



Oregon Department of Environmental Quality

Drinking Water Assessment for the Willow Creek Agricultural Water Quality Management Area November 2023

Overview

- Public drinking water systems in the Willow Creek Agricultural Water Quality Management Area utilize groundwater sources to serve approximately 11,799 persons regularly.
- Recent alerts for coliform bacteria are common, including eight community water systems and five non-transient, non-community water systems such as schools or workplaces. No systems had violations for the *E. coli* maximum contaminant level (MCL).
- Four public water systems had alerts for elevated nitrate concentrations. Lamb Weston located southwest of the Umatilla Ordnance Depot has multiple recent alerts for nitrate levels over the MCL.
- 43 of 139 private well results in the area had elevated nitrate concentrations (≥ 7 mg/L).
- Contaminants in water supplies potentially related to agriculture co-occur with human populations, agricultural land uses, and aquifers susceptible to contaminant infiltration.
- DEQ recommends measures to reduce the movement of bacteria and leachable nitrate in soils and irrigation management to prevent leaching in this Agricultural Water Quality Management area. This would reduce risk to groundwater sources of drinking water, reducing treatment costs for communities, and protecting public health. Resources for addressing risks to drinking water supplies can be found in the [Groundwater Resource Guide](#).
- This management area includes the [Lower Umatilla Basin Groundwater Management Area](#) (LUBGWMA). Groundwater Management Areas are designated by DEQ when groundwater in an area has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. The LUBGWMA was designated in 1990 due to nitrate contamination concerns. There are many information resources available about the areas including strategies for mitigating nonpoint source pollution located at the link above.
- 25 of the 39 public wells and 132 of the 139 RET results are located within the LUBGWMA.
- DEQ recommends Oregon Department of Agriculture (ODA) and the Soil and Water Conservation Districts (SWCDs) include a task in the plan to further evaluate agricultural land uses in and upgradient of private domestic and public drinking water wells in the Columbia shore communities of Boardman, Irrigon, Country Garden Estates, Port of Morrow and Lamb Weston (**Figure 1**).

Water Use

17 public water systems (PWS) obtain domestic drinking water from groundwater sources in the Willow Creek Agricultural Water Quality Management Area (Ag WQMA). Drinking water is an important beneficial use under the federal Clean Water Act. When CWA standards are met in source waters, a drinking water treatment plant using standard technology can generate water meeting the Safe Drinking Water Act's maximum contaminant

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levels (MCLs). There are eight community public water systems in the plan area serving approximately 8,620 people on a regular basis, in addition to visitors at recreation sites. There are 5 active non-transient, non-community workplace or school public water systems serving 2,110 persons regularly. The two remaining active public water systems are transient non-community systems and non-public, state-regulated systems with an estimated service population of 1,019. See **Table 1** below for a list of public water systems, their classifications, sources and activity status, and populations served.

Agricultural land uses (e.g. wheat, irrigated crops, livestock) are present near many of the public water system wells and springs in the area. The agricultural areas in the northern part of the area, within the LUGWMA and near the towns of Boardman and Irrigon, have the majority of both intensive agriculture and human population. Forestland is prevalent in the uplands in the southeast. (**Figure 3**)

Bacteria

Five public water systems in the management area have alerts for detections of E. coli in the past 10 years. No public water systems have recent violations for the E. coli MCL. These PWSs with bacterial detections are marked in bold text in **Table 1**.

Nitrates

Nitrate alerts (generated when nitrate exceeds 5 mg/L) exist for Country Garden Estates Mobile Home Park, the Port of Morrow, The City of Boardman, and Lamb Weston (**Table 1**). Lamb Weston has over 20 nitrate alerts and four MCL violations in 2020. The drinking water MCL for nitrates is 10 mg/L.

These contaminants are often related to animal and cropland agriculture. The locations of nitrate contamination of private domestic wells (**Figures 1 and 4**) and public drinking water sources is near to agricultural land use such as row crops and livestock, near Irrigon and Boardman and the western border of the town of Umatilla, in the very northeastern section of the management area.

The soils through most of the Ag WQMA have high, moderately high, or moderate nitrate leaching potential, according to the Natural Resources Conservation Service's (NRCS) National Cooperative Soil Survey, based on slope, precipitation, and land use (**Figure 2**). Nitrate from fertilizers and septic systems can readily penetrate to the aquifers used for drinking water when leaching potential is high or very high, and bacteria removal through soil filtration can be less effective in sandy soils.

