Changes in precipitation can lead to shifts in species composition or vegetation structure. More frequent fire could result in conversion to annual grasslands, which would be adversely impact many species. Shrubsteppe habitats and species will likely be adversely affected under projected future climate conditions. The level of certainty is high that the summers will get drier and hotter in the Columbia Plateau. Fall, winter, and spring will be wetter and hotter. Inter-mountain Basins Big Sagebrush Steppe

Burrowing owls
Photo by Doug Kuehn

is projected to decline by the end of the century. About 4% is projected to remain stable, and 70% to become climatically unsuitable.

Building climate resilience into the goals and objectives of the plan

The information below is a list of Columbia Basin Wildlife Area goals and objectives potentially affected by climate change, or those with a "climate nexus." Actions and considerations are listed to ensure climate impacts are addressed in implementation of the wildlife area management plan. Washington's arid lands host many native plant and animal species that already live near their physiological limits for water and temperature stress. Projected higher summer temperatures will further stress already vulnerable species. Increased temperatures will also benefit invasive species such as cheatgrass, which thrives in hot, open environments and crowds out native species.

In Grant County, the historical acreage of shrubsteppe was over 1.6 million acres, and in 1988 was measure at about 572,000 acres, or a 65% loss (Dobler 1996). Higher temperatures can lead to more fires, and unless restored, other species such as cheatgrass can invade.

Table 10: Plan objectives with climate nexus

Objective with climate nexus	Opportunities to build resilience
GOAL: Maintain or improve the ecological integrity of priority sites	
1A. Improve post-fire habitat enhancement response in frequently burned areas.	Include adaptation for increased fire occurrences.
1B. Conduct weed control measures to maintain access and decrease fires, maintain legal compliance, and improve habitat.	Consider and plan for possible new weeds. Consider monitoring for invasive species expected to increase under climate change.
1D. Enhance shrubsteppe/grassland habitat (such as dense nesting cover) as funding and staff time allow.	Consider projected changes in temperature and precipitation that will be challenges for enhancement activities. Ensure the plant or seed mix is diverse and appropriate to changing conditions.
GOAL: Maintain or increase wetland value and function	
2A. Implement wetland management which is focused on enhancements and also includes development of new wetlands on the wildlife area.	Ensure enhancements are designed for future flows and species selection. Use climate change trends as a criteria for prioritizing where to restore or create new wetlands. Consider how other ecologically important wetlands in region may be affected by climate change – importance of these managed wetlands may increase with a broader perspective.
2D. Implement prescribed burn plan for managing vegetation and improving wetland habitat. Expand on burn plan to include additional areas.	Consider areas where climate resiliency could be increased.
GOAL: Achieve species diversity at levels consistent with healthy ecosystems	
3B. Enhance northern leopard frog habitat through burning, spraying, and fish removal. Identify opportunities to expand the population.	Maintain appropriate water levels on the landscape for oviposition and connectivity. Consider climate change with plant selection.
3E. Identify and implement opportunities to enhance monarch butterfly, bumble bees, and other pollinator habitat by 2024.	Check for habitat suitability and future climate scenarios. Prioritize planting locations based on suitable future climatic conditions.
3F. Develop a strategy to conserve striped whipsnake.	Consider habitat suitability in future climate scenarios.

Objective with climate nexus	Opportunities to build resilience
3H. Improve habitat for wintering mule deer	Consider climate change impacts when enhancing winter food sources.
3I. Enhance habitat at Upland Restoration sites.	Consider climate change impacts when enhancing upland habitat which is important for climate refugia.
GOAL: Enhance recreational experience through site development	
4B. Continue to improve recreational experience, user expectations, and support of the wildlife area by providing information such as on the web, at kiosks, in maps, brochures, and directional signage.	As new signage and interpretive material is developed, keep in mind opportunities to include climate change information, which can increase the knowledge of the ecological importance of the habitats.
4D. Develop designated trail networks in high use areas, and decommission some user-built trails.	Consider climate change impacts when selecting routes.
4E. Develop a Campground at Frenchman's Coulee.	Consider climate change impacts when locating and designing the facility.
GOAL: Improve recreation opportunities	
5A. Assess potential to improve lakes and stock with fish (trout and/or warm water) by 2024.	Consider that habitat suitability for certain species may change with climate change.
6D. Maintain and enhance water access sites.	Facility enhancements should include climate change considerations.
6F. Improve access to ADA blinds.	Facility enhancements should include climate change considerations.
6H. Create a prioritized list of water access site developments and improvements.	Consider adaptations that may be required due to climate change impacts.
6.I. Develop and implement a Travel Management Plan	Facility design should include climate change considerations.
Goal: Maintain safe, highly functional, and cost-effective administration facilities and equipment.	
11C. Determine importance of maintaining DNR leases and decide which leases to continue.	When evaluating leases to continue, consider which areas are well suited to future climate – where species can adapt to climate change. Consider cost of maintaining habitat with climate future. Consider habitat species with high vulnerability to climate changes and for landscape connectivity.

