4. Results

4.1 Statewide

Available data were sufficient to assess status and/or trend at 7512 stations within the state. These stations were located across 2236 assessment units consisting of 'Streams', 'Watershed Units', 'Lakes', 'Estuary or Bays' and 'Coastlines'. Data for dissolved oxygen, pH, temperature, total phosphorus, total suspended solids, *Escherichia coli*, enterococcus and fecal coliform were available for analysis and included in this report. The following section summarizes the results of the state-wide analysis.

The map in Figure 1 shows the locations of all of the stations that were queried across the state.

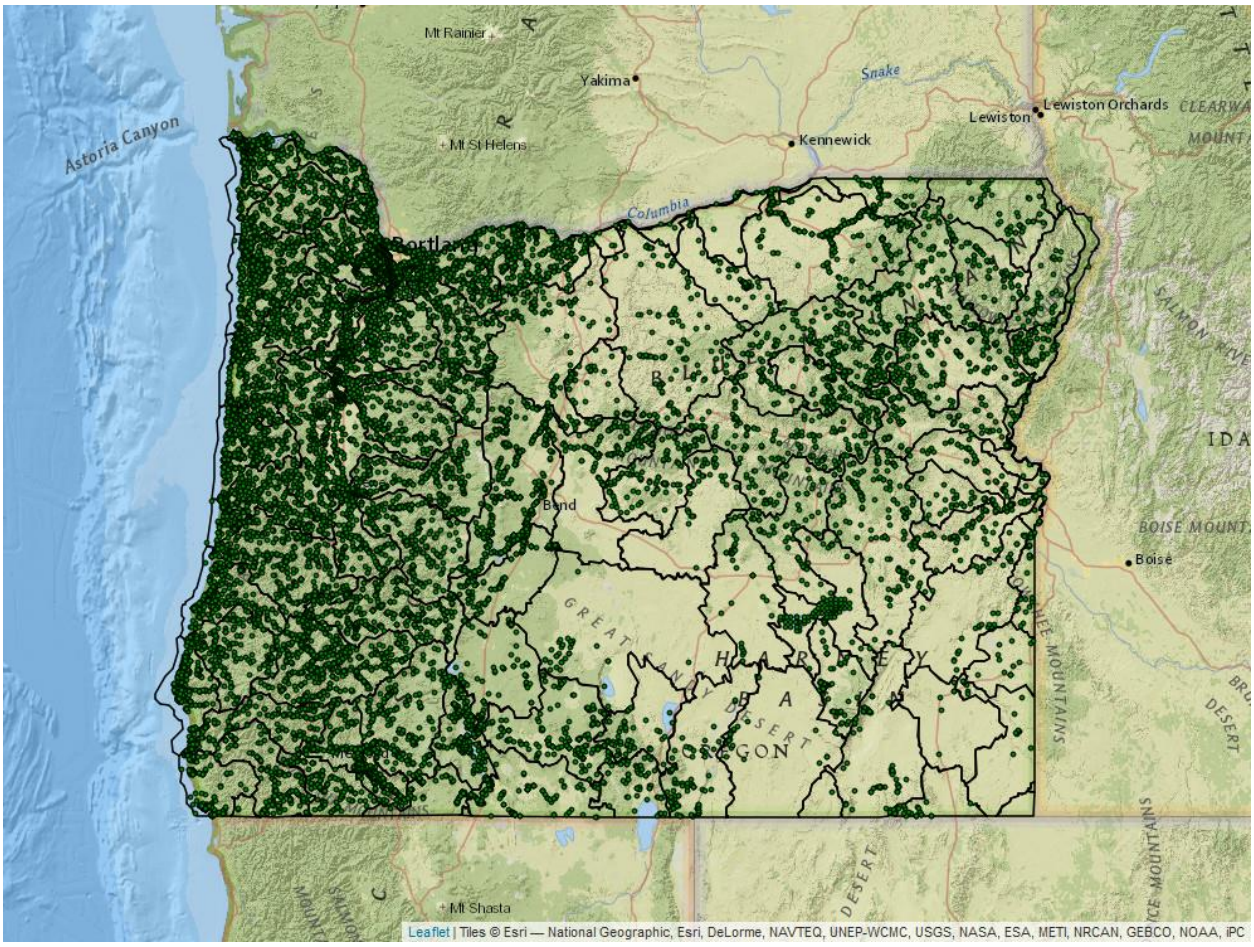

Figure 1: All stations queried across the state

4.1.1 Parameter Summary Maps

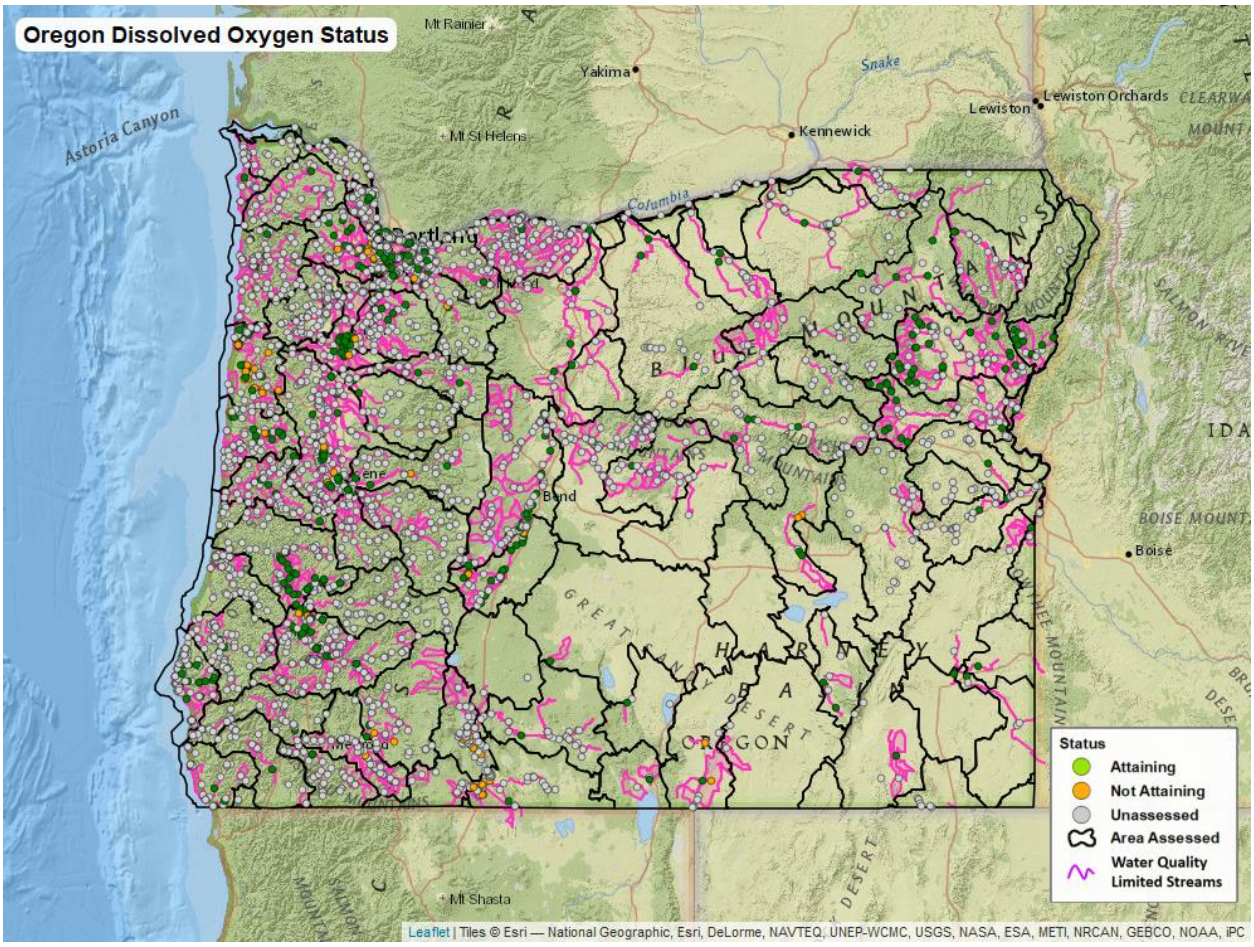

Figure 2: Summary map of the 2016–2019 status of dissolved oxygen monitoring stations across the state

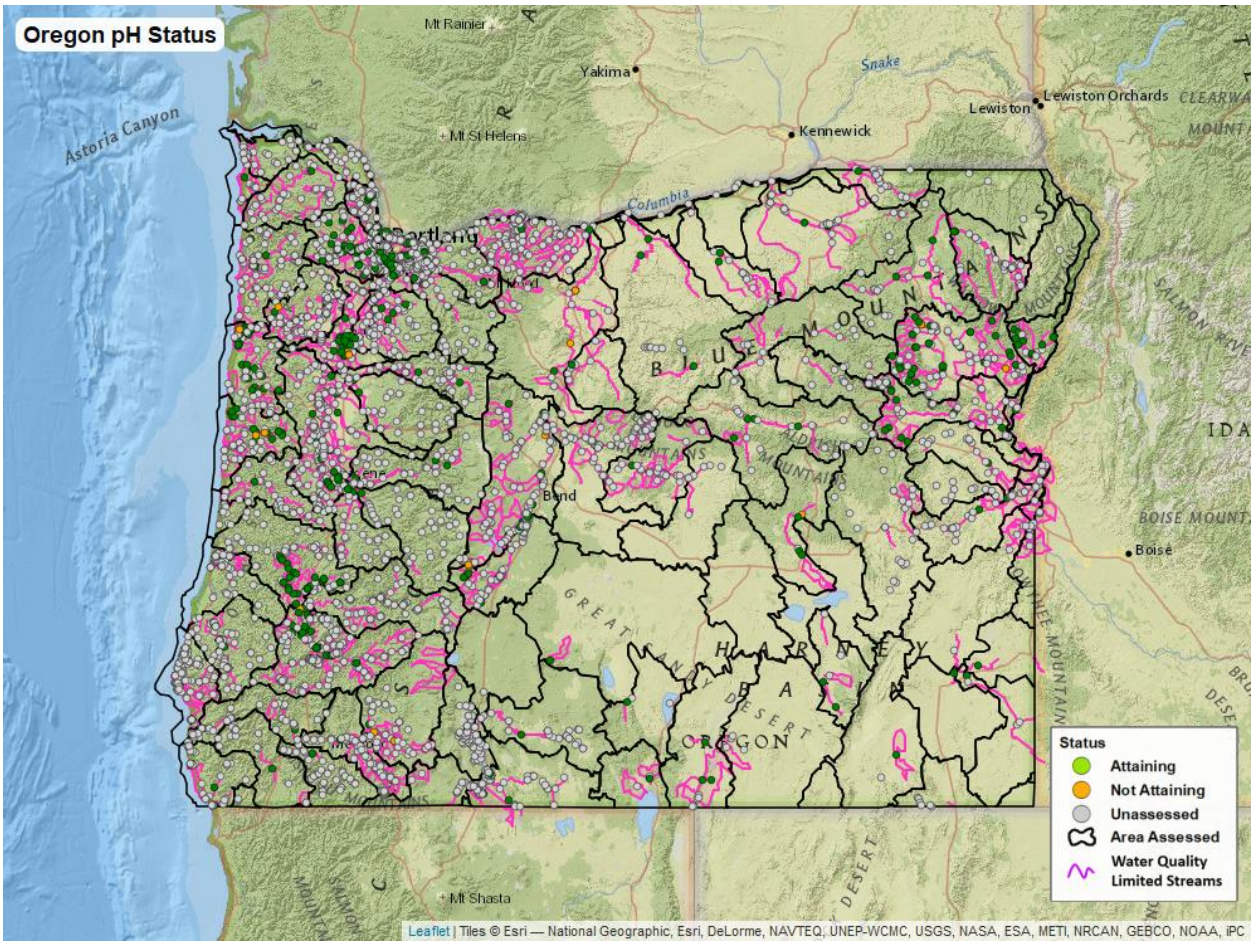

Figure 3: Summary map of the 2016–2019 status of pH monitoring stations across the state

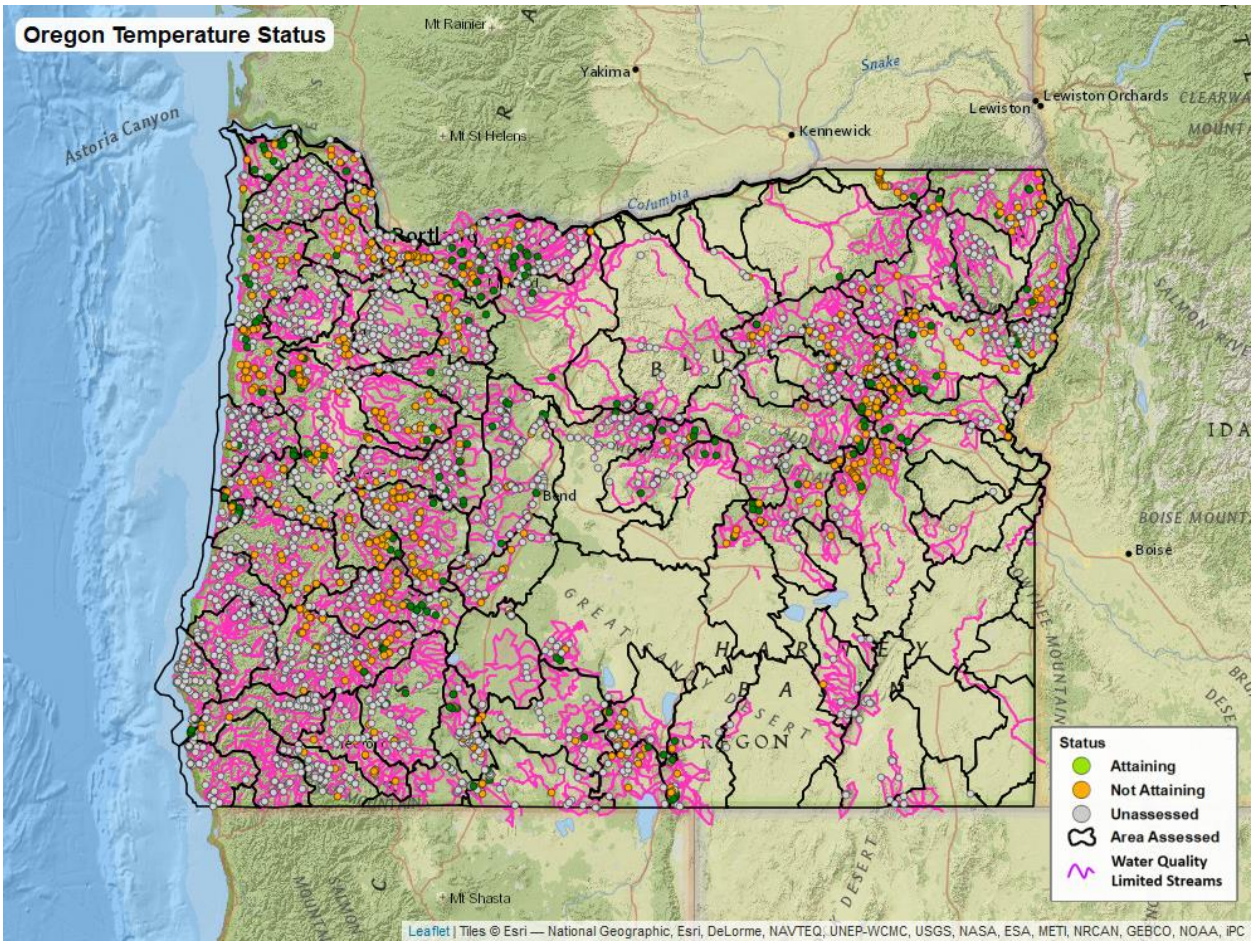

Figure 4: Summary map of the 2016–2019 status of temperature monitoring stations across the state

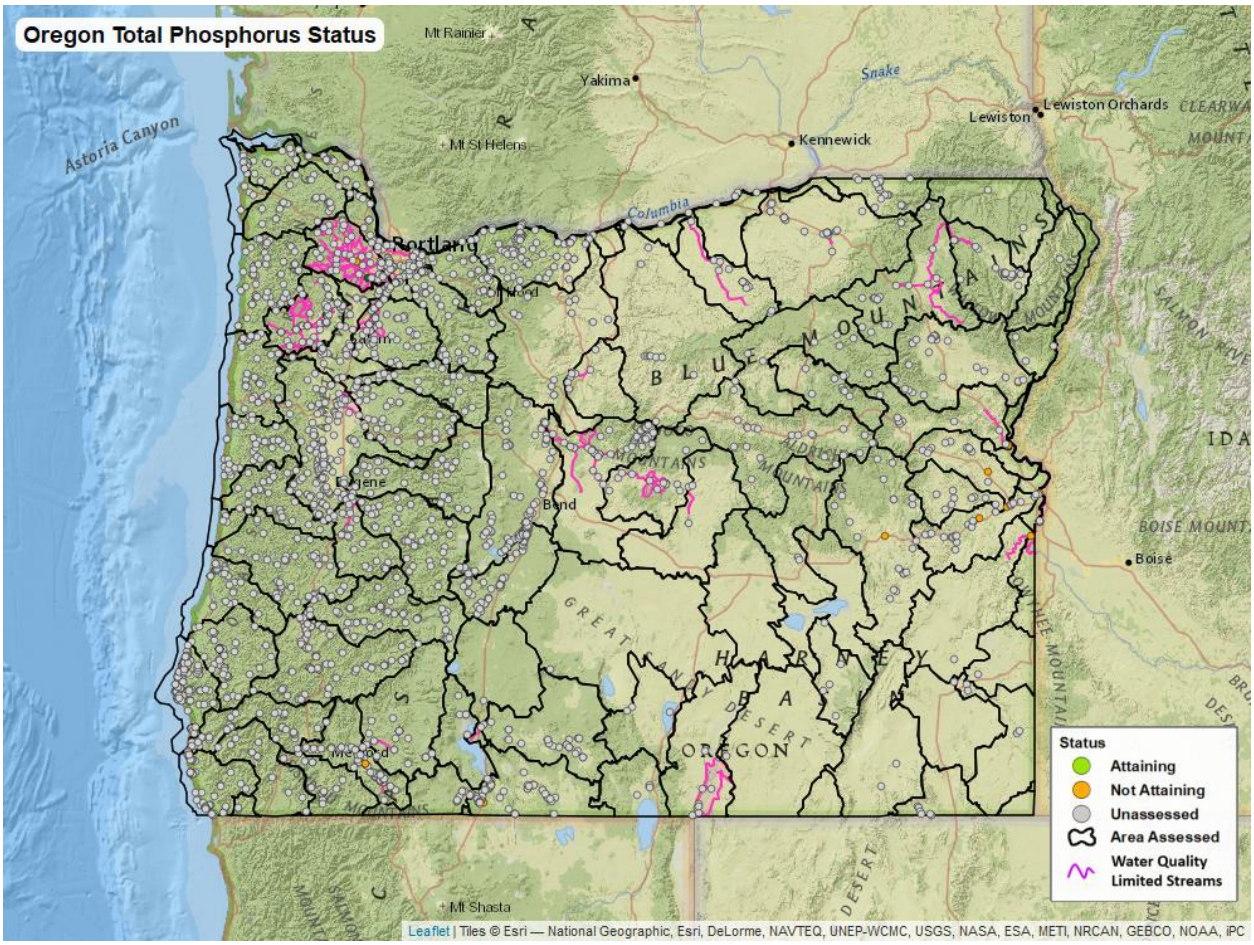

Figure 5: Summary map of the 2016–2019 status of total phosphorus monitoring stations across the state

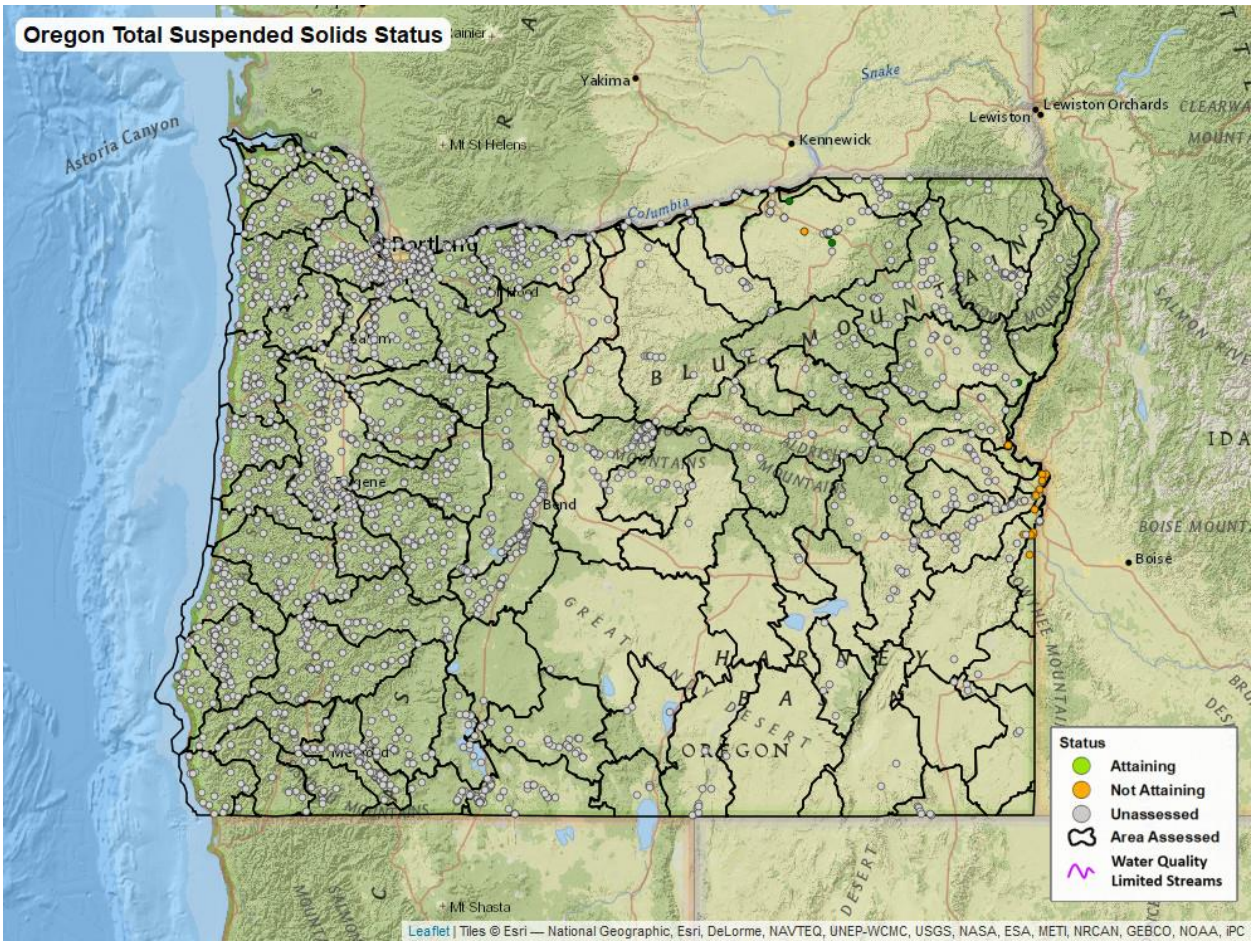

Figure 6: Summary map of the 2016–2019 status of total suspended solids monitoring stations across the state

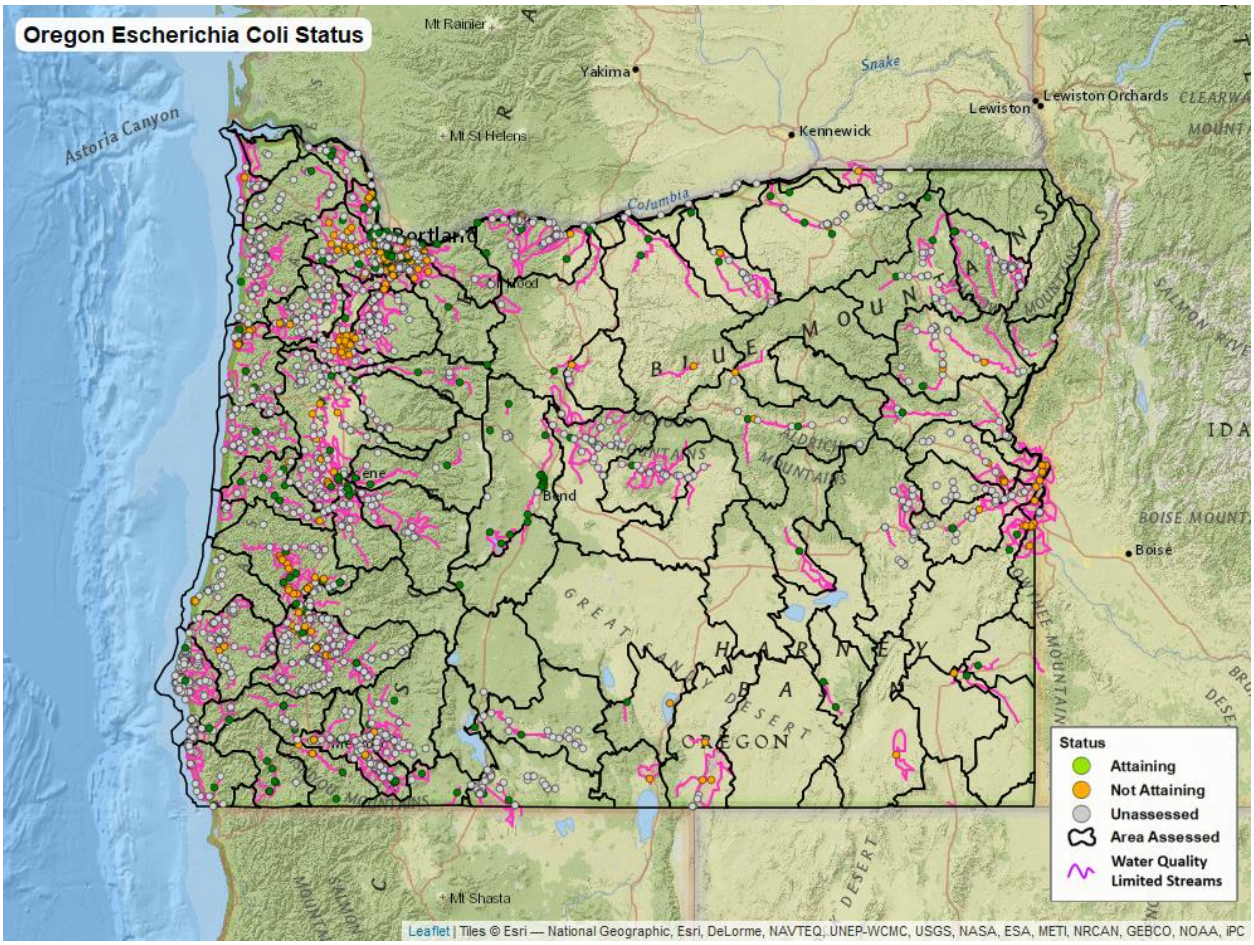

Figure 7: Summary map of the 2016–2019 status of *Escherichia coli* monitoring stations across the state

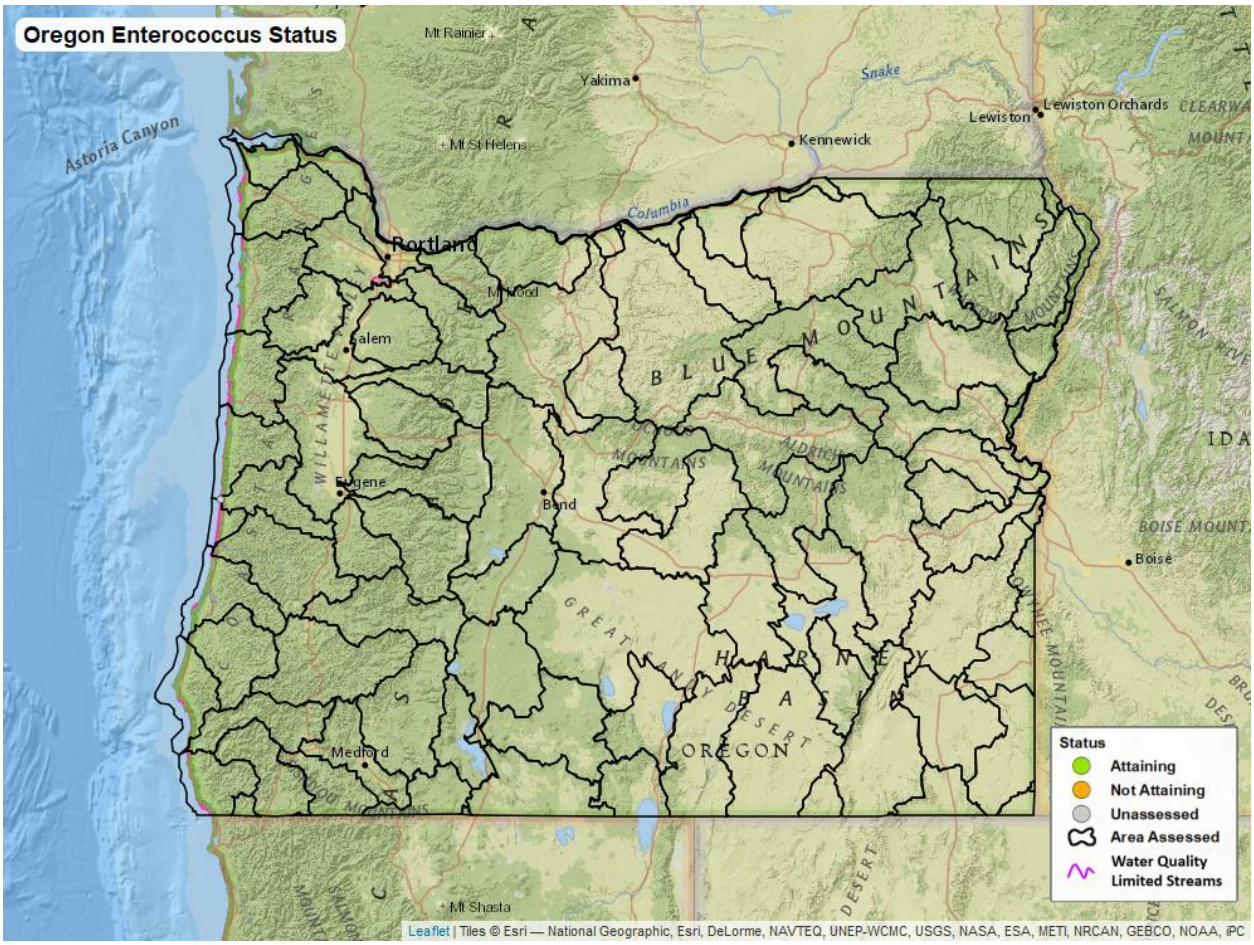

Figure 8: Summary map of the 2016–2019 status of enterococcus monitoring stations across the state

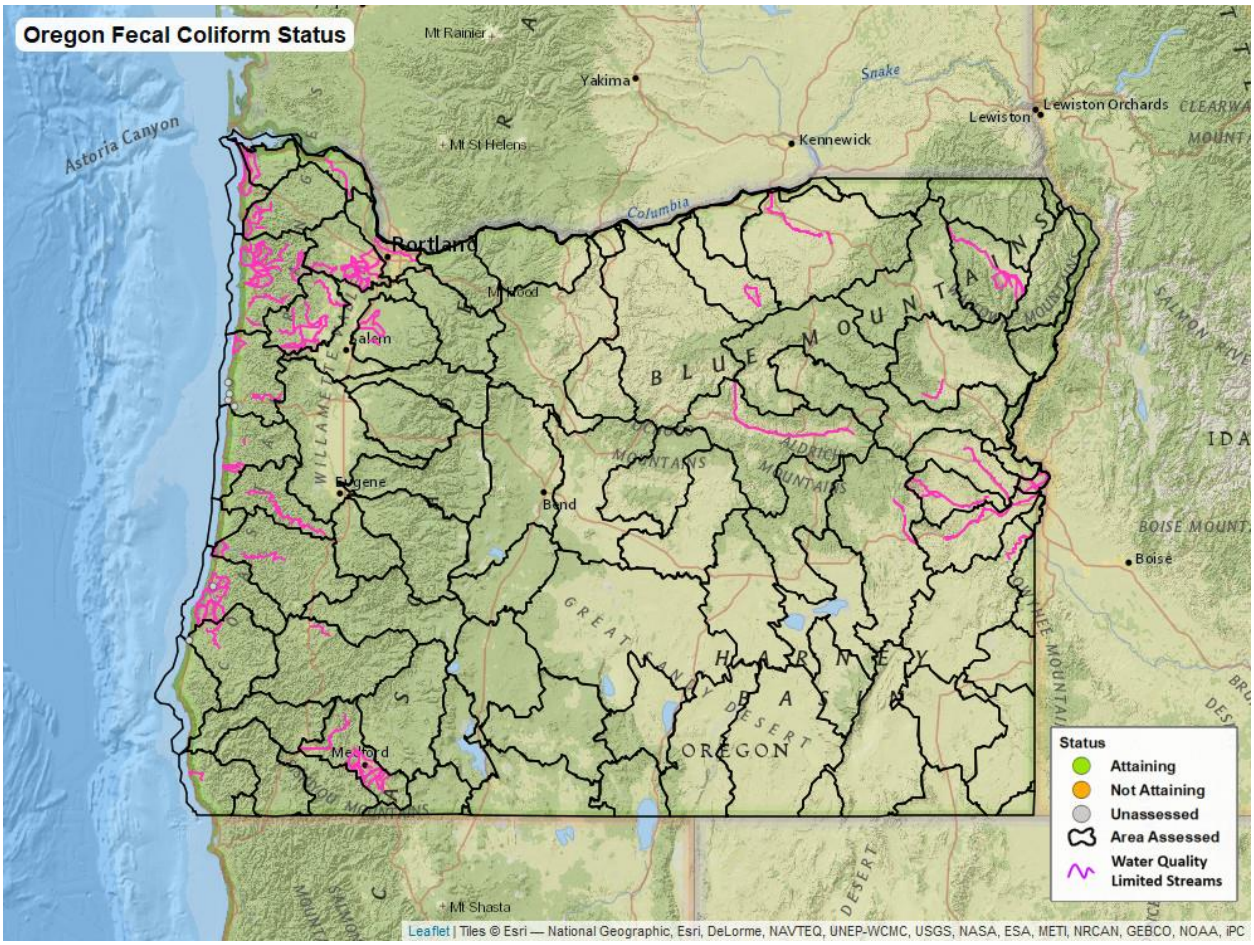

Figure 9: Summary map of the 2016–2019 status of fecal coliform monitoring stations across the state

4.1.2 Status

Table 22 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 22

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	242	55	1077
Enterococcus	0	0	1
Escherichia coli	140	138	530
Fecal Coliform	0	0	7
pH	256	23	1060
Temperature	137	429	975
Total Phosphorus	2	13	1037
Total Suspended Solids	5	14	1065

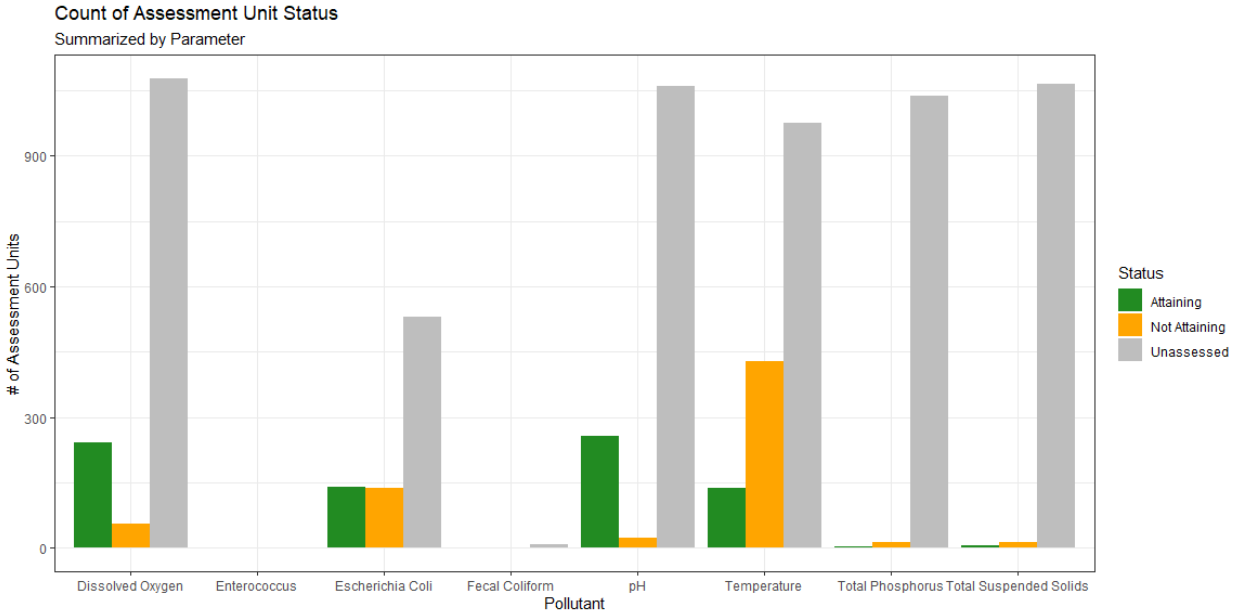

Figure 10: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period across the state.

Table 23 contains a summary of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type for the 2016–2019 status period.