DEQ specifically addresses drinking water issues identified for public water systems. A query of Oregon Water Resources' water rights database for private domestic points of diversion (using a threshold of 0.005 cubic feet per second for domestic surface water rights that are household use only, not irrigation) identified 31 private domestic water rights in the Willow Creek Ag WQMA. There are also numerous private groundwater wells for domestic use. The Domestic Well Testing Act database (real estate transaction testing data) for 1989-2018 indicates 43 significant detections of nitrate (≥ 7 mg/L) in private wells out of 139 total wells included in the database for this area. Of those private wells, 28 had nitrate concentrations of ≥ 10 mg/L. The private wells with high nitrate are primarily concentrated in the northeast portion of the area where residences are the most numerous. Attention may be needed to well depth, well construction, nitrate leaching potential of local soils, and proximity to nutrient sources such as septic systems, fertilizer use sites, and high concentrations of livestock in these areas. This would be consistent with the recommendations of the LUBGWMA.

DEQ recommends Oregon Department of Agriculture (ODA) and the Soil and Water Conservation Districts (SWCDs) include a task in the plan to further evaluate agricultural land uses in and upgradient of the groundwater source areas of the Columbia shore communities of Boardman, Irrigon, Country Garden Estates,

Port of Morrow and Lamb Weston. This is also the area where higher nitrate levels were detected in residential wells. Implementation of best management practices in this area may reduce the potential for agricultural sources to impact drinking water sources (**Figure 1**).

Other

Other contaminants not related to agriculture within the management area include arsenic and sodium.

Drinking Water Protection staff are happy to provide additional details, maps, and recommendations upon request.

Contact

For more information, please contact the [Drinking Water Protection Program](#) or send an email to drinkingwater.protection@deq.oregon.gov.

Non-discrimination statement

DEQ does not discriminate on the basis of race, color, national origin, disability, age or sex in administration of its programs or activities. Visit DEQ's [Civil Rights and Environmental Justice page](#).

Table 1. Public Water Systems in the Willow Creek Ag WQMA

Note: Table 1 does not include public water systems which purchase drinking water from these water systems but does include the population served by wholesale customers in the Total Population. **Bold text indicates public water systems with recent E. coli alerts.**

PWS ID	Public Water System Name	Drinking Water Source	System Type	Population	MCL Exceedance
Groundwater Systems					
4100130	City of Boardman	Groundwater	Community	4,490	E. coli, Nitrate
4100369	City of Heppner	Groundwater	Community	1,187	E. coli
4100370	Black Mountain Water District	Groundwater	Community	43	E. coli
4100402	City of Lone	Groundwater	Community	330	
4100403	City of Irrigon	Groundwater	Community	2,030	
4100479	City of Lexington	Groundwater	Community	255	
4101136	US Army Depot-Umatilla Admin	Groundwater	Non-Transient Non-Community	35	
4101182	Country Garden Estates Mobile Home Park	Groundwater	Community	175	Nitrate
4101214	Shady Rest Mobile Court	Groundwater	Community	110	
4101328	Port of Morrow	Groundwater	Non-Transient Non-Community	1,350	Nitrate
4105884	OLAM West Coast, Inc.	Groundwater	Non-Transient Non-Community	100	
4190513	PGE Boardman Coal Fire Plant	Groundwater	Oregon Very Small	20	
4193659	ODOT Boardman Rest Area	Groundwater	Transient Non-Community Water System (NC)	999	
4194664	US Army Depot-Umatilla North INACTIVE System	Groundwater	Oregon Very Small	20	
4194562	Lamb Weston	Groundwater	Non-Transient Non-Community	500	E. coli, Nitrate
4195174	Columbia River Dairy	Groundwater	Non-Transient Non-Community	125	E. coli
4195180	Willow Creek Dairy INACTIVE System	Groundwater	Non-Transient Non-Community	30	

