

Appendix E

John Day Basin Report

1. Basin Description

The John Day Basin, located in north-central Oregon, includes four subbasins (North Fork, South Fork, Middle Fork and Lower John Day), and drains approximately 8,100 square miles; making it the fourth-largest river basin in Oregon. The John Day is the third longest free-flowing river in the contiguous United States and the longest containing entirely un-supplemented runs of anadromous fish. The Basin incorporates portions of eleven counties. Originating in the Strawberry Mountains near Prairie City, the John Day River flows 284 miles in a northwesterly direction, entering the Columbia River approximately four miles upstream of the John Day dam. Absent of dams, the John Day River provides unparalleled habitat for wild runs of spring Chinook salmon and summer steelhead, Pacific lamprey, westslope cutthroat, redband and bull trout.

Nearly 40 percent of the basin is public land. Ponderosa pine forests in the Ochoco and Blue mountains dominate the John Day River headwaters. The north and middle forks of the John Day meander through open meadows and prairie ranchland. Mid and lower-elevation grasslands are primarily in private ownership and livestock grazing is the predominant land use here. Livestock are primarily cattle. Irrigated agriculture is undertaken on many floodplain meadows throughout the Basin, and dry land farming is present to varying degrees. Large wheat farms are common in the lower subbasin and dry land hay is grown in scattered areas throughout the Basin. Recreation is an increasing use on private lands.

The Basin population is small and widely dispersed. The Basin boundary overlaps ten rural counties, the largest and most populated of which is Grant County. There are seventeen incorporated cities in the Basin, all with population under 2000. John Day and Prairie City are the largest; county seats include Canyon City (Grant County), Fossil (Wheeler County), Moro (Sherman County) and Condon (Gilliam County).

Elevations within the Basin range from the Blue, Strawberry, Aldrich and Ochoco Mountains, at just over 9,000 feet to the Columbia River just above the John Day Dam at about 380 feet. The largest rivers in the Basin are the John Day River, and the North, Middle and South Forks (in order of volume). Climate in the Basin ranges from sub-humid in the upper Basin to semi-arid in the lower subbasin. Most precipitation falls between November and March. Upper elevations receive up to 50 inches of precipitation annually, mostly in the form of snow; lower elevations typically receive 12 inches or less of annual precipitation. Across the Basin, air temperature varies from sub-zero during winter months to over 100°F during the summer.

The John Day Basin is home to the famous John Day Fossil Beds National Monument, managed by the National Park Service. The park is known for its well-preserved layers of fossil plants and mammals that lived in the region between the late Eocene, about 45 million years ago, and the late Miocene, about 5 million years ago. The monument consists of three geographically separate units: Sheep Rock, Painted Hills, and Clarno, covering over 13,900 acres. About 250,000 people visit the park annually. The fossil record includes animals (horses, camels, rhinoceroses, bears, pronghorn, deer, weasels, raccoons, cats, dogs, lions, sloths and others), plants (oak, sycamore, maple, ginkgo, and elm trees). Two fossilized teeth found recently near Dayville are the earliest record of beaver (*Castor californicus*), in North America, dating to about 7 million years old.

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Table E-1: 2011 Land use and land cover for each subbasin in the John Day.

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower John Day	8155.474	1.1	10.9	12.7	74.7	0.6
Middle Fork John Day	2051.845	0.6	54.6	0.2	44.2	0.4
North Fork John Day	4787.384	0.7	58.6	0.4	39.7	0.6
Upper John Day	5540.189	1.1	44.3	0.5	52.7	1.4



Figure E-1: Land use in the John Day administrative basin.

1.1 Basin Contacts

Table E-2: Oregon DEQ basin contact.

Administrative Area	DEQ Basin Coordinator
John Day Basin	Don Butcher: 541-278-4603: butcher.don@deq.state.or.us

2. Water Quality Impairments and TMDLs

2.1 Water Quality Impaired Stream Segments

Under Section 303(d) of the Clean Water Act, states, territories and authorized tribes must submit lists of impaired waters. Impaired waters are those that do not attain water quality standards or support all designated uses. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. Table E-3 identifies the number of John Day Basin waterbody segments impaired by parameter from the 2012 Integrated Report and the number of segments with approved TMDLs. Sources: [ODEQ](#), [USEPA](#)

Table E-3: Number of impaired stream segments with and without a TMDL as identified in Oregon's 2012 Integrated Report and Assessment database.