Table 23: The number of assessment units in each status category by parameter for the 2016–2019 status period across the state.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Coastline	Dissolved Oxygen	0	0	1
Coastline	Fecal Coliform	0	0	4
Coastline	pH	0	0	1
Coastline	Total Phosphorus	0	0	1
Estuary or Bay	Dissolved Oxygen	1	0	16
Estuary or Bay	*Enterococcus*	0	0	1
Estuary or Bay	*Escherichia coli*	0	0	14
Estuary or Bay	Fecal Coliform	0	0	3
Estuary or Bay	pH	1	0	14
Estuary or Bay	Temperature	0	1	11
Estuary or Bay	Total Phosphorus	0	0	12
Estuary or Bay	Total Suspended Solids	0	0	14
Lake	Dissolved Oxygen	2	3	62
Lake	*Escherichia coli*	12	3	24
Lake	pH	3	2	63
Lake	Temperature	2	4	22
Lake	Total Phosphorus	0	0	49

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Total Suspended Solids	2	0	43
Stream	Dissolved Oxygen	182	35	524
Stream	*Escherichia coli*	106	95	309
Stream	pH	193	13	519
Stream	Temperature	48	260	496
Stream	Total Phosphorus	2	12	551
Stream	Total Suspended Solids	3	9	562
Watershed Unit	Dissolved Oxygen	57	17	474
Watershed Unit	*Escherichia coli*	22	40	183
Watershed Unit	pH	59	8	463
Watershed Unit	Temperature	87	164	446
Watershed Unit	Total Phosphorus	0	1	424
Watershed Unit	Total Suspended Solids	0	5	446

Table 24 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period across the state.

Table 24: Summary of the 2016–2019 status at monitoring stations across the state.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	442	83	3071
Enterococcus	0	0	1
Escherichia coli	288	244	1839
Fecal Coliform	0	0	7
pH	441	32	3322
Temperature	266	753	2652
Total Phosphorus	2	16	2148
Total Suspended Solids	5	23	2309

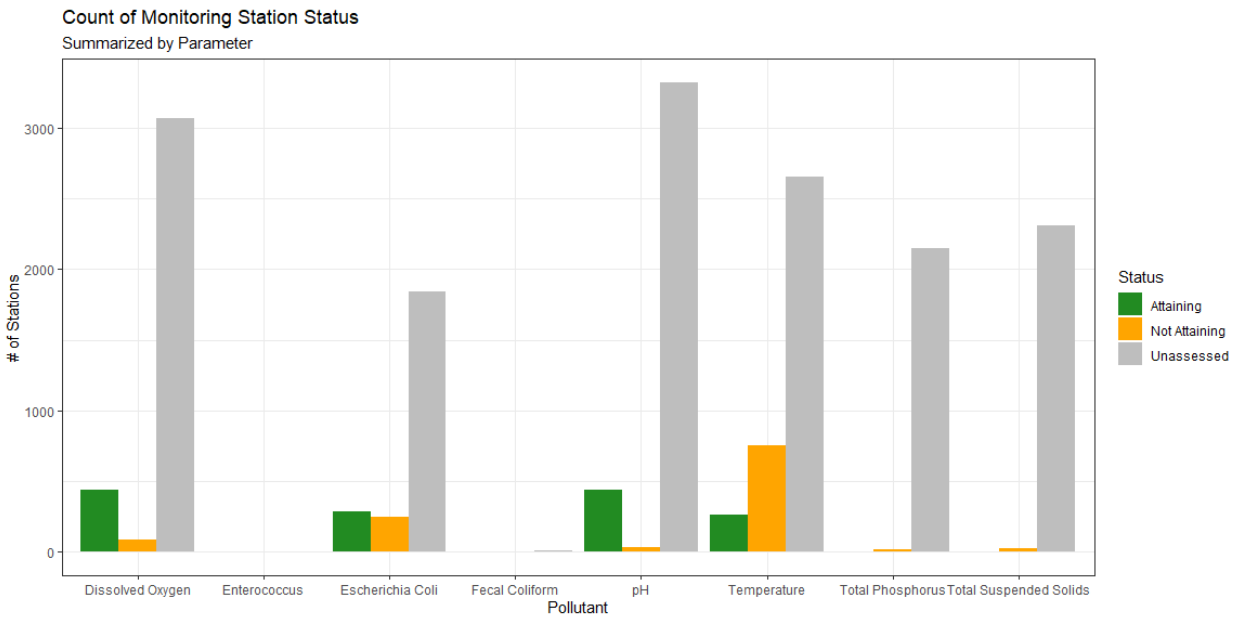

Figure 11: The number of stations in each status category by parameter for the 2016–2019 status period across the state.

4.1.3 Trend

A summary of the trends across parameters is shown in Table 25. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 25: Statewide summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	137	51	8	112	3288
Enterococcus	0	0	0	0	1
Escherichia coli	67	47	6	151	2100
Fecal Coliform	0	0	0	0	7
pH	0	153	62	138	3442
Temperature	41	197	8	22	3403
Total Phosphorus	34	16	67	61	1988
Total Suspended Solids	45	30	21	111	2130

4.2 Black Rock Desert Basin

A summary of status and trend results for the Black Rock Desert Basin and all subbasins within the Black Rock Desert Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix A**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Black Rock Desert Basin are water quality limited for 1 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 9 stations within the Black Rock Desert Basin. These stations were located across 7 assessment units consisting of 'Streams' and 'Watershed Units'. Data for dissolved oxygen, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.2.1 Land Use

Table 26: Land use within the Black Rock Desert Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Quinn	1401	0.3	0.6	0.1	96.8	2.2
Thousand-Virgin	700	0.0	0.4	0.0	99.4	0.1

4.2.2 Parameter Maps

The maps in Figure 12 through Figure 16 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

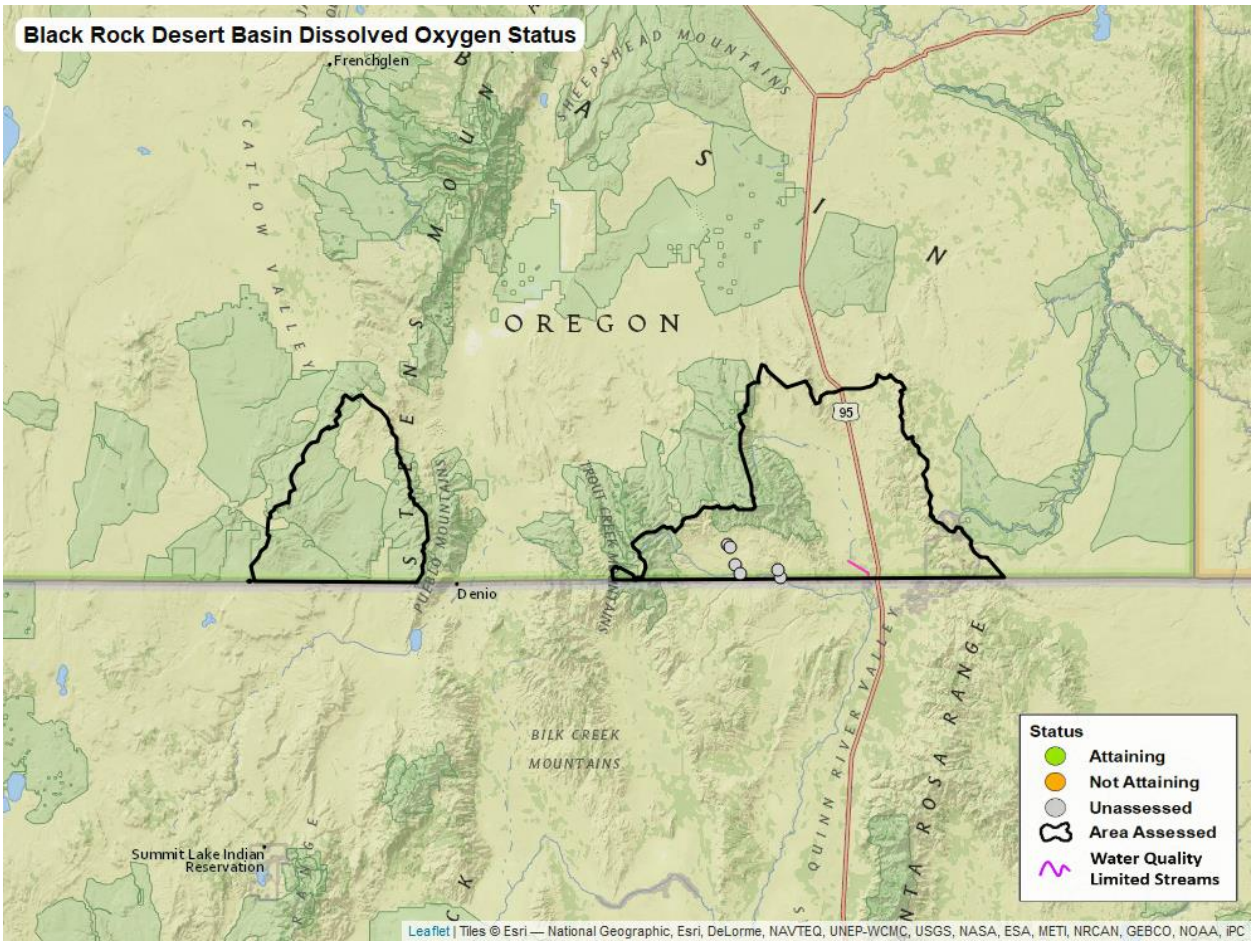

Figure 12: Summary map of the status of dissolved oxygen across the Black Rock Desert Basin.

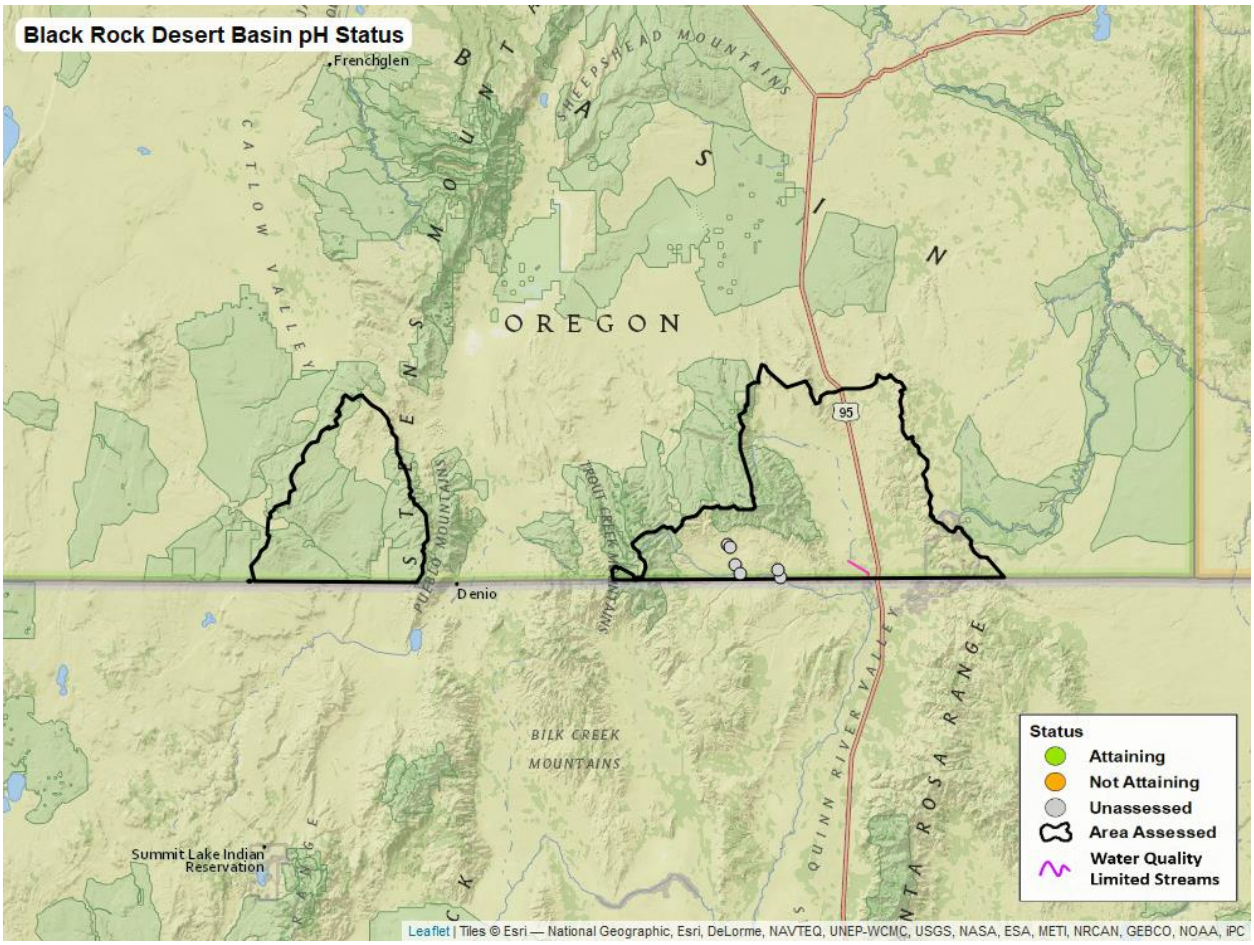

Figure 13: Summary map of the status of pH across the Black Rock Desert Basin.

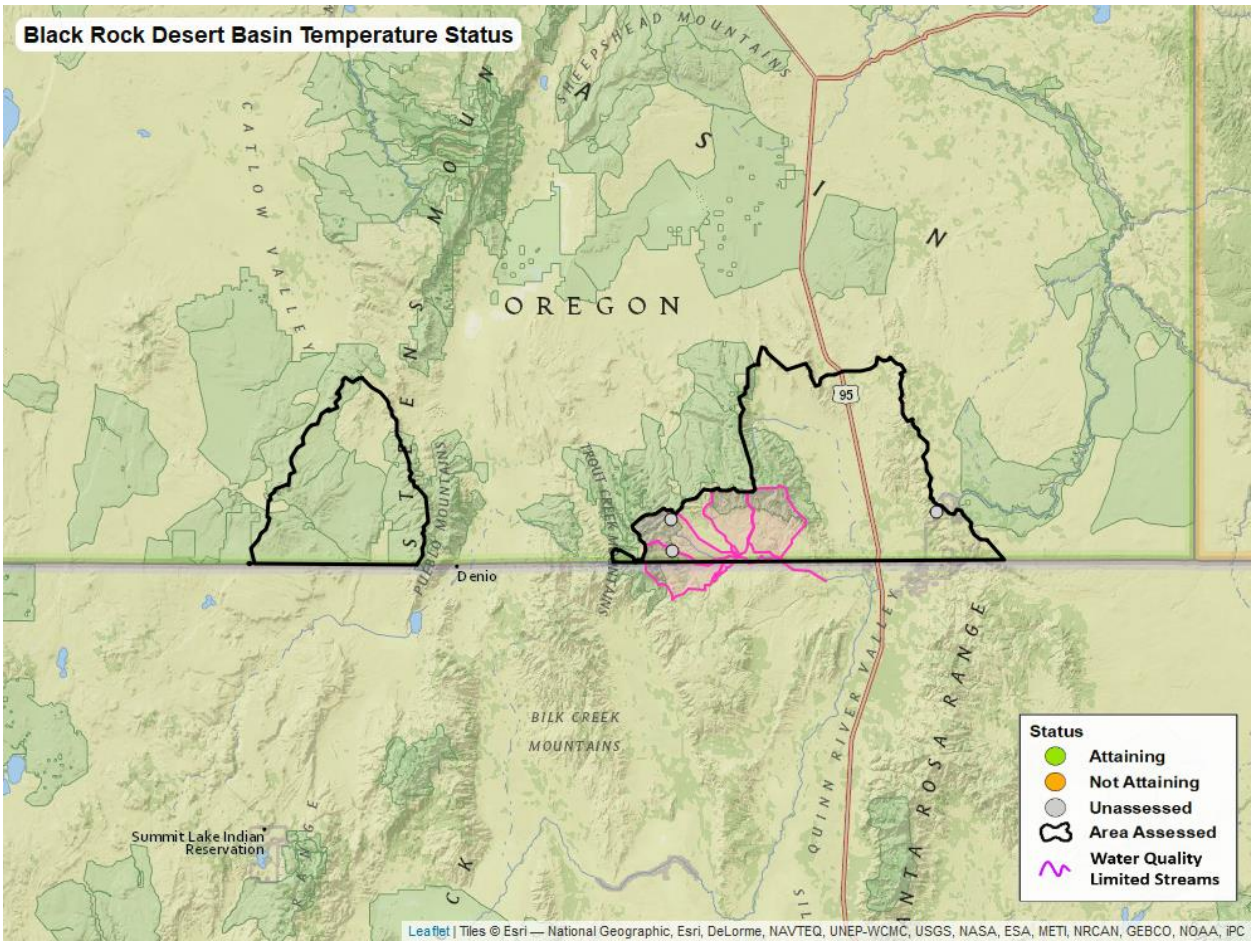

Figure 14: Summary map of the status of temperature across the Black Rock Desert Basin.

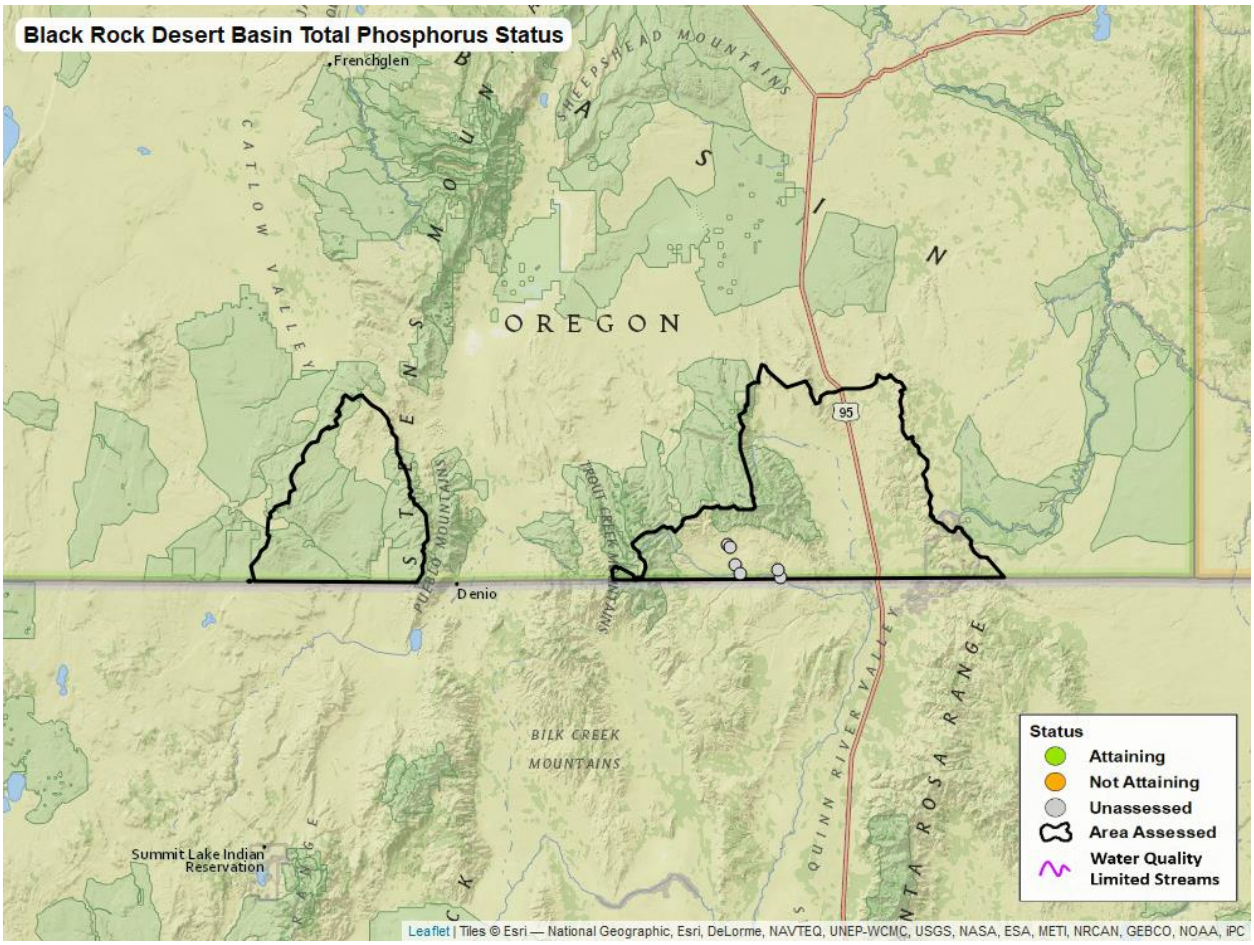

Figure 15: Summary map of the status of total phosphorus across the Black Rock Desert Basin.

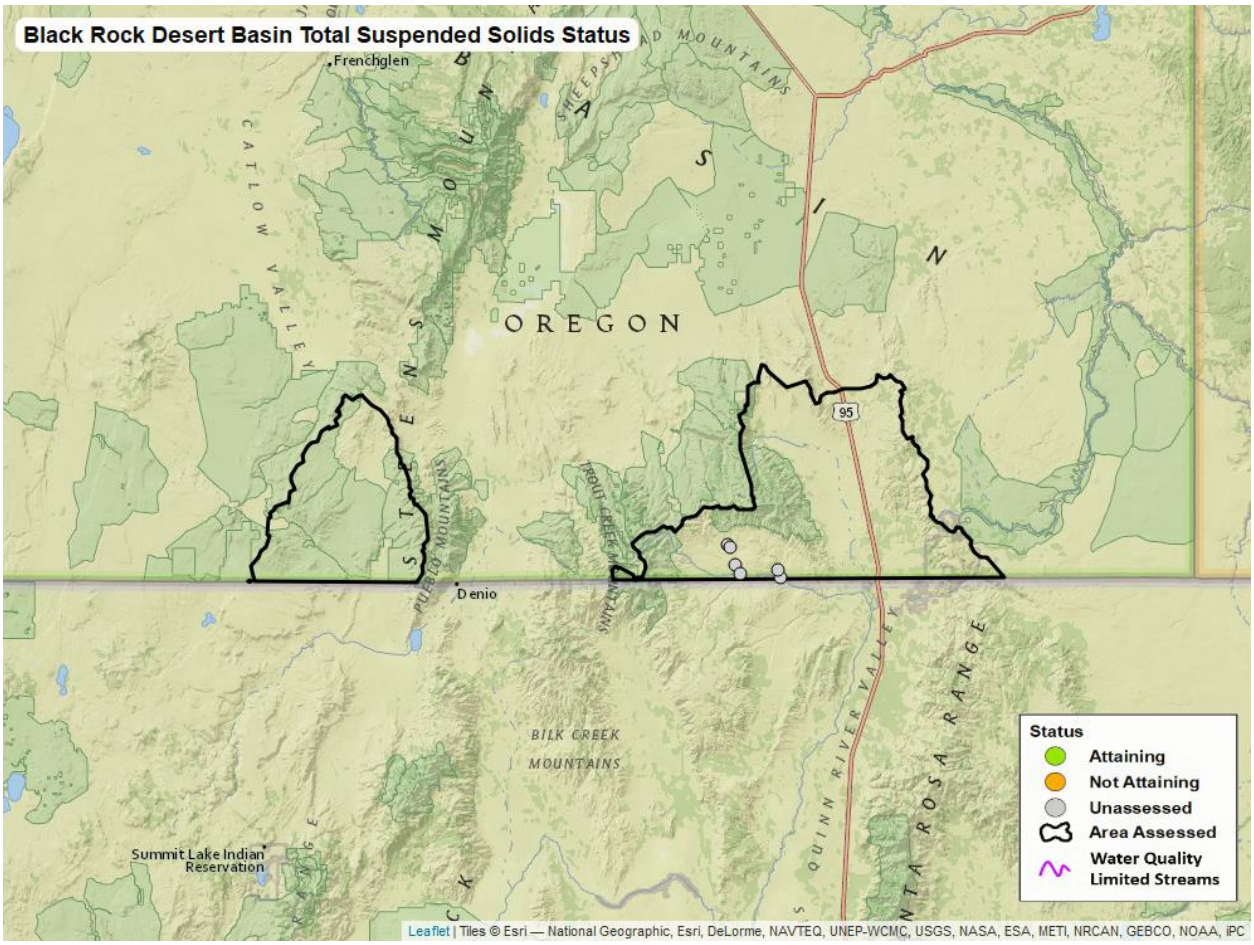

Figure 16: Summary map of the status of total suspended solids across the Black Rock Desert Basin.

4.2.3 Status

There are 7 assessment units within the Black Rock Desert Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 27 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 27: Summary of the 2016–2019 assessment unit status within the Black Rock Desert Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	4
PH	0	0	4
Temperature	0	0	3
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

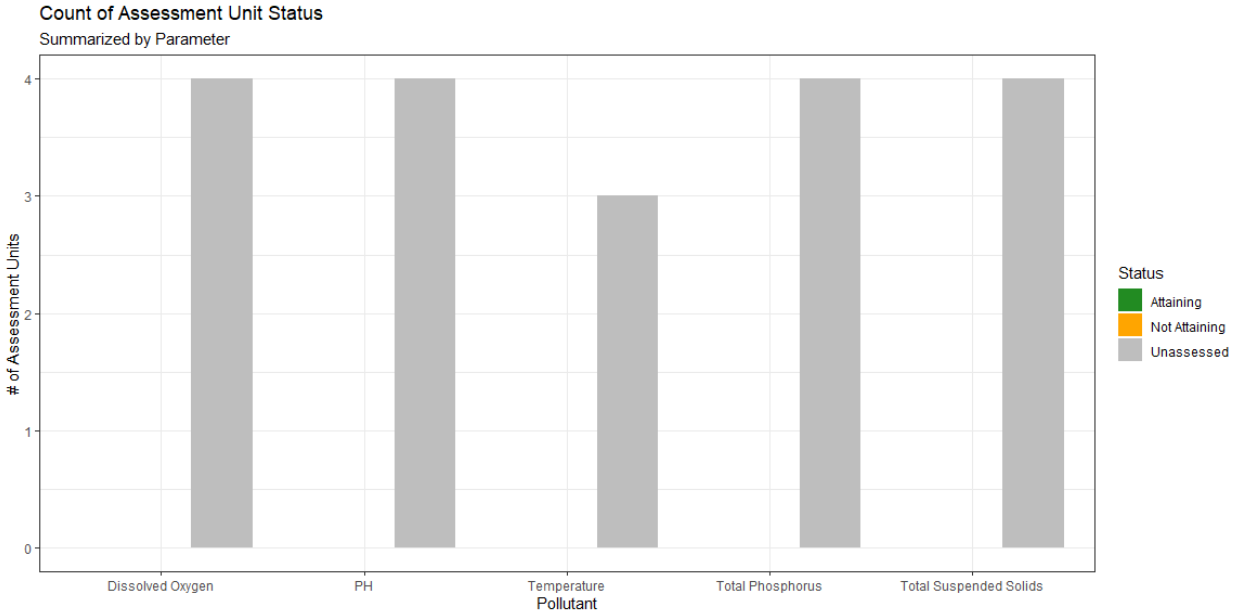

Figure 17: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Black Rock Desert Basin.

Table 28 and Figure 17 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Black Rock Desert Basin for the 2016–2019 status period.

Table 28: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Black Rock Desert Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	2
Stream	PH	0	0	2
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	0	0	3
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

Table 29 and Figure 18 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix A.

Table 29: Summary of the 2016–2019 status at monitoring stations within the Black Rock Desert Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	6

Pollutant	Attaining	Not Attaining	Unassessed
PH	0	0	6
Temperature	0	0	3
Total Phosphorus	0	0	6
Total Suspended Solids	0	0	6

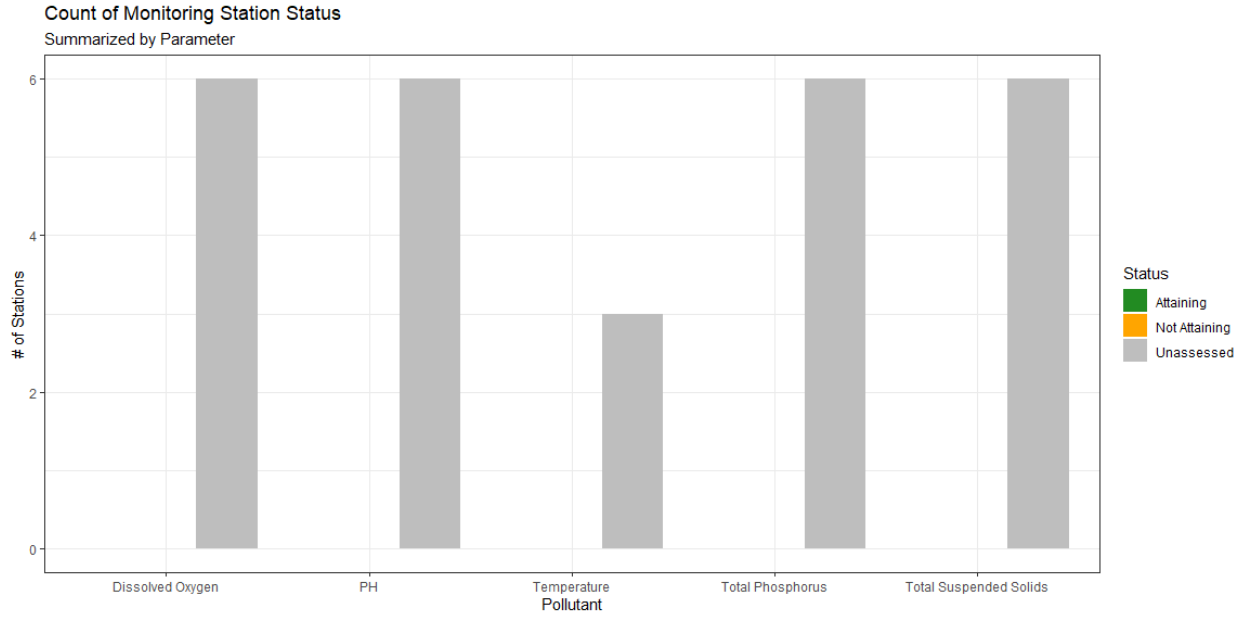

Figure 18: Summary plot of the 2016–2019 station status within the Black Rock Desert Basin by parameter.

4.2.4 Trend

A summary of the trends across parameters is shown in Table 30. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 30: Black Rock Desert Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	6
PH	0	0	0	0	6
Temperature	0	0	0	0	3
Total Phosphorus	0	0	0	0	6
Total Suspended Solids	0	0	0	0	6

4.2.5 Subbasin Summary

4.2.5.1 Upper Quinn Subbasin

4.2.5.1.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.2.5.1.2 Status

There are 7 assessment units within the Upper Quinn Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 31 and Figure 19 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 31: Summary of the 2016–2019 assessment unit status within the Upper Quinn Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	4
PH	0	0	4
Temperature	0	0	3
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

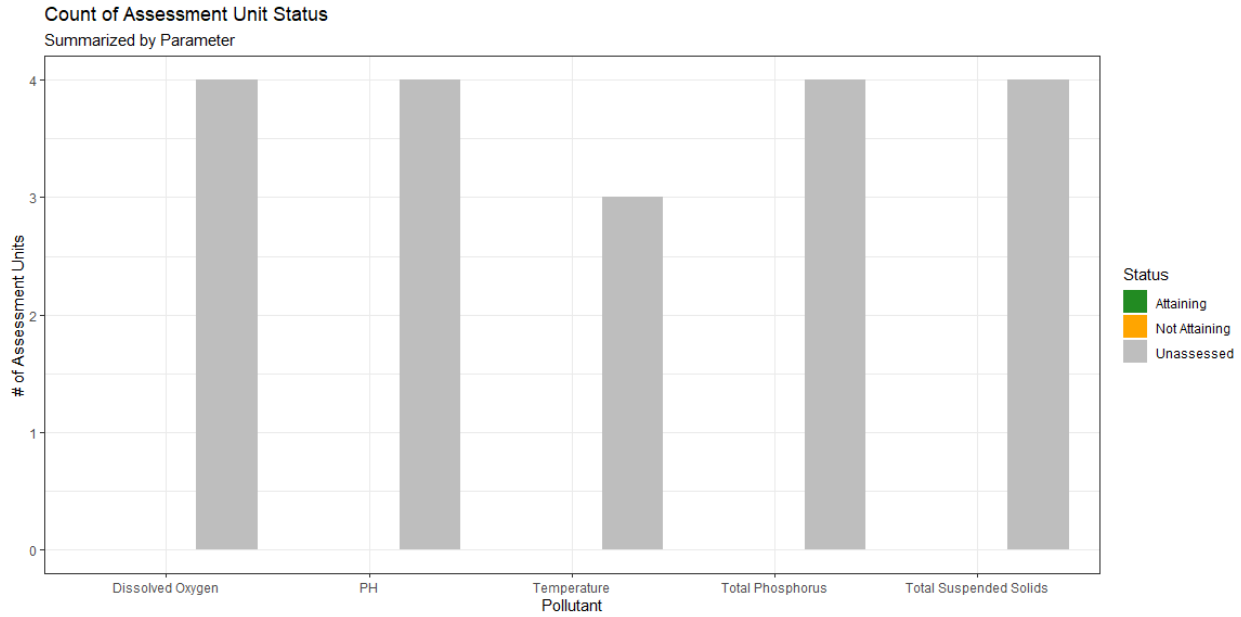

Figure 19: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Quinn Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 32 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Quinn Subbasin for the 2016 – 2019 status period.

Table 32: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Quinn Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	2
Stream	PH	0	0	2
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	0	0	3
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 9 stations within the Upper Quinn Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix A**. Table 33 and Figure 20 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 33: Summary of the 2016–2019 status at monitoring stations within the Upper Quinn Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	6
PH	0	0	6
Temperature	0	0	3
Total Phosphorus	0	0	6
Total Suspended Solids	0	0	6

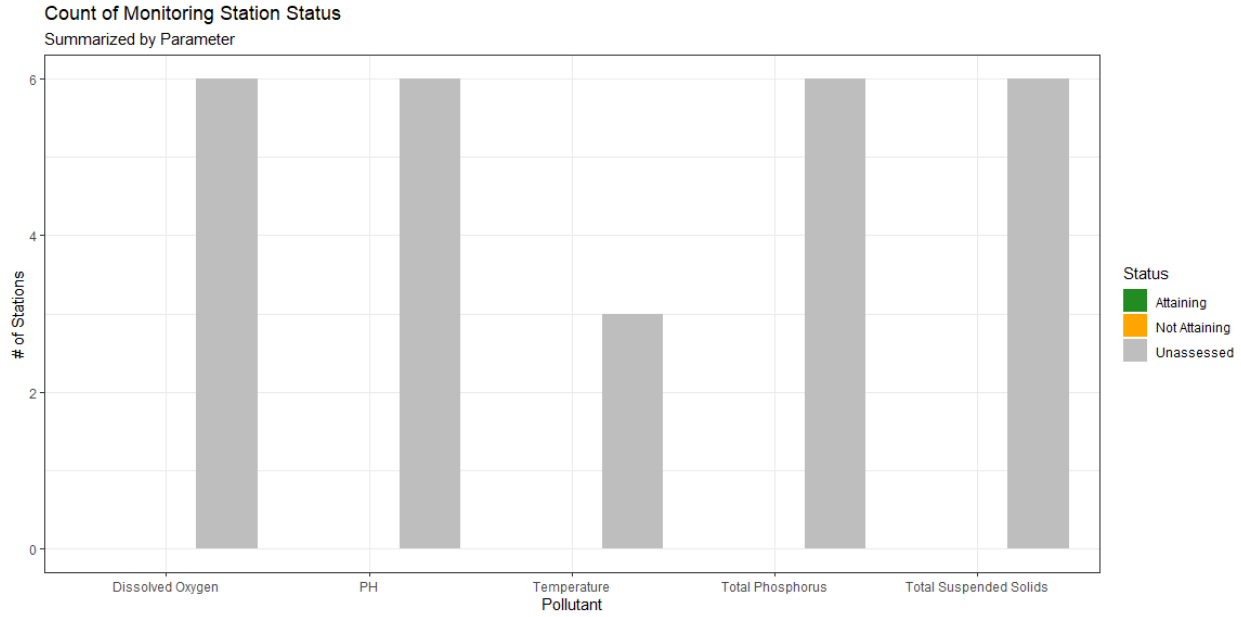

Figure 20: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Quinn Subbasin.