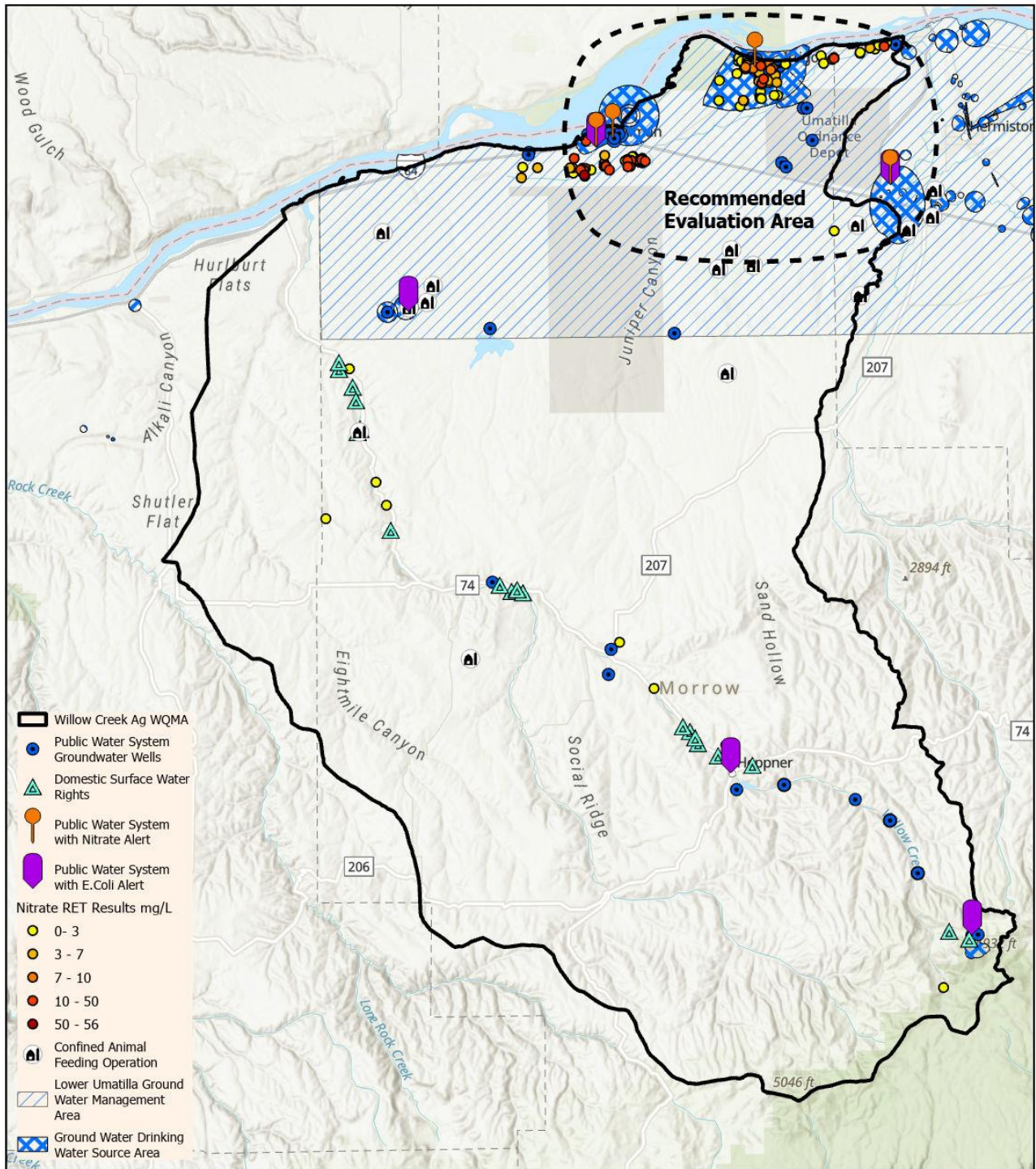
System Type

C - "Community Water System (C)" means a public water system that has 15 or more service connections used by year-round residents, or that regularly serves 25 or more year-round residents.

NTNC - "Non-Transient Non-Community Water System (NTNC)" means a public water system that is not a Community Water System and that regularly serves at least 25 of the same persons over 6 months per year.

NC - "Transient Non-Community Water System (NC)" means a public water system that serves a transient population of 25 or more persons.

OVS - "Oregon Very Small" means a public water system, which serves 4 to 14 service connections or serves 10 to 24 people. Monitoring requirements for these systems are the same as those for Transient Non-Community water systems.



