

Drinking Water Information in the Klamath Headwaters Agricultural  
Water Quality Management Area

Oregon Department of Environmental Quality, Drinking Water Protection Program

2/3/2021

- Public drinking water systems in the Klamath Headwaters Agricultural Water Quality Management Area utilize groundwater sources to serve approximately 53,834 persons regularly.
- Recent alerts for *E. coli* bacteria exist for one Community Water System with no MCL violations. Several systems have recent alerts for Total Coliform bacteria with no violations.
- Three water systems have alerts for elevated nitrate concentration with one MCL violation at Lorees Chalet Restaurant.
- Eighteen of 351 private wells results in the area have elevated ( $\geq 3$  mg/L) nitrate concentrations.
- Contaminants in water supplies potentially related to agriculture occur near human populations, agricultural land uses, and aquifers susceptible to contaminant infiltration.

Eighty-three active public water systems obtain domestic drinking water from groundwater sources in the Klamath Agricultural Water Quality Management Area. 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 maximum contaminant limits (MCLs). There are 12 Community public water systems in the plan area using only groundwater wells to serve approximately 43,694 people on a regular basis, in addition to visitors at recreation sites. There are five Non-Transient, Non-Community workplace or school public water systems using groundwater, serving 4,119 persons regularly. The remaining 66 public water systems are Transient Non-Community systems and Non-Public, state-regulated systems with an estimated service population of 6,021. 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. hay/pasture, alfalfa, livestock, and irrigated crops such as oats, barley potatoes, and sugar beets) are present near many of the public water system wells and springs in the area. Agricultural areas around Upper Klamath Lake have the majority of both intensive agriculture area and human population, providing the contributing areas for numerous streams (many used for private domestic water supply) in the WQMA.

*Bacteria*

One Community public water system in the management area, the Sprague River Water Association, has recent alerts for detections of *E. coli* and no violations. Forty-seven systems have recent alerts for Total Coliform, and none has violations.

### *Nitrates*

Nitrate alerts (generated when nitrate exceeds 5 mg/L) exist for Lorees Chalet Restaurant, El Rodeo, and Cascade 97 Shell and Food Mart. All three of these systems are currently inactive. 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 (see below) and public drinking water sources is near the Sprague and Wood Rivers and Upper Klamath Lake and to agricultural land use such as irrigated crops.

Of the soils assessed in the management area, most have high nitrate leaching potential, according to the National Cooperative Soil Survey, based on slope, precipitation, and land use. Nitrate from fertilizers and septic systems can readily penetrate to the aquifers used for drinking water when leaching potential is high, and bacteria removal through soil filtration can be less effective in sandy soils.

Oregon Health Authority rated some of the public water system wells in the Ag WQMA for contaminant susceptibility for land use impacts to drinking water sources based on Source Water Assessments, aquifer characteristics, and well locations and construction. The majority of evaluated PWS wells rate as high susceptibility. The nitrate and other contamination issues described above and the ready movement of nitrogen into aquifers in the area verify this susceptibility. Measures to reduce leachable nitrate in soils would reduce risk to groundwater sources of drinking water.

DEQ only 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 cfs for domestic surface water rights that are household use only, not irrigation) identified 143 private domestic water rights in the Klamath 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 one significant detection of nitrate (>7mg/L) in private wells out of 351 total results included in the database for this area. Of those private wells, eight results are  $\geq 5$  mg/L, and zero are  $\geq 10$ mg/L.

### *Other*

Other contaminants found that are not related to agricultural activities include arsenic, tetrachloroethylene, sodium, xylenes, and lead.