4.2.5.1.3 Trend

A summary of the trends within parameters is shown in Table 34. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 34: Subbasin Summary of trend results at stations across the Upper Quinn.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	6
PH	0	0	0	0	6
Temperature	0	0	0	0	3
Total Phosphorus	0	0	0	0	6
Total Suspended Solids	0	0	0	0	6

4.3 Columbia River

A summary of status and trend results for the Columbia River and all subbasins within the Columbia River are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix B**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Columbia River are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 80 stations within the Columbia River. These stations were located across 25 assessment units consisting of 'Lakes' and 'Streams'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.3.1 Land Use

Table 35: Land use within the Columbia River Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Columbia-Lake Wallula	115	0.3	0.0	0.1	0.3	99.2
Middle Columbia-Hood	59	1.0	0.4	0.0	0.5	97.5
Lower Columbia-Sandy	24	0.6	3.9	0.1	0.5	94.7
Lower Columbia-Clatskanie	143	3.2	8.7	2.0	0.3	86.0
Lower Columbia	295	0.2	3.0	0.0	0.1	96.6

4.3.2 Parameter Maps

The maps in Figure 21 through Figure 26 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

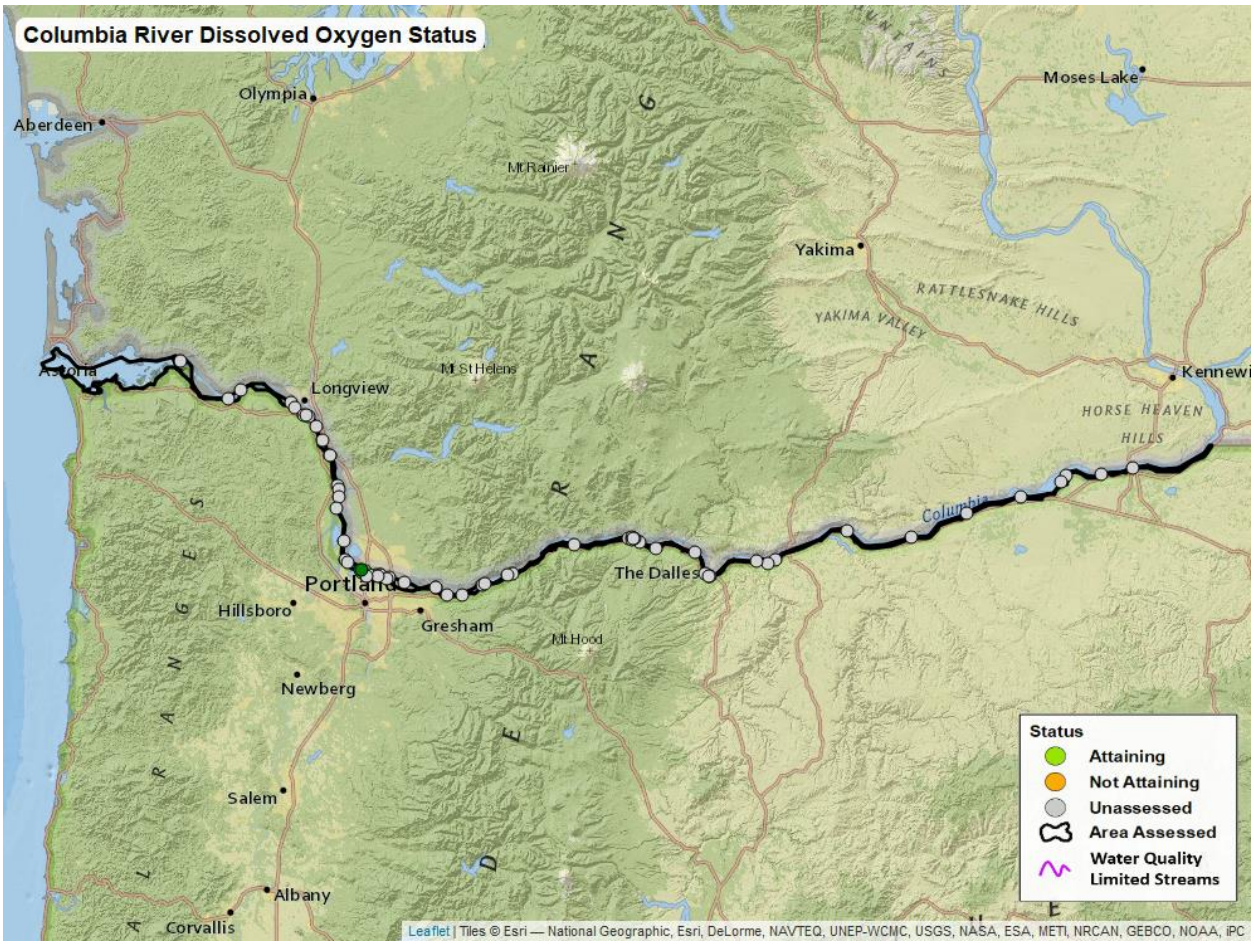

Figure 21: Summary map of the status of dissolved oxygen across the Columbia River.

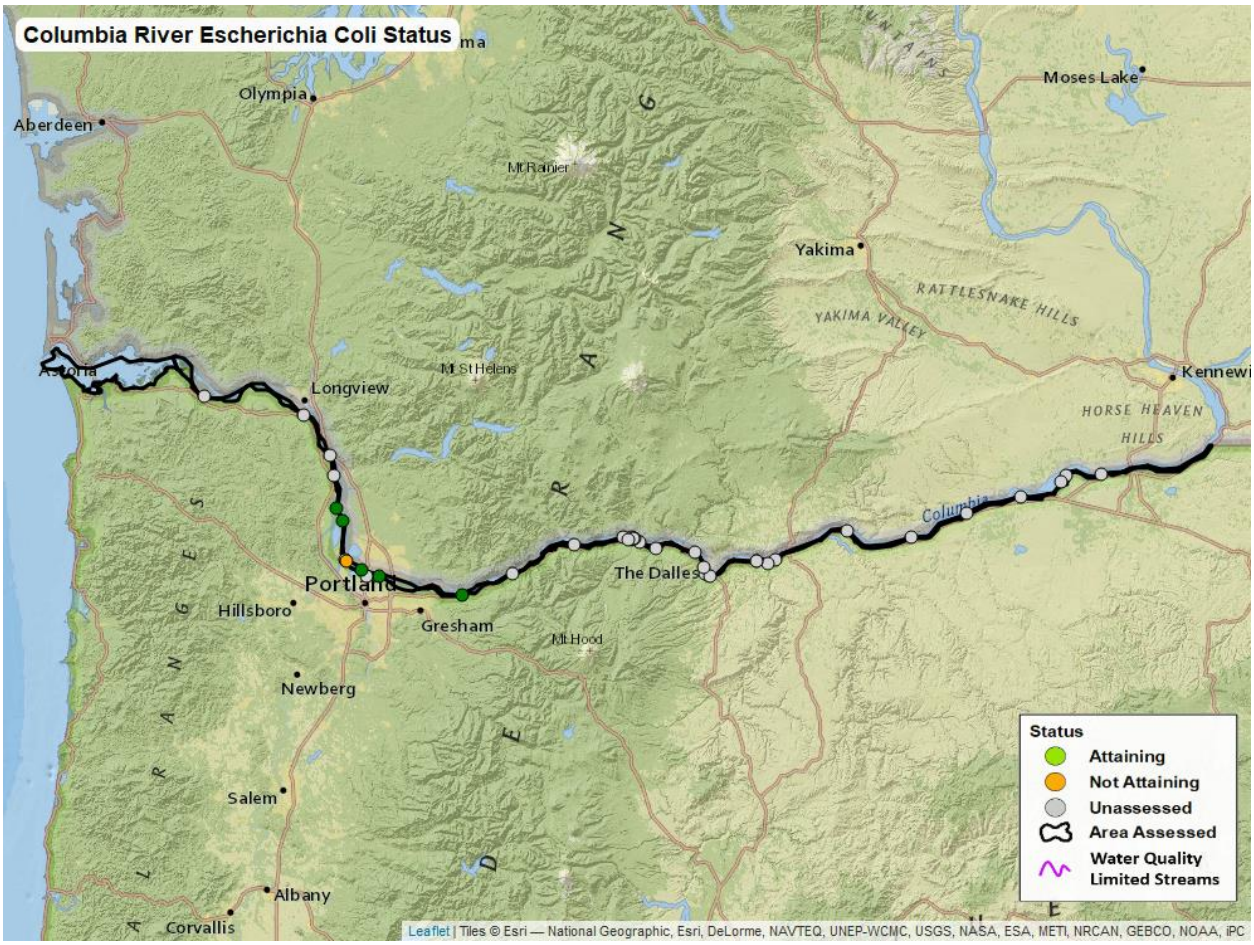

Figure 22: Summary map of the status of *Escherichia coli* across the Columbia River.

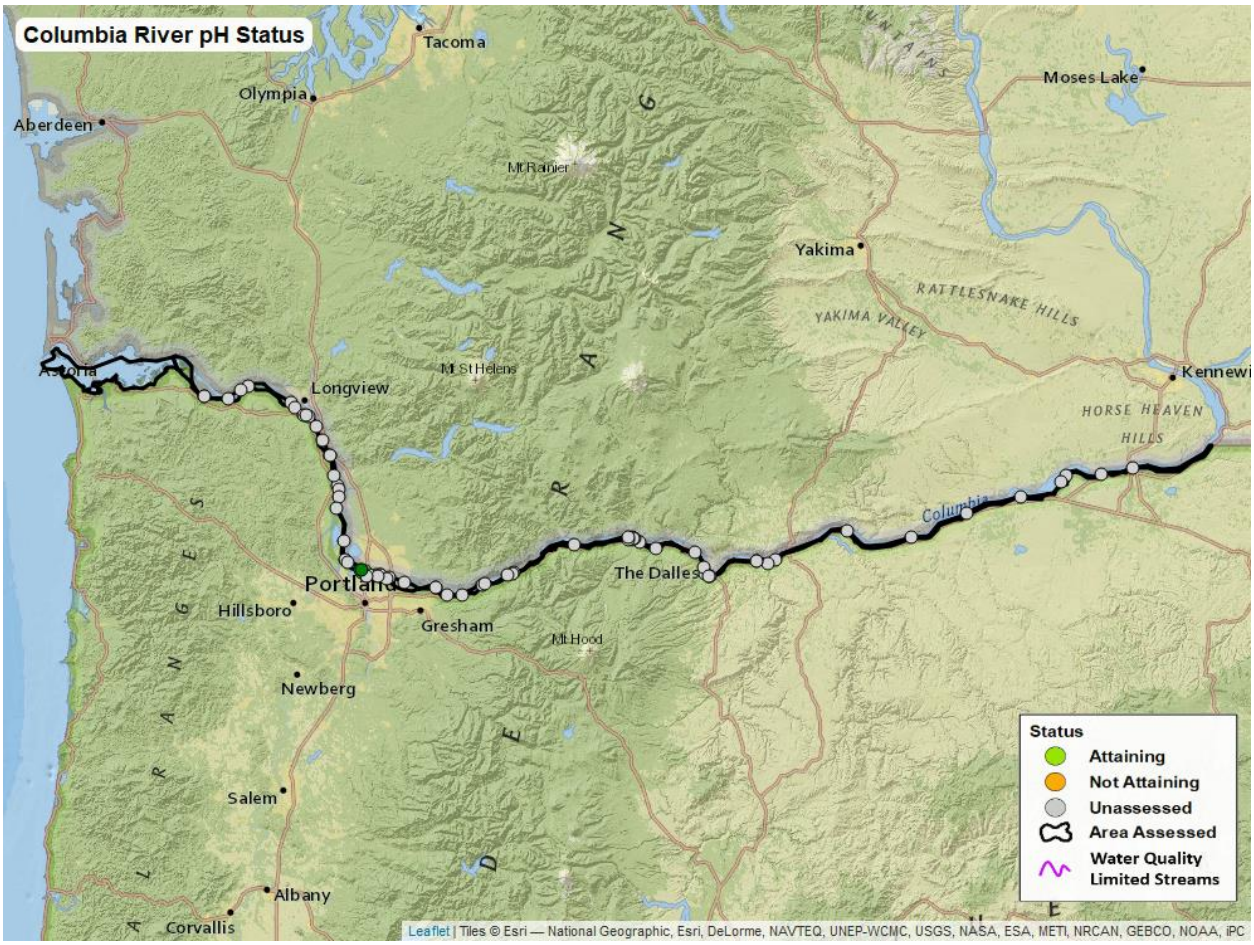

Figure 23: Summary map of the status of pH across the Columbia River.

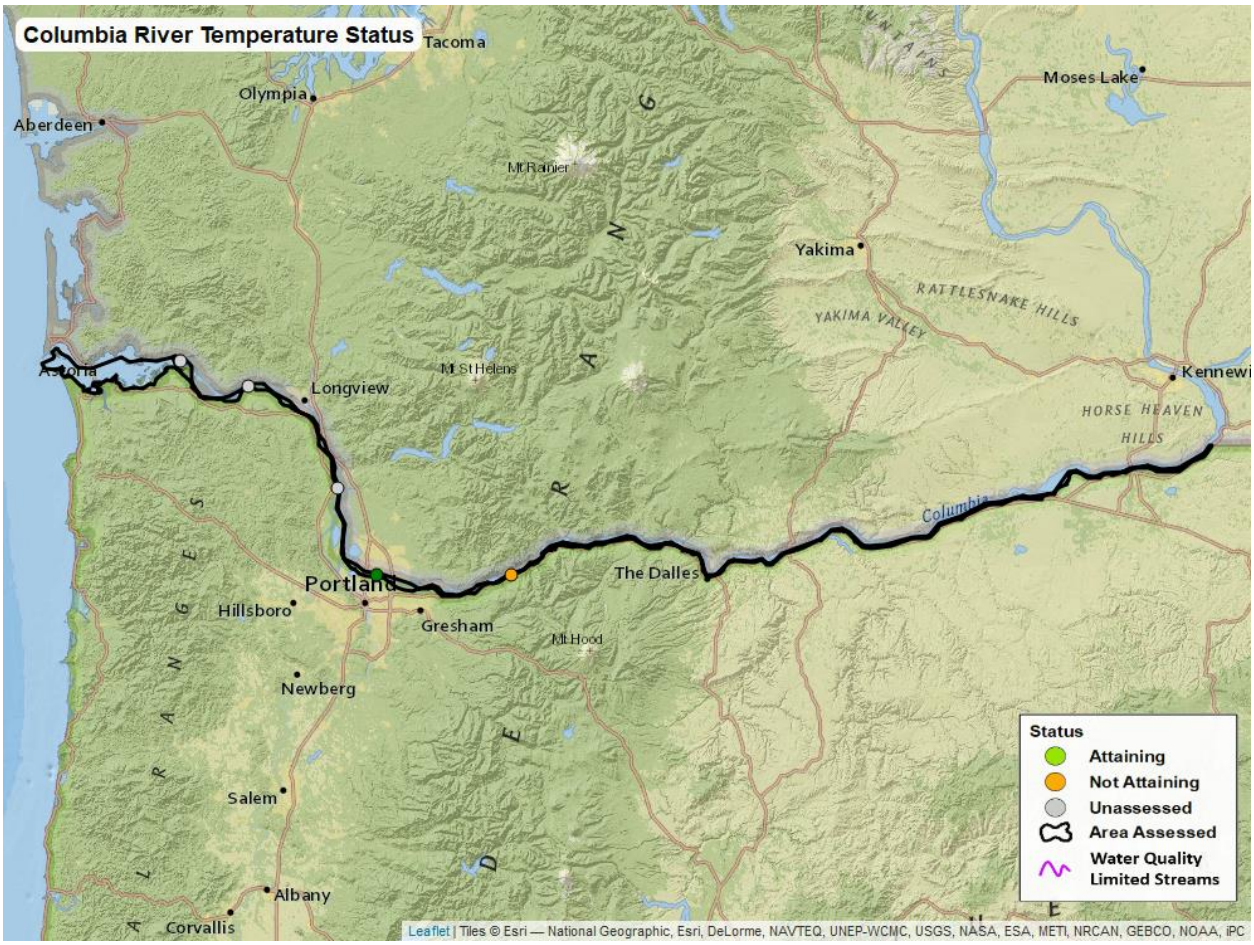

Figure 24: Summary map of the status of temperature across the Columbia River.

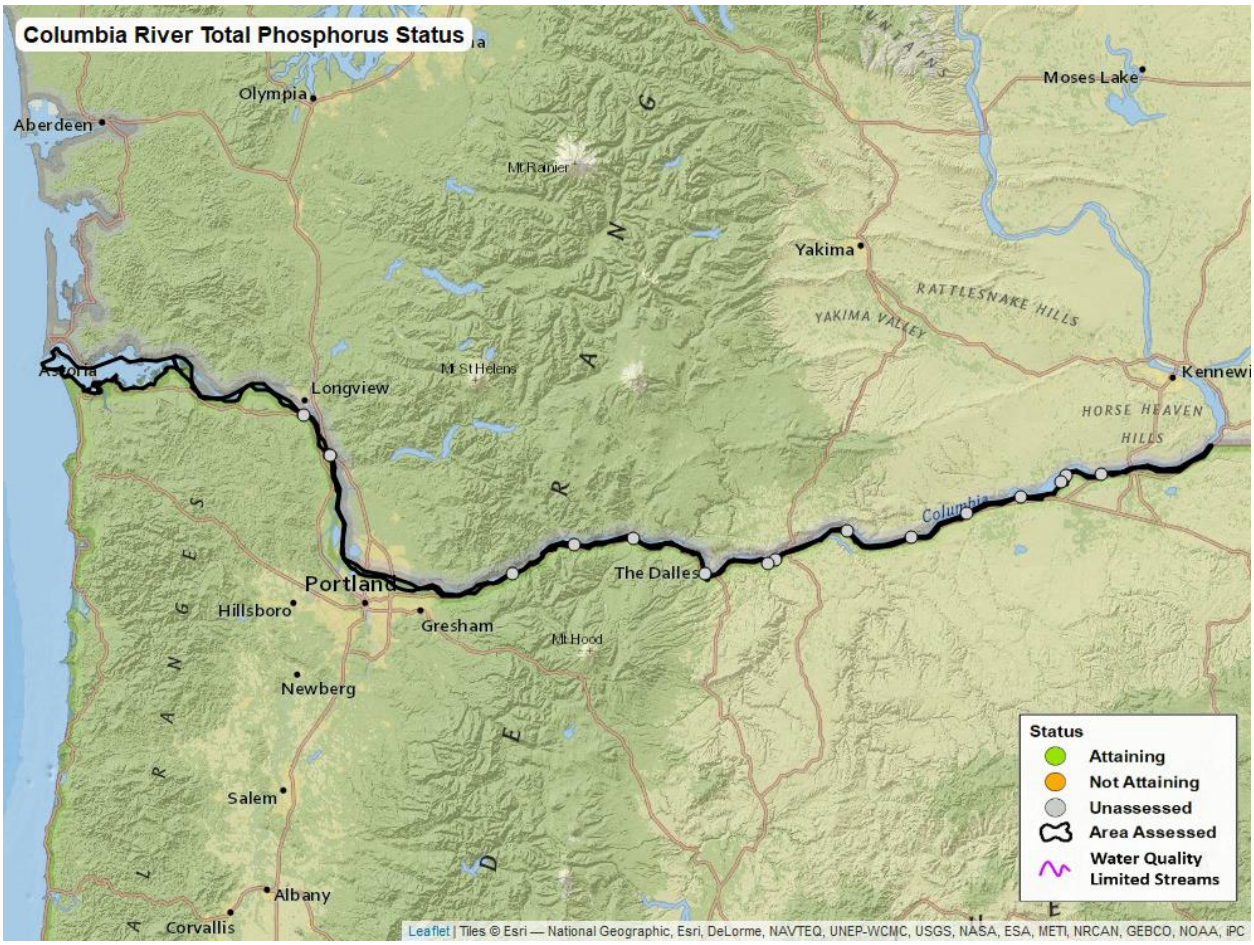

Figure 25: Summary map of the status of total phosphorus across the Columbia River.

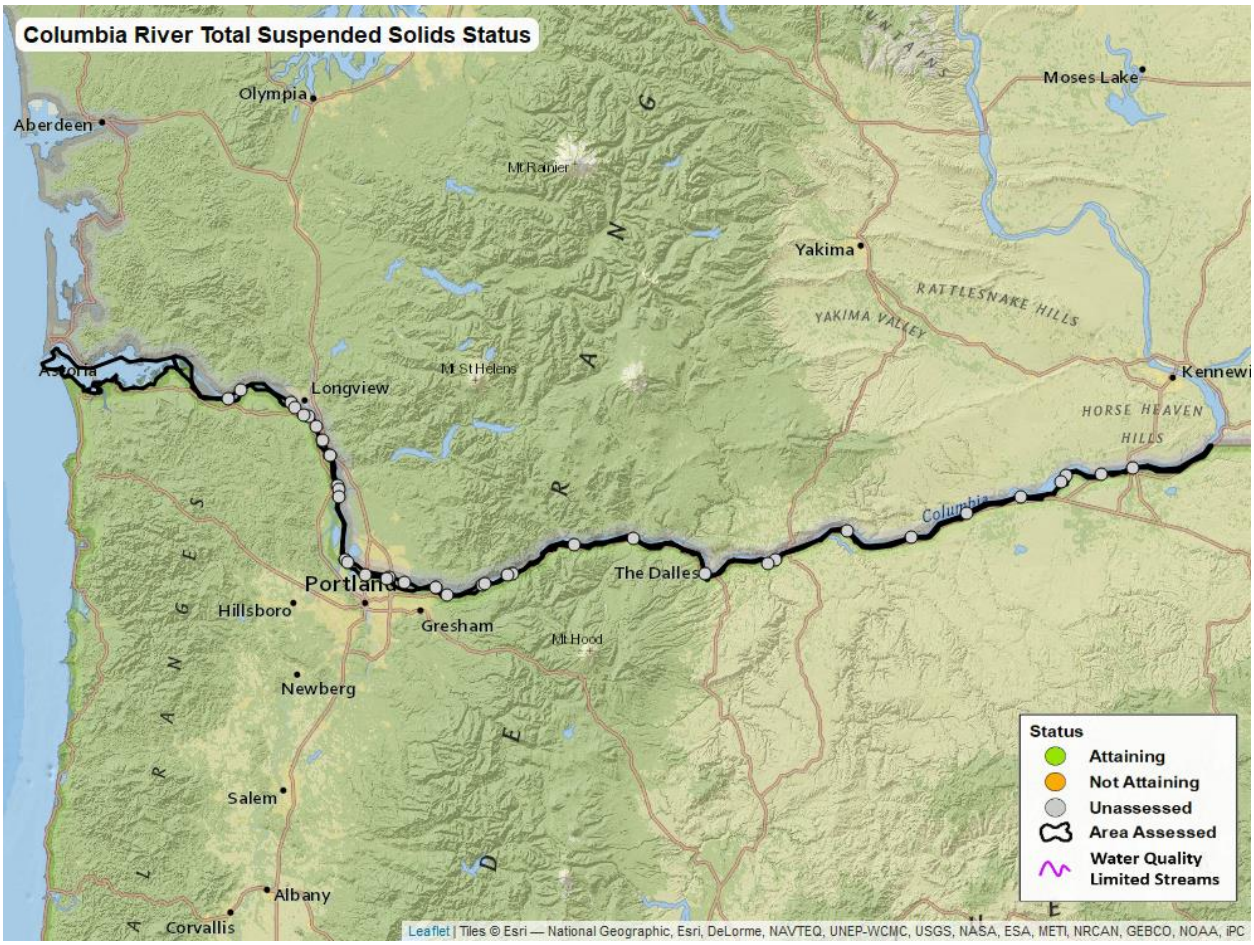

Figure 26: Summary map of the status of total suspended solids across the Columbia River.

4.3.3 Status

There are 25 assessment units within the Columbia River containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 36 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 36: Summary of the 2016–2019 assessment unit status within the Columbia River.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	23
Escherichia coli	3	1	15
PH	1	0	23
Temperature	1	1	3
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	22

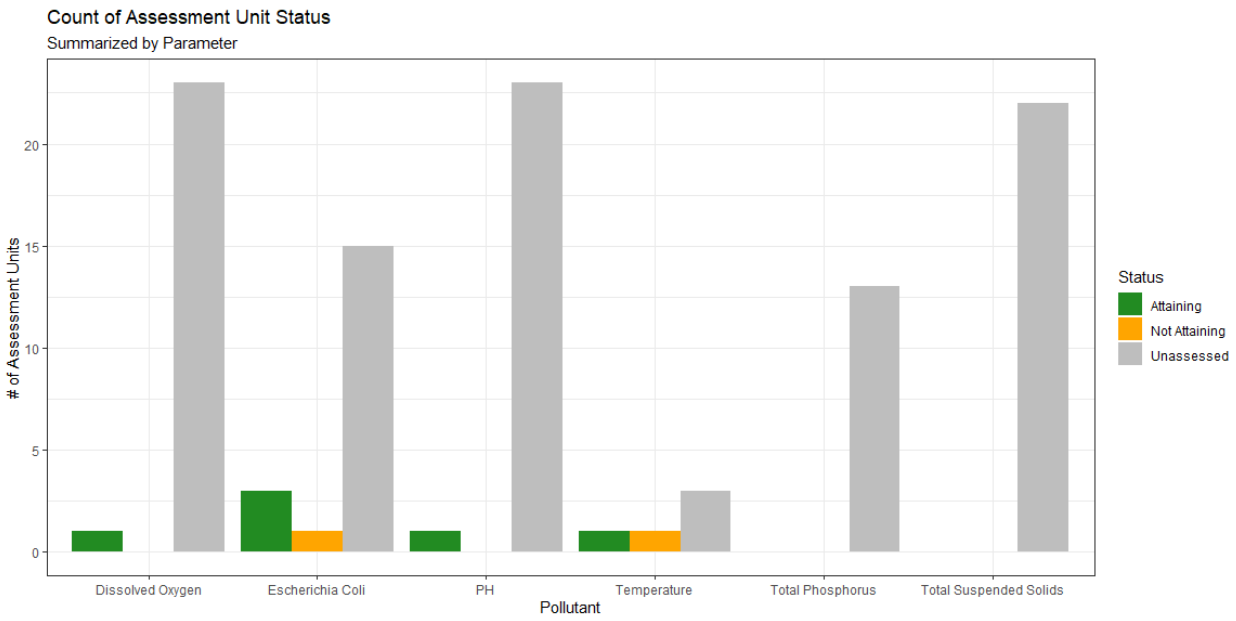

Figure 27: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Columbia River.

Table 37 and Figure 27 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Columbia River for the 2016–2019 status period.

Table 37: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Columbia River.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	12
Lake	*Escherichia coli*	1	0	10
Lake	PH	0	0	12
Lake	Total Phosphorus	0	0	10
Lake	Total Suspended Solids	0	0	11
Stream	Dissolved Oxygen	1	0	11
Stream	*Escherichia coli*	2	1	5
Stream	PH	1	0	11
Stream	Temperature	1	1	3
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	11

Table 38 and Figure 28 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix B.

Table 38: Summary of the 2016–2019 status at monitoring stations within the Columbia River.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	65
Escherichia coli	7	1	30
PH	1	0	73
Temperature	1	1	3
Total Phosphorus	0	0	16
Total Suspended Solids	0	0	39

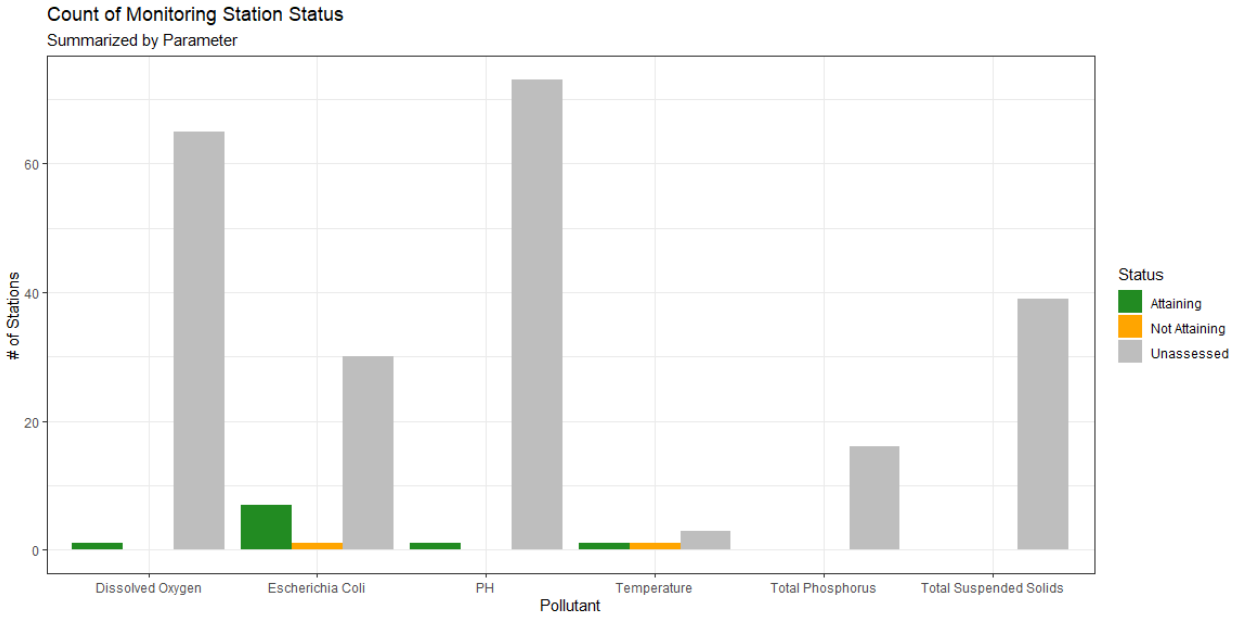

Figure 28: Summary plot of the 2016–2019 station status within the Columbia River by parameter.

4.3.4 Trend

A summary of the trends across parameters is shown in Table 39. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 39: Columbia River summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	0	65
Escherichia coli	0	0	1	1	36
PH	0	2	0	0	72
Temperature	0	1	0	0	4
Total Phosphorus	0	0	0	0	16
Total Suspended Solids	0	0	0	0	39

4.3.5 Subbasin Summary

4.3.5.1 Middle Columbia-Hood Subbasin

4.3.5.1.1 Water Quality Limited Assessment Units

Table 40: Number of water quality limited assessment units in the Middle Columbia-Hood Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	2

4.3.5.1.2 Status

There are 5 assessment units within the Middle Columbia-Hood Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 41 and Figure 29 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 41: Summary of the 2016–2019 assessment unit status within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	5
Escherichia coli	1	0	4
PH	0	0	5
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

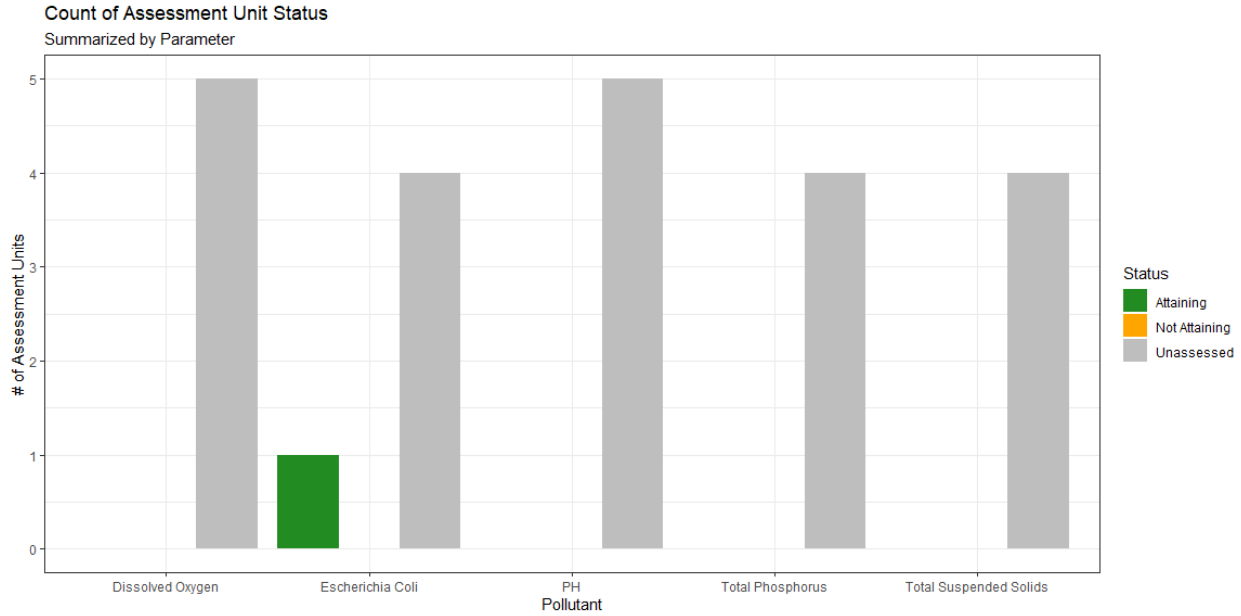

Figure 29: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 42 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Columbia-Hood Subbasin for the 2016 – 2019 status period.

Table 42: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	5
Lake	*Escherichia coli*	1	0	4
Lake	PH	0	0	5
Lake	Total Phosphorus	0	0	4
Lake	Total Suspended Solids	0	0	4

There are 21 stations within the Middle Columbia-Hood Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix B**. Table 43 and Figure 30 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 43: Summary of the 2016–2019 status at monitoring stations within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	16
Escherichia coli	2	0	16
PH	0	0	20
Total Phosphorus	0	0	5
Total Suspended Solids	0	0	5

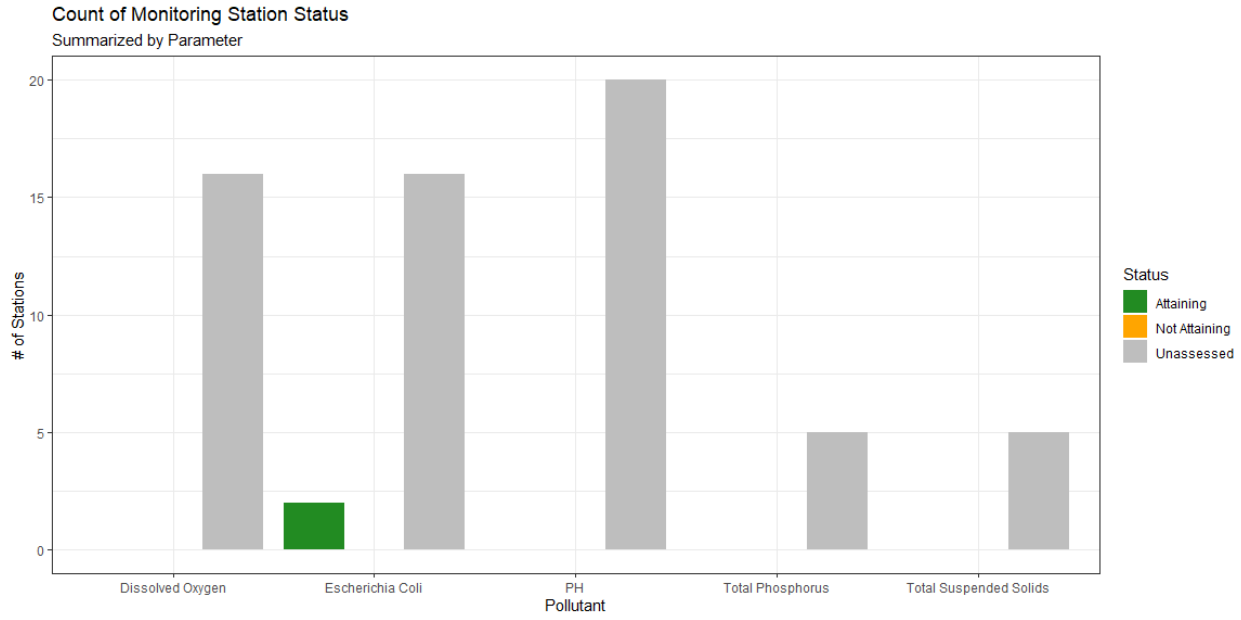

Figure 30: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

4.3.5.1.3 Trend

A summary of the trends within parameters is shown in Table 44. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 44: Subbasin Summary of trend results at stations across the Middle Columbia-Hood.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	16
Escherichia coli	0	0	0	1	17
PH	0	0	0	0	20
Total Phosphorus	0	0	0	0	5
Total Suspended Solids	0	0	0	0	5

4.3.5.2 Lower Columbia-Sandy Subbasin

4.3.5.2.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.3.5.2.2 Status

There are 3 assessment units within the Lower Columbia-Sandy Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 45 and Figure 31 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 45: Summary of the 2016–2019 assessment unit status within the Lower Columbia-Sandy Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	3
Escherichia coli	1	0	1
PH	0	0	3
Temperature	0	1	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	3

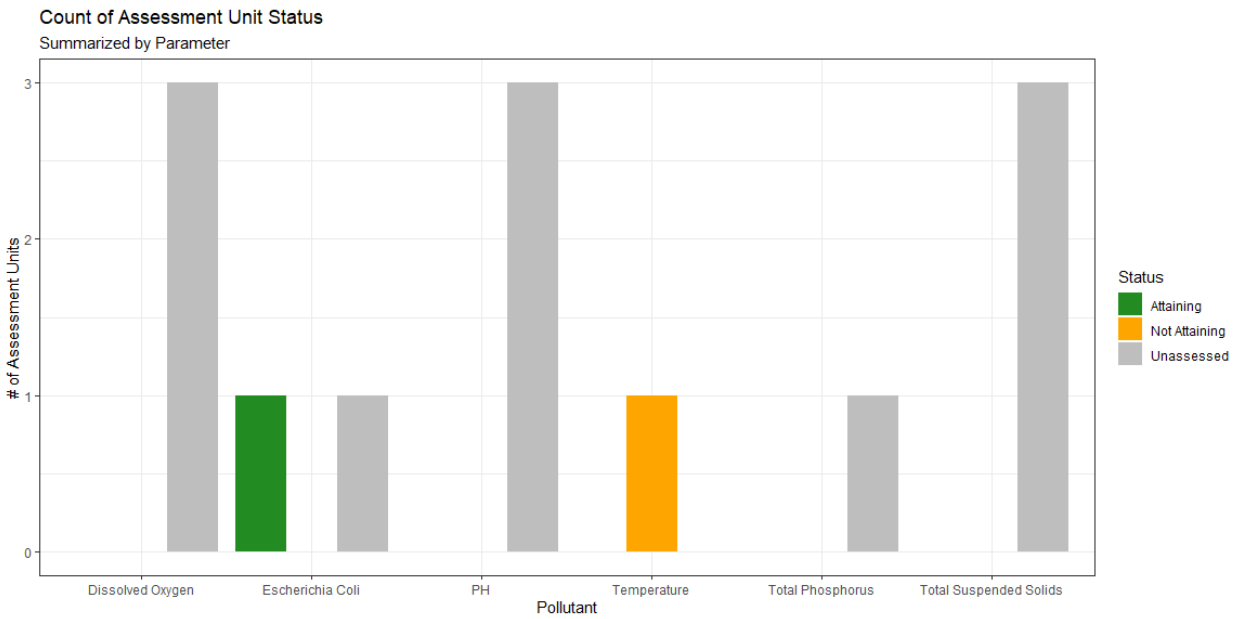

Figure 31: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 46 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Columbia-Sandy Subbasin for the 2016 – 2019 status period.