Drinking Water Source Areas in the Willow Creek Agricultural Water Quality Management Area

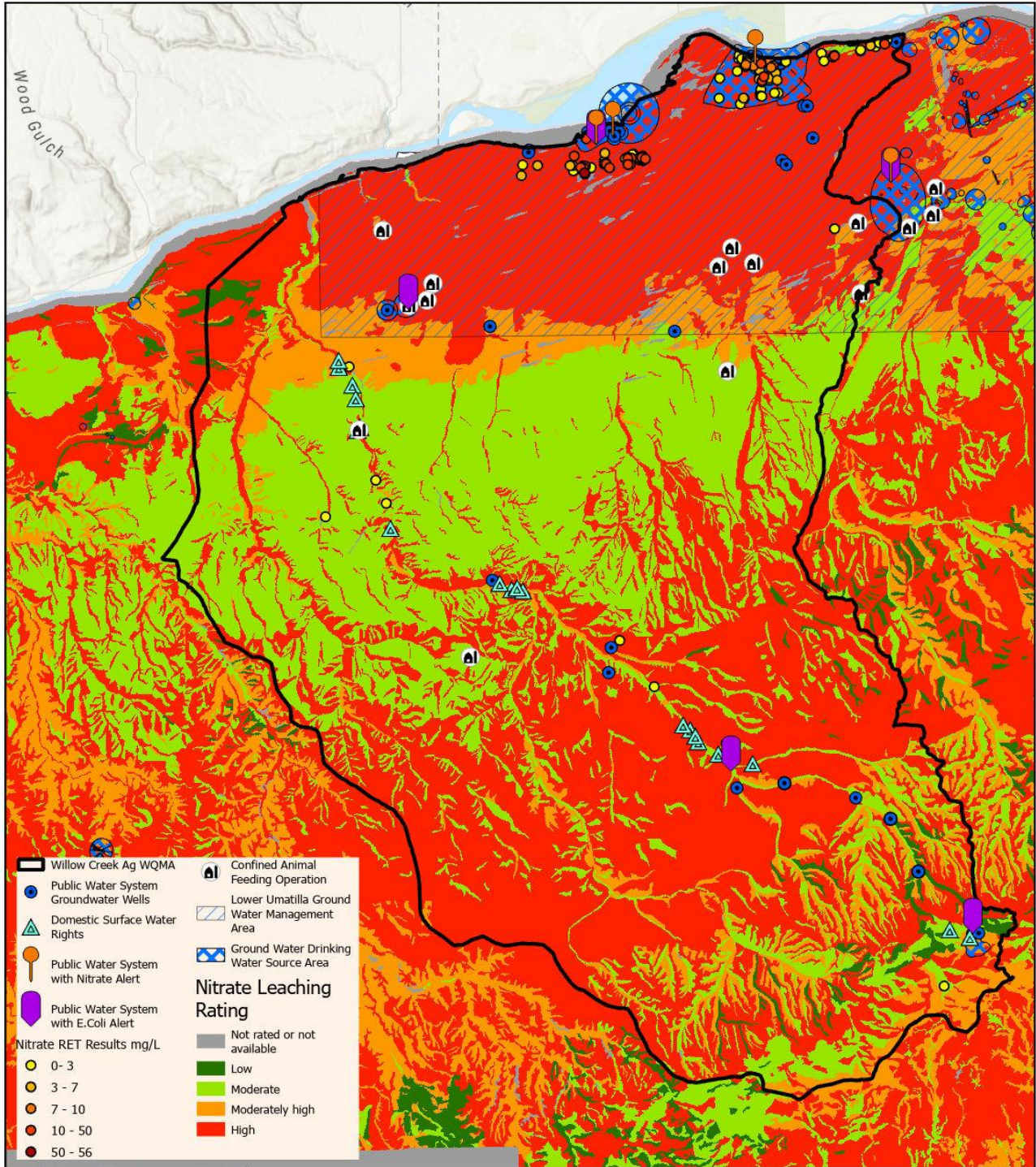


Figure 1



County of Crook, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Oregon State Parks, State of Oregon GEO, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, Esri, NASA, NGA, USGS, Esri Community Maps Contributors, Esri, HERE, Garmin, FourSquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri, USGS Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere





Drinking Water Source Areas in the Willow Creek Agricultural Water Quality Management Area: NRCS Nitrate Leaching Potential - Irrigated