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

**Table 1. Public Water Systems in the Klamath Headwaters 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 PWSs w/ recent *E. coli* alerts.**

PWS ID	Public Water System Name	Drinking Water Source	System Type	Pop.
<b><u>Groundwater Systems</u></b>				
4105151	Crater Lake RV Park	INACTIVE (1 well)	NC	50
4105171	Camp McLoughlin	1 well	NC	30
4105174	Camp Esther Applegate LDS	1 well	NC	100
4105261	Klamath Co Parks - Henzel Park	1 well	NC	57
4106000	Palomino Deli & Mini Mart	1 well	NC	50
4190159	Oregon Motel 8 and RV Park	1 well	NC	50
4190172	Rocky Point Resort	2 wells	NC	100
4190367	Feather Bed Inn	1 active, 1 inactive well	NC	32
4190376	YMCA Low ECHO	1 well	NC	35
4190379	Diamond Lake Junction Cafe	1 well	NC	100
4190818	Klamath Co Parks - Hagelstein Park	1 well	NC	50
4191038	OPRD Collier State Park	1 well	NC	325
4191111	ODOT HD Beaver Marsh Rest Area - North	1 well	NC	750
4191538	Campers Cove	1 well	NC	50
4191560	Cabins at Hyatt Lake	1 well	NP	10
4192826	USFS Lake of the Woods	1 well	NC	350
4192829	USFS Fourmile Lake CG	1 well	NC	50
4192830	USFS Digit Point CG	1 well	NC	40
4193639	Cascade Water Improvement District	1 well	NC	255
4194023	The Chemult Motel	1 well	NC	100
4194027	Harriman Springs RV & Cabins	1 well	NP	20
4194028	Budget Inn	1 well	NC	50
4194030	Lorees Chalet Restaurant	INACTIVE (1 well)	NC	60
4194031	Big Mountain Drive-Up	INACTIVE (1 well)	NC	100
4194053	Melitas RV Park	2 wells (1 active, 1 inactive)	NC	100
4194059	Potters Trailer Park	1 well	NC	26
4194124	Mountain Lakes Bible Camp	1 well	NC	65
4194146	Green Springs Inn	1 well	NC	75
4194164	Whispering Pines Motel	1 well	NC	30
4194165	Rapids Motel	INACTIVE (1 well)	NC	25
4194209	Aspen Inn Motel	INACTIVE (1 well)	NC	25
4194377	Cascade 97 Shell & Food Mart	INACTIVE (1 well)	NC	75
4194390	Ama Mini Mart #2	1 well	NC	40
4194435	Water Wheel Campground	1 well	NC	30
4194522	Klamath Sportsman Park	1 well	NC	25
4194530	Double D Mountain Market	1 well	NC	100
4194697	R & D Market	1 well	NC	50
4194712	Sportsmans River Retreat RV Park & CG	1 well	NC	55
4194766	ODOT HD Beaver Marsh Rest Area - South	1 well	NC	750
4194808	Train Mtn Railroad Museum	3 wells	NC	25
4194858	Crater Lake Resort	1 well	NC	70
4194903	Odessa Market	1 well	NC	50
4194925	ODF/WL Klamath Fish Hatchery	INACTIVE (1 well)	NP	12
4195082	USFS Fourmile CG - Hand Pump 2	1 well	NC	50
4101083	USFS Chemult Ranger Station	1 well	NC	20