Table 46: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	3
Stream	*Escherichia coli*	1	0	1
Stream	PH	0	0	3
Stream	Temperature	0	1	0
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	3

There are 10 stations within the Lower Columbia-Sandy Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix B**. Table 47 and Figure 32 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 47: Summary of the 2016–2019 status at monitoring stations within the Lower Columbia-Sandy Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	8
Escherichia coli	1	0	1

Pollutant	Attaining	Not Attaining	Unassessed
PH	0	0	9
Temperature	0	1	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	7

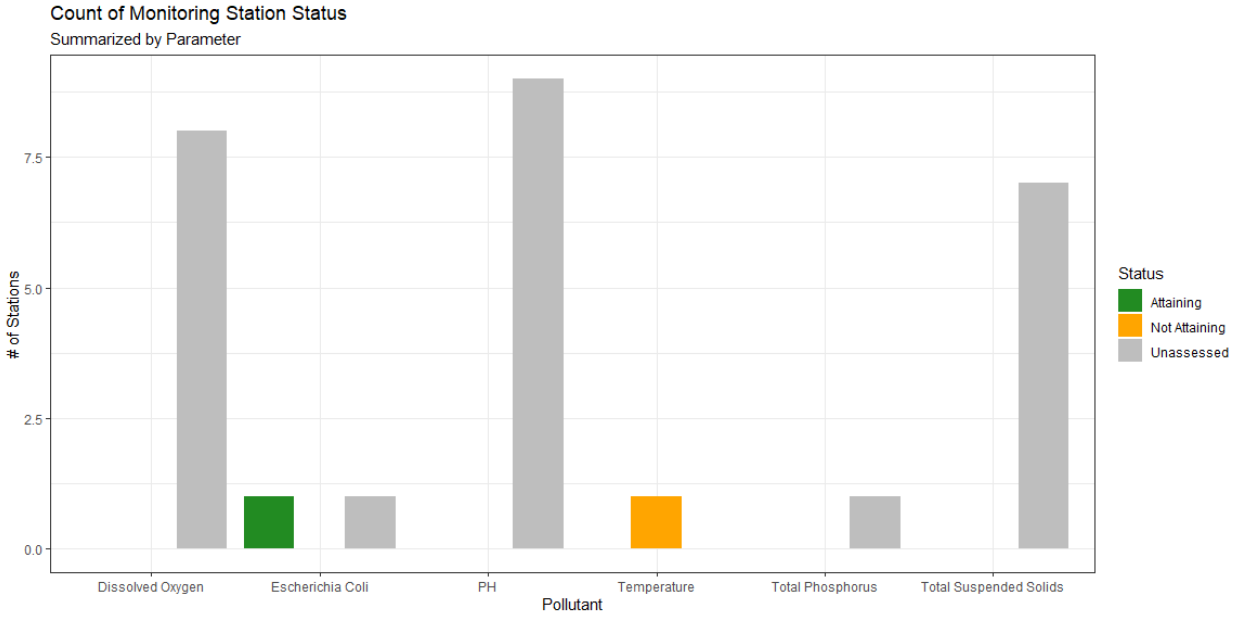

Figure 32: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

4.3.5.2.3 Trend

A summary of the trends within parameters is shown in Table 48. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 48: Subbasin Summary of trend results at stations across the Lower Columbia-Sandy.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	8
Escherichia coli	0	0	0	0	2
PH	0	0	0	0	9
Temperature	0	1	0	0	0
Total Phosphorus	0	0	0	0	1
Total Suspended Solids	0	0	0	0	7

4.3.5.3 Lower Columbia-Clatskanie Subbasin

4.3.5.3.1 Water Quality Limited Assessment Units

Table 49: Number of water quality limited assessment units in the Lower Columbia-Clatskanie Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1

4.3.5.3.2 Status

There are 10 assessment units within the Lower Columbia-Clatskanie Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 50 and Figure 33 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 50: Summary of the 2016–2019 assessment unit status within the Lower Columbia-Clatskanie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	8
Escherichia coli	1	1	4
PH	1	0	8
Temperature	1	0	3
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	8

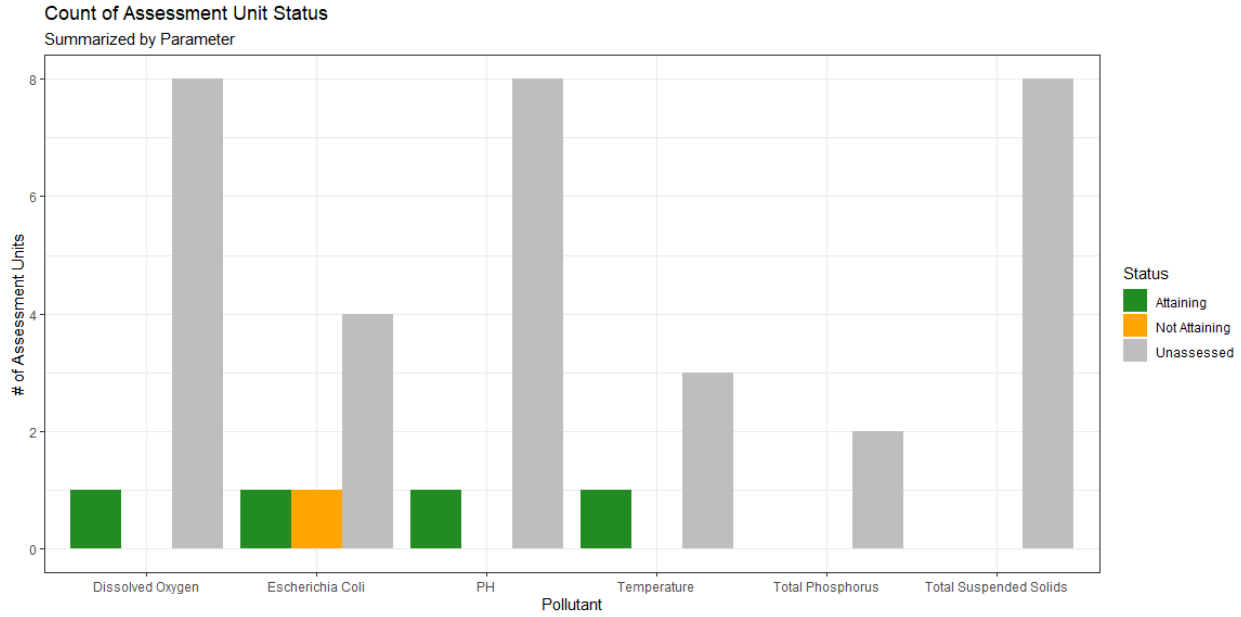

Figure 33: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 51 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Columbia-Clatskanie Subbasin for the 2016 – 2019 status period.

Table 51: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	8
Stream	*Escherichia coli*	1	1	4
Stream	PH	1	0	8
Stream	Temperature	1	0	3
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	8

There are 41 stations within the Lower Columbia-Clatskanie Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix B**. Table 52 and Figure 34 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 52: Summary of the 2016–2019 status at monitoring stations within the Lower Columbia-Clatskanie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	33
Escherichia coli	4	1	6
PH	1	0	36
Temperature	1	0	3
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	19

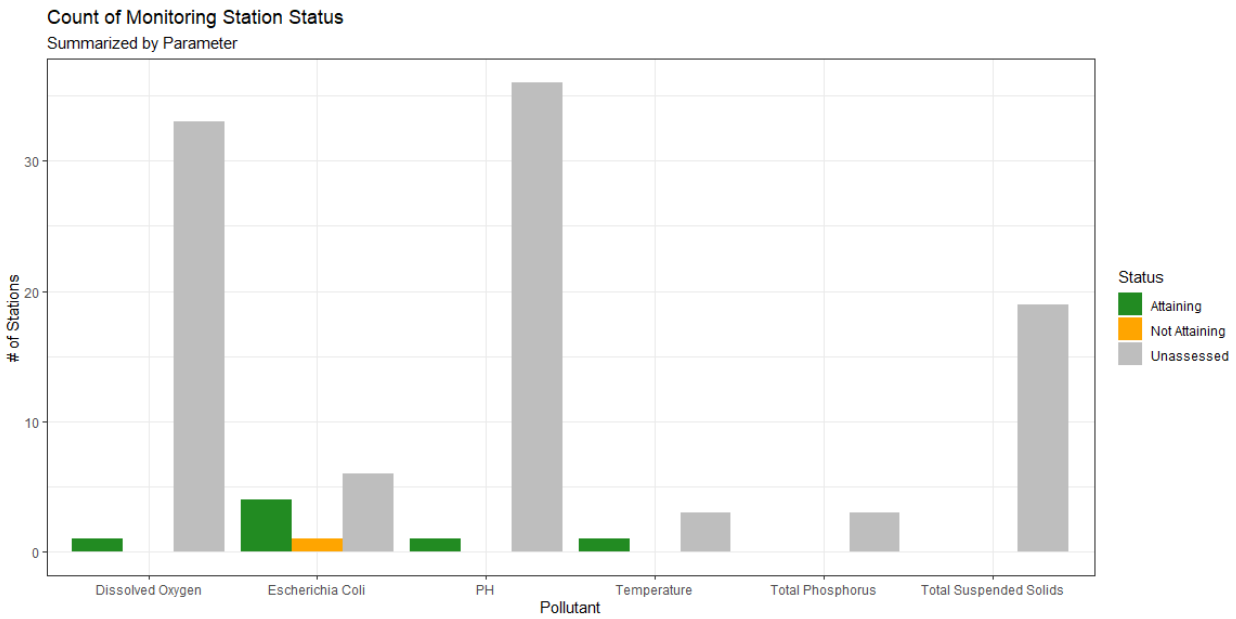

Figure 34: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

4.3.5.3.3 Trend

A summary of the trends within parameters is shown in Table 53. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 53: Subbasin Summary of trend results at stations across the Lower Columbia-Clatskanie.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	0	33
Escherichia coli	0	0	1	0	10
PH	0	2	0	0	35
Temperature	0	0	0	0	4
Total Phosphorus	0	0	0	0	3
Total Suspended Solids	0	0	0	0	19

4.3.5.4 Middle Columbia-Lake Wallula Subbasin

4.3.5.4.1 Water Quality Limited Assessment Units

Table 54: Number of water quality limited assessment units in the Middle Columbia-Lake Wallula Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1

4.3.5.4.2 Status

There are 7 assessment units within the Middle Columbia-Lake Wallula Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 55 and Figure 35 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 55: Summary of the 2016–2019 assessment unit status within the Middle Columbia-Lake Wallula Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	7
Escherichia coli	0	0	6
PH	0	0	7
Total Phosphorus	0	0	6
Total Suspended Solids	0	0	7

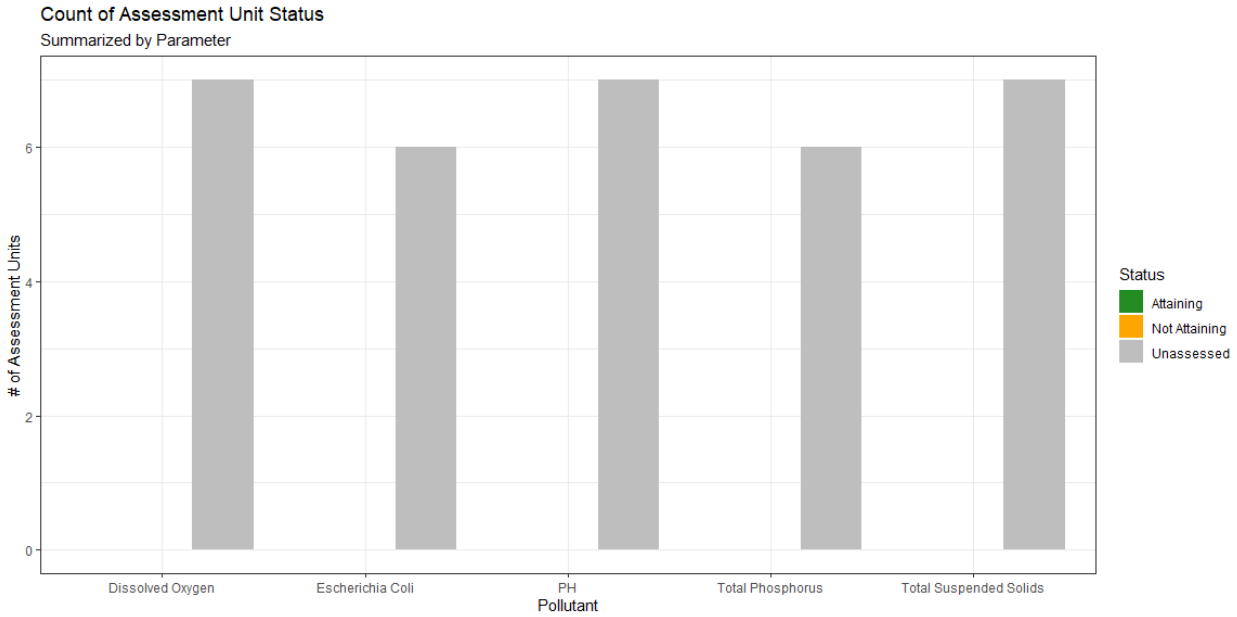

Figure 35: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Lake Wallula Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 56 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Columbia-Lake Wallula Subbasin for the 2016 – 2019 status period.

Table 56: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Lake Wallula Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	7
Lake	*Escherichia coli*	0	0	6

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	PH	0	0	7
Lake	Total Phosphorus	0	0	6
Lake	Total Suspended Solids	0	0	7

There are 8 stations within the Middle Columbia-Lake Wallula Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix B**. Table 57 and Figure 36 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 57: Summary of the 2016–2019 status at monitoring stations within the Middle Columbia-Lake Wallula Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	8
Escherichia coli	0	0	7
PH	0	0	8
Total Phosphorus	0	0	7
Total Suspended Solids	0	0	8

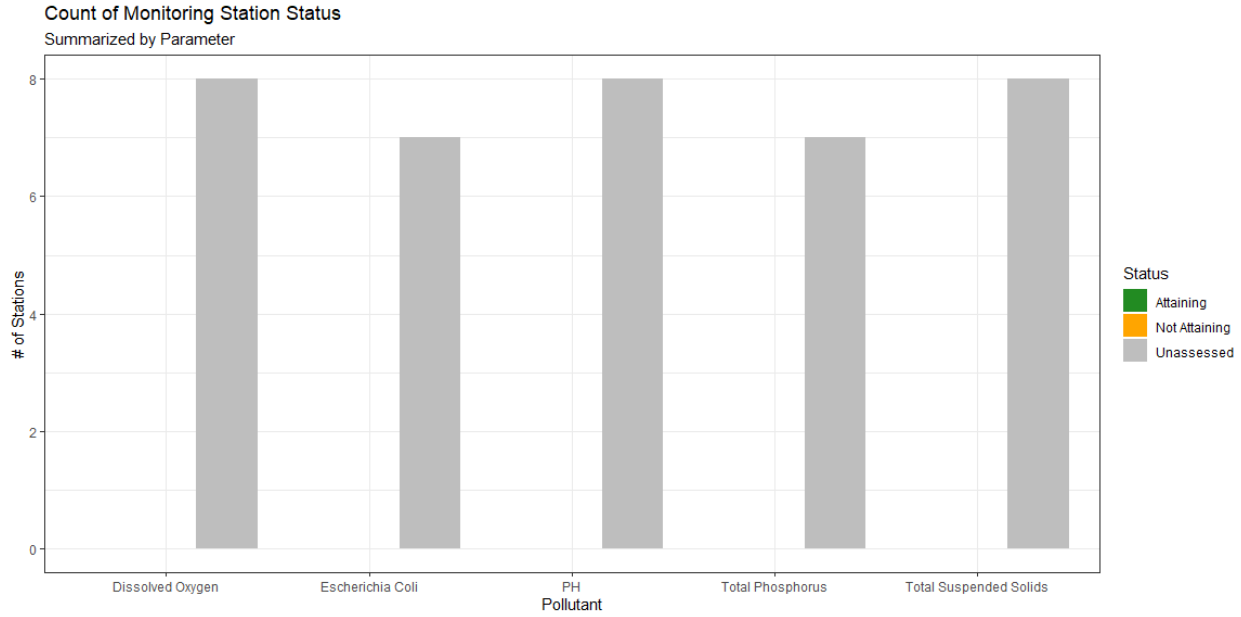

Figure 36: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Lake Wallula Subbasin.

4.3.5.4.3 Trend

A summary of the trends within parameters is shown in Table 58. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 58: Subbasin Summary of trend results at stations across the Middle Columbia-Lake Wallula.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	8
Escherichia coli	0	0	0	0	7
PH	0	0	0	0	8
Total Phosphorus	0	0	0	0	7
Total Suspended Solids	0	0	0	0	8

4.4 Deschutes Basin

A summary of status and trend results for the Deschutes Basin and all subbasins within the Deschutes Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix C**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Deschutes Basin are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 567 stations within the Deschutes Basin. These stations were located across 147 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.4.1 Land Use

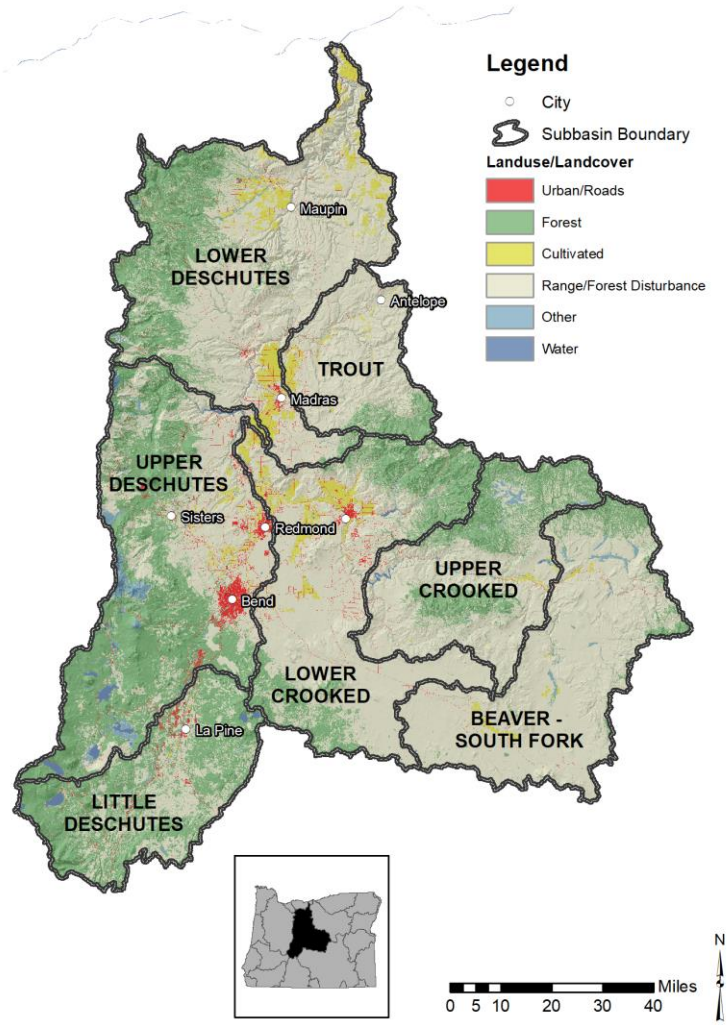

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 59: Land use within the Deschutes Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Deschutes	5580	4.2	48.8	1.9	39.8	5.2
Little Deschutes	2727	2.0	60.8	0.3	34.9	2.0
Beaver-South Fork	3964	0.3	8.2	1.0	89.3	1.2

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Crooked	2994	0.3	29.4	0.5	67.7	1.9
Lower Crooked	4787	2.2	21.1	5.5	70.8	0.4
Lower Deschutes	5946	1.6	22.5	7.4	67.7	0.7
Trout	1793	0.9	11.6	3.4	84.0	0.1

4.4.2 Parameter Maps

The maps in Figure 38 through Figure 43 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

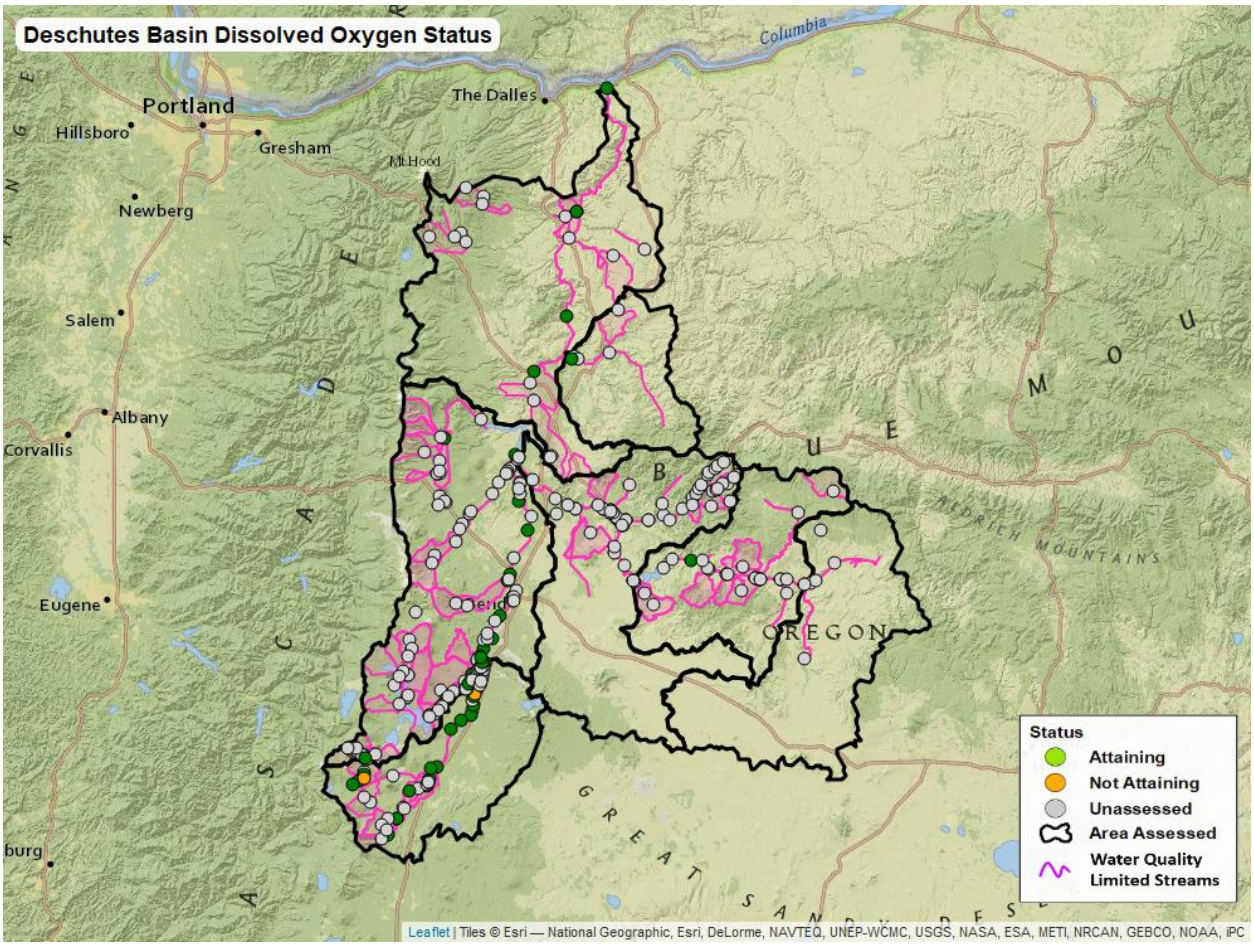

Figure 38: Summary map of the status of dissolved oxygen across the Deschutes Basin.

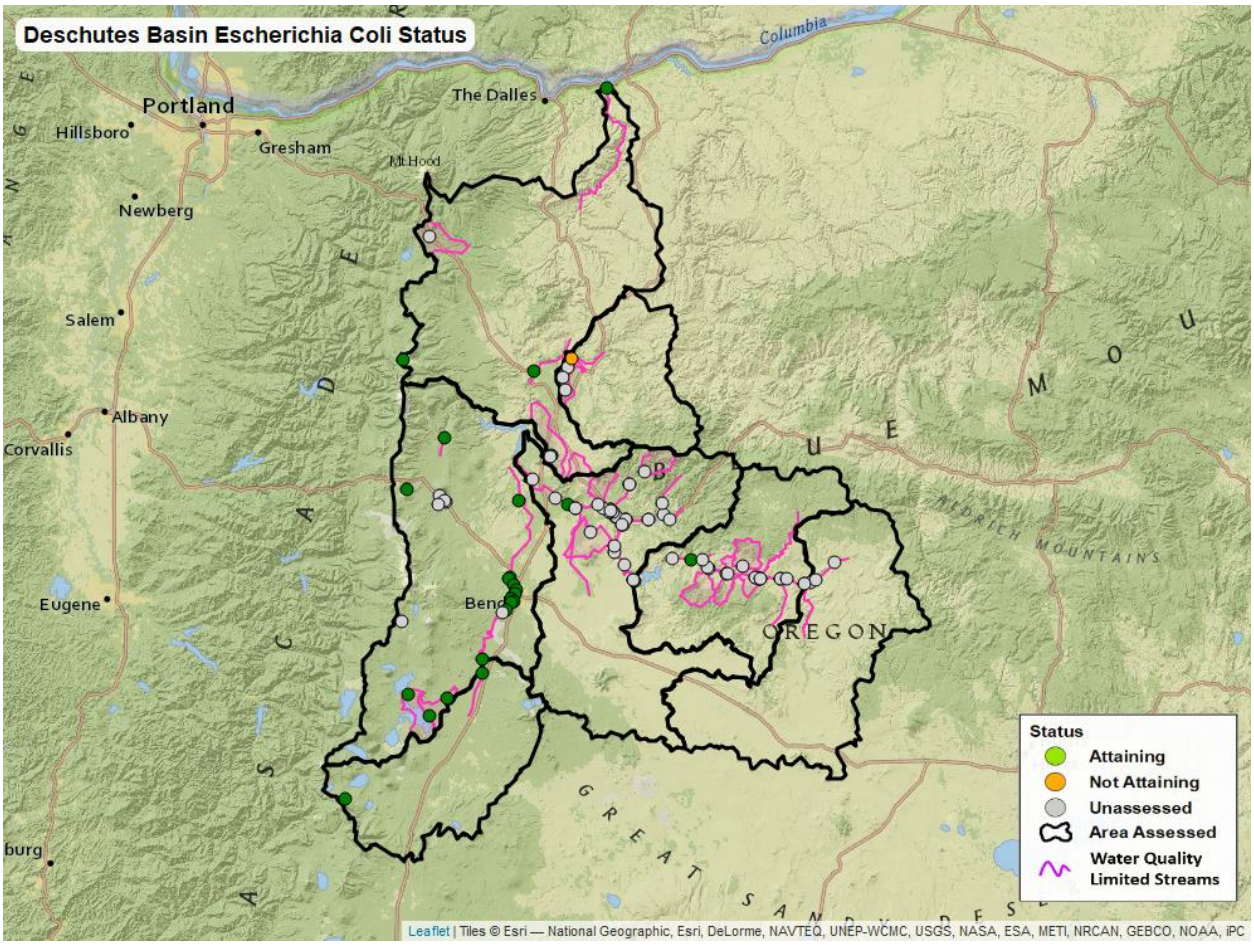

Figure 39: Summary map of the status of *Escherichia coli* across the Deschutes Basin.

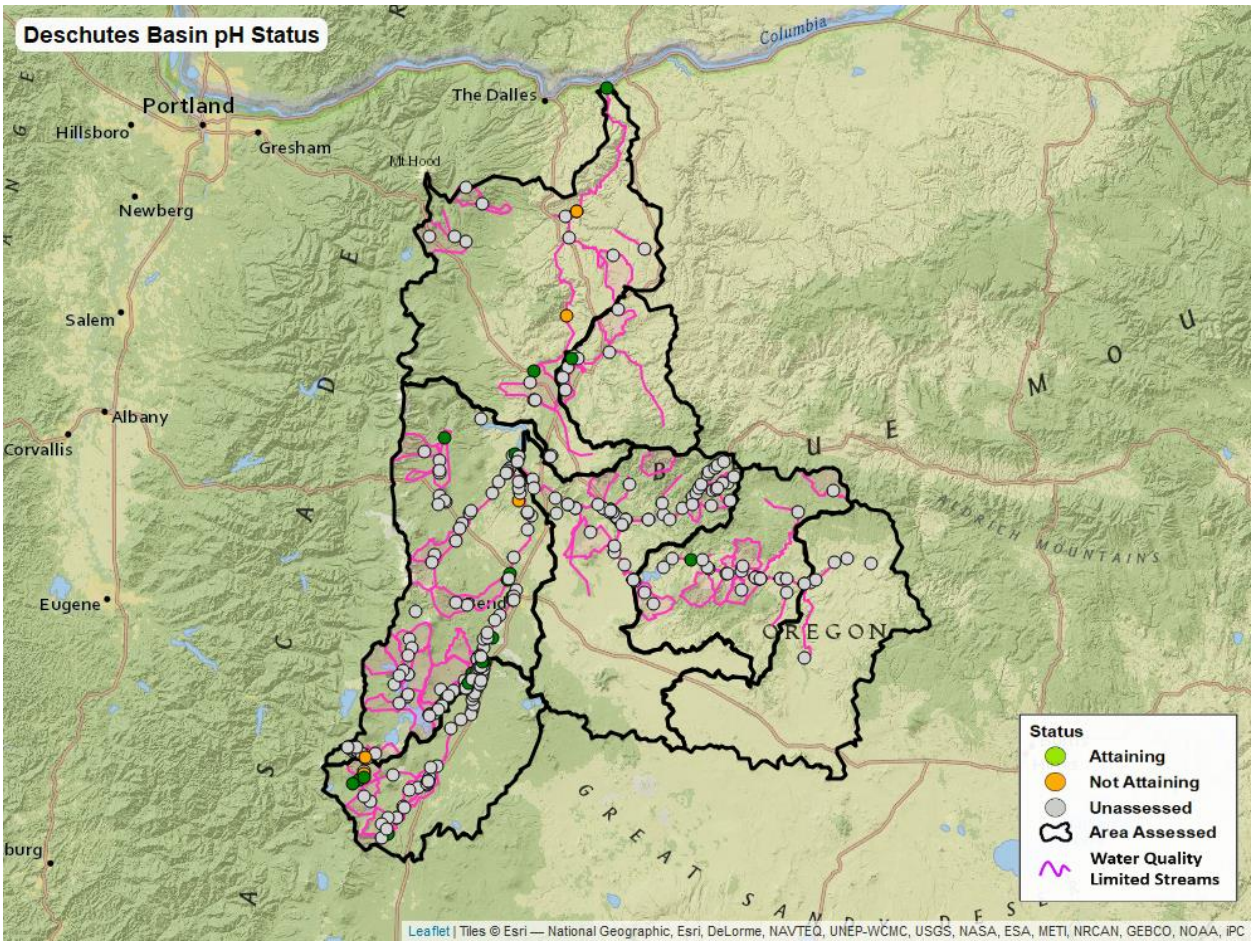

Figure 40: Summary map of the status of pH across the Deschutes Basin.

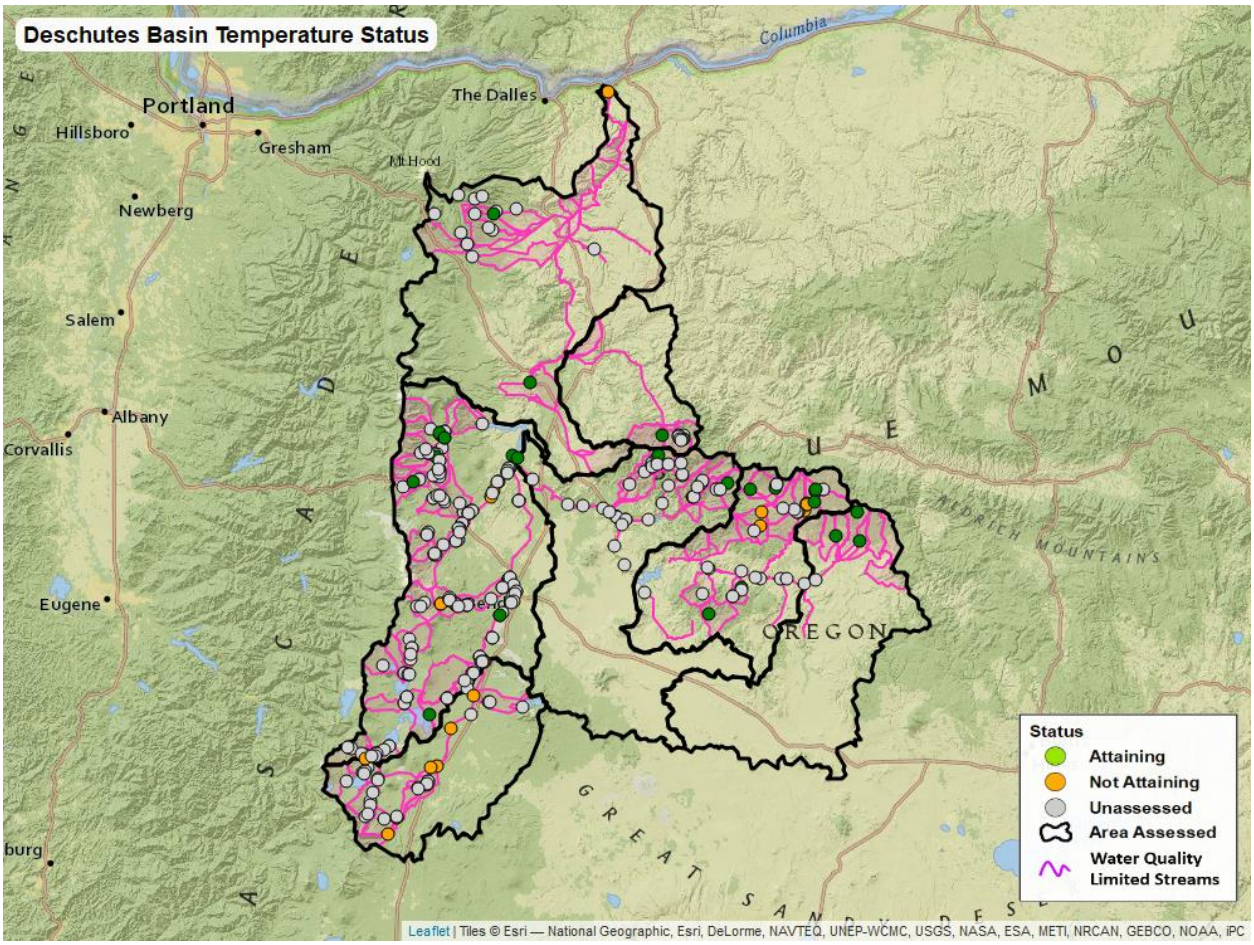

Figure 41: Summary map of the status of temperature across the Deschutes Basin.

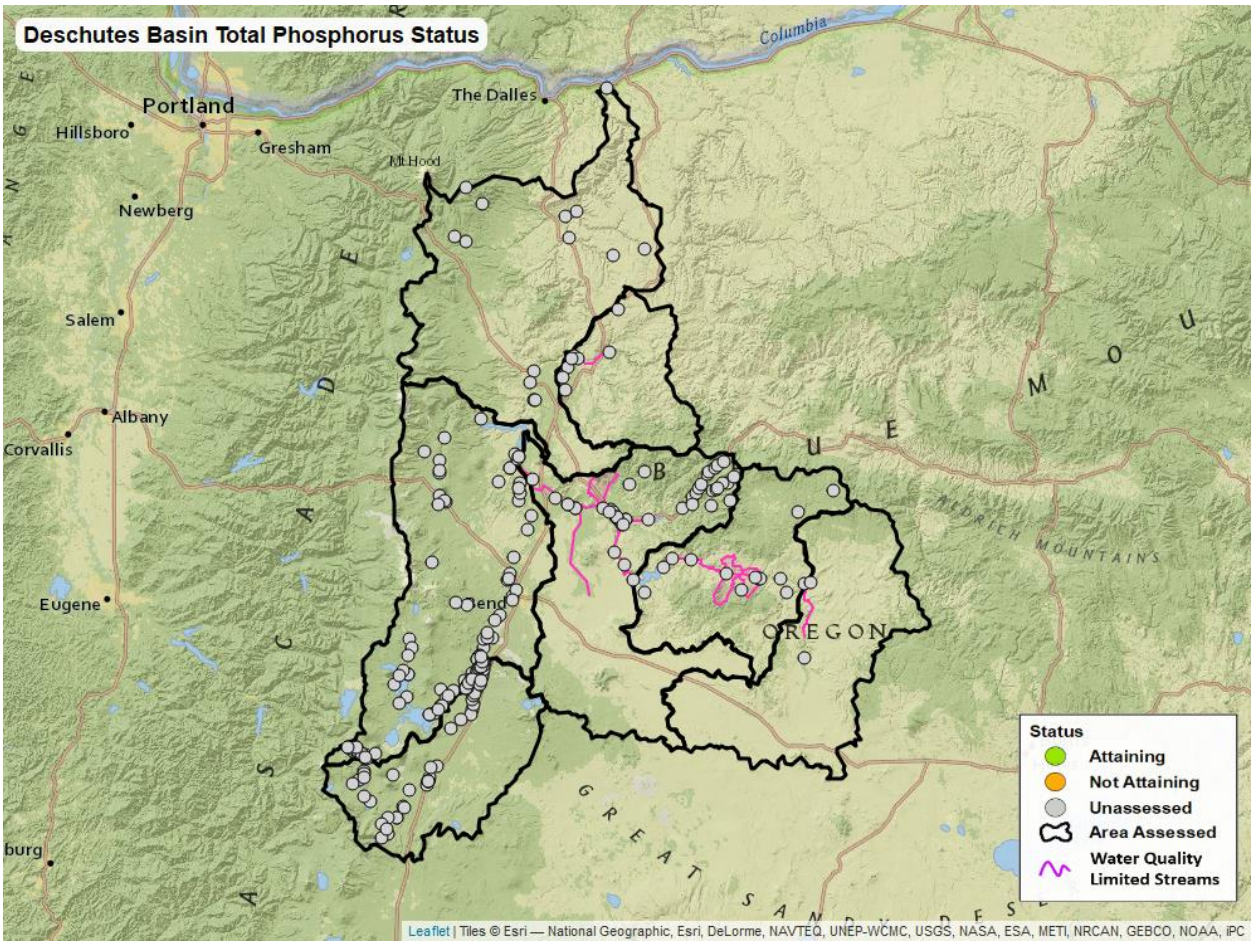

Figure 42: Summary map of the status of total phosphorus across the Deschutes Basin.