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Appendices

A. Species and habitat information
B. Weed management plan
C. Lower Crab Creek NAP
D. WDFW Contacts
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Appendix A. Species and habitat information

Terrestrial SGCN Relationship with Ecological Systems of Concern
(this needs to be completed)

Priority habitats in Grant and Adams Counties

Source: WDFW Priority Habitats and Species, 2017

Grant and Adams Counties	Units
Aspen Stands	Banks Lake
Biodiversity Areas & Corridors	Banks Lake, Sun Lakes, Gloyd Seeps, Quincy Lakes, Desert, Seep Lakes Lower Crab Creek
Inland Dunes	Desert, Seep Lakes
Shrubsteppe	Banks Lake, Billy Clapp Lake, Desert, Gloyd Seeps, Lower Crab Creek, Priest Rapids, Quincy Lakes, Rocky Ford, Seep Lakes, Sprague Lake, Sun Lakes, Winchester
Riparian	Banks Lake, Billy Clapp Lake, Desert, Gloyd Seeps, Lower Crab Creek, Priest Rapids, Quincy Lakes, Rocky Ford, Seep Lakes, Sprague Lake, Sun Lakes, Winchester
Freshwater Wetlands & Fresh Deepwater	Banks Lake, Billy Clapp Lake, Desert, Gloyd Seeps, Lower Crab Creek, Priest Rapids, Quincy Lakes, Rocky Ford, Seep Lakes, Sprague Lake, Sun Lakes, Winchester
Instream	Gloyd Seeps, Lower Crab Creek
Caves	Banks Lake, Billy Clapp Lake, Lower Crab Creek, Quincy Lakes, Sun Lakes
Cliffs	Banks Lake, Billy Clapp Lake, Lower Crab Creek, Sun Lakes
Snags and Logs	Banks Lake, Billy Clapp Lake, Desert, Gloyd Seeps, Lower Crab Creek,
Talus	Banks Lake, Billy Clapp Lake, Sun Lakes

Appendix B. Weed management plan

Weed control goals at the Columbia Basin Wildlife Area

Weed control is an integral component of the vegetation management work that occurs on the Columbia Basin Wildlife Area. The objective of weed control is to provide sound stewardship, maintain and improve wildlife habitat, meet legal control obligations, and protect adjacent private lands and lands owned by other agencies.

The Washington State Weed Board establishes, monitors, and maintains the statewide noxious weed list. The list is comprised of three classes. Class A includes high priority, new or low infestation to eradicate. Class B includes weeds prevalent in areas to control and prevent spread as able. Class C is for weeds that are commonly present to control and prevent spread as needed. County weed boards and weed districts work in conjunction with the state board to refine the list to represent the needs of their specific areas, monitor weed occurrence, and notify landowners of issues. The Columbia Basin Wildlife Area falls under the jurisdiction of three county weed boards and four weed districts. The wildlife area is part of a rural, agriculturally based community, and it is important to maintain good neighbor relations, particularly when it comes to weed control and being responsive when issues arise.

The Columbia Basin Wildlife Area, as required by state law (RCW 17.10), uses the broad-based strategy of Integrated Pest Management (IPM) to identify issues, prioritize needs, and determine proper control methods. IPM utilizes a combined approach of biological, cultural, physical, and chemical tools to manage weed populations at appropriate and acceptable occurrence levels. When prioritizing Class B and Class C control work, factors such as nuisance level, potential to become problematic, and interference with management goals are considered. Weed monitoring, pre and post treatment, is an important component as method timing is critical to effective control.