4101080	NPS Annie Spr: HQ/Rim Crater Lake	2 wells	C	200
4101084	USFS Chiloquin Ranger Station	INACTIVE (1 well)	NTNC	70
4100184	Chiloquin Municipal Water Dept	2 wells (1 active, 1 inactive emergency)	C	730
4101327	Oregon Shores Beach Club Inc	2 wells	C	352
4101285	Oregon Shores Recreation Club	2 wells	C	275
4194555	Jeld Wen Inc	2 wells	NTNC	227
<b>4100831</b>	<b>Sprague River Water Assn</b>	<b>1 well</b>	<b>C</b>	<b>60</b>
4101128	Oregon Water Utilities - Pinecrest	1 well	C	78
4100129	Bly Water District	2 wells	C	352
4101277	Bley-Was Heights Water System	INACTIVE (1 well)	C	42
4194774	Klamath Veneer Inc	INACTIVE (1 well)	NTNC	32
4100450	Lakeside Mobile Home & RV Park Inc	1 well	C	110
4193997	Oregon Institute of Technology	3 wells (1 active, 1 inactive emergency, 1 GWP)	NTNC	3,700
4100438	Round Lake Estates	1 well	C	250
4105016	Pinehurst School District	1 well	NP	20
4191034	OPRD Tub Springs State Wayside	1 spring	NC	150
4105181	Sand Creek Station	1 well	NC	25
4105189	Wilson Cottages	INACTIVE (1 well)	NC	25
4194775	Lone Pine Trailer Park	2 wells (1 active, 1 inactive emergency)	NC	25
4195317	Point Comfort	1 well	NC	26
4101497	Lakewoods Water District	1 well	NC	30
4194236	Jo's Motel & Campground	2 wells (1 active, 1 inactive emergency)	NC	30
4195465	Walts Mushroom Camp	INACTIVE (1 well)	NC	30
4195198	Agency Lake Resort 2 South	1 GW well	NC	45
4195057	El Rodeo	INACTIVE (1 GW well)	NC	50
4195426	Klamath Outdoor Science School	1 well	NC	50
4194040	Klamath Travel Inn	1 well	NC	60
4194049	Walts Rv Park	1 well	NC	70
4195315	Pilot Travel Center-Chemult	1 well	NC	500
4105101	Fort Klamath Museum	1 well	NC	50
4190626	Blm Hyatt Lake Rec Site	1 well	NC	150
4190737	Jackson Co Pks Lily Glen #2	1 well	NC	25
4192825	Usfs Williamson River Cg	1 well	NC	50
4194146	Green Springs Inn	1 well	NC	75
4100443	Klamath Falls Water Dept	14 wells (10 active, 4 inactive emergency)	C	40,475
4194860	Sage Community School	INACTIVE (1 well)	NTNC	90
4101475	Oregon Water Utilities - Mountain Lakes	2 wells (1 active, 1 inactive emergency)	C	770

*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.

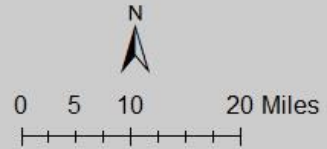
NP - "State Regulated Water System (NP)" means a public water system, which serves 4 to 14 service connections or serves 10 to 24 people. Monitoring requirements for these systems are the same as those for Transient Non-Community water systems.