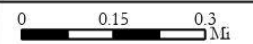
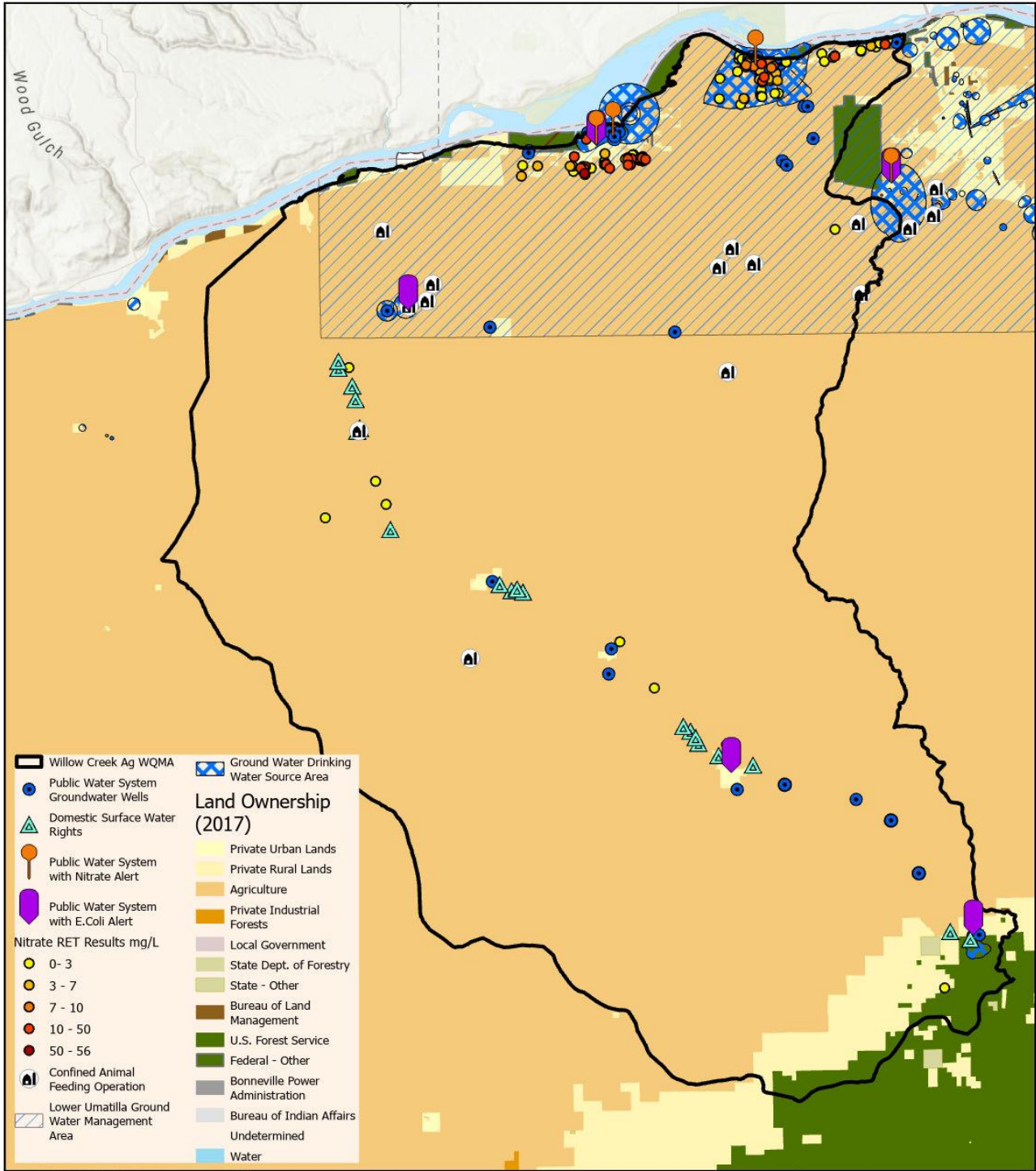


Figure 2



County of Crook, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Oregon State Parks, State of Oregon GEO, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, Esri, NASA, NGA, USGS, Esri Community Maps Contributors, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri, USGS Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere





Drinking Water Source Areas in the Willow Creek Agricultural Water Quality Management Area: Land Use/Ownership