Parameter	Segments without a TMDL	Segments with a TMDL
Biological Criteria	31	3
Copper	1	0
Dissolved Oxygen	21	1*
E. Coli	0	1
Fecal Coliform	0	1
Fish tissue, Mercury	1	0
Iron	2	0
Lead	1	0
pH	4	0
Sedimentation	29	0
Temperature	0	254

* The TMDL targets a dissolved oxygen concentration of 6.5 mg/l.

2.2 Total Maximum Daily Load Watershed Plans

The federal Clean Water Act requires that water pollutant reduction plans, called Total Maximum Daily Loads (TMDLs), be developed for water bodies that are listed in Category 5 of the Integrated Report (303(d) List). TMDLs describe the maximum amount of pollutants that can enter the river or stream and still meet water quality standards.

TMDLs take into account the pollution from major sources including discharges from industry and sewage treatment facilities, runoff from farms, forests and urban areas, and natural sources. TMDLs include a margin of safety to account for uncertainty, and may include a reserve capacity that allows for future discharges to a river or stream. DEQ typically develops TMDLs on a watershed, subbasin, or basin level and occasionally at the reach level depending on the type and extent of impairments.

The Water Quality Management Plan (WQMP) is the framework for TMDL implementation that is issued by Oregon along with the TMDL (Oregon Administrative Rules 340-042-0040(1)). The TMDL and WQMP serve as a multi-sector plan and provides the blueprint for TMDL related implementation activities. Table E-4 lists the TMDLs that have been approved in the John Day Basin.

Table E-4: Approved TMDLs in the John Day Basin and the impairments addressed by those TMDLs.

TMDL Document Name	Impairments Addressed
John Day River Basin TMDL and WQMP	Bacteria (water contact recreation), Dissolved Oxygen, Temperature

3. Implementation Highlights

3.1 Section 319 Grants

Federal Section 319(h) funds are provided annually through the EPA to states for the development and implementation of each state’s Nonpoint Source Management Program. In Oregon a portion of 319 grant funding is “passed through” to support community or partner projects that address Oregon’s nonpoint source program priorities. Generally, DEQ requires grantees to report annually on the progress made implementing their grant project. This section highlights those outputs and accomplishments reported to DEQ in 2019. Note this section does not identify or include projects proposed and awarded a grant in 2019. Outputs and accomplishments for those projects will be reported to DEQ in future years once they have been implemented. For a listing of projects proposed and awarded a grant in 2019 see Section 3.6.2 of the main report.

In 2019, there were three 319 projects active that reported project outputs and accomplishments to DEQ. Combined the projects have a total grant budget of \$53,441. Table E-5 describes the projects and the reported outputs.

Table E-5: Project outputs reported in 2019 for Section 319 pass through grants.

Project Name	Grantee	Project Description	Reported Outputs
Lower John Day UAV Protocol Development	Gilliam County Soil and Water Conservation District	This project will develop a procedure for continuous monitoring of the riparian vegetation using an UAV equipped with appropriate sensors and develop a protocol for the use of UAVs in monitoring riparian vegetation (including protocols for both planning the flight mission and image processing). The data for the comparison of data quality from UAV and plane-based imagery (LiDAR) will be collected in Ferry Canyon, near Condon, Oregon. The Ferry Canyon Watershed covers approximately 81,000 acres and features 10.5 miles of priority native spawning habitat (steelhead and chinook). Over 800 acres of floodplain will be flown with UAVs. The collected data will be processed to make digital orthomosaics, a Digital Terrain Model (DTM), and a Digital Surface Model. These models will be used to help identify areas of concern and reduce the cost of selecting restoration opportunity areas. The protocols developed will be made available in an open forum to all interested natural resource professionals throughout the region and are expected to be implemented by several organizations from eastern Oregon such as Gilliam-East John Day Watershed Council, Mid John Day Bridge Creek Watershed Council, Sherman County Watershed Council, Sherman SWCD, and Wheeler SWCD.	The project was just getting started in 2019. There are no project outputs to report at this time.
Ballace and Lick Creek Riparian Improvements	Grant County Soil and Water Conservation District	The recipient will work with project partners to install a minimum of 2,400 feet of riparian fence on Ballance and Lick Creeks	Landowner/community outreach as well as project site selection has been completed. Materials have been