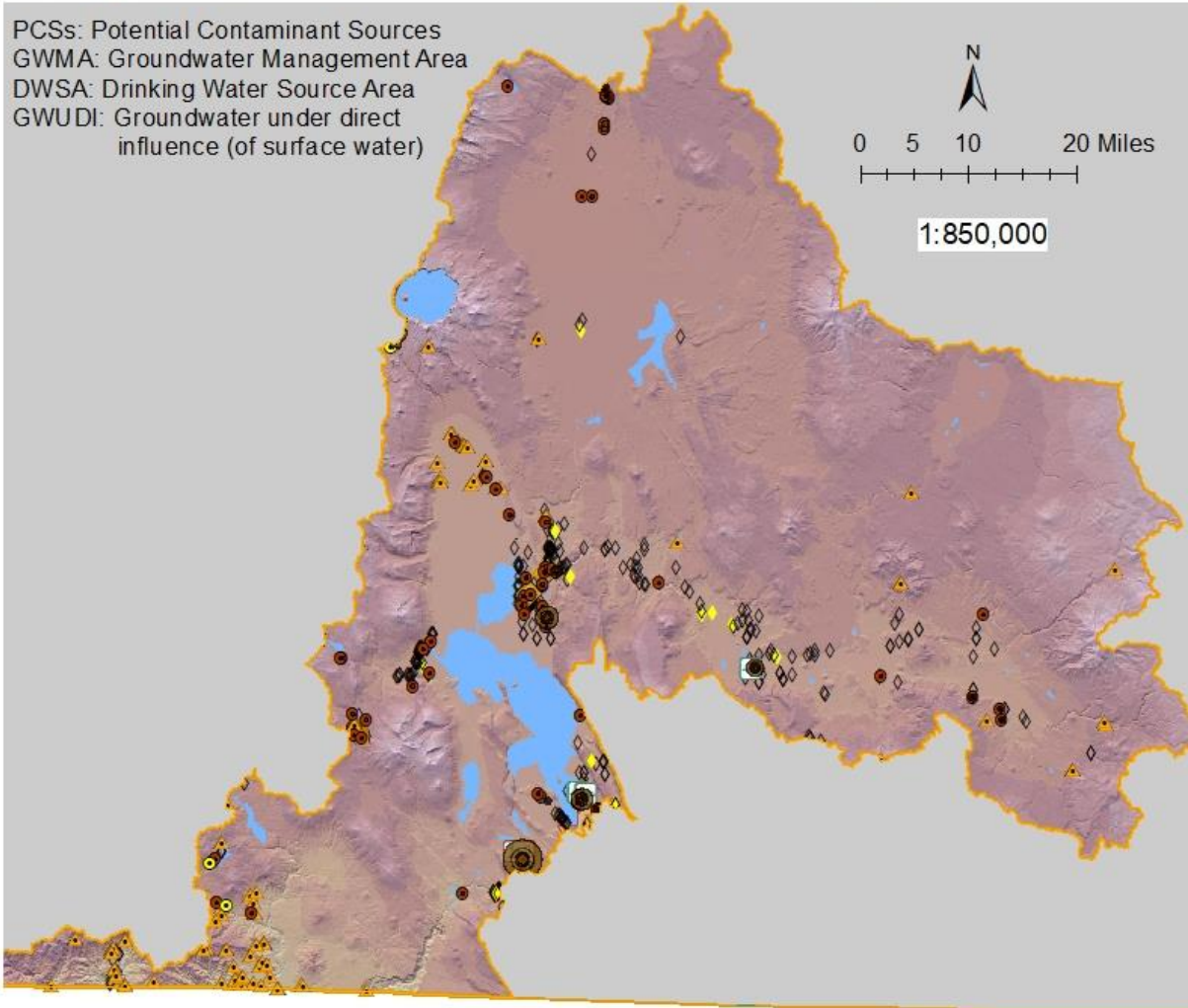
# Drinking Water Source Areas for Public Water Systems in Klamath Headwaters

## Agricultural Water Quality Management Area

PCSSs: Potential Contaminant Sources  
 GWMA: Groundwater Management Area  
 DWSA: Drinking Water Source Area  
 GWUDI: Groundwater under direct influence (of surface water)



1:850,000



- |                                    |                    |                               |
|------------------------------------|--------------------|-------------------------------|
| Klamath_Ag WQMA                    | Animals PCSSs      | Nitrate: Private Well Testing |
| Groundwater DWSA                   | Other Ag PCSSs     |                               |
| Surface watershed for GWUDI system | Domestic SW Rights |                               |
| Public Water Supply Spring         | Surface water DWSA |                               |
| Public Water Supply Well           | City Limits (2017) |                               |
| Cropland PCSSs                     |                    | 0 to 3 mg/L                   |
|                                    |                    | >3 to 7 mg/L                  |
|                                    |                    | >7 to 10 mg/L                 |
|                                    |                    | >10 to 50 mg/L                |
|                                    |                    | >50 mg/L                      |

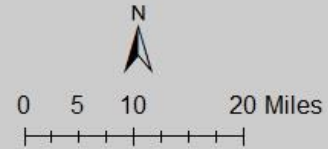
The Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. For groundwater this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells typically show the 1-, 2-, 5-, and 10- or 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs typically show area of short-, intermediate-, and long-term groundwater flow to the spring. DWSAs for surface water represents the watershed that supplies the waterbody where the intake is located.