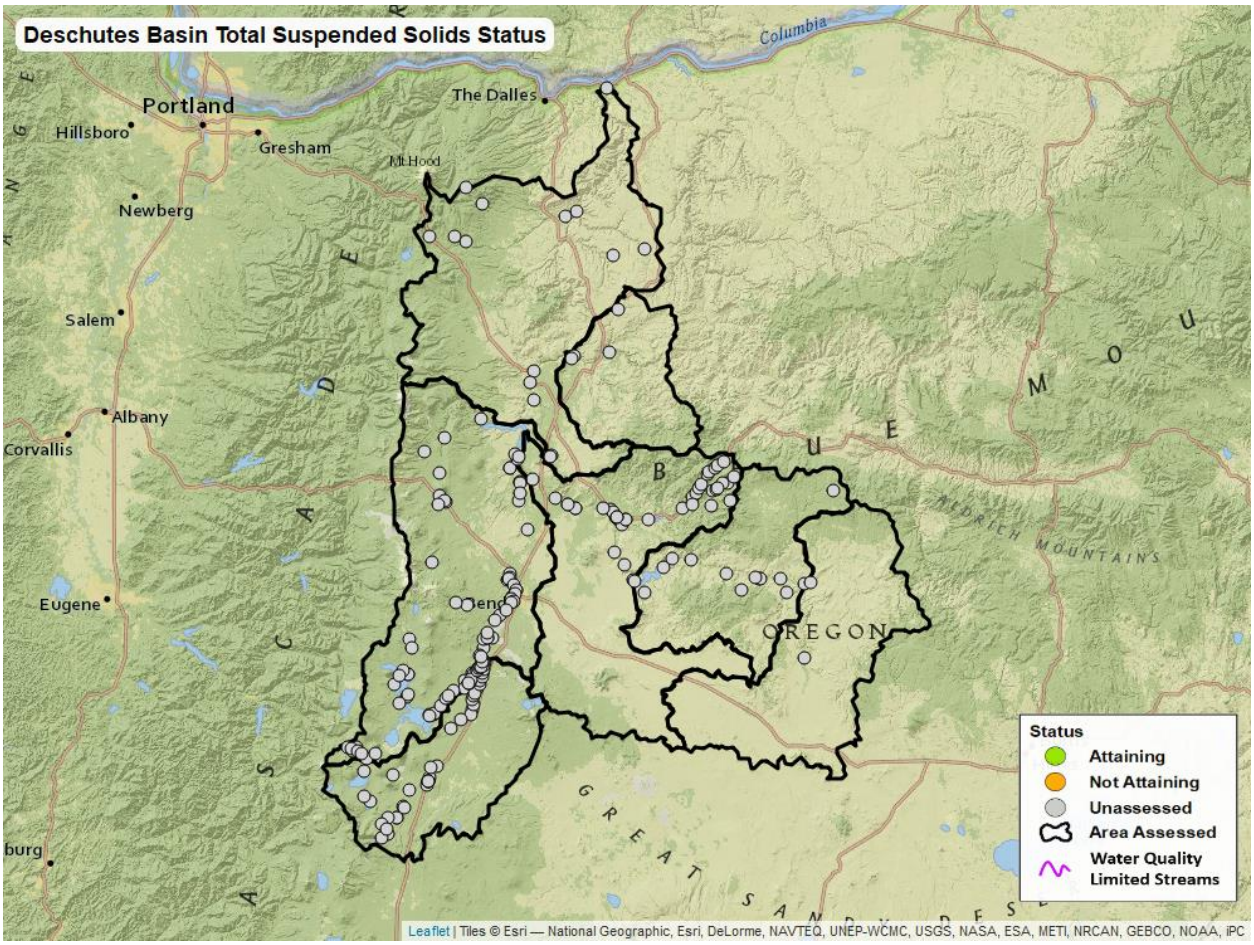

Figure 43: Summary map of the status of total suspended solids across the Deschutes Basin.

4.4.3 Status

There are 147 assessment units within the Deschutes Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 60 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 60: Summary of the 2016–2019 assessment unit status within the Deschutes Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	22	4	76
Escherichia coli	16	1	25
PH	13	7	80
Temperature	25	18	61
Total Phosphorus	0	0	84
Total Suspended Solids	0	0	81

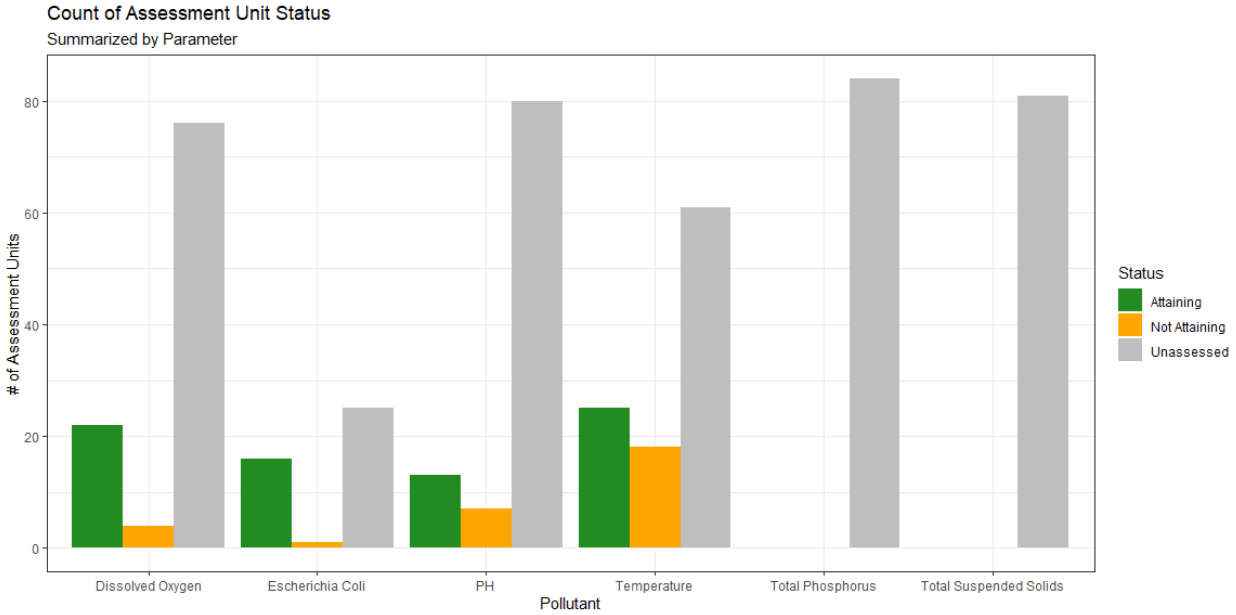

Figure 44: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Deschutes Basin.

Table 61 and Figure 44 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Deschutes Basin for the 2016–2019 status period.

Table 61: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Deschutes Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	1	2	7
Lake	*Escherichia coli*	0	0	2
Lake	PH	1	2	7
Lake	Temperature	1	1	3
Lake	Total Phosphorus	0	0	8
Lake	Total Suspended Solids	0	0	8
Stream	Dissolved Oxygen	12	1	28
Stream	*Escherichia coli*	10	1	14
Stream	PH	8	3	31
Stream	Temperature	3	8	20
Stream	Total Phosphorus	0	0	39
Stream	Total Suspended Solids	0	0	36
Watershed Unit	Dissolved Oxygen	9	1	41
Watershed Unit	*Escherichia coli*	6	0	9
Watershed Unit	PH	4	2	42
Watershed Unit	Temperature	21	9	38
Watershed Unit	Total Phosphorus	0	0	37

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	37

Table 62 and Figure 45 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix C.

Table 62: Summary of the 2016–2019 status at monitoring stations within the Deschutes Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	46	7	236
Escherichia coli	26	1	69
PH	23	10	264
Temperature	31	31	242
Total Phosphorus	0	0	229
Total Suspended Solids	0	0	206

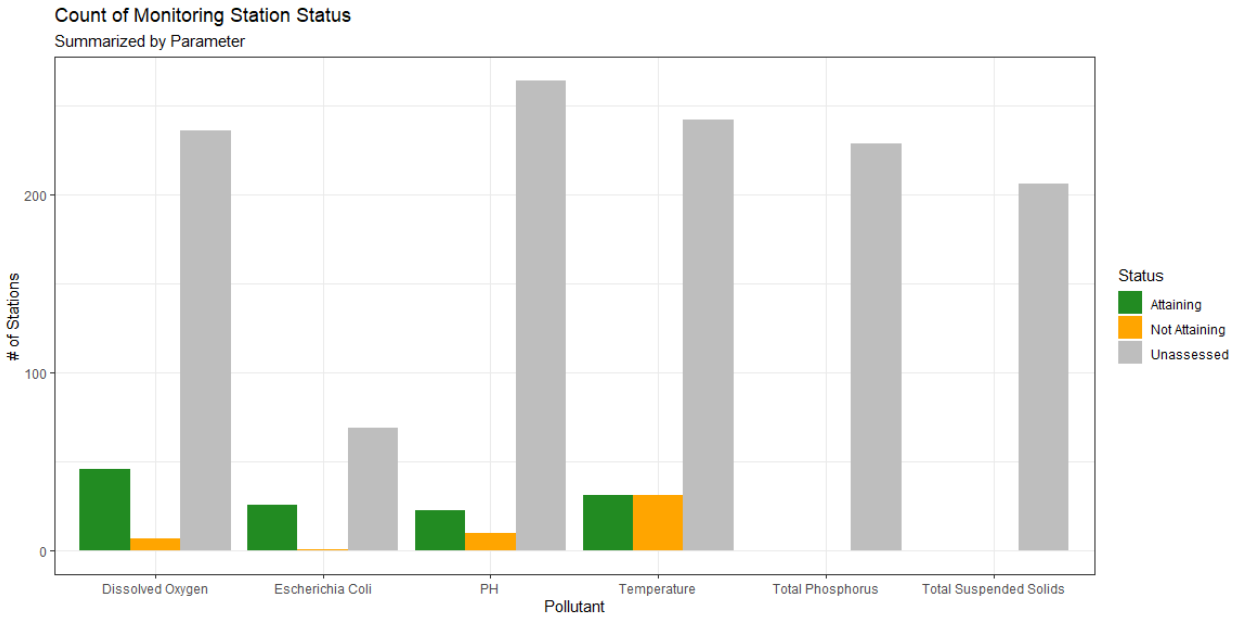

Figure 45: Summary plot of the 2016–2019 station status within the Deschutes Basin by parameter.

4.4.4 Trend

A summary of the trends across parameters is shown in Table 63. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 63: Deschutes Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	5	1	0	9	274

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	4	2	13	77
PH	0	3	4	8	282
Temperature	2	9	0	1	292
Total Phosphorus	1	0	9	1	218
Total Suspended Solids	0	2	2	8	194

4.4.5 Subbasin Summary

4.4.5.1 Lower Deschutes Subbasin

4.4.5.1.1 Water Quality Limited Assessment Units

Table 64: Number of water quality limited assessment units in the Lower Deschutes Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	3

4.4.5.1.2 Status

There are 26 assessment units within the Lower Deschutes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 65 and Figure 46 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 65: Summary of the 2016–2019 assessment unit status within the Lower Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	13
Escherichia coli	4	0	2
PH	2	2	12
Temperature	2	1	10
Total Phosphorus	0	0	12
Total Suspended Solids	0	0	13

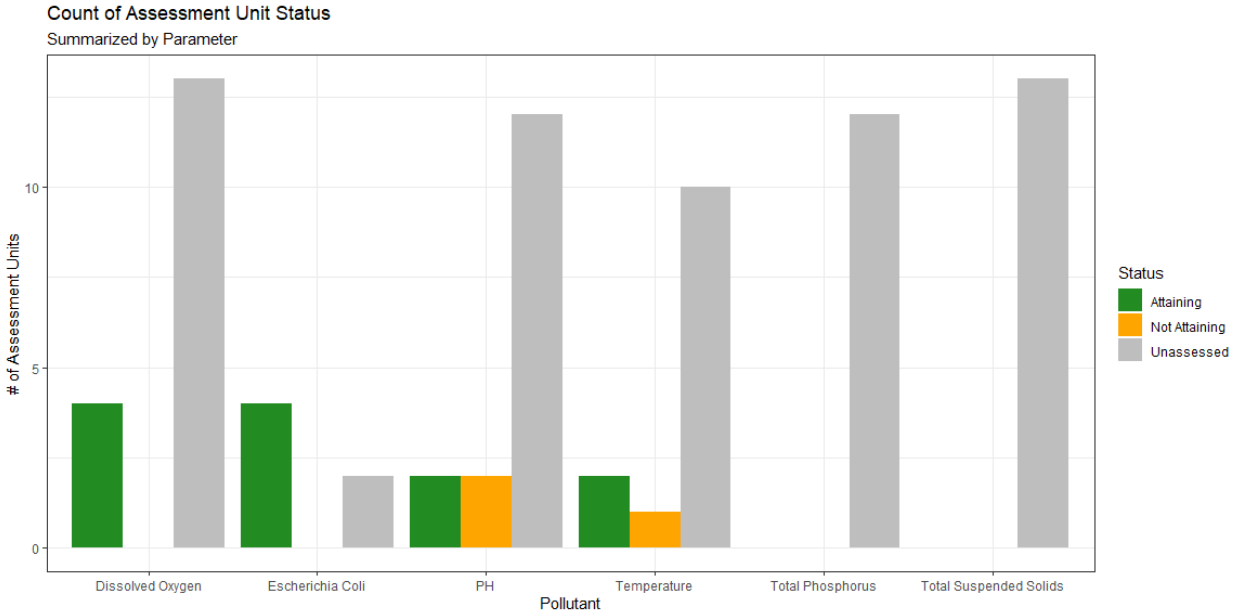

Figure 46: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Deschutes Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 66 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Deschutes Subbasin for the 2016 – 2019 status period.

Table 66: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Deschutes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	3	0	4
Stream	*Escherichia coli*	2	0	0
Stream	PH	2	1	5
Stream	Temperature	0	1	3
Stream	Total Phosphorus	0	0	8
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	1	0	7
Watershed Unit	*Escherichia coli*	2	0	1
Watershed Unit	PH	0	1	5
Watershed Unit	Temperature	2	0	7
Watershed Unit	Total Phosphorus	0	0	3

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	5

There are 38 stations within the Lower Deschutes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 67 and Figure 47 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 67: Summary of the 2016–2019 status at monitoring stations within the Lower Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	16
Escherichia coli	4	0	2
PH	2	2	15
Temperature	2	1	14
Total Phosphorus	0	0	14
Total Suspended Solids	0	0	15

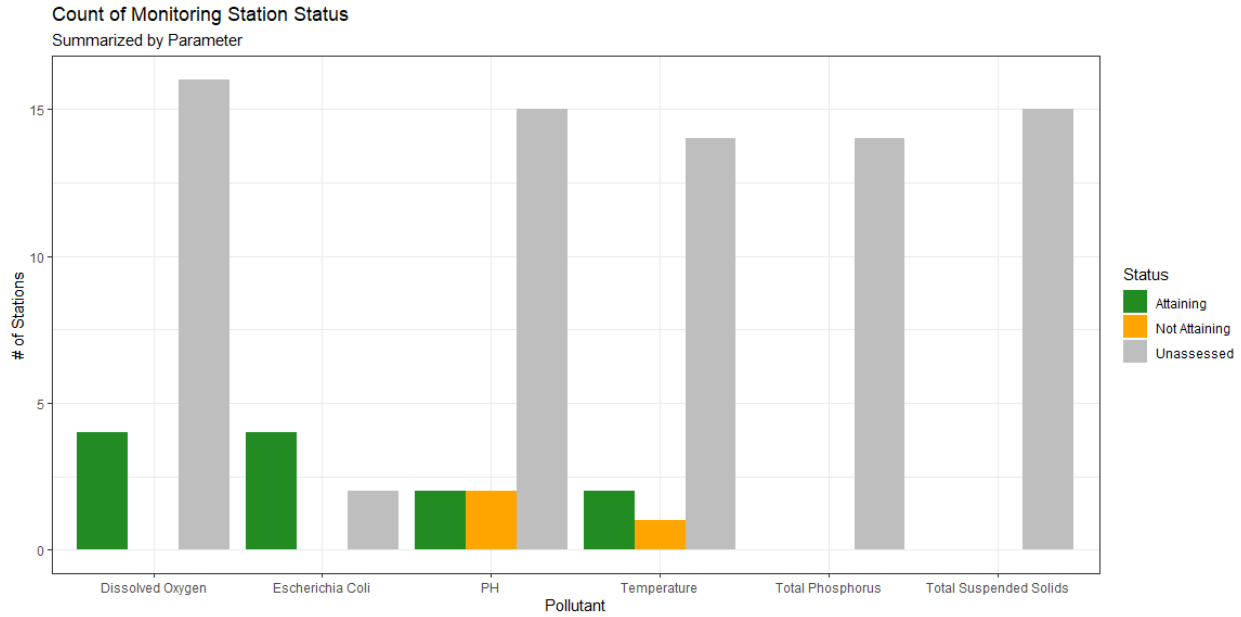

Figure 47: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Deschutes Subbasin.

4.4.5.1.3 Trend

A summary of the trends within parameters is shown in Table 68. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 68: Subbasin Summary of trend results at stations across the Lower Deschutes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	1	16

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	0	0	2	4
PH	0	1	0	3	15
Temperature	0	2	0	0	15
Total Phosphorus	0	0	2	0	12
Total Suspended Solids	0	1	0	1	13

4.4.5.2 Upper Deschutes Subbasin

4.4.5.2.1 Water Quality Limited Assessment Units

Table 69: Number of water quality limited assessment units in the Upper Deschutes Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	7

4.4.5.2.2 Status

There are 46 assessment units within the Upper Deschutes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 70 and Figure 48 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 70: Summary of the 2016–2019 assessment unit status within the Upper Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	10	1	22
Escherichia coli	7	0	2
PH	7	3	21
Temperature	9	5	25
Total Phosphorus	0	0	29
Total Suspended Solids	0	0	29

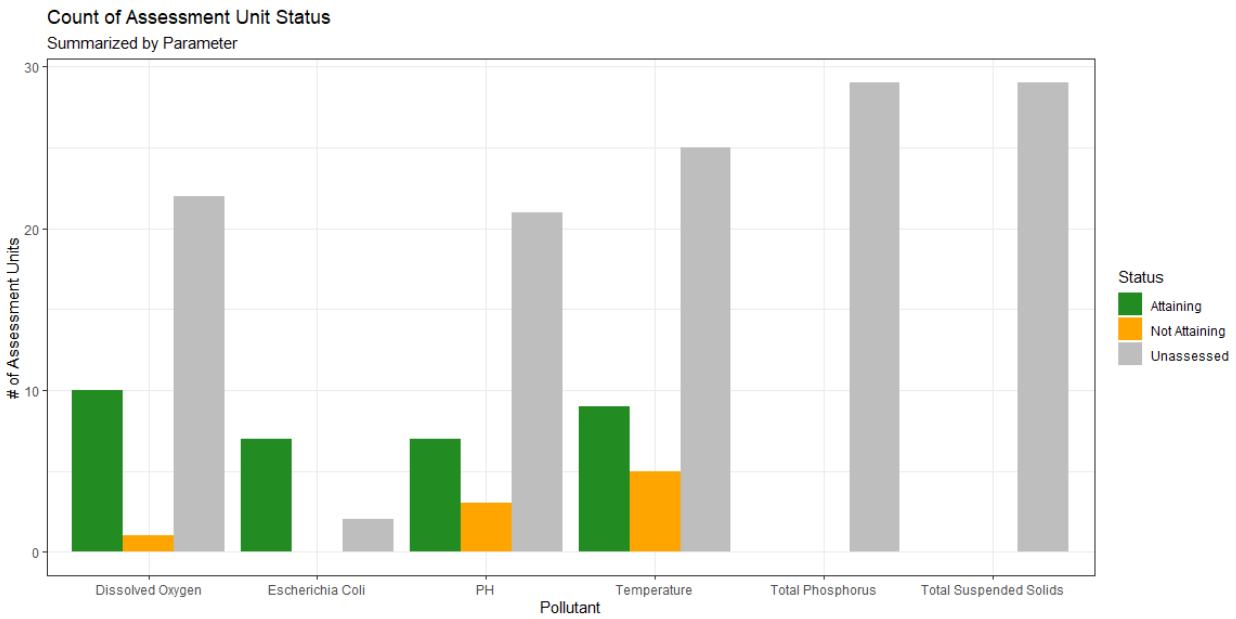

Figure 48: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Deschutes Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 71 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Deschutes Subbasin for the 2016 – 2019 status period.

Table 71: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Deschutes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	1	1	3
Lake	*Escherichia coli*	0	0	1
Lake	PH	1	1	3
Lake	Temperature	0	1	2
Lake	Total Phosphorus	0	0	4
Lake	Total Suspended Solids	0	0	4
Stream	Dissolved Oxygen	4	0	3
Stream	*Escherichia coli*	4	0	0
Stream	PH	3	1	3
Stream	Temperature	3	2	2
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	5	0	16
Watershed Unit	*Escherichia coli*	3	0	1
Watershed Unit	PH	3	1	15
Watershed Unit	Temperature	6	2	21

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	18
Watershed Unit	Total Suspended Solids	0	0	18

There are 274 stations within the Upper Deschutes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 72 and Figure 49 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 72: Summary of the 2016–2019 status at monitoring stations within the Upper Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	23	1	93
Escherichia coli	17	0	6
PH	13	6	99
Temperature	15	11	139
Total Phosphorus	0	0	97
Total Suspended Solids	0	0	87

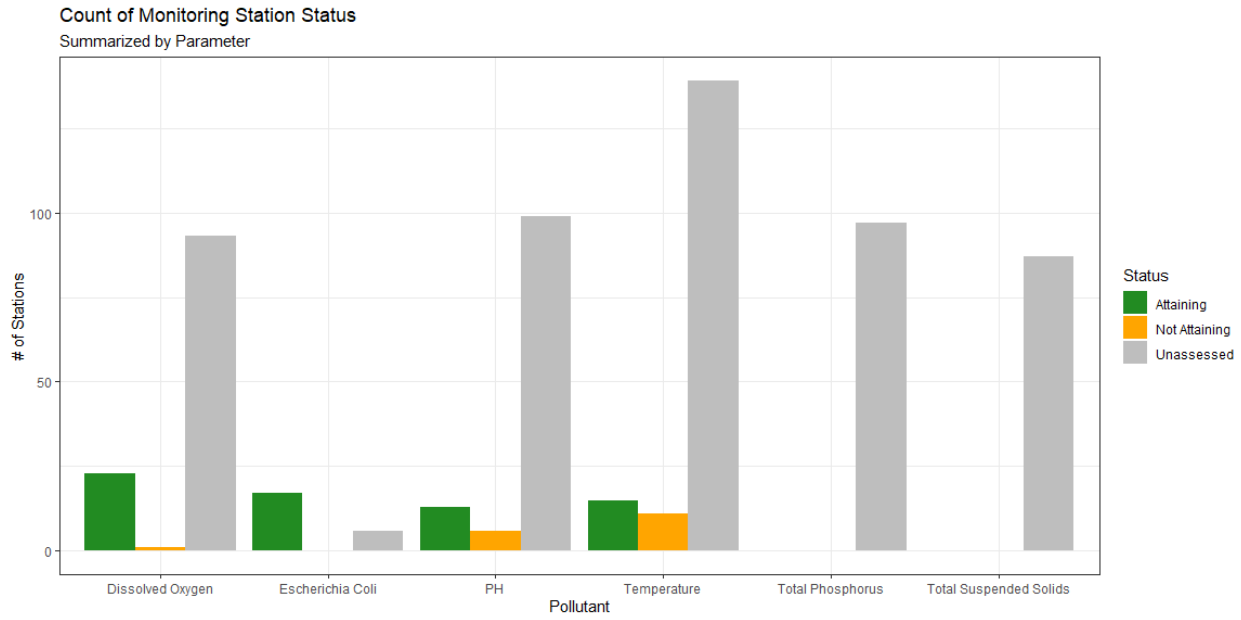

Figure 49: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Deschutes Subbasin.

4.4.5.2.3 Trend

A summary of the trends within parameters is shown in Table 73. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 73: Subbasin Summary of trend results at stations across the Upper Deschutes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	0	0	3	112
Escherichia coli	0	2	2	9	10
PH	0	1	2	2	113
Temperature	2	6	0	1	156
Total Phosphorus	0	0	5	0	92
Total Suspended Solids	0	1	2	2	82

4.4.5.3 Lower Crooked Subbasin

4.4.5.3.1 Water Quality Limited Assessment Units

Table 74: Number of water quality limited assessment units in the Lower Crooked Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	1
pH	3
Total Phosphorus, mixed forms	6

4.4.5.3.2 Status

There are 21 assessment units within the Lower Crooked Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 75 and Figure 50 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 75: Summary of the 2016–2019 assessment unit status within the Lower Crooked Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	17
Escherichia coli	2	0	9
PH	0	1	17
Temperature	3	2	8
Total Phosphorus	0	0	15
Total Suspended Solids	0	0	14

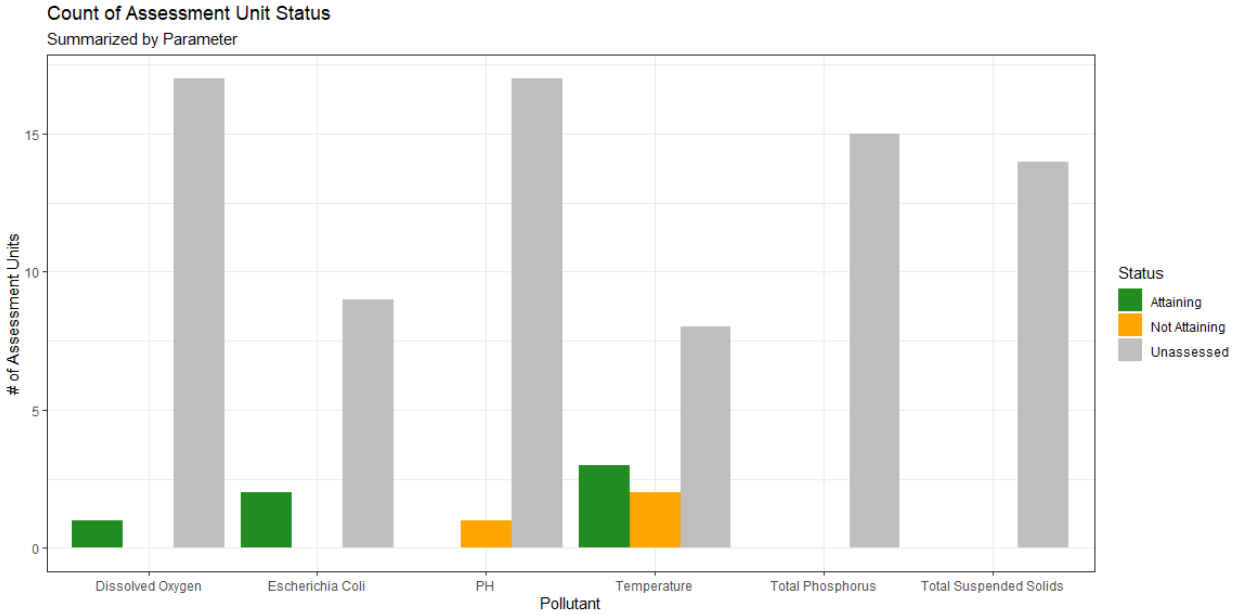

Figure 50: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Crooked Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 76 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Crooked Subbasin for the 2016 – 2019 status period.

Table 76: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Crooked Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Temperature	1	0	0
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	1	0	9
Stream	*Escherichia coli*	2	0	6
Stream	PH	0	1	9
Stream	Temperature	0	1	6
Stream	Total Phosphorus	0	0	9
Stream	Total Suspended Solids	0	0	9
Watershed Unit	Dissolved Oxygen	0	0	7
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	7
Watershed Unit	Temperature	2	1	2
Watershed Unit	Total Phosphorus	0	0	5

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	4

There are 102 stations within the Lower Crooked Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 77 and Figure 51 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 77: Summary of the 2016–2019 status at monitoring stations within the Lower Crooked Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	65
Escherichia coli	2	0	37
PH	0	1	68
Temperature	3	2	36
Total Phosphorus	0	0	48
Total Suspended Solids	0	0	45

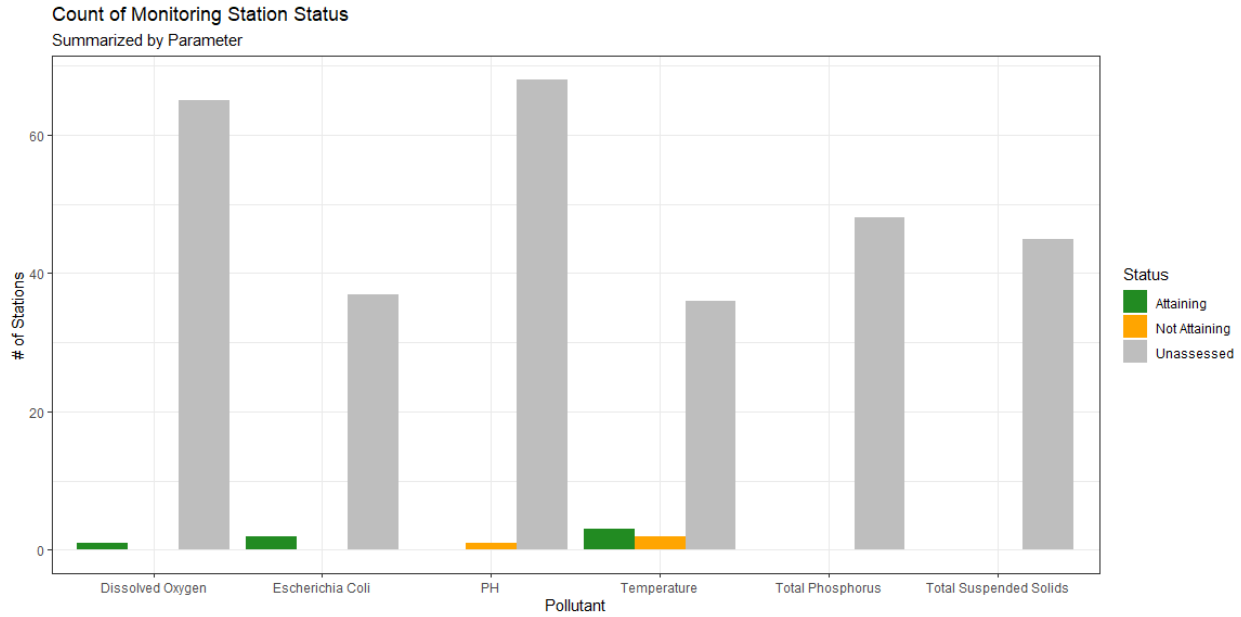

Figure 51: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Crooked Subbasin.

4.4.5.3.3 Trend

A summary of the trends within parameters is shown in Table 78. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 78: Subbasin Summary of trend results at stations across the Lower Crooked.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	64

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	0	0	2	37
PH	0	1	0	1	67
Temperature	0	1	0	0	40
Total Phosphorus	1	0	0	0	47
Total Suspended Solids	0	0	0	2	43

4.4.5.4 Little Deschutes Subbasin

4.4.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.4.5.4.2 Status

There are 16 assessment units within the Little Deschutes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 79 and Figure 52 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 79: Summary of the 2016–2019 assessment unit status within the Little Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	3	3
Escherichia coli	3	0	0
PH	3	1	8
Temperature	0	6	8
Total Phosphorus	0	0	12
Total Suspended Solids	0	0	11

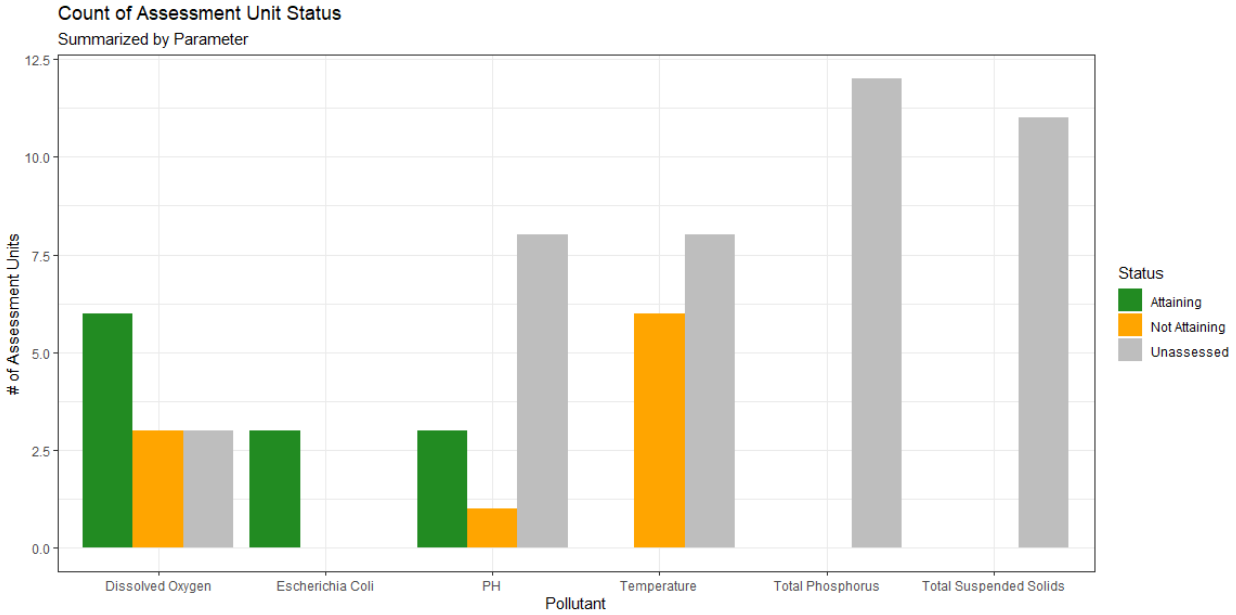

Figure 52: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Little Deschutes Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 80 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Little Deschutes Subbasin for the 2016 – 2019 status period.

Table 80: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Little Deschutes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	1	1
Lake	PH	0	1	1
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	3	1	0
Stream	*Escherichia coli*	2	0	0
Stream	PH	2	0	2
Stream	Temperature	0	3	1
Stream	Total Phosphorus	0	0	4
Stream	Total Suspended Solids	0	0	4
Watershed Unit	Dissolved Oxygen	3	1	2
Watershed Unit	*Escherichia coli*	1	0	0
Watershed Unit	PH	1	0	5
Watershed Unit	Temperature	0	3	6
Watershed Unit	Total Phosphorus	0	0	6

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	6

There are 69 stations within the Little Deschutes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 81 and Figure 53 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 81: Summary of the 2016–2019 status at monitoring stations within the Little Deschutes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	16	6	27
Escherichia coli	2	0	0
PH	6	1	42
Temperature	0	10	24
Total Phosphorus	0	0	46
Total Suspended Solids	0	0	40

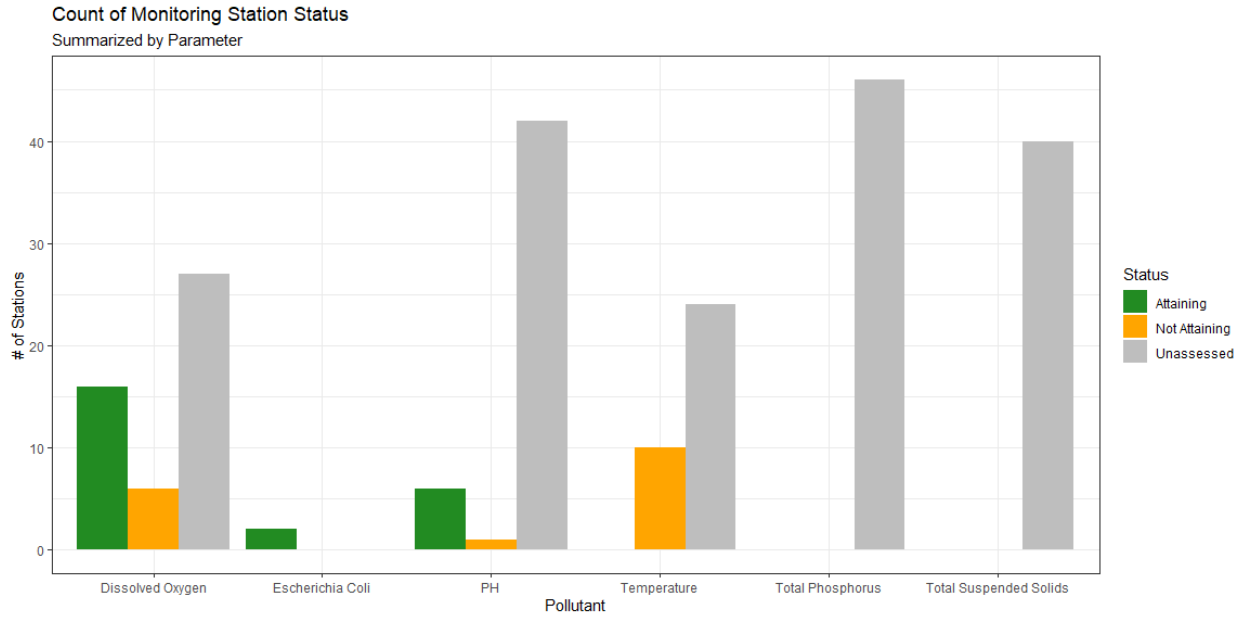

Figure 53: The number of stations in each status category by parameter for the 2016–2019 status period within the Little Deschutes Subbasin.