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Project Name	Grantee	Project Description	Reported Outputs
		and install a minimum of eight (8) livestock watering troughs in pastures associated with Ballance and Lick Creeks. The 319 Grant funds will be used to purchase riparian fencing materials and livestock watering troughs. Partner funding and in-kind services will be used to purchase additional materials, hire a contractor to install the stockwater system (including design and construction oversight), and conduct noxious weed treatment.	purchased, and the in-kind match is ready. Actual construction has not yet taken place due to weather and wildfire concerns.
Sherman County Conservation Awareness Program (CAP) Phase II	Sherman County Soil and Water Conservation District	The project aims to enhance local education on salmonids and water quality in general and increase community engagement through class-room presentations, tree planting, tree sales, farm field days, meetings, surveys, and soil quality programs.	This grant was closed 12/31/2019 and had provided a positive outcome for the Sherman County SWCD to improve outreach and education to the local communities and to participate as a part of basin-wide partnerships and assist with outreach and planning. In 2018 and 2019, the SWCD has conducted many school programs, including field trips and the Salmon and Trout Education Program, hosted annual meetings on diverse topics related to the local environment and local crops with 40-60 attendees each year, and conducted annual tree sale and helped educate community members on planting. The SWCD worked with Oregon State Park to host Arbor Day tree planting; partnered with the North Central Livestock Association Bull Tour, the Sherman County Crop Hop, and the OSU Extension Field Day to showcase effective livestock and crop practices and new ideas in the county; and

Project Name	Grantee	Project Description	Reported Outputs
			partnered with the Lower Deschutes Cooperative Weed Management Area at Maupin Daze in May 2019 and the CWMA partner raft trip down the Deschutes in August 2019. These programs were incredibly educational for partners and the community about noxious weeds, noxious weed treatment, and noxious weed prevention. The SWCD also had a large booth at the Sherman County fair both years and provided information about the programs and educational materials about conservation issues and fire issues in the county.

3.2 Clean Water State Revolving Fund (CWSRF)

The Clean Water State Revolving Fund loan program provides below market rate loans to public agencies for the planning, design and construction of various projects that prevent or mitigate water pollution. Eligible agencies include federally recognized Indian tribal governments, cities, counties, sanitary districts, soil and water conservation districts, irrigation districts, various special districts and intergovernmental entities. DEQ partners with Oregon communities to implement projects that attain and maintain water quality standards, and are necessary to protect beneficial uses. This section highlights the ongoing projects and the outputs and accomplishments reported to DEQ in 2019.

In 2019 there were no nonpoint source related Clean Water State Revolving Fund projects with reported outputs in the John Day.

3.3 Source Water Protection Grants

The Oregon Health Authority regulates drinking water under state law and the Safe Drinking Water Act and works cooperatively with DEQ on source water protection efforts. Using the Drinking Water Revolving Loan Fund, OHA funds Source Water Protection Grants (up to \$30,000 per public water system) for source water protection activities, monitoring, and planning in Drinking Water Source Areas. In addition, loans are available for improving drinking water treatment, source water protection activities, or land acquisition in source areas. Oregon’s Infrastructure Finance Authority is responsible for administering these projects. The loan fund set-asides also fund five Drinking Water Protection positions at DEQ that provide technical assistance to public water systems and communities while they develop and implement strategies that reduce the risk within the delineated source water areas. This section highlights the ongoing projects and the outputs and accomplishments reported to DEQ in 2019.

In 2019 there were no nonpoint source related Drinking Water Source Protection program projects with reported outputs in the John Day.

3.4 Drinking Water Provider Partnership Grants

Oregon DEQ participates in the Drinking Water Providers Partnership (DWPP) with USDA Forest Service Region 6, EPA Region 10, the U.S. Bureau of Land Management OR/WA Office, the Washington Department of Health, Geos Institute and WildEarth Guardians. Together, these partners coordinate a competitive grant solicitation and award program for environmental conservation and restoration projects in municipal watersheds across the Northwest. The Drinking Water Providers Partnership made the first of the annual awards in 2016 and most projects have a focus on nonpoint sources of pollution. The goal of the Partnership and the funding is to develop and support local partnerships to restore and protect the health of watersheds which communities depend upon for drinking water while also benefiting aquatic and riparian ecosystems, including the native fish that inhabit them. This section highlights the ongoing projects and the outputs and accomplishments reported to the DWPP in 2019.