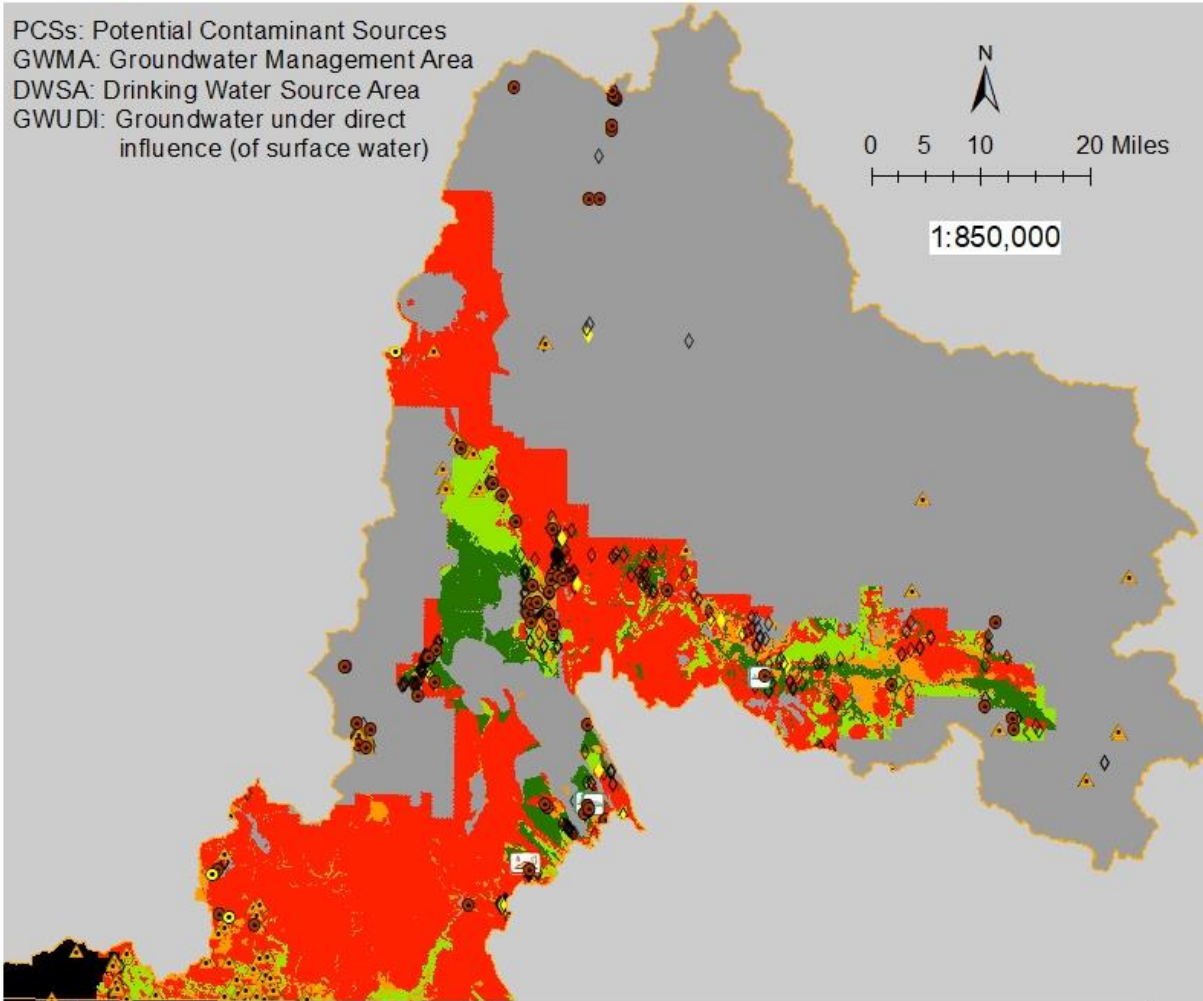
# Drinking Water Source Areas for Public Water Systems in Klamath Headwaters