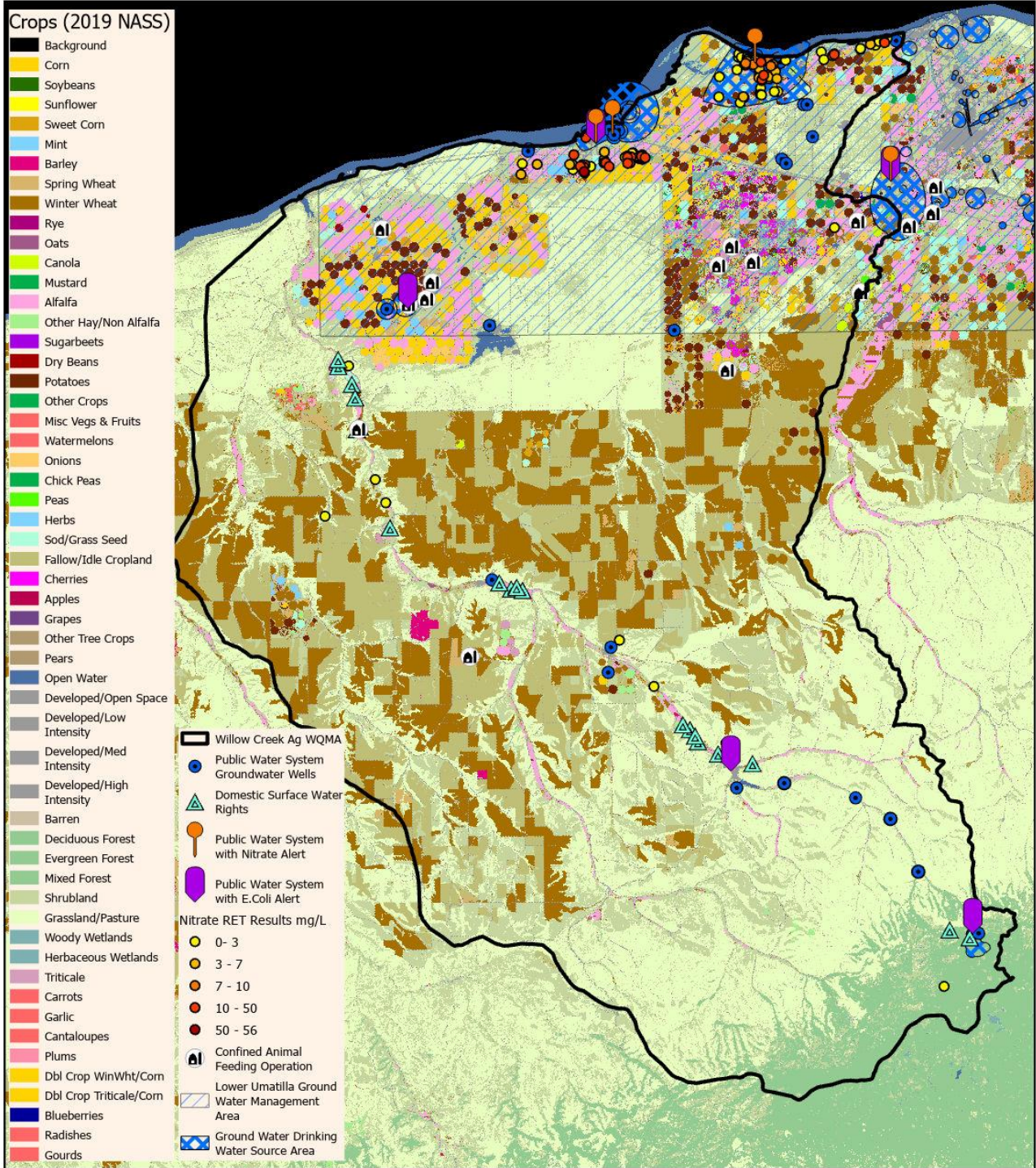
0 0.15 0.3 Miles

Figure 3



County of Crook, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Oregon State Parks, State of Oregon GEO, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, Esri, NASA, NGA, USGS, Esri Community Maps Contributors, Esri, HERE, Garmin, FourSquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri, USGS Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere





Drinking Water Source Areas in the Willow Creek Agricultural Water Quality Management Area: Crops (2019 NASS)

0 0.15 0.3 Mi

Figure 4

County of Crook, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, Oregon State Parks, State of Oregon GEO, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, Esri, NASA, NGA, USGS, Esri Community Maps Contributors, Esri, HERE, Garmin, FourSquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri, USGS Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Drinking Water Protection Program
State of Oregon

DEQ

Oregon Health Authority