IPM Weed Control Tools

- **Biological** – Federal and state agriculture department approved insects (or pathogens) that target specific plants. The insects undergo years of extensive testing prior to approval for release to ensure they will only target the intended plant. Biological agents require a specific plant to meet their life cycle need, so the plant will likely persist on the landscape but at an acceptably reduced level. Refraining from using herbicides when biological agents are actively present is important to control persistence. The wildlife area works cooperatively with WSU Extension to obtain biological agents for release in appropriate locations. The most successful biological agents to date have been a purple loosestrife foliage feeding beetle (*Galerucella* spp.), and a toadflax stem-mining weevil (*Mecinus j*.).
- **Cultural** – This action is disruptive to an aspect of the targeted plant's growth-cycle, though causes relatively minimal disturbance to the surrounding area. These actions include re-establishing desired vegetation, use of weed barrier fabric, organic mulch, targeted drip irrigation, and wetland water elevation management to disrupt plant development or flood/freeze kill, hand removal of seed heads, limited plant removal, and possibly limited prescribed fire, among others.
- **Physical** – Physical and mechanical control are more disturbing activities, often a necessary step toward achieving the desired end result. Actions may include extensive hand removal, chainsaw removal, light tillage with an ATV, light and heavy tillage with a wheel tractor or skidsteer, rototilling, mowing, tree and brush removal with an excavator, dozier, or heavy mulcher, large scale prescribed fire, and revegetation work.

- **Chemical** - Herbicides can be an effective tool for controlling weeds. Some current formulations allow for a more targeted treatment without being overly damaging to surrounding desirable vegetation. There are a variety of delivery methods, all of which have been used on the wildlife area depending on the situation. These include cut stump treatments, hack and squirt, injection, wick application, backpack application, ATV/truck/tractor broadcast and spot treatment, boat spot treatment, and fixed wing and rotary wing aerial broadcast treatments.

Types of Weed Control Performed on the CBWA:

Weed control is a regular and recurring annual activity on the wildlife area. Seasonal temperatures, precipitation, winds, and seasonal groundwater fluctuations resulting from the operation of the Bureau of Reclamation's Columbia Basin Irrigation Project all affect weed germination, vigor, maturation and seed production. These variables are considered when determining preferred treatment and timing. The majority of weed control work performed generally falls into one of following categories:

- **Noxious weeds** – Identifying, prioritizing and addressing listed noxious weed infestations and issues negatively affecting neighbors, management goals, and general wildlife habitat quality. The duration of this work is ongoing.
- **Revegetation work** – This refers to planned revegetation projects to address a degraded habitat situation. Weed control on these projects can be a 1-5 year commitment, depending on seasonal variables. Existing weed issues must be addressed prior to planting a site, and follow-up treatments are required to prevent highly responsive annual weeds such as cheatgrass, Russian thistle, mustards and kochia from preventing establishment of the desired vegetation.
- **Post wildfire work** – Following a wildfire, when funds are available, this is an opportunistic one-time, possibly two-time, herbicide treatment that primarily targets the annual weeds cheatgrass, Russian thistle and kochia, which can quickly and effectively outcompete recovering desirable vegetation for released nutrients and water. Supplemental reseeding may occur under favorable circumstances. These treatments are intended to provide 1-2 growing seasons of weed control/suppression while desirables re-establish.
- **Roadsides and parking areas** – This is a recurring annual activity, comprised of an annual fall and/or early spring residual herbicide treatment intended to prevent germination of persistent annual weeds such as kochia and Russian thistle from establishing along access roads and in parking areas. As the effectiveness of the residual treatment degrades, weed breakthrough occurs typically along the outer edge of the spray pattern, and to a much lesser extent with the treatment band, in late June-July. During this period a follow up treatment with a contact herbicide is necessary to prevent seed production. Maintaining weed free access roads and parking areas is a high priority for several reasons. First, vehicles are a well-documented weed spreading vector. Second, minimal or no immediate roadside vegetation lessons the potential of a vehicle or human caused wildfire. Third, access roads and parking areas serve as maintained fire breaks and safety zones during wildfire season and have been used as such during suppression efforts over the years. Finally, maintain open vegetation free roads and parking areas is an important part of providing a quality recreational experience.