## Agricultural WQMA: Nitrate Leaching Potential

PCSSs: Potential Contaminant Sources  
 GWMA: Groundwater Management Area  
 DWSA: Drinking Water Source Area  
 GWUDI: Groundwater under direct influence (of surface water)



1:850,000



Klamath_AgWQMA		Nitrate: Private Well Testing	Nitrate Leaching Rating		
	Public Water Supply Spring		0 to 3 mg/L		Not rated or not available
	Public Water Supply Well		>3 to 7 mg/L		Low
	Cropland PCSSs		>7 to 10 mg/L		Moderate
	Animals PCSSs		>10 to 50 mg/L		Moderately high
	Other Ag PCSSs		>50 mg/L		High

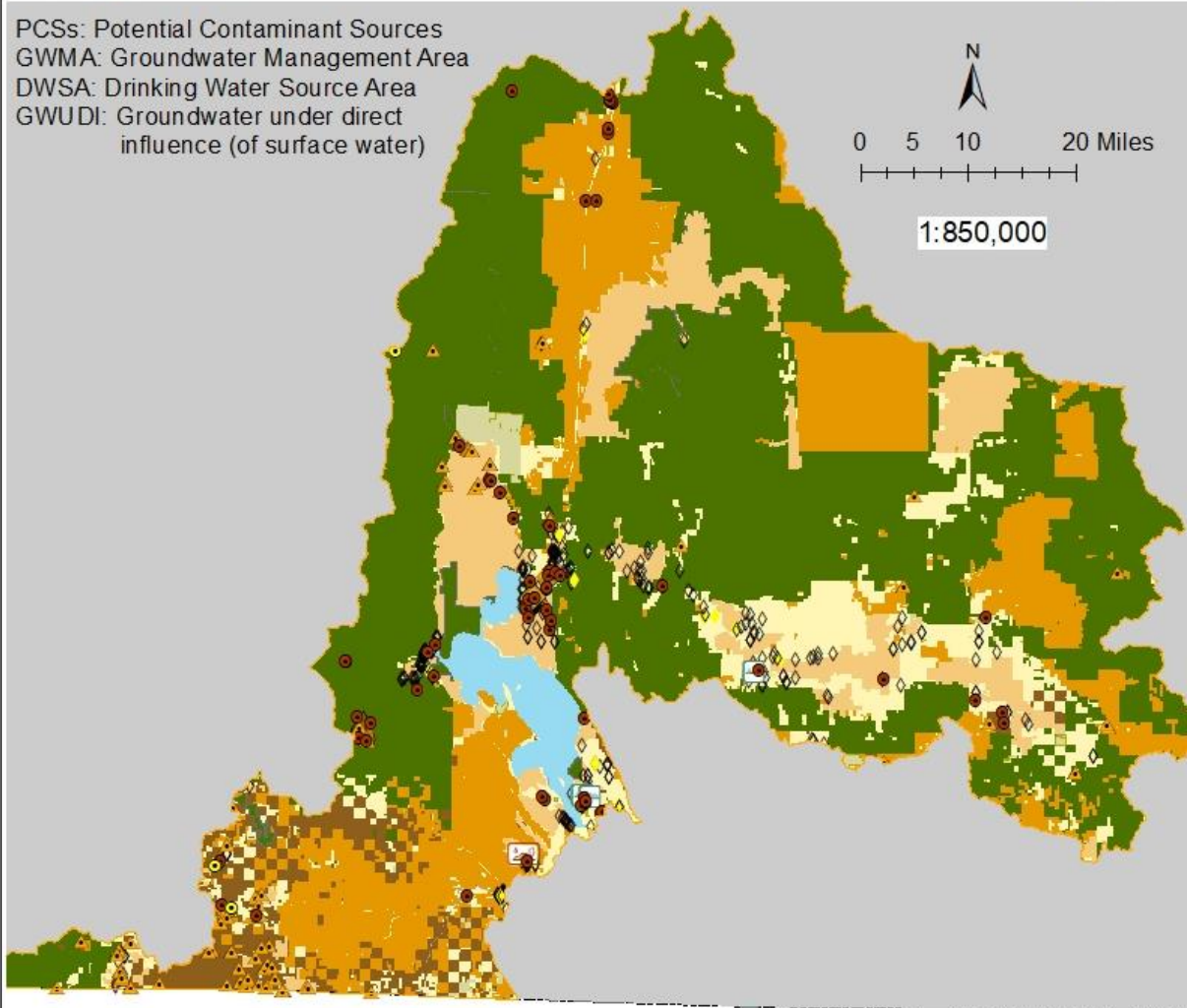
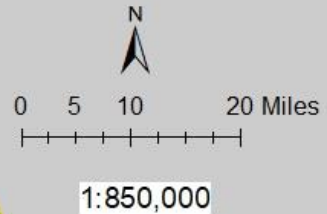
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# Drinking Water Source Areas for Public Water Systems in Klamath Headwaters