4.4.5.4.3 Trend

A summary of the trends within parameters is shown in Table 82. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 82: Subbasin Summary of trend results at stations across the Little Deschutes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	1	47

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	1	0	0	1
PH	0	0	1	1	47
Temperature	0	0	0	0	34
Total Phosphorus	0	0	1	0	45
Total Suspended Solids	0	0	0	1	39

4.4.5.5 Upper Crooked Subbasin

4.4.5.5.1 Water Quality Limited Assessment Units

Table 83: Number of water quality limited assessment units in the Upper Crooked Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	4
Total Phosphorus, mixed forms	2

4.4.5.5.2 Status

There are 24 assessment units within the Upper Crooked Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 84 and Figure 54 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 84: Summary of the 2016–2019 assessment unit status within the Upper Crooked Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	15
Escherichia coli	1	0	9
PH	1	0	15
Temperature	6	4	8
Total Phosphorus	0	0	10
Total Suspended Solids	0	0	9

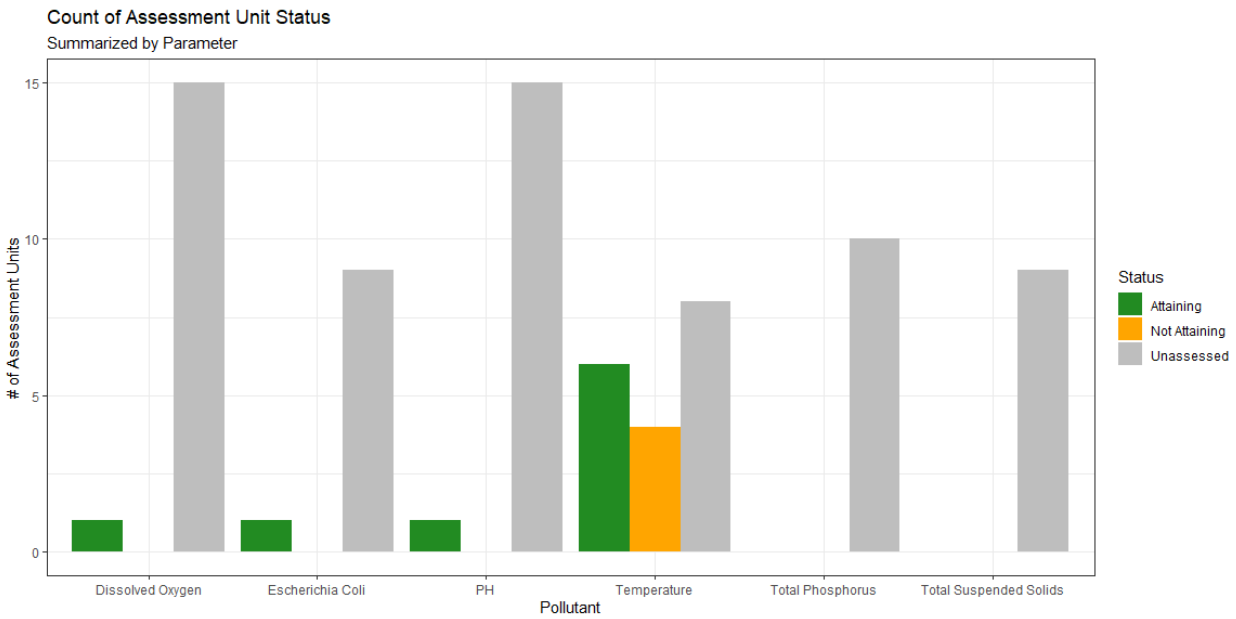

Figure 54: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Crooked Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 85 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Crooked Subbasin for the 2016 – 2019 status period.

Table 85: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Crooked Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	8
Stream	*Escherichia coli*	1	0	6
Stream	PH	1	0	8
Stream	Temperature	0	1	7
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	7
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	7
Watershed Unit	Temperature	6	3	1
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	3

There are 56 stations within the Upper Crooked Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 86 and Figure 55 summarizes

the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 86: Summary of the 2016–2019 status at monitoring stations within the Upper Crooked Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	24
Escherichia coli	1	0	16
PH	1	0	25
Temperature	6	7	22
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	12

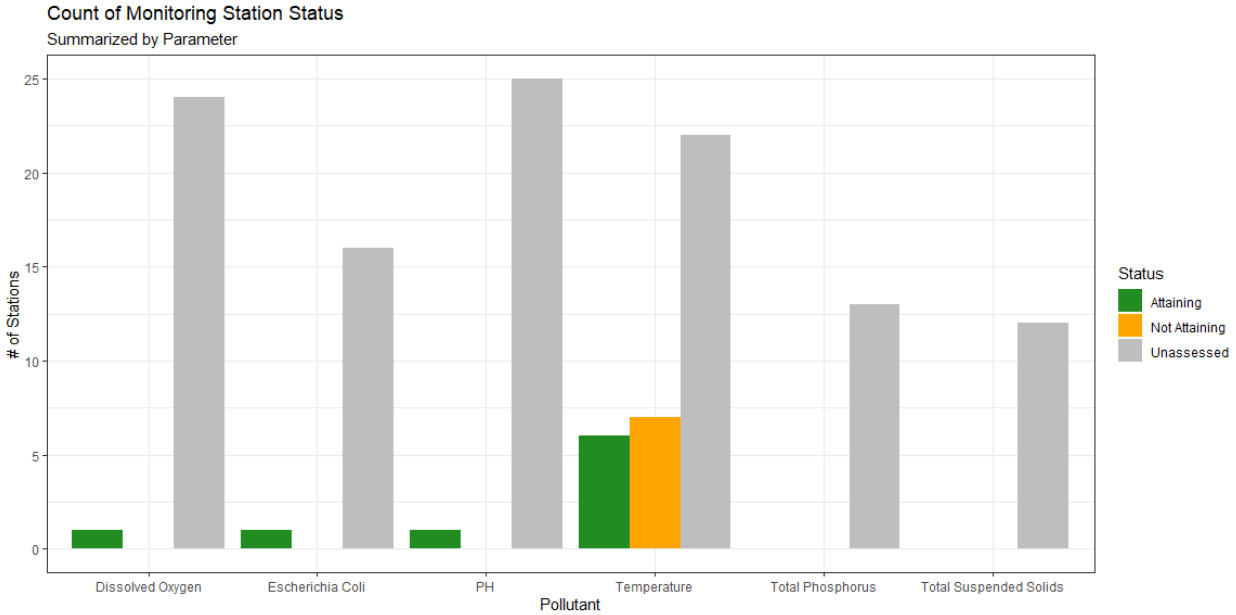

Figure 55: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Crooked Subbasin.

4.4.5.5.3 Trend

A summary of the trends within parameters is shown in Table 87. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 87: Subbasin Summary of trend results at stations across the Upper Crooked.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	24
Escherichia coli	0	1	0	0	16
PH	0	0	1	0	25
Temperature	0	0	0	0	35
Total Phosphorus	0	0	1	0	12

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	0	1	11

4.4.5.6 Beaver-South Fork Subbasin

4.4.5.6.1 Water Quality Limited Assessment Units

Table 88: Number of water quality limited assessment units in the Beaver-South Fork Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	1
Total Phosphorus, mixed forms	1

4.4.5.6.2 Status

There are 8 assessment units within the Beaver-South Fork Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 89 and Figure 56 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 89: Summary of the 2016–2019 assessment unit status within the Beaver-South Fork Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	4
Escherichia coli	0	0	2
PH	0	0	4
Temperature	3	0	2
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

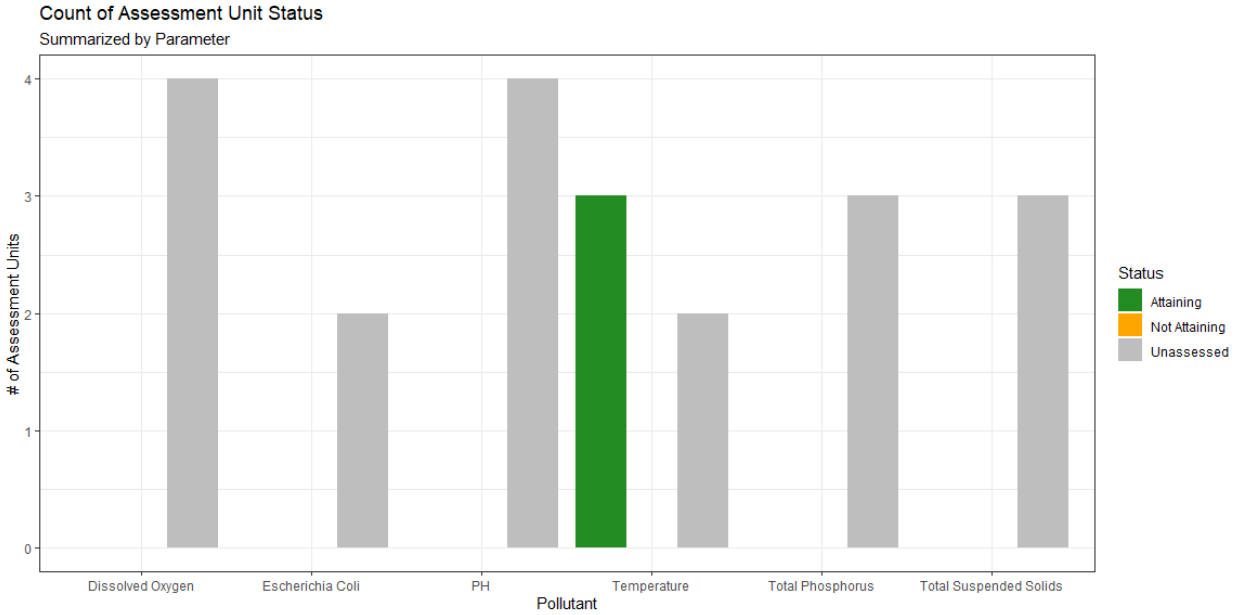

Figure 56: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Beaver-South Fork Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 90 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Beaver-South Fork Subbasin for the 2016 – 2019 status period.

Table 90: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Beaver-South Fork Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	3
Stream	*Escherichia coli*	0	0	2
Stream	PH	0	0	3
Stream	Temperature	0	0	2
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	3
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	PH	0	0	1
Watershed Unit	Temperature	3	0	0

There are 13 stations within the Beaver-South Fork Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 91 and Figure 57 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 91: Summary of the 2016–2019 status at monitoring stations within the Beaver-South Fork Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	7
Escherichia coli	0	0	5
PH	0	0	8
Temperature	3	0	2
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

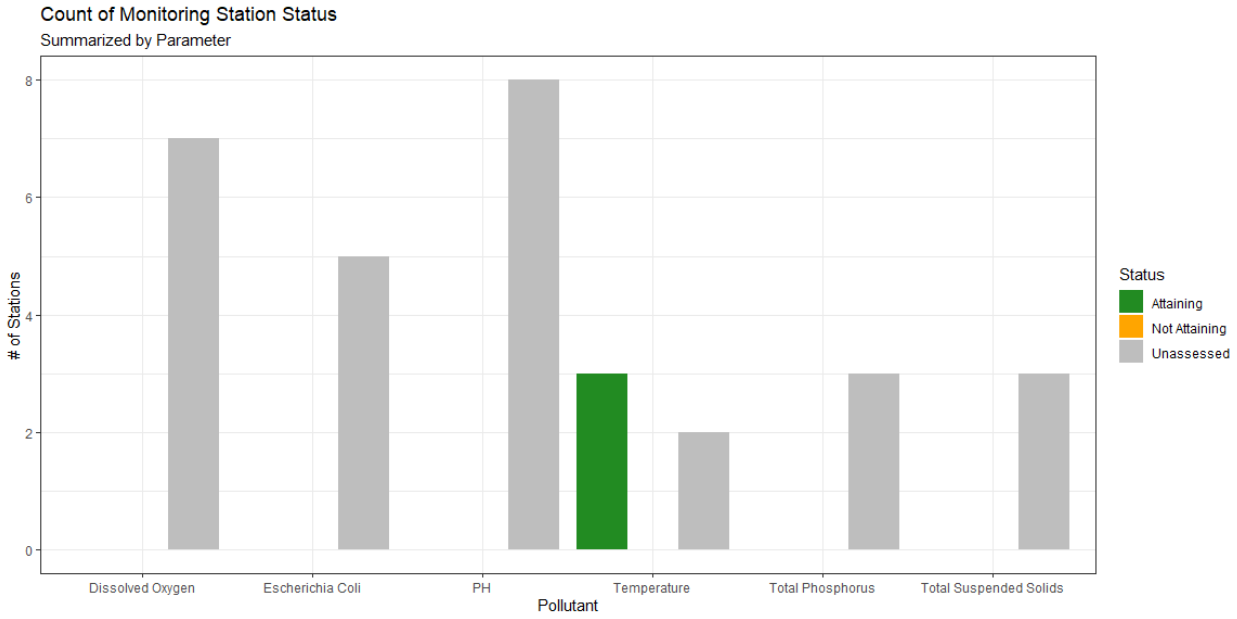

Figure 57: The number of stations in each status category by parameter for the 2016–2019 status period within the Beaver-South Fork Subbasin.

4.4.5.6.3 Trend

A summary of the trends within parameters is shown in Table 92. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 92: Subbasin Summary of trend results at stations across the Beaver-South Fork.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	7
Escherichia coli	0	0	0	0	5
PH	0	0	0	0	8
Temperature	0	0	0	0	5
Total Phosphorus	0	0	0	0	3
Total Suspended Solids	0	0	0	0	3

4.4.5.7 Trout Subbasin

4.4.5.7.1 Water Quality Limited Assessment Units

Table 93: Number of water quality limited assessment units in the Trout Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	1

4.4.5.7.2 Status

There are 7 assessment units within the Trout Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 94 and Figure 58 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 94: Summary of the 2016–2019 assessment unit status within the Trout Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	0	1	1
PH	1	0	3
Temperature	2	0	1
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	3

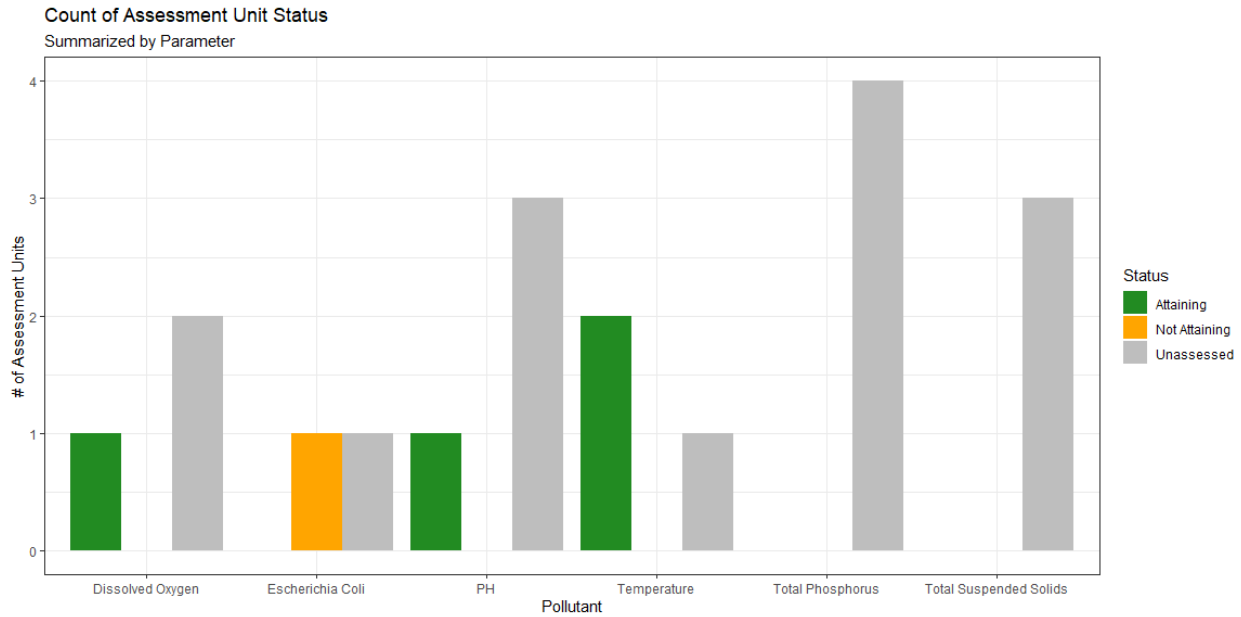

Figure 58: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Trout Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 95 summarizes of the number of attaining, not attaining, and unassessed

assessment units by parameter and assessment unit type within the Trout Subbasin for the 2016 – 2019 status period.

Table 95: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Trout Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	0	1	0
Stream	PH	1	0	1
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	2	0	1
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	1

There are 15 stations within the Trout Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix C**. Table 96 and Figure 59 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 96: Summary of the 2016–2019 status at monitoring stations within the Trout Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	4
Escherichia coli	0	1	3
PH	1	0	7
Temperature	2	0	5
Total Phosphorus	0	0	8
Total Suspended Solids	0	0	4

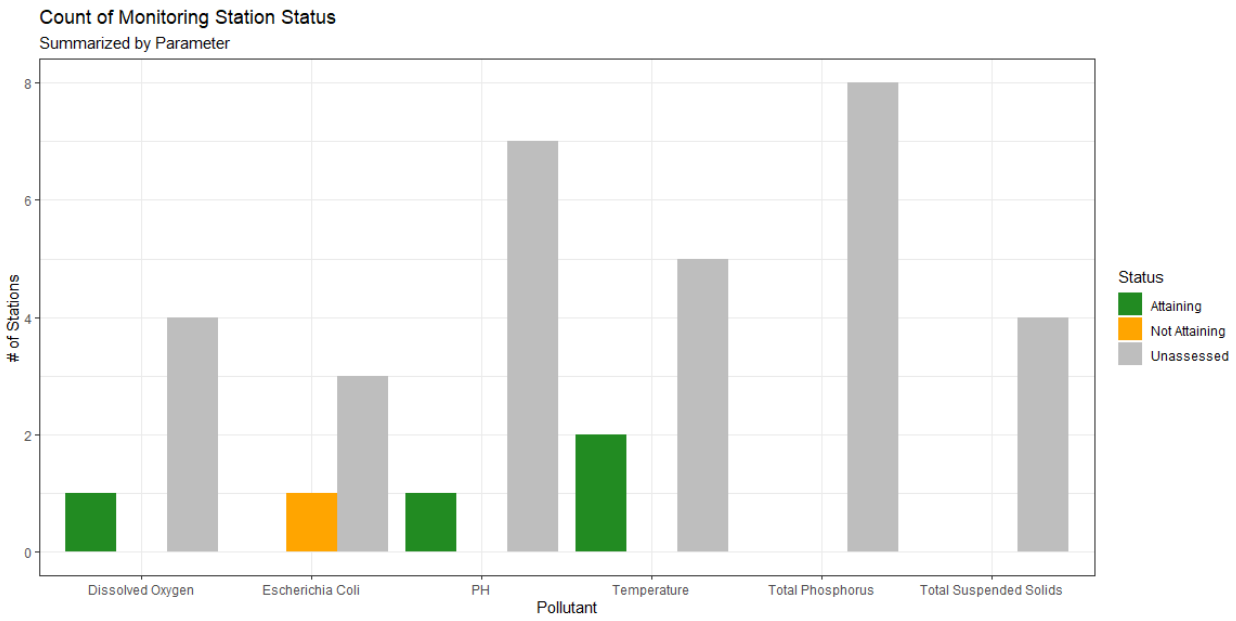

Figure 59: The number of stations in each status category by parameter for the 2016–2019 status period within the Trout Subbasin.

4.4.5.7.3 Trend

A summary of the trends within parameters is shown in Table 97. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 97: Subbasin Summary of trend results at stations across the Trout.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	4
Escherichia coli	0	0	0	0	4
PH	0	0	0	1	7
Temperature	0	0	0	0	7
Total Phosphorus	0	0	0	1	7
Total Suspended Solids	0	0	0	1	3

4.5 Goose Lake

A summary of status and trend results for the Goose Lake and all subbasins within the Goose Lake are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix D**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Goose Lake are water quality limited for 1 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 26 stations within the Goose Lake. These stations were located across 14 assessment units consisting of 'Watershed Units' and 'Streams'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.5.1 Land Use

Table 98: Land use within the Goose Lake Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Goose Lake	1877	1.1	39.7	10.5	40.3	8.4

4.5.2 Parameter Maps

The maps in Figure 60 through Figure 65 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

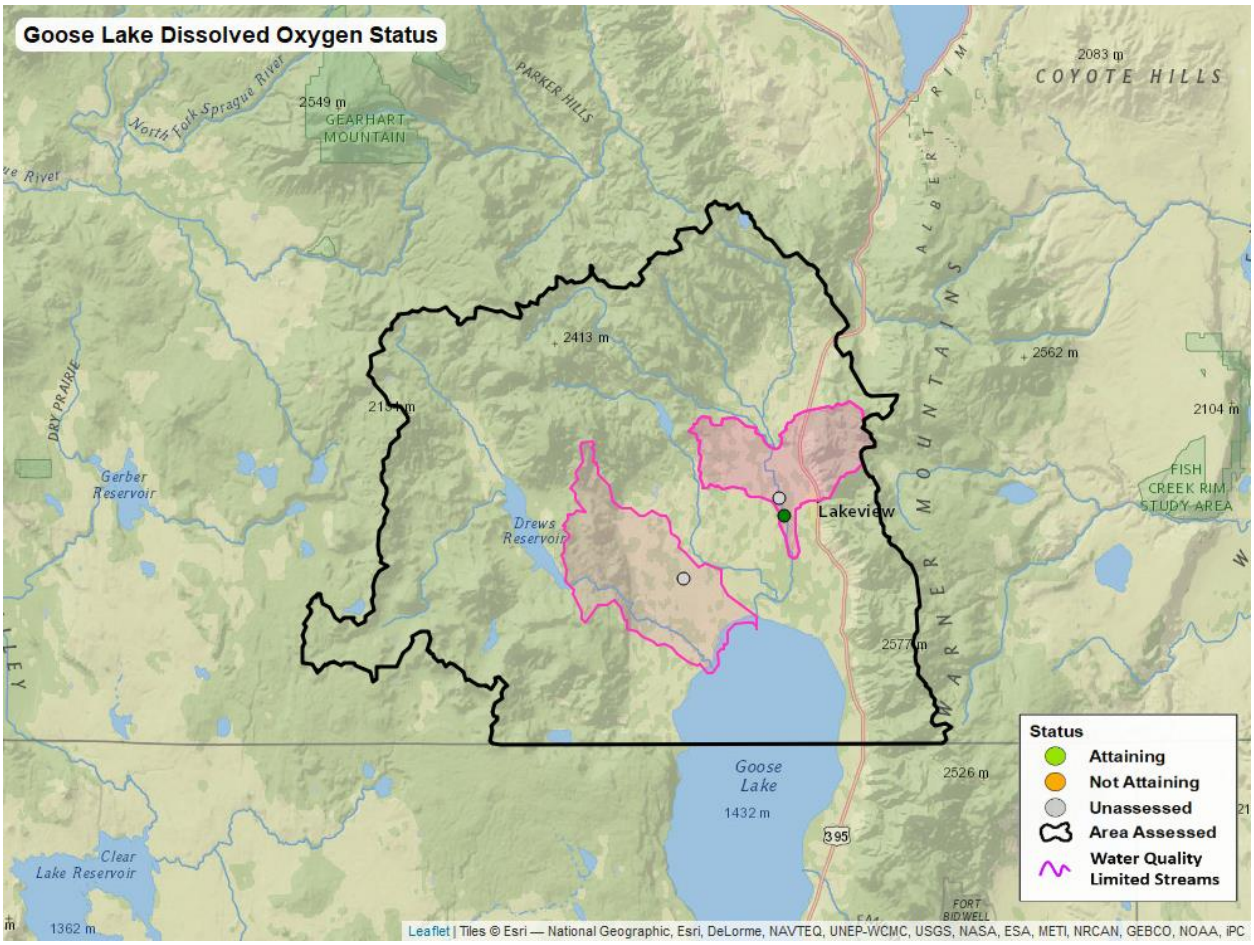

Figure 60: Summary map of the status of dissolved oxygen across the Goose Lake.

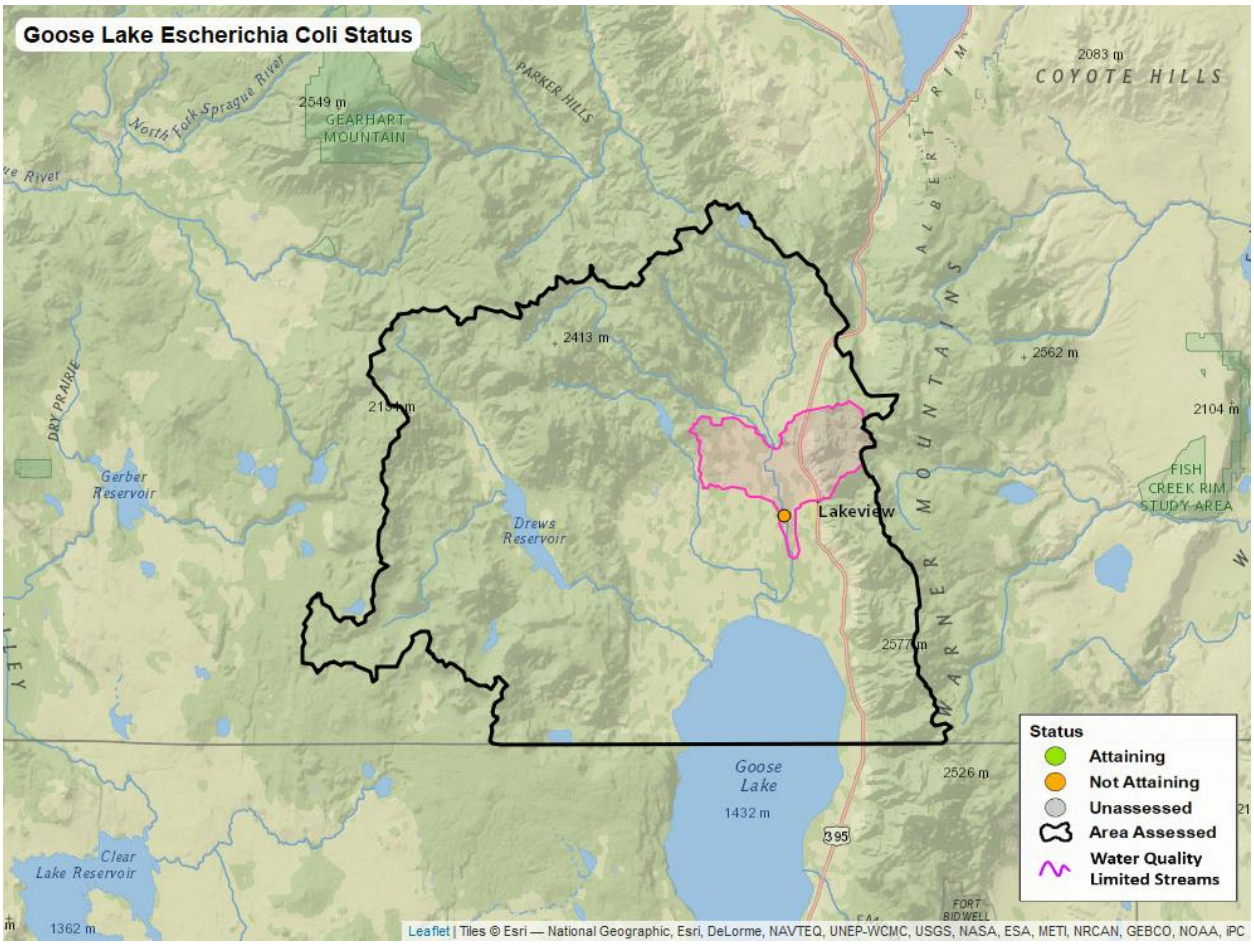

Figure 61: Summary map of the status of *Escherichia coli* across the Goose Lake.

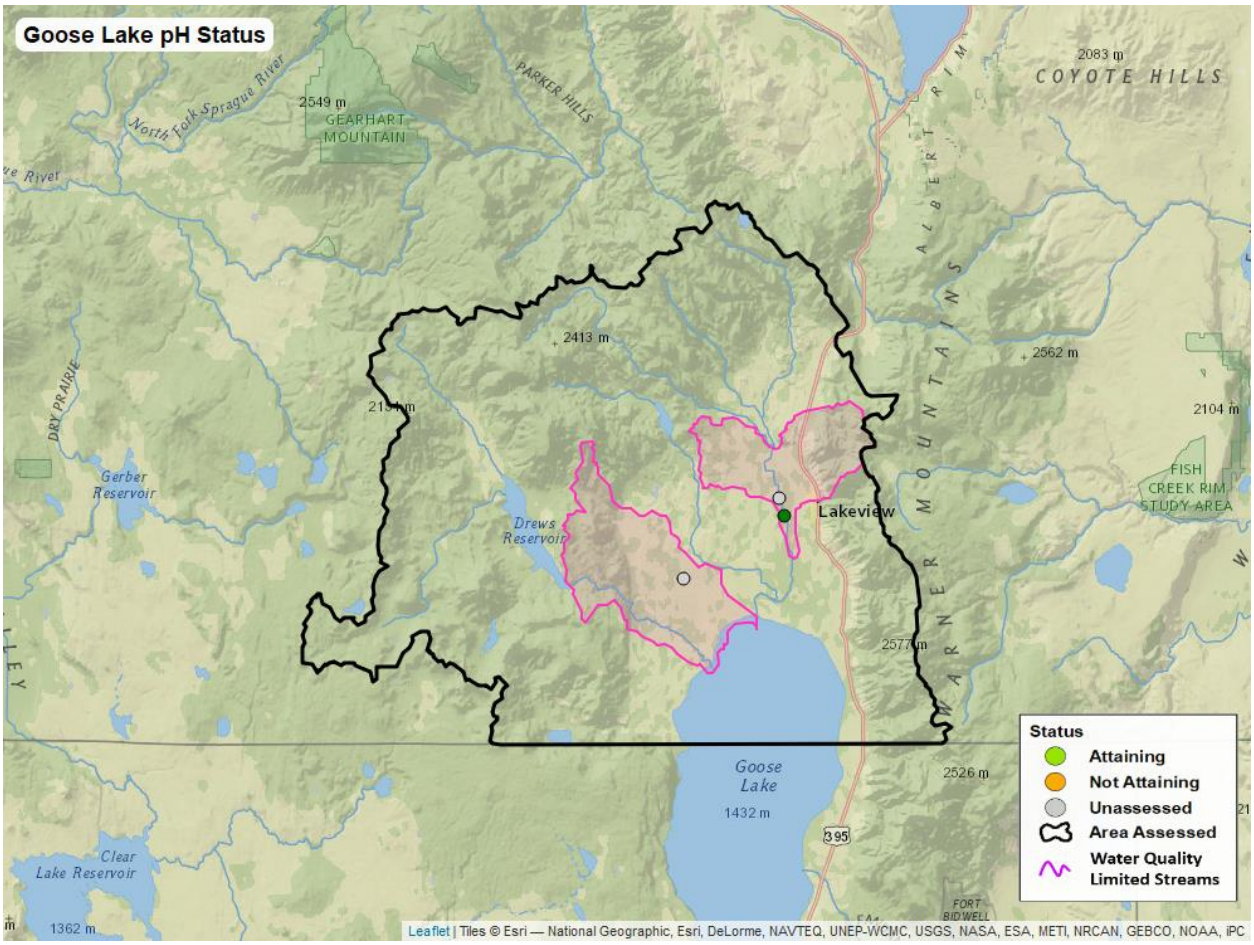

Figure 62: Summary map of the status of pH across the Goose Lake.

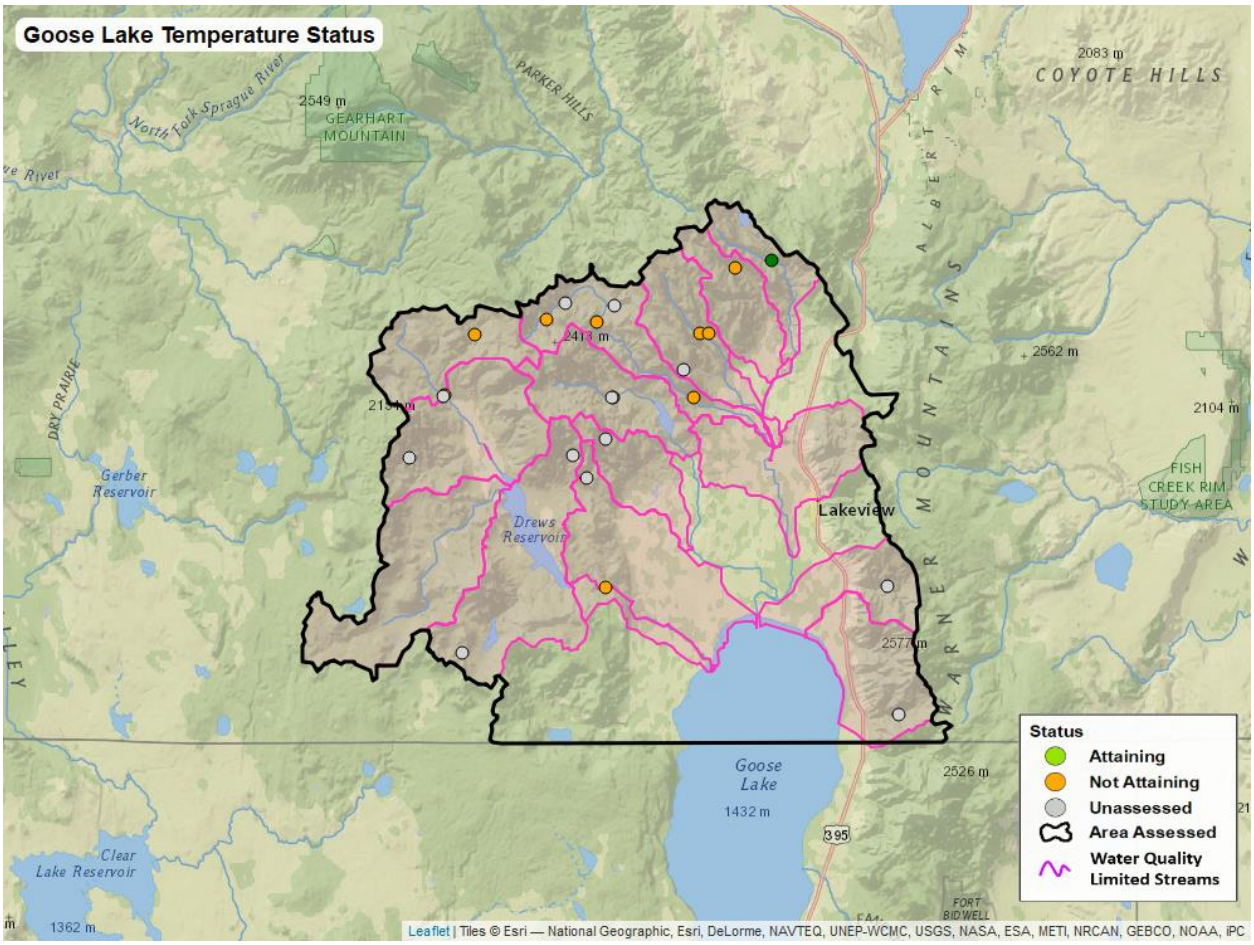

Figure 63: Summary map of the status of temperature across the Goose Lake.

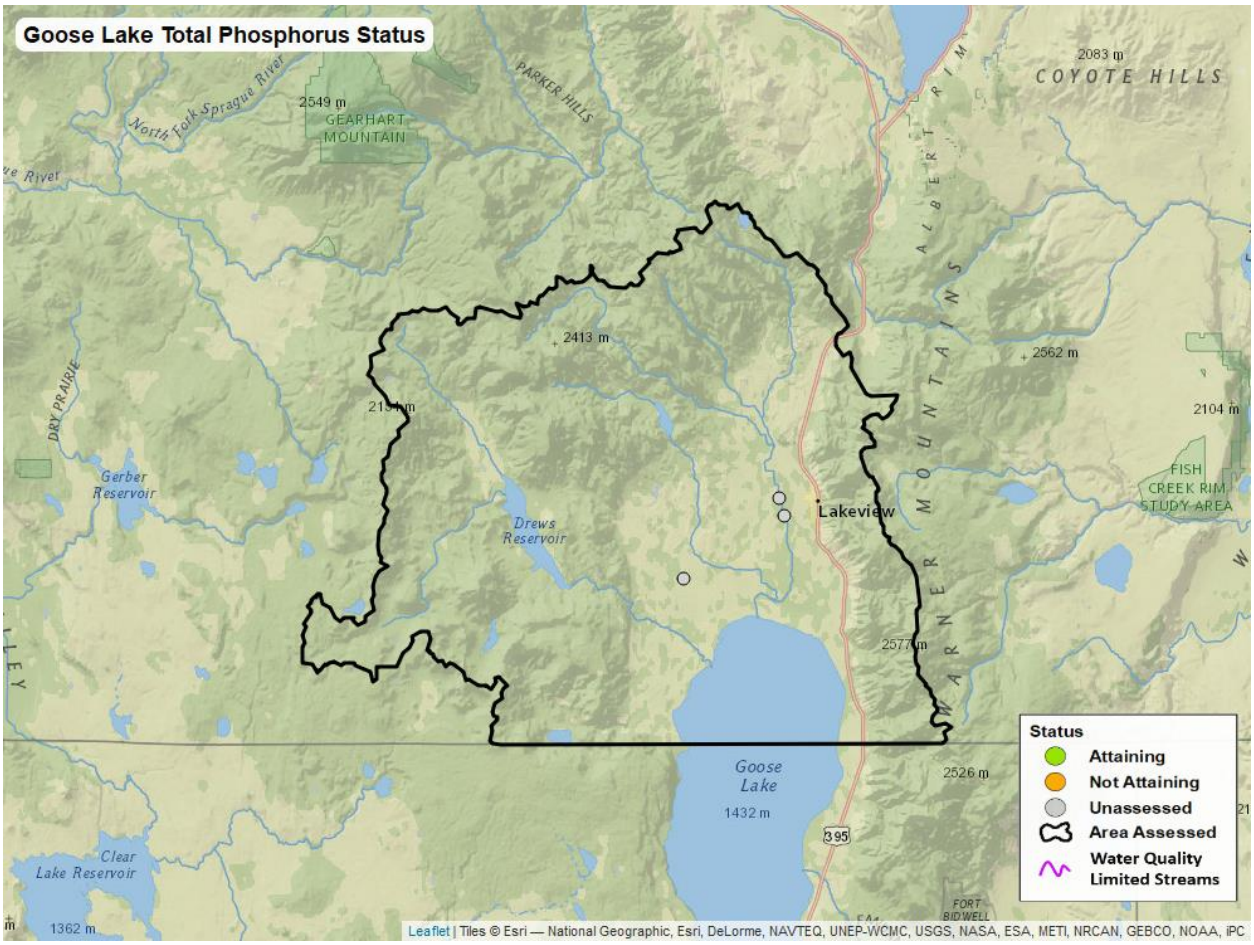

Figure 64: Summary map of the status of total phosphorus across the Goose Lake.