Weed Species of Concern on the Columbia Basin Wildlife Area

Persistent and problematic weeds of concern that occur and are treated on the wildlife area include but are not limited to the following:

- Cheatgrass *(Bromus tectorum)*
- Kochia *(Kochia scoparia L.)*
- Knapweed, Diffuse *(Centaurea diffusa L.)*
- Knapweed, Russian *(Acroptilon repens L.)*
- Knapweed, Spotted *(Centaurea biebersteinii)*
- Perennial Pepperweed *(Lepidium latifolium L.)*
- Phragmites *(Phragmites australis L.)*
- Poison Hemlock *(Conium maculatum)*
- Puncturevine *(Tribulus terrestris L.)*
- Purple Loosestrife *(Lythrum salicaria L.)*
- Rush Skeletonweed *(Chondrilla juncea L.)*
- Russian Olive *(Elaeagnus angustifolia L.)*
- Salt Cedar *(Tamarisk ramosissima L.)*
- Thistle, Canada *(Cirsium arvense L.)*
- Thistle, Musk *(Carduus nutans L.)*
- Thistle, Russian *(Salsola iberica)*
- Thistle, Scotch *(Onopordum acanthium)*
- Toadflax, Dalmation *(Linaria dalmatica ssp. dalmatica)*

Weeds occurring on the Columbia Basin Wildlife Area and associated units are listed in Table 1. The table describes the weed's classification, an estimate of the acreage affected by the weed, how many acres were treated, the relative density of infestation, the general trend the weed infestation has been exhibiting, the control objective and or strategy for the weed and finally, which wildlife units have the weed present.

Detailed descriptions and natural history information for each of the above state-listed weed species listed above can be found at the Washington State Noxious Weed Control Board web site http://www.nwcb.wa.gov/search.asp. Information on other species contained in the list can be found at the University of California's IPM Online web site: http://www.ipm.ucdavis.edu/PMG/weeds_intro.html.

Weed management information for individual weed species can be found at the PNW Weed Management Handbook link at: http://pnwhandbooks.org/weed/control-problem-weeds.

Table 1: Columbia Basin Wildlife Area weed table including the weed class and unit location on the wildlife area.

Weed Species	Grant County Weed Class	2018 Treated Acres	2019 Treated Acres	2020 Treated Acres	Wildlife Area Unit Weed Distribution
Canada thistle	C	11.8	19	29.5	Desert, Gloyd Seeps, Sprague Lake, UWR, Quincy Lakes, Winchester Reservoir
Catchweed bedstraw	NA	2.9			Desert, Sprague Lake, UWR
Cheatgrass	NA	1,882.50	27	1101	Gloyd Seeps, Potholes Reservoir, Quincy Lakes, Lower Crab Creek, UWR
Cocklebur (species?)	C or NA	0.8			Desert
Dalmatian toadflax	B	3.2	2.9	2	Gloyd Seeps, Billy Clapp, Sprague Lake, Banks Lake
Kochia	B	397.7	140	101	Desert, Gloyd Seeps, Quincy Lakes, Seep Lakes, Potholes Reservoir, Goose Lakes, North Potholes, Lower Crab Creek, UWR, Winchester Reservoir
Perennial pepperweed	B	261	75	69.5	Desert, Gloyd Seeps, Quincy Lakes, Lower Crab Creek, Winchester Reservoir, Banks Lake
Phragmites	B	801.7	1204.5	988.4	Desert, Potholes Reservoir, Banks Lake, Lower Crab Creek, Gloyd Seeps, Winchester Reservoir, Quincy Lakes
Poison hemlock	B-Designate	3.0		2.5	Desert, Lower Crab Creek
Purple loosestrife	B	2.9	1.4	1	Quincy Lakes, Sun Lakes
Rush skeletonweed	B	5.5	2.5	0.5	Gloyd Seeps, Seep Lakes
Russian olive	C	117.5	60.5	86	Desert, Gloyd Seeps, Lower Crab Creek, UWR
Russian thistle	NA	95.4 (277)	220	105.5	Desert, Gloyd Seeps, Quincy Lakes, Seep Lakes, Potholes Reservoir, North Potholes, Lower Crab Creek, UWR, Winchester Reservoir
Scotch thistle	B-Designate	5.5	13.75	2	Seep Lakes
Hairy whitetop (Hoary cress)	C	5.0	12.5	22.5	Corfu, Gloyd Seeps
Yellow flag iris	C	1.0	1		Desert
Russian knapweed	B		5	13.5	Gloyd Seeps, Sun Lakes, Banks Lake
General weeds			105		Desert
General weeds		237.9	380.4	311.8	All Units: Roadsides and Parking Areas

Appendix C. Lower Crab Creek Natural Area Preserve

Part of the Lower Crab Creek was designated a Natural Area Preserve (NAP) in 1986. NAPs are defined by RCW 79.70 as areas of land or water which have retained their natural character, although not necessarily completely natural and undisturbed, or which are important in preserving rare or vanishing flora, fauna, geological, natural historical, or similar features of scientific or educational value. The Department of Natural Resources manages most NAPs in Washington.