## Agricultural WQMA: Land Use / Ownership

PCs: Potential Contaminant Sources  
 GWMA: Groundwater Management Area  
 DWSA: Drinking Water Source Area  
 GWUDI: Groundwater under direct influence (of surface water)



- |                            |                           |                                 |
|----------------------------|---------------------------|---------------------------------|
| Klamath_AgWQMA             | Local Government          | Federal - Other                 |
| Private Urban Lands        | State Dept. of Forestry   | Bonneville Power Administration |
| Private Rural Lands        | State - Other             | Bureau of Indian Affairs        |
| Agriculture                | Bureau of Land Management | Undetermined                    |
| Private Industrial Forests | U.S. Forest Service       | Water                           |

The Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. For groundwater this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells typically show the 1-, 2-, 5-, and 10- or 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs typically show area of short-, intermediate-, and long-term groundwater flow to the spring. DWSAs for surface water represents the watershed that supplies the waterbody where the intake is located.

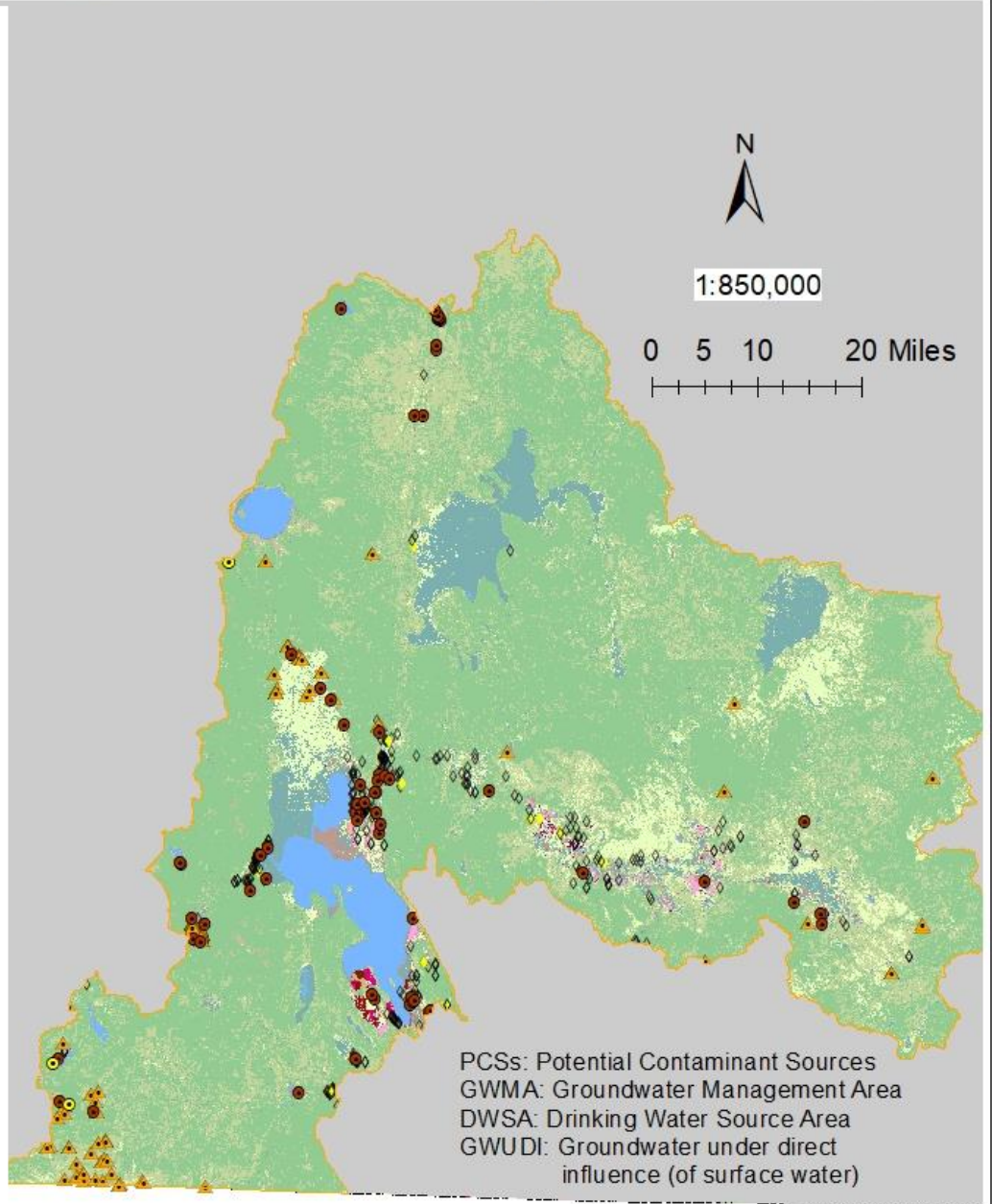