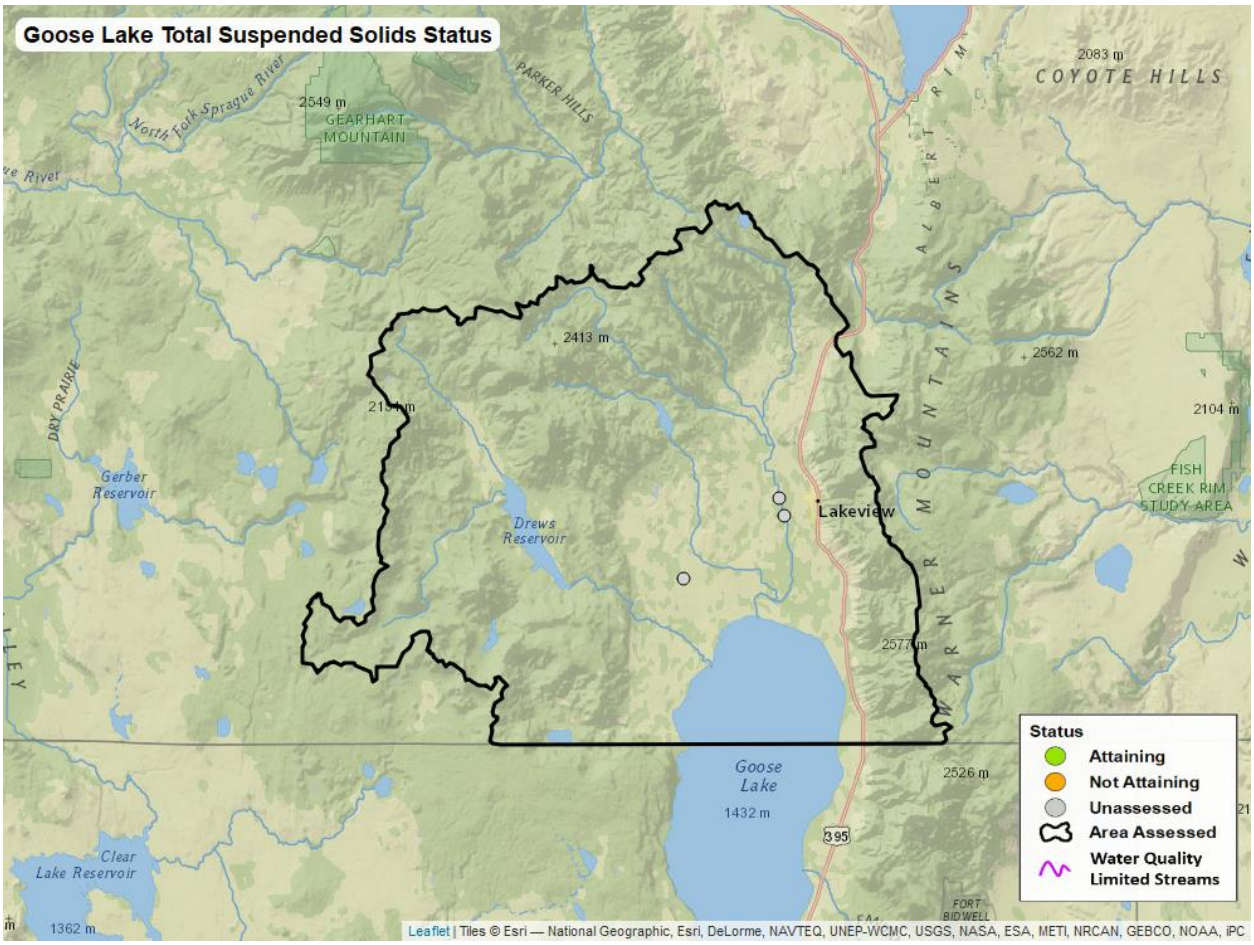

Figure 65: Summary map of the status of total suspended solids across the Goose Lake.

4.5.3 Status

There are 14 assessment units within the Goose Lake containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 99 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 99: Summary of the 2016–2019 assessment unit status within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	1
Escherichia coli	0	1	0
PH	1	0	1
Temperature	1	5	7
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

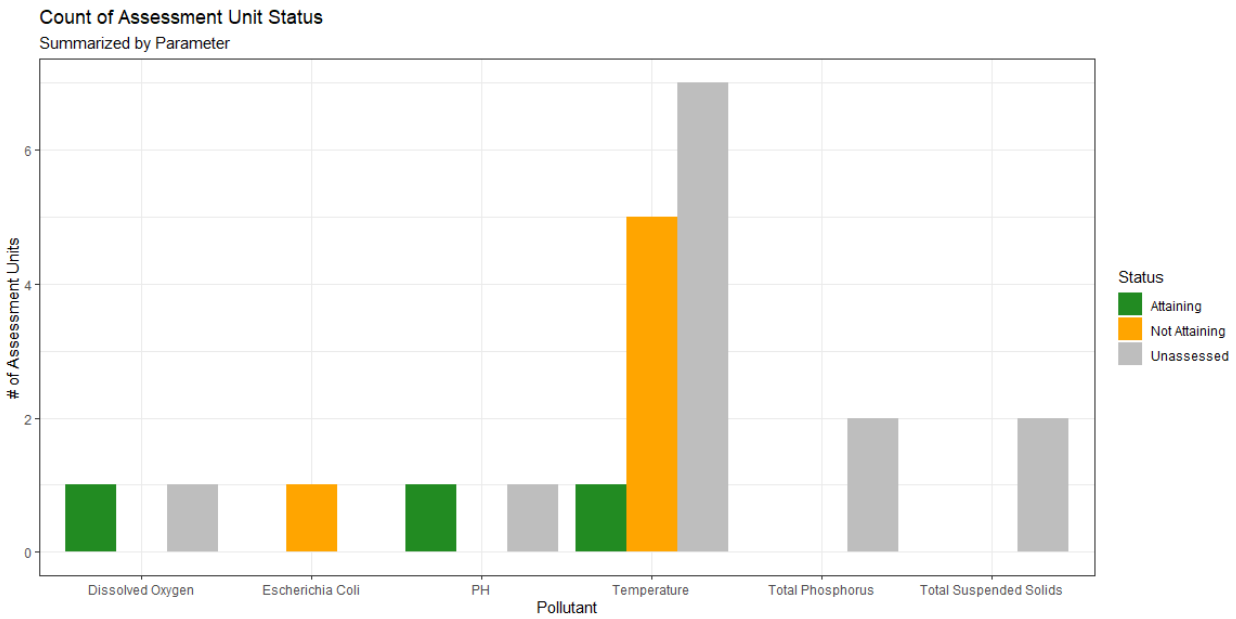

Figure 66: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

Table 100 and Figure 66 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Goose Lake for the 2016–2019 status period.

Table 100: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Temperature	0	1	0
Watershed Unit	Dissolved Oxygen	1	0	1
Watershed Unit	*Escherichia coli*	0	1	0
Watershed Unit	PH	1	0	1
Watershed Unit	Temperature	1	4	7
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

Table 101 and Figure 67 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix D.

Table 101: Summary of the 2016–2019 status at monitoring stations within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	0	1	0
PH	1	0	2
Temperature	1	9	13

Pollutant	Attaining	Not Attaining	Unassessed
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

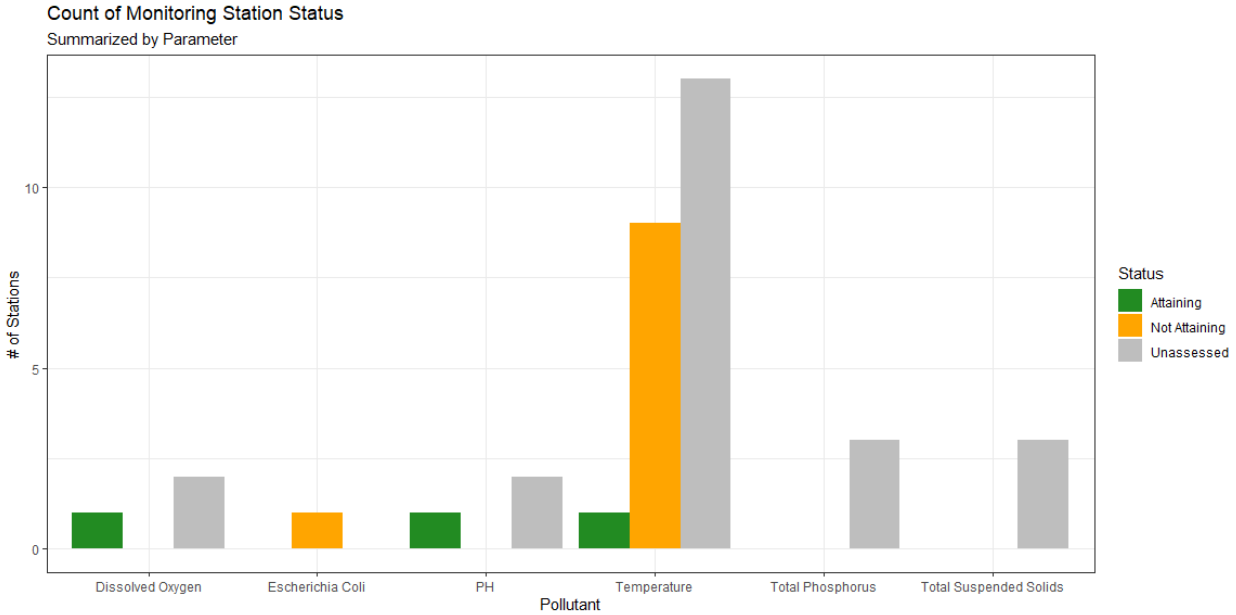

Figure 67: Summary plot of the 2016–2019 station status within the Goose Lake by parameter.

4.5.4 Trend

A summary of the trends across parameters is shown in Table 102. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 102: Goose Lake summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	2
Escherichia coli	0	0	0	0	1
PH	0	0	0	1	2
Temperature	0	0	0	0	23
Total Phosphorus	0	0	0	1	2
Total Suspended Solids	1	0	0	0	2

4.5.5 Subbasin Summary

4.5.5.1 Goose Lake Subbasin

4.5.5.1.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.5.5.1.2 Status

There are 14 assessment units within the Goose Lake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 99 and Figure 66 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 99: Summary of the 2016–2019 assessment unit status within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	1
Escherichia coli	0	1	0
PH	1	0	1
Temperature	1	5	7
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

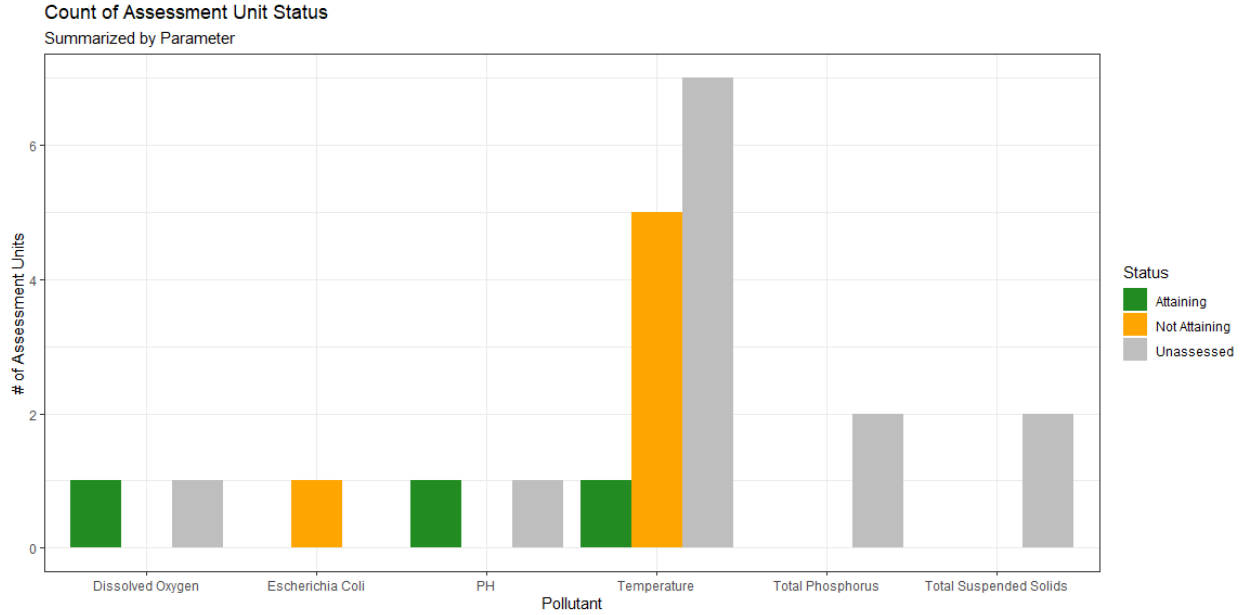

Figure 66: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 100 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Goose Lake Subbasin for the 2016 – 2019 status period.

Table 100: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Temperature	0	1	0
Watershed Unit	Dissolved Oxygen	1	0	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	*Escherichia coli*	0	1	0
Watershed Unit	PH	1	0	1
Watershed Unit	Temperature	1	4	7
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 26 stations within the Goose Lake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix D**. Table 101 and Figure 67 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 101: Summary of the 2016–2019 status at monitoring stations within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	0	1	0
PH	1	0	2
Temperature	1	9	13
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

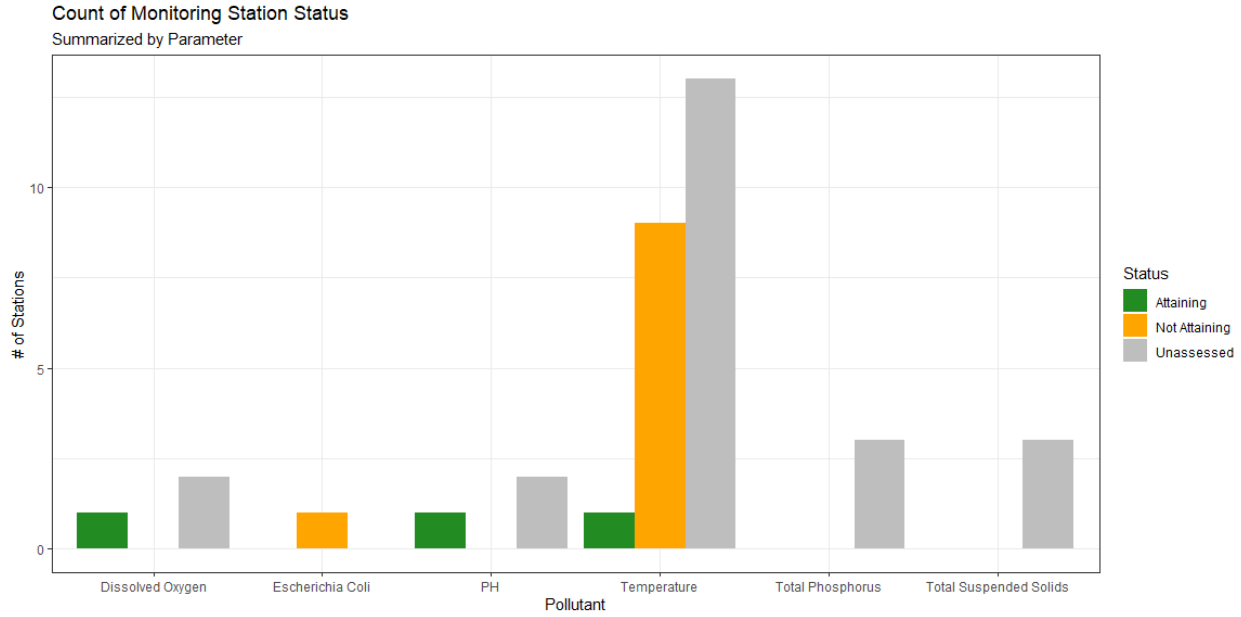

Figure 67: Summary plot of the 2016–2019 station status within the Goose Lake by parameter.

4.5.5.1.3 Trend

A summary of the trends within parameters is shown in Table 102. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 102: Goose Lake summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	2
Escherichia coli	0	0	0	0	1
PH	0	0	0	1	2
Temperature	0	0	0	0	23
Total Phosphorus	0	0	0	1	2
Total Suspended Solids	1	0	0	0	2

4.6 Grande Ronde

A summary of status and trend results for the Grande Ronde and all subbasins within the Grande Ronde are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix E**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Grande Ronde are water quality limited for 4 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 233 stations within the Grande Ronde. These stations were located across 113 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.6.1 Land Use

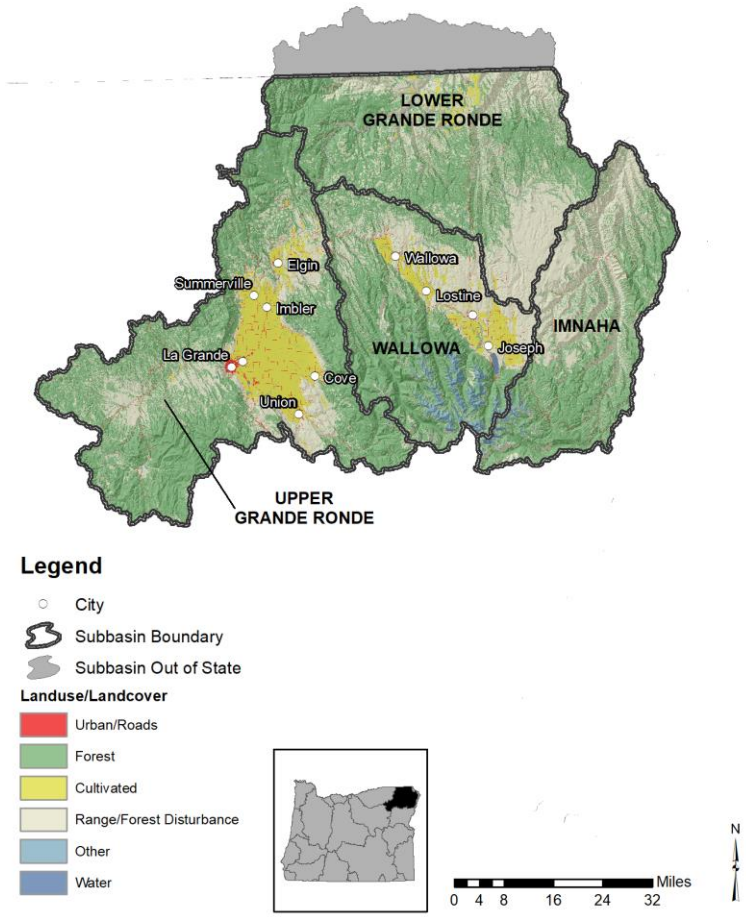

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 103: Land use within the Grande Ronde Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Imnaha	2203	0.4	48.5	0.0	49.1	2.0
Upper Grande Ronde	4238	1.7	58.9	12.7	26.4	0.3
Wallowa	2471	1.2	51.6	8.4	32.2	6.5

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Grande Ronde	3049	0.2	50.9	1.6	47.1	0.2

4.6.2 Parameter Maps

The maps in Figure 68 through Figure 73 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

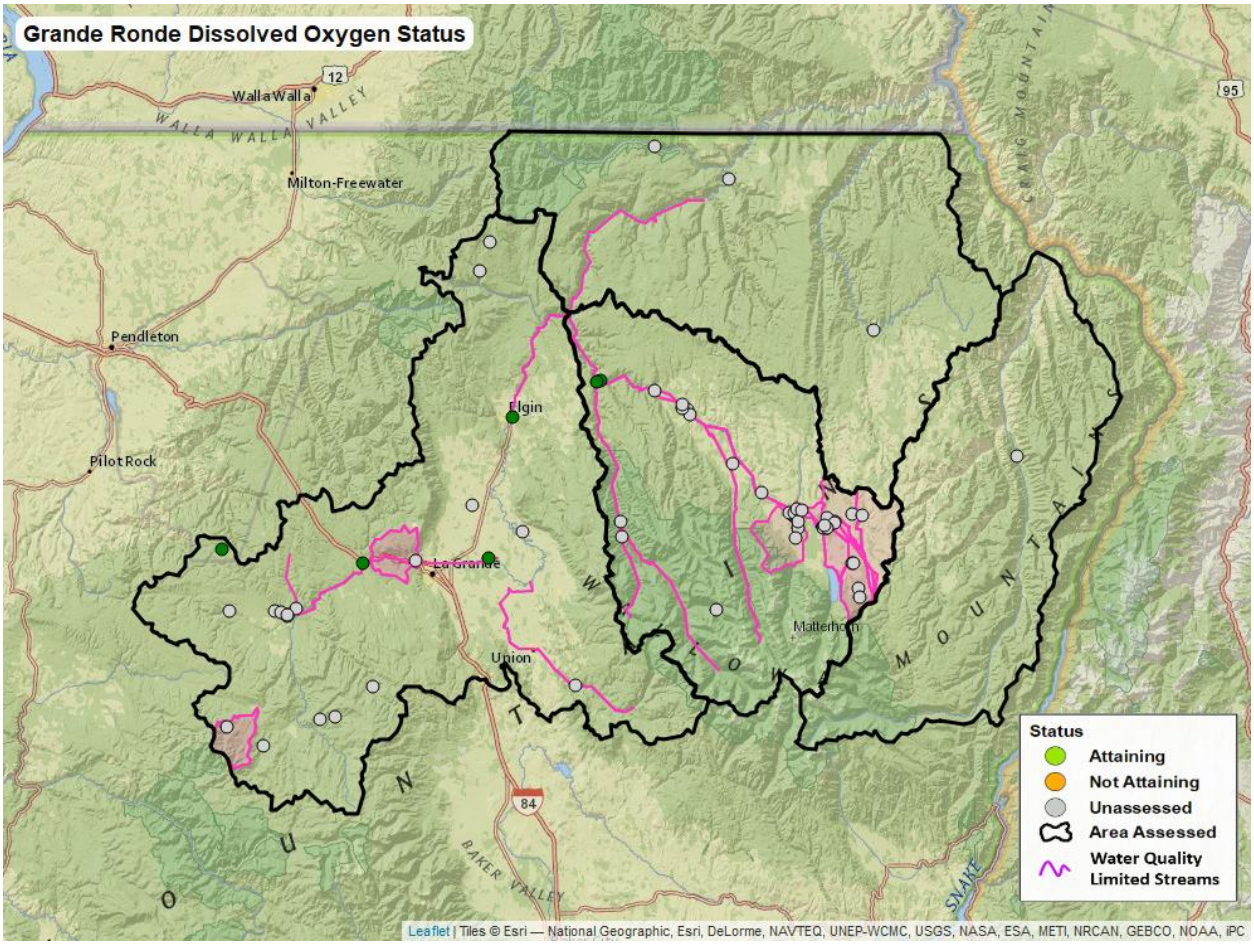

Figure 68: Summary map of the status of dissolved oxygen across the Grande Ronde.

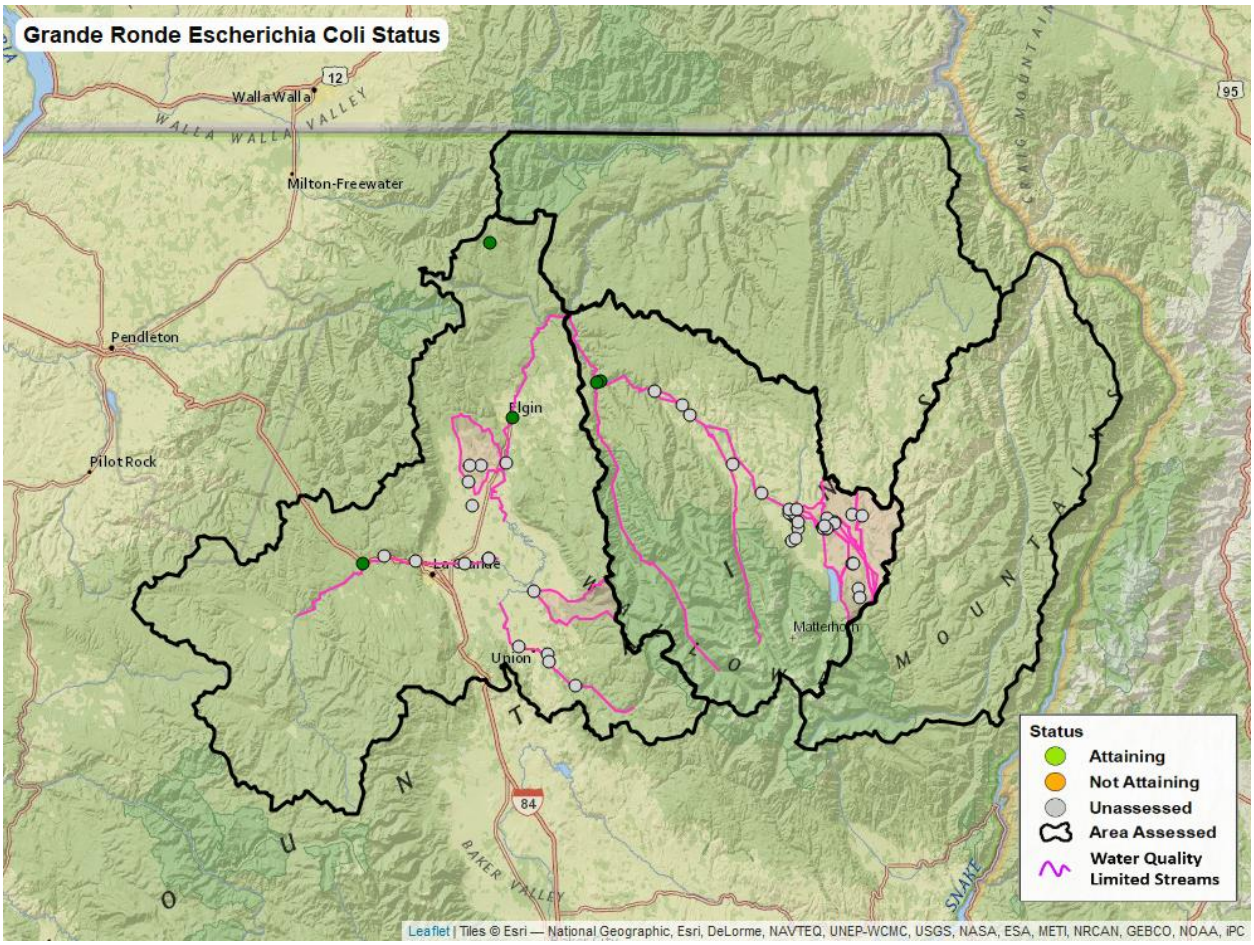

Figure 69: Summary map of the status of *Escherichia coli* across the Grande Ronde.

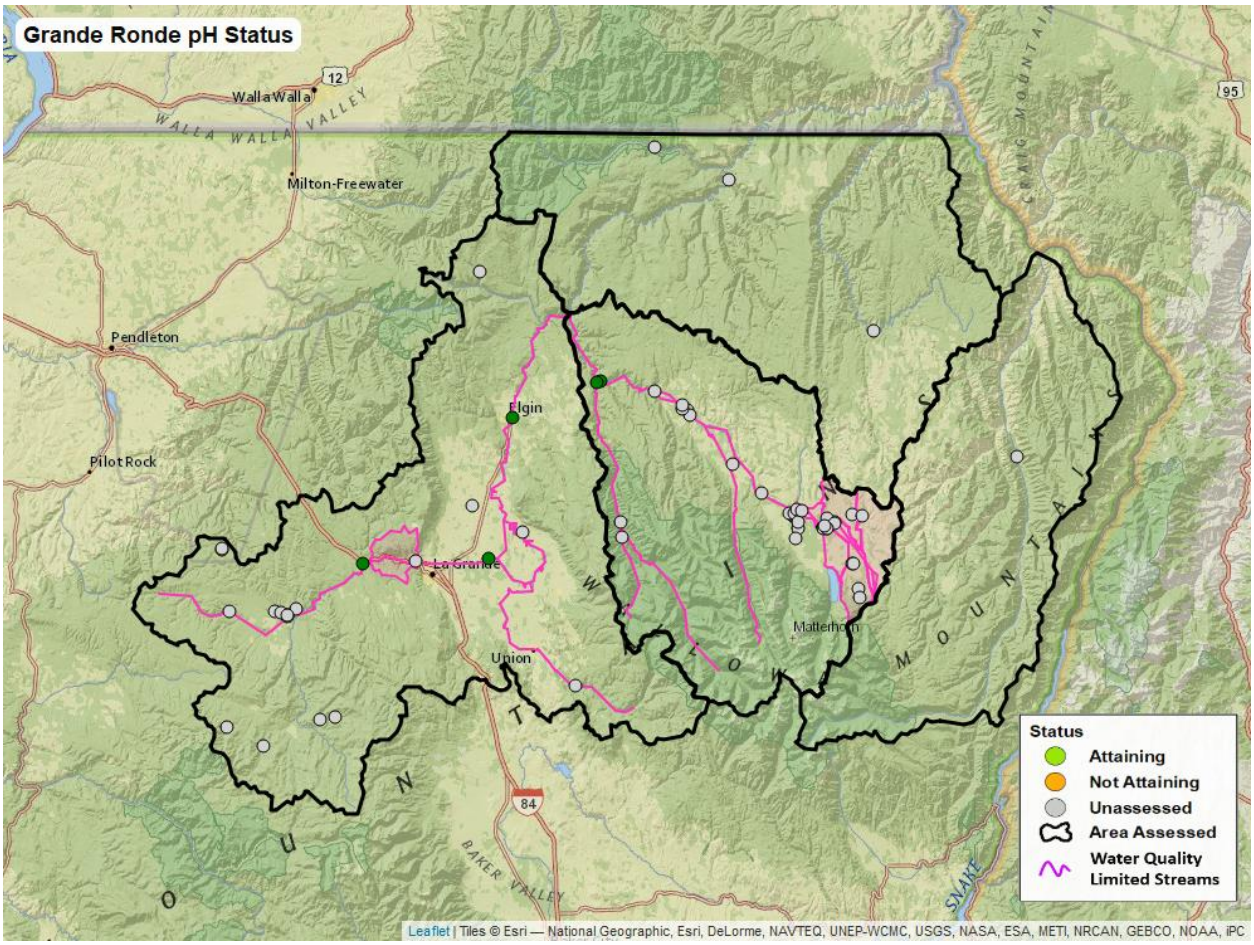

Figure 70: Summary map of the status of pH across the Grande Ronde.

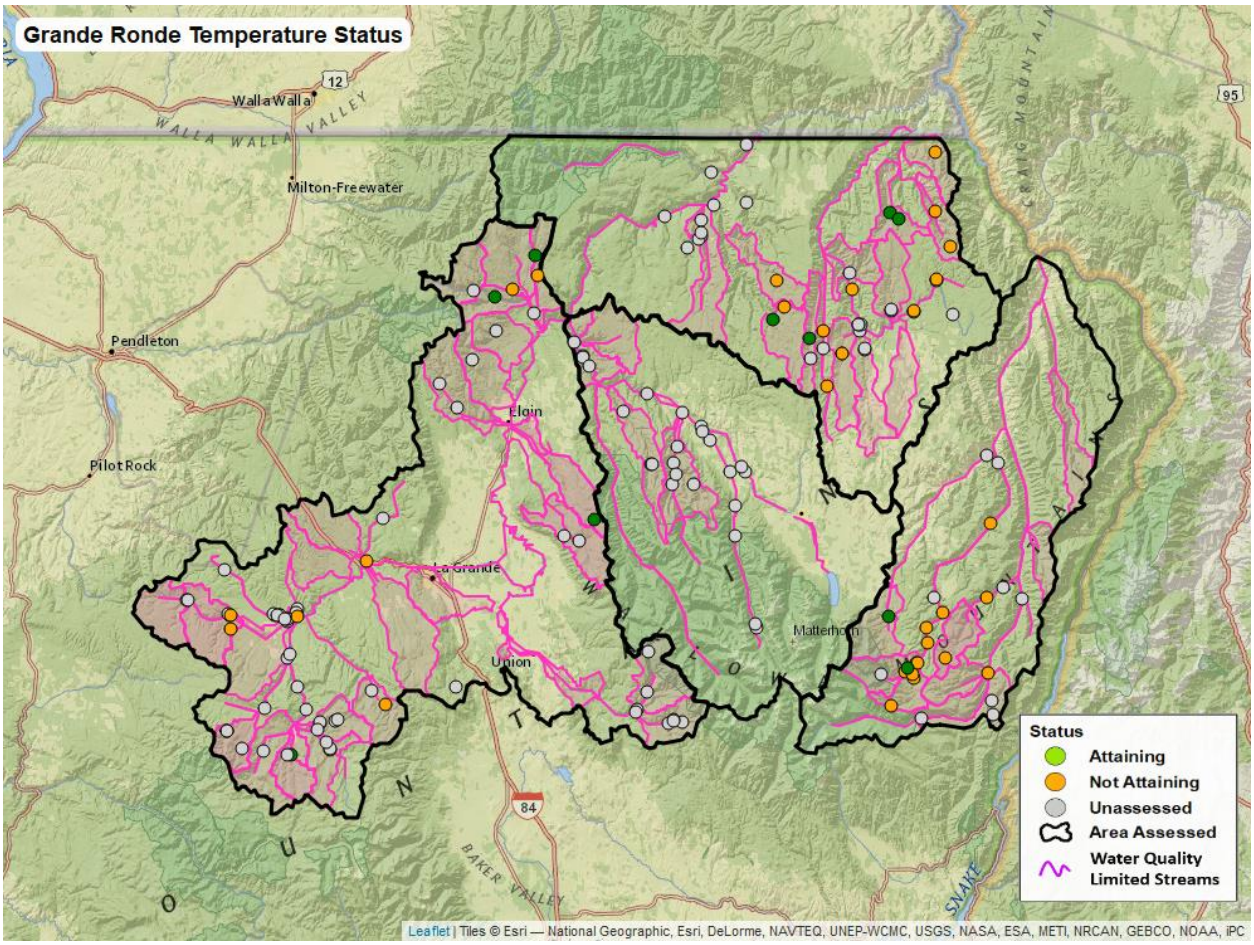

Figure 71: Summary map of the status of temperature across the Grande Ronde.

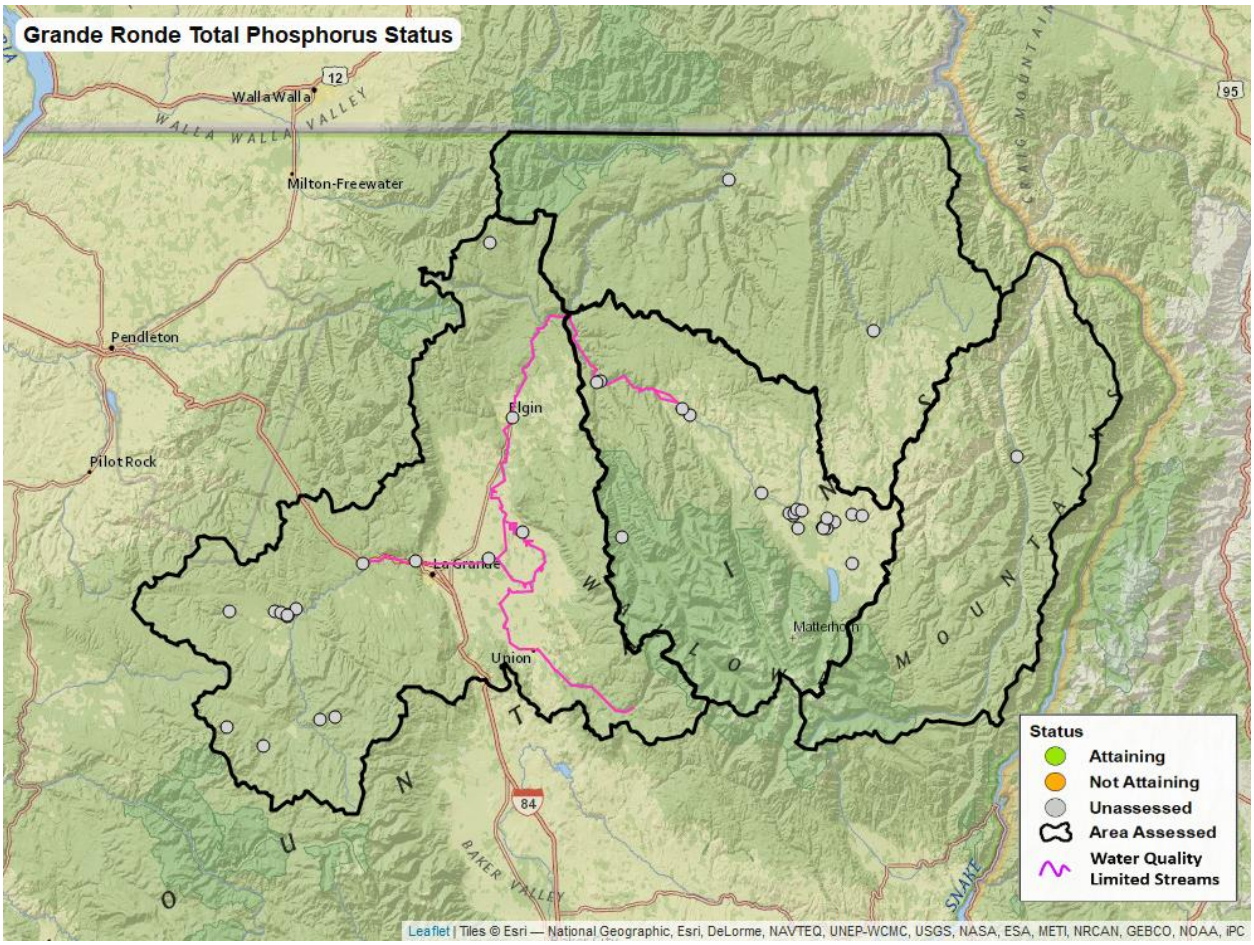

Figure 72: Summary map of the status of total phosphorus across the Grande Ronde.