The area received the NAP designation because of its high-quality black greasewood (*Sarcobatus vermiculatus*) and alkali saltgrass *(Distichlis stricta)* association. This plant community accounts for about 60% of the canopy cover, and is the largest and highest quality example of this plant association. While saline and alkaline vegetation occurs throughout the Columbia Basin, the associations are typically degraded or destroyed, and only very few examples of moderate condition *Sarcobatus* and *Distichlis* vegetation are known in Washington. Lake Lenore is another site in Washington that approaches the size and quality of this site, but the overall condition is lower and recreation pressure is greater there.

Other features include:

- Alkali saltgrass association
- Big sagebrush-spiny hopsage and Sandberg's bluegrass community (fragment)
- Black greasewood and Sandberg's bluegrass community (fragment)
- Giant wildrye-alkali saltgrass association (fragment)

Approximately 150 acres of the Lower Crab Creek Unit make up the Natural Area Preserve. It is located along the southern margins of Lower Crab Creek. Except for a narrow east-west riparian strip along the northern boundary, soils with a high pH have developed from evaporation of subsurface water. The site is bordered on three sides by a four-strand barbed wire fence.

The area was grazed prior to 1985 and has not been drastically altered. Introduced species occur in low numbers throughout the site, including Russian olive (*Elaeagnus angustifolia*), tall wheatgrass (*Agropyron elongatum*), annual wheatgrass (*Agropyron triticeum*), and quack grass (*Agropyron repens*). Some of these species were planted in the past prior to WDFW management, as forage for waterfowl.

The guiding principle in management of this preserve is to allow natural ecological and geological processes to predominate, while controlling activities that directly or indirectly modify these processes.

WDFW manages the preserve for those primary features which the preserve is intended to represent, and is managed to retain the unmodified condition. Exception may be required to maintain a plant community, species population, or ecological process which is the primary feature the preserve is intended to represent. The preserve is primarily for scientific and education use.

The values for which the NAP was established are still present. The greasewood/alkali brush habitat is intact. Because of its location within the unit, recreational use is sparse and does not impact the values of the NAP. The NAP is not publicized for recreational purposes. Like the rest of the unit, it is open to hunting part of the year. Weed control that occurs complies with state and county weed control ordinances and regulations. There is some encroachment of Russian olive. One objective of the wildlife area management plan is to implement sustainable Russian olive removal on this unit. One of the boundary fences has collapsed, but it does not seem to be impacting the NAP. It is noted for future repair.

Management objectives in the original agreement include:

- Planned physical alterations require approval from the Region. Unplanned or unapproved alterations are not allowed.
- Information about the preserve will be provided to the district with fire control responsibility. Following fire, a recovery plan will be prepared by the Region. Any plan for prescribed burning needs approval.
- Introduction of plants or animals is prohibited.
- DNR Natural Heritage Program will be consulted regarding management and monitoring of plan communities.
- Weed control will be undertaken to comply with ordinances and regulations.
- Extraction of minerals and rock or gravel is prohibited

Appendix D. Fire Response

Agency	Units Covered	Status
Adams Co FPD#1 (Ritzville)	Sprague Lake	No current protection
Adams Co FPD#2 (Hatton/Lind)	Upland Restoration (LCA)	No current protection
Adams Co FPD#4 (Harder/McCall)	Sprague Lake	No current protection
Grant Co FPD#3 (Quincy)	Quincy Lakes, Upland Restoration	Active contract
Grant Co FPD#4 (Warden)	Upland Restoration	Active contract
Grant Co FPD#7 (Soap Lake)	Sun Lakes, Rocky Ford Creek, Gloyd	Active contract
Grant Co FPD#8 (Mattawa)	Buckshot	Active contract
Grant Co FPD#5&15 (Moses Lake)	Rocky Ford Creek, Gloyd, Desert	Active contract
Grant Co FPD#10&11 (Royal Slope)	Lower Crab Creek, Desert	Active contract
Grant Co FPD#12 (Wilson Creek)	Billy Clapp Lake	Active contract
Grant Co FPD#13 (Ephrata)	Rocky Ford Creek, Upland Restoration (Martin Rd)	Active contract
Grant Co FPD#14 (Electric City)	Banks Lake (Barker Cyn)	Active contract

Contact	Email	Phone Number
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Appendix E. Public Response Summary (SEPA)

Columbia Basin Wildlife Area Management Plan

SEPA comments and other comments. SEPA Review Period: (to be added)

Date & Source	Comment	*WDFW Response*