# Drinking Water Source Areas for Public Water Systems in Klamath Headwaters Agricultural WQMA: Crops (NASS 2015)

- Klamath\_Ag WQMA
- Public Water Supply Spring
- Public Water Supply Well
- Domestic SW Rights
- Alfalfa
- Barley
- Barren
- Buckwheat
- Clover/Wildflowers
- Corn
- Deciduous Forest
- Developed/Low Intensity
- Developed/Med Intensity
- Developed/Open Space
- Dry Beans
- Durum Wheat
- Evergreen Forest
- Fallow/Idle Cropland
- Forest
- Grass/Pasture
- Herbaceous Wetlands
- Millet
- Mixed Forest
- Oats
- Onions
- Potatoes
- Rye
- Safflower
- Shrubland
- Sod/Grass Seed
- Spring Wheat
- Water
- Wetlands
- Winter Wheat
- Woody Wetlands

**Nitrate: Private Well Testing**

- 0 to 3 mg/L
- >3 to 7 mg/L
- >7 to 10 mg/L
- >10 to 50 mg/L
- >50 mg/L



PCSS: Potential Contaminant Sources  
 GWMA: Groundwater Management Area  
 DWSA: Drinking Water Source Area  
 GWUDI: Groundwater under direct influence (of surface water)

Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. DWSAs are defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells are defined by 5-, 10-, and 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs are defined by short-, intermediate-, and long-term groundwater flow to the spring. GWUDI represents the watershed that supplies the waterbody where the intake is located.