In 2019 there were no active Drinking Water Providers Partnership projects with reported outputs in the John Day.

3.5 OWEB Grant Funded Projects

The Oregon Watershed Enhancement Board (OWEB) is a state agency that provides grants to help Oregonians take care of local streams, rivers, wetlands, and natural areas. These grant projects often address nonpoint sources of pollution and are thus included in this report.

Based on the most recent data available in OWEB’s Oregon Watershed Restoration Inventory (OWRI) database, there were 22 OWEB funded projects completed in 2018 with a total cash and in-kind budget of \$4,583,161. The tables below summarize reported outputs for different project activities in each John Day subbasin.

Learn more about OWEB grant programs at <https://www.oregon.gov/OWEB/grants/Pages/grant-programs.aspx>.

Table E-6: Summary of OWEB grant funded fish passage projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Fish Passage Crossing improvement (Number of treatments)	Fish Passage Non-crossing improvement (Number of treatments)
Lower John Day	NA	1
Middle Fork John Day	2	1
North Fork John Day	1	NA
Upper John Day	1	1

Table E-7: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Stream bank stabilized (Miles)	Engineered structures installed (Number of treatments)
Middle Fork John Day	3.0	7
North Fork John Day	0.1	NA

Table E-8: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Instream habitat: Large wood placement (Number of treatments)	Instream habitat: Structure placement (Number of treatments)
Lower John Day	153	5
Middle Fork John Day	200	15
North Fork John Day	581	12
Upper John Day	21	NA

Table E-9: Summary of OWEB grant funded riparian projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian fencing (Area treated)	Riparian fencing (Stream sides treated)
Middle Fork John Day	5.0	2
Upper John Day	34.3	3

Table E-10: Summary of OWEB grant funded riparian projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Riparian invasive plant control (Stream sides treated)	Riparian vegetation planting (Area treated)	Riparian vegetation planting (Length of treatment)	Riparian vegetation planting (Stream sides treated)
Middle Fork John Day	NA	18	NA	2
North Fork John Day	1	NA	0.8	NA

Table E-11: Summary of OWEB grant funded road projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Road decommission (1 station or 100 Feet)
North Fork John Day	161.7

Table E-12: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Sub-basin	Irrigation system improvement (Acre)	Irrigation system improvement (Feet)	Terracing (Acre)	Terracing (Feet)	Terracing (Number of treatments)	Water/sediment control basins (Acre)	Water/sediment control basins (Number of treatments)
Lower John Day	84	4100	690	20149	23	257	2
Upper John Day	104	3860	NA	NA	NA	NA	NA

Table E-13: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Off-channel livestock or wildlife watering (Number of treatments)	Upland fencing (Acre)	Upland fencing (Mile)
Lower John Day	5	30.9	0.7
North Fork John Day	NA	9.7	0.3
Upper John Day	7	37.7	NA

Table E-14: Summary of OWEB grant funded upland projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Upland invasive plant control (Area treated)	Upland vegetation management (Area treated)	Upland vegetation planting (Area treated)
Lower John Day	224.0	1378.0	390.0
North Fork John Day	14.8	NA	1.5
Upper John Day	6500.0	27.5	5421.0

Table E-15: Summary of OWEB grant funded instream projects completed in 2018, the most recent year data is available in the OWEB OWRI database.

Subbasin	Wetland improvement (Area treated)	Wetland invasive plant control (Area treated)	Wetland vegetation planting (Area treated)
North Fork John Day	9.7	6.9	6.9

3.6 TMDL Implementation Highlights

TMDL implementation actions taken by Designated Management Agencies (DMAs) or third parties are described in the table below. Most of these actions were summarized from annual reports submitted by DMAs to DEQ in calendar year 2019.

Table E-16: TMDL implementation activities reported in 2019 by Designated Management Agencies or third parties.

TMDL	DMA	Reported Actions
John Day River TMDL	Gilliam County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Grant County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Jefferson County	Began TMDL implementation planning.
John Day River TMDL	Prairie City	Began TMDL implementation planning.
John Day River TMDL	Sherman County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Wasco County	Began TMDL implementation planning and submitted first implementation plan.
John Day River TMDL	Wheeler County	Began TMDL implementation planning and submitted first implementation plan.