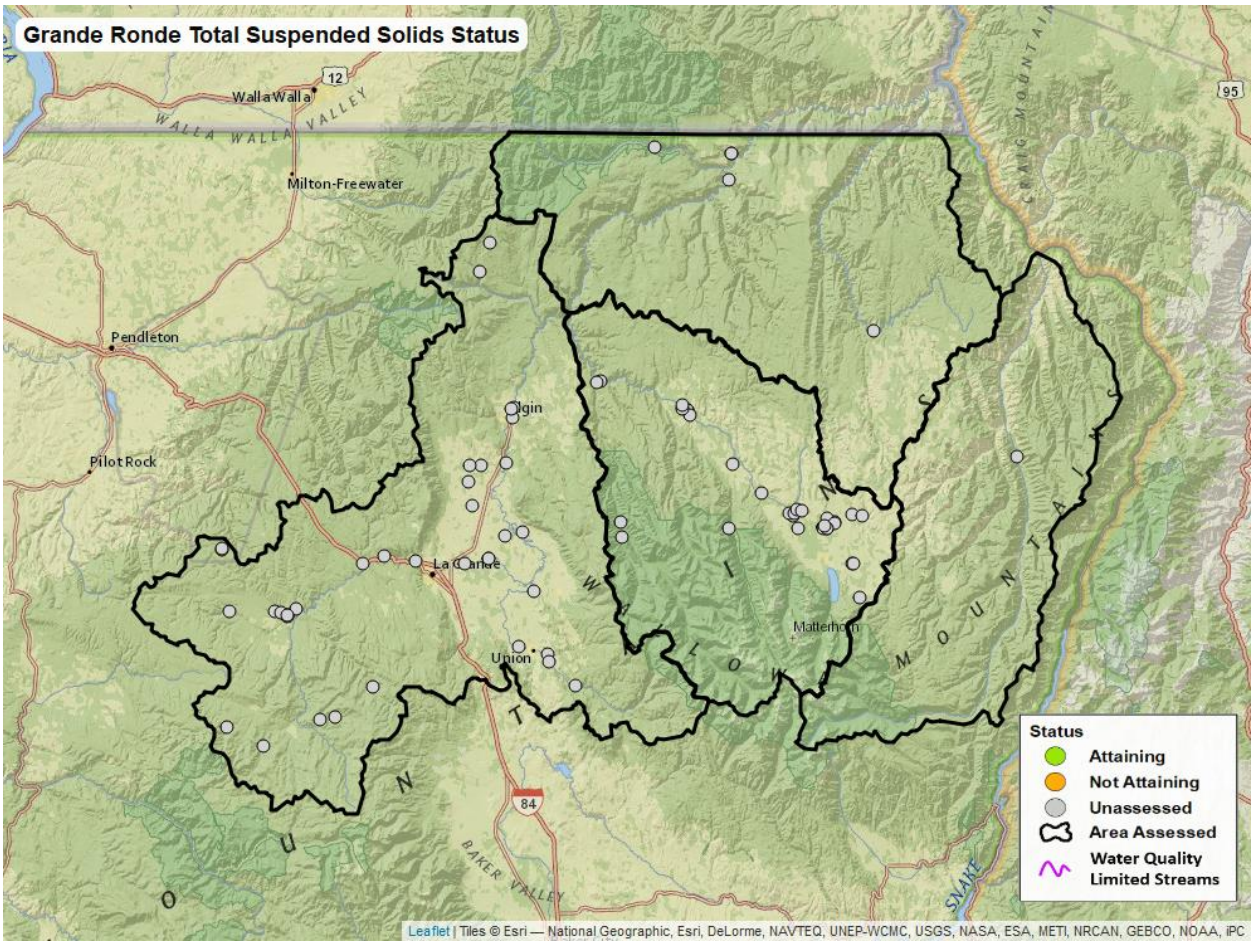

Figure 73: Summary map of the status of total suspended solids across the Grande Ronde.

4.6.3 Status

There are 113 assessment units within the Grande Ronde containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 104 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 104: Summary of the 2016–2019 assessment unit status within the Grande Ronde.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	30
Escherichia coli	6	0	17
PH	5	0	28
Temperature	7	23	54
Total Phosphorus	0	0	28
Total Suspended Solids	0	0	43

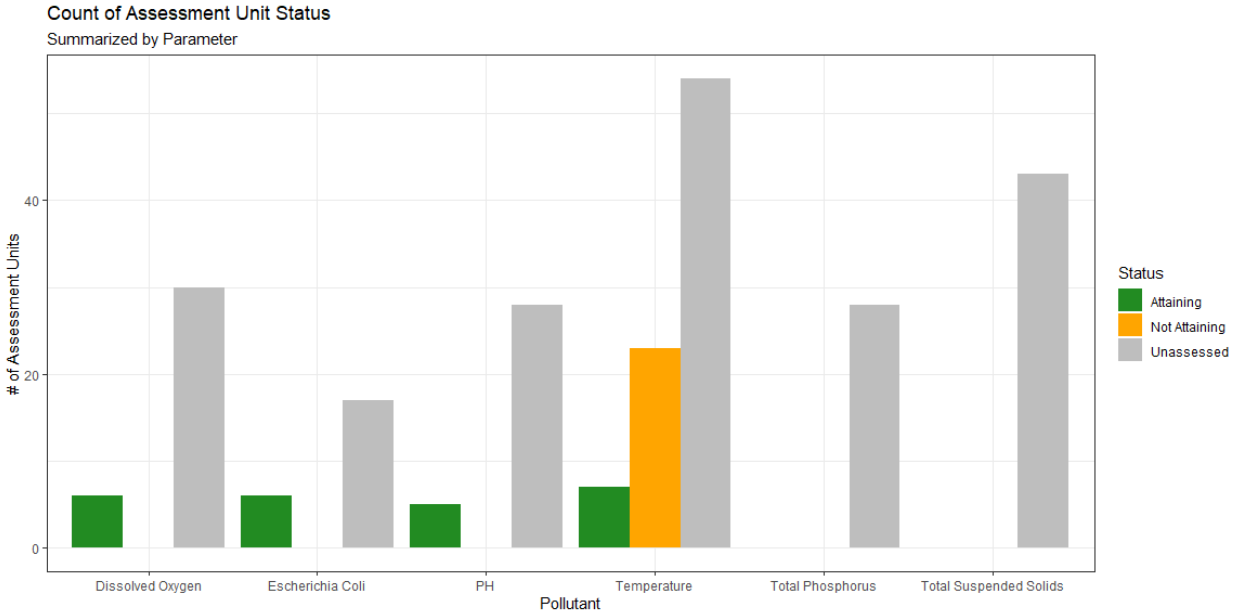

Figure 74: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Grande Ronde.

Table 105 and Figure 74 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Grande Ronde for the 2016–2019 status period.

Table 105: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Grande Ronde.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	1	0	0
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	5	0	18
Stream	*Escherichia coli*	5	0	9
Stream	PH	5	0	17
Stream	Temperature	1	12	27
Stream	Total Phosphorus	0	0	18
Stream	Total Suspended Solids	0	0	26
Watershed Unit	Dissolved Oxygen	1	0	11
Watershed Unit	*Escherichia coli*	0	0	8
Watershed Unit	PH	0	0	11
Watershed Unit	Temperature	6	11	27
Watershed Unit	Total Phosphorus	0	0	9
Watershed Unit	Total Suspended Solids	0	0	16

Table 106 and Figure 75 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix E.

Table 106: Summary of the 2016–2019 status at monitoring stations within the Grande Ronde.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	60
Escherichia coli	6	0	47
PH	5	0	59
Temperature	10	32	113
Total Phosphorus	0	0	45
Total Suspended Solids	0	0	79

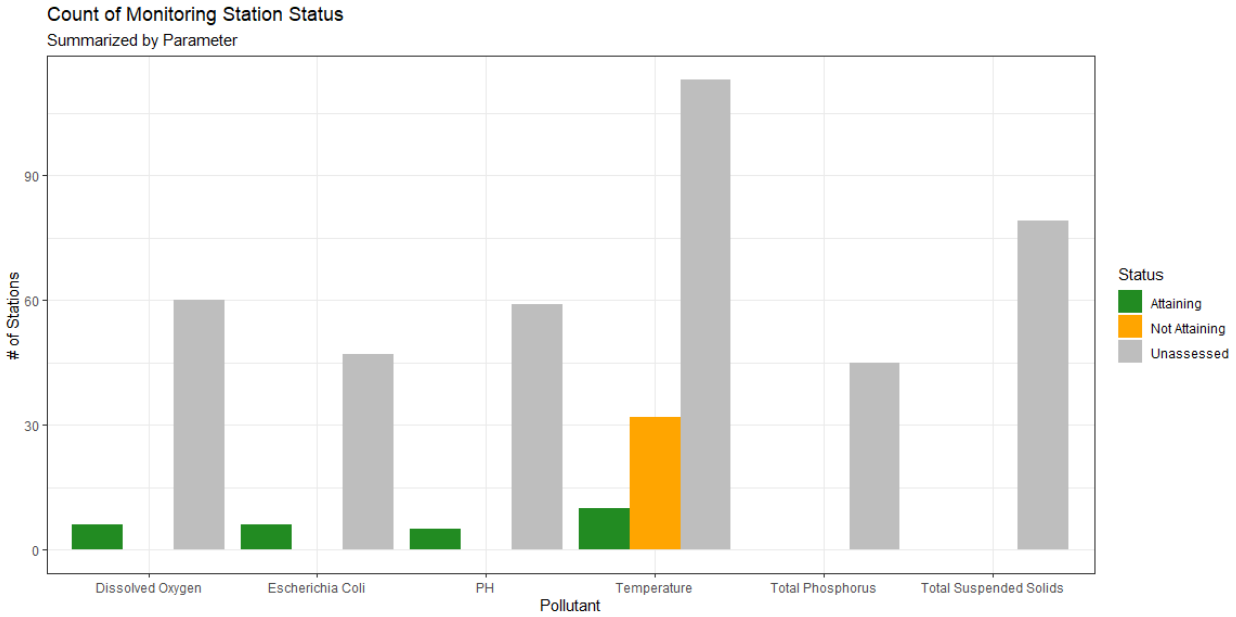

Figure 75: Summary plot of the 2016–2019 station status within the Grande Ronde by parameter.

4.6.4 Trend

A summary of the trends across parameters is shown in Table 107. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 107: Grande Ronde summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	5	60
Escherichia coli	0	4	0	1	48
PH	0	1	2	3	58
Temperature	2	3	0	1	149

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	1	0	3	1	40
Total Suspended Solids	1	0	1	3	74

4.6.5 Subbasin Summary

4.6.5.1 Wallowa Subbasin

4.6.5.1.1 Water Quality Limited Assessment Units

Table 108: Number of water quality limited assessment units in the Wallowa Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	8
Total Phosphorus, mixed forms	1

4.6.5.1.2 Status

There are 24 assessment units within the Wallowa Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 109 and Figure 76 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 109: Summary of the 2016–2019 assessment unit status within the Wallowa Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	14
Escherichia coli	2	0	10
PH	2	0	13
Temperature	0	0	12
Total Phosphorus	0	0	12
Total Suspended Solids	0	0	16

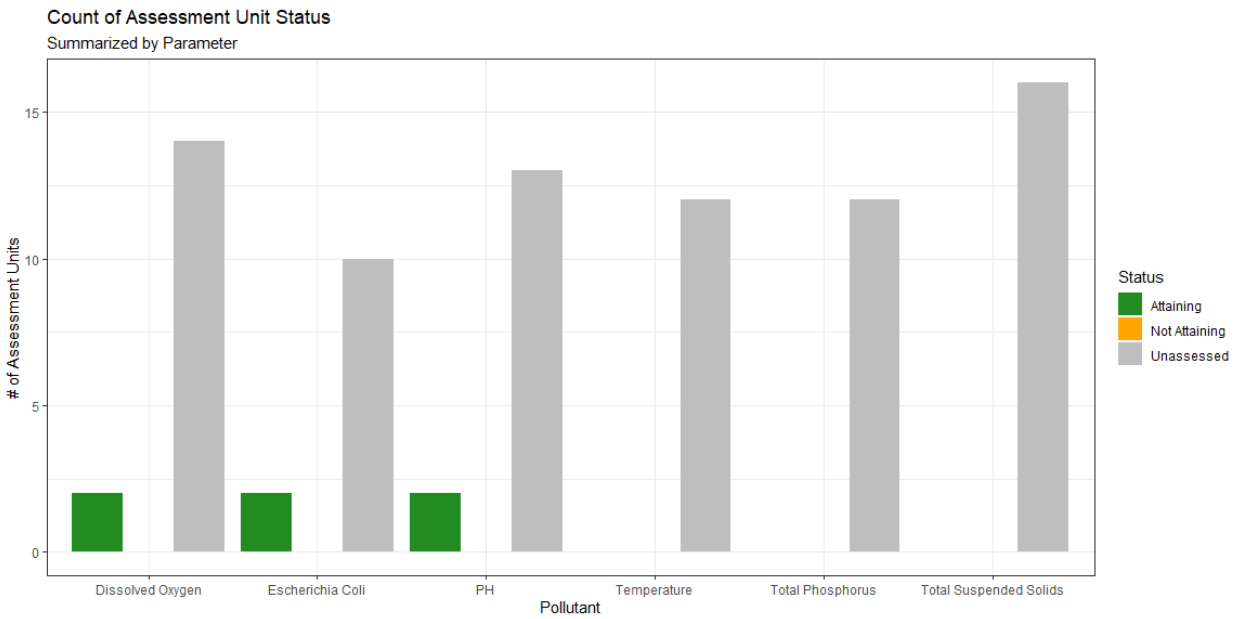

Figure 76: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Wallowa Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 110 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Wallowa Subbasin for the 2016 – 2019 status period.

Table 110: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Wallowa Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	2	0	8
Stream	*Escherichia coli*	2	0	5
Stream	PH	2	0	7
Stream	Temperature	0	0	7
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	9
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	*Escherichia coli*	0	0	5
Watershed Unit	PH	0	0	6
Watershed Unit	Temperature	0	0	5
Watershed Unit	Total Phosphorus	0	0	5
Watershed Unit	Total Suspended Solids	0	0	7

There are 66 stations within the Wallowa Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix E**. Table 111 and Figure 77 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 111: Summary of the 2016–2019 status at monitoring stations within the Wallowa Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	37
Escherichia coli	2	0	33
PH	2	0	36
Temperature	0	0	24
Total Phosphorus	0	0	24
Total Suspended Solids	0	0	35

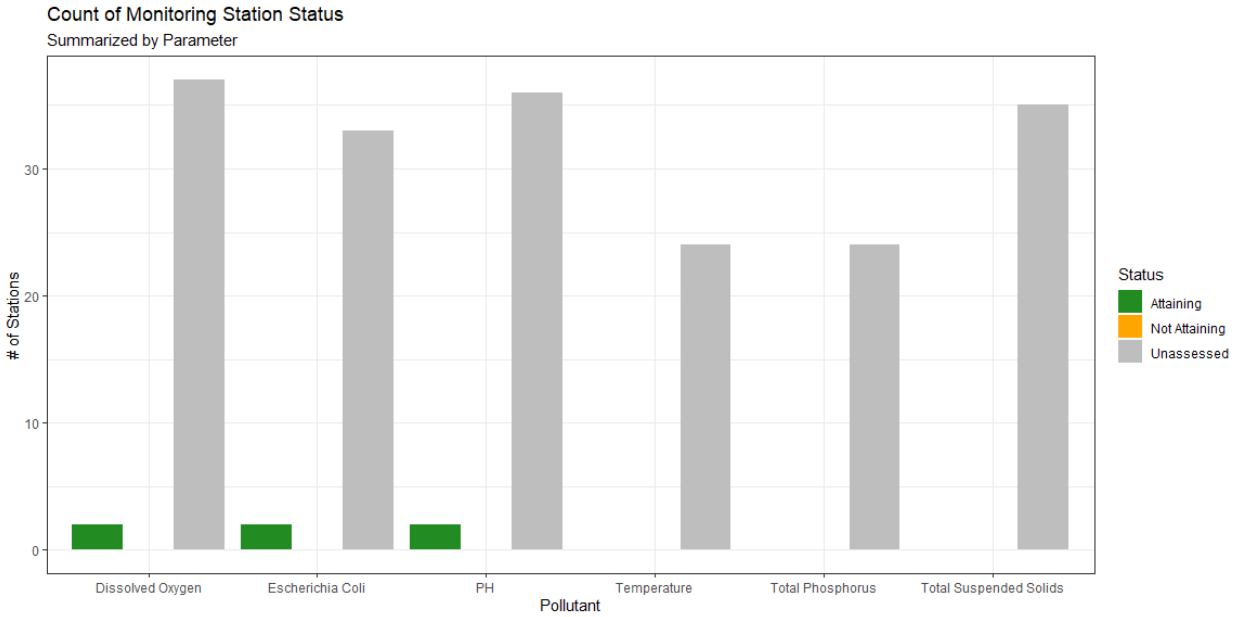

Figure 77: The number of stations in each status category by parameter for the 2016–2019 status period within the Wallowa Subbasin.

4.6.5.1.3 Trend

A summary of the trends within parameters is shown in Table 112. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 112: Subbasin Summary of trend results at stations across the Wallowa.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	37
Escherichia coli	0	2	0	0	33
PH	0	0	2	0	36
Temperature	0	0	0	0	24
Total Phosphorus	0	0	1	1	22
Total Suspended Solids	0	0	0	2	33

4.6.5.2 Upper Grande Ronde Subbasin

4.6.5.2.1 Water Quality Limited Assessment Units

Table 113: Number of water quality limited assessment units in the Upper Grande Ronde Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	5
Total Phosphorus, mixed forms	7

4.6.5.2.2 Status

There are 52 assessment units within the Upper Grande Ronde Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 114 and Figure 78 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 114: Summary of the 2016–2019 assessment unit status within the Upper Grande Ronde Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	14
Escherichia coli	4	0	8
PH	3	0	13
Temperature	3	8	26
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	24

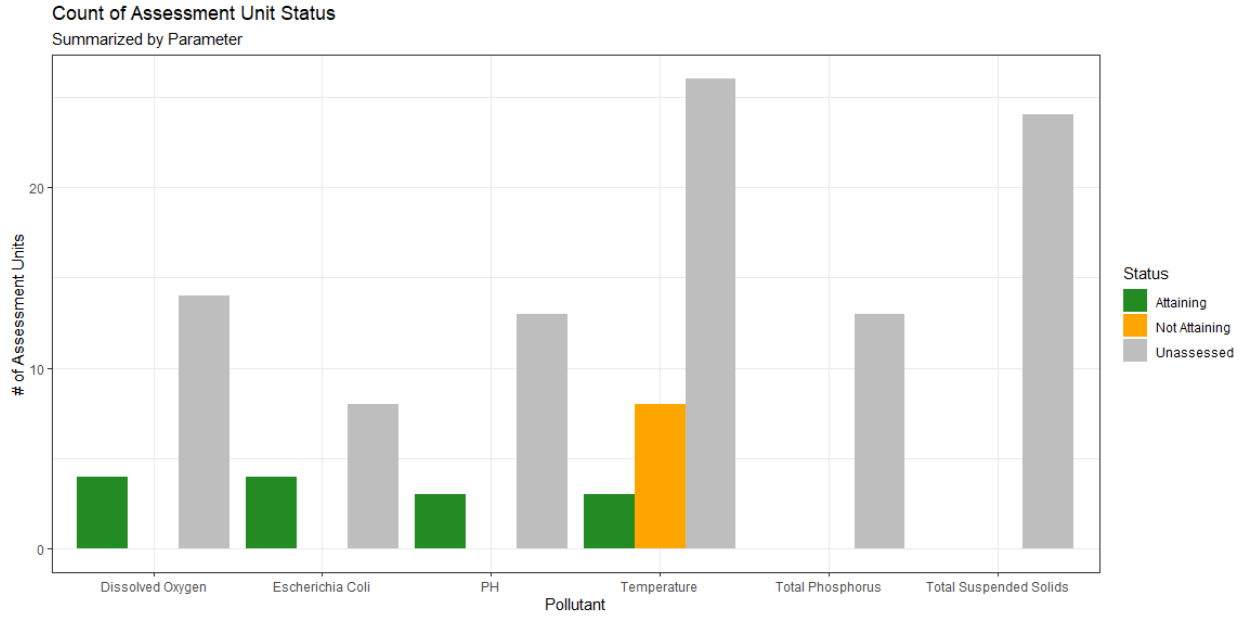

Figure 78: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Grande Ronde Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 115 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Grande Ronde Subbasin for the 2016 – 2019 status period.

Table 115: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Grande Ronde Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	1	0	0
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	3	0	8
Stream	*Escherichia coli*	3	0	5
Stream	PH	3	0	8
Stream	Temperature	0	4	13
Stream	Total Phosphorus	0	0	9
Stream	Total Suspended Solids	0	0	15
Watershed Unit	Dissolved Oxygen	1	0	5
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	5
Watershed Unit	Temperature	3	4	13
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	8

There are 97 stations within the Upper Grande Ronde Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix E**. Table 116 and Figure 79 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 116: Summary of the 2016–2019 status at monitoring stations within the Upper Grande Ronde Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	19
Escherichia coli	4	0	14
PH	3	0	19
Temperature	4	8	55
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	38

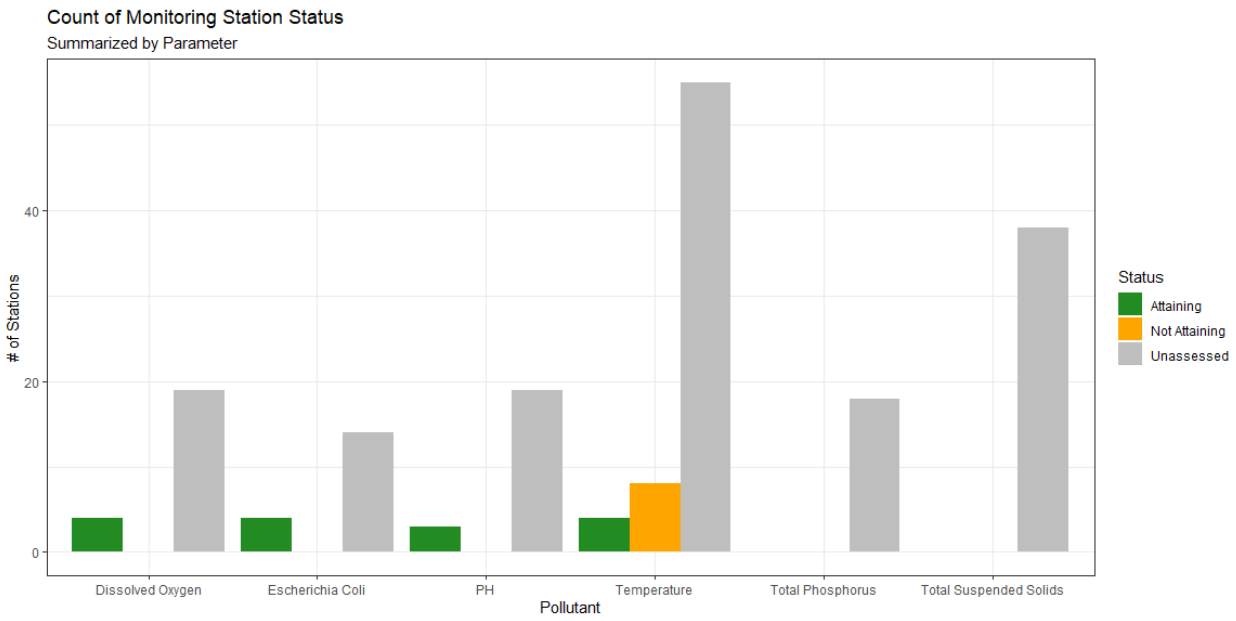

Figure 79: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Grande Ronde Subbasin.

4.6.5.2.3 Trend

A summary of the trends within parameters is shown in Table 117. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 117: Subbasin Summary of trend results at stations across the Upper Grande Ronde.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	3	19
Escherichia coli	0	2	0	1	15
PH	0	1	0	3	18
Temperature	1	1	0	0	65
Total Phosphorus	1	0	2	0	15
Total Suspended Solids	1	0	1	1	35

4.6.5.3 Lower Grande Ronde Subbasin

4.6.5.3.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.6.5.3.2 Status

There are 27 assessment units within the Lower Grande Ronde Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 118 and Figure 80

summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 118: Summary of the 2016–2019 assessment unit status within the Lower Grande Ronde Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	3
PH	0	0	3
Temperature	2	10	13
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	4

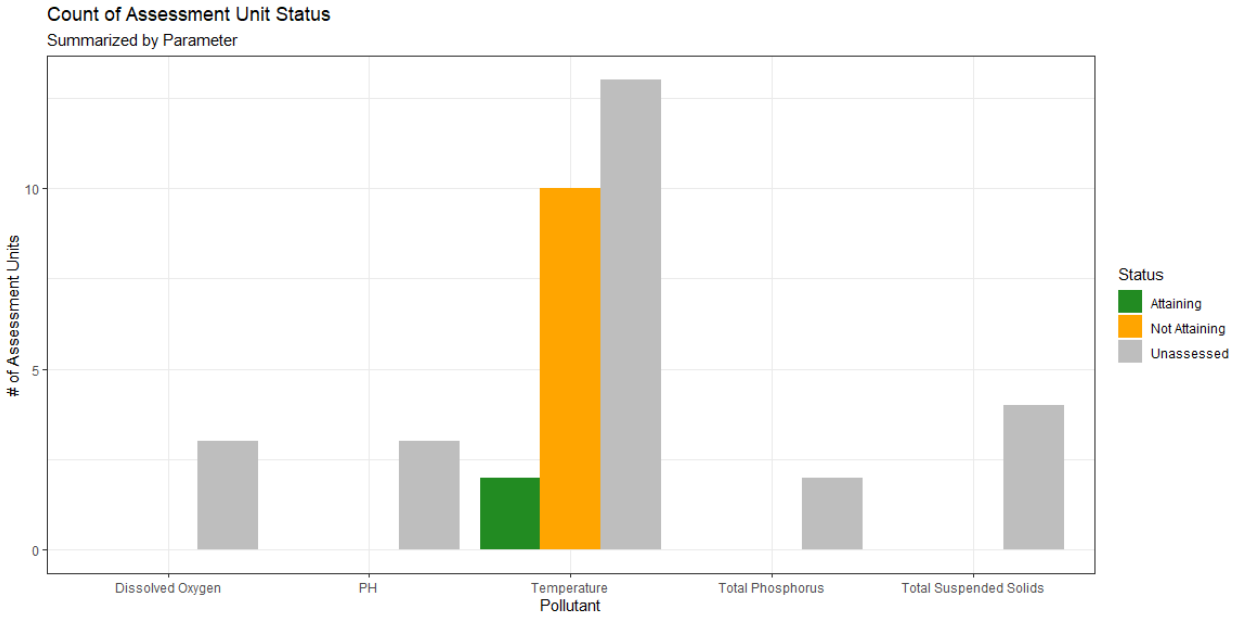

Figure 80: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Grande Ronde Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 119 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Grande Ronde Subbasin for the 2016 – 2019 status period.

Table 119: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Grande Ronde Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	2
Stream	PH	0	0	2
Stream	Temperature	0	5	5
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	PH	0	0	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Temperature	2	5	8
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	2

There are 45 stations within the Lower Grande Ronde Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix E**. Table 120 and Figure 81 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 120: Summary of the 2016–2019 status at monitoring stations within the Lower Grande Ronde Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	3
PH	0	0	3
Temperature	4	11	25
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	5

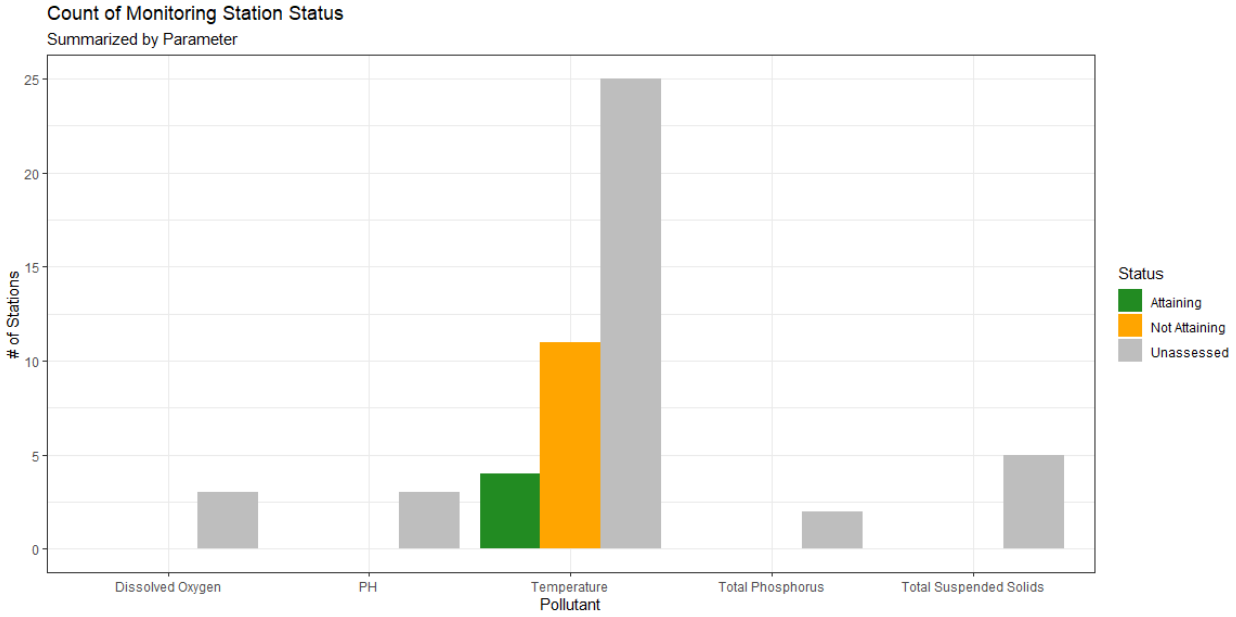

Figure 81: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Grande Ronde Subbasin.

4.6.5.3.3 Trend

A summary of the trends within parameters is shown in Table 121. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 121: Subbasin Summary of trend results at stations across the Lower Grande Ronde.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	3
PH	0	0	0	0	3
Temperature	1	2	0	1	36
Total Phosphorus	0	0	0	0	2
Total Suspended Solids	0	0	0	0	5

4.6.5.4 Imnaha Subbasin

4.6.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.6.5.4.2 Status

There are 12 assessment units within the Imnaha Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 122 and Figure 82 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 122: Summary of the 2016–2019 assessment unit status within the Imnaha Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	1
PH	0	0	1
Temperature	2	5	4
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

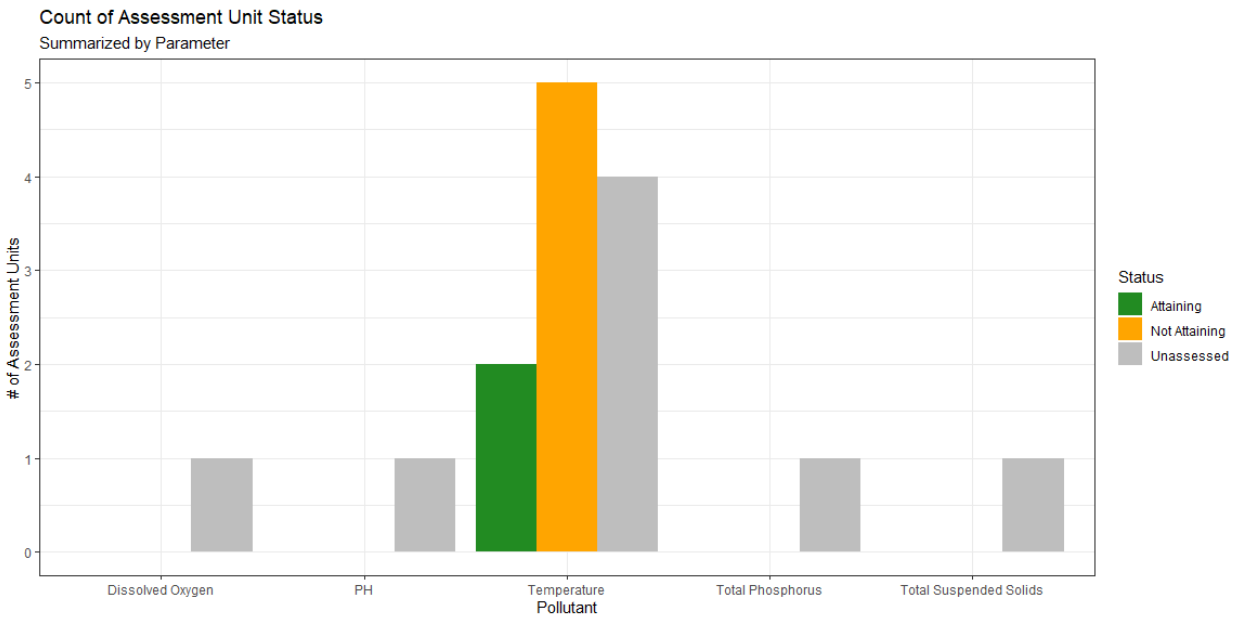

Figure 82: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Imnaha Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 123 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Imnaha Subbasin for the 2016 – 2019 status period.

Table 123: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Imnaha Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	1
Stream	PH	0	0	1
Stream	Temperature	1	3	2
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Temperature	1	2	2

There are 25 stations within the Imnaha Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix E**. Table 124 and Figure 83 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 124: Summary of the 2016–2019 status at monitoring stations within the Imnaha Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	1
PH	0	0	1
Temperature	2	13	9

Pollutant	Attaining	Not Attaining	Unassessed
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

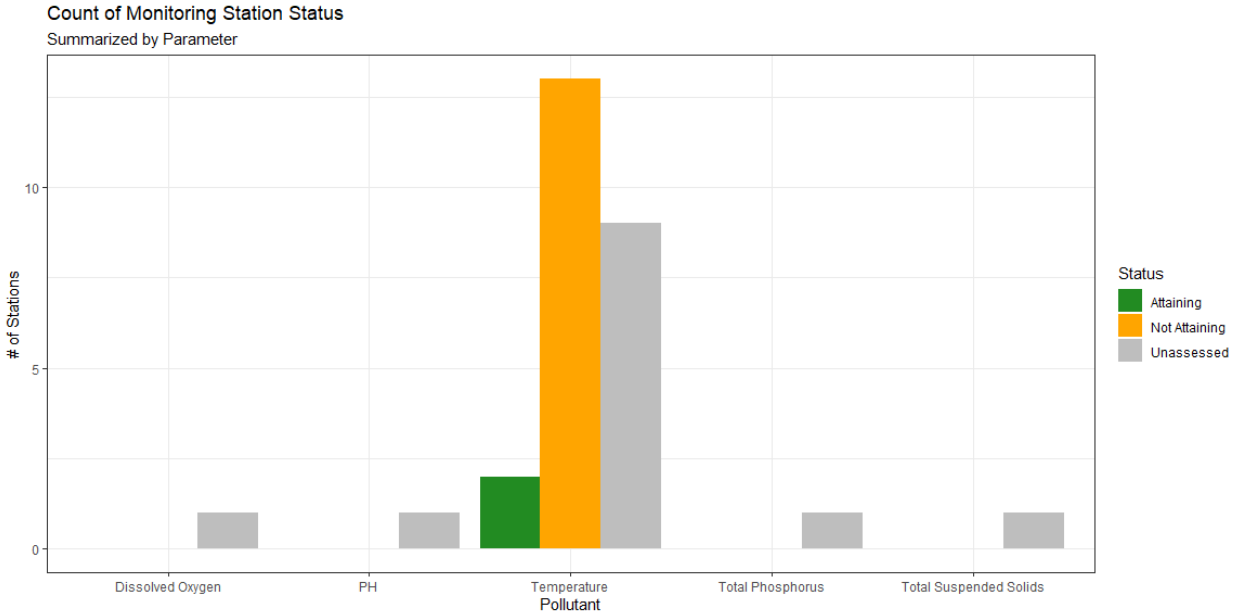

Figure 83: The number of stations in each status category by parameter for the 2016–2019 status period within the Imnaha Subbasin.

4.6.5.4.3 Trend

A summary of the trends within parameters is shown in Table 125. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 125: Subbasin Summary of trend results at stations across the Imnaha.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	1
PH	0	0	0	0	1
Temperature	0	0	0	0	24
Total Phosphorus	0	0	0	0	1
Total Suspended Solids	0	0	0	0	1

4.7 John Day Basin

A summary of status and trend results for the John Day Basin and all subbasins within the John Day Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix F**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the John Day Basin are water quality limited for 2 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 305 stations within the John Day Basin. These stations were located across 130 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.7.1 Land Use

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 126: Land use within the John Day Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper John Day	5540	1.1	39.7	0.2	57.5	1.5
North Fork John Day	4787	1.0	56.9	0.2	41.5	0.4
Middle Fork John Day	2052	0.8	54.5	0.1	44.2	0.3

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower John Day	8156	1.2	11.2	13.6	73.7	0.4

4.7.2 Parameter Maps

The maps in Figure 84 through Figure 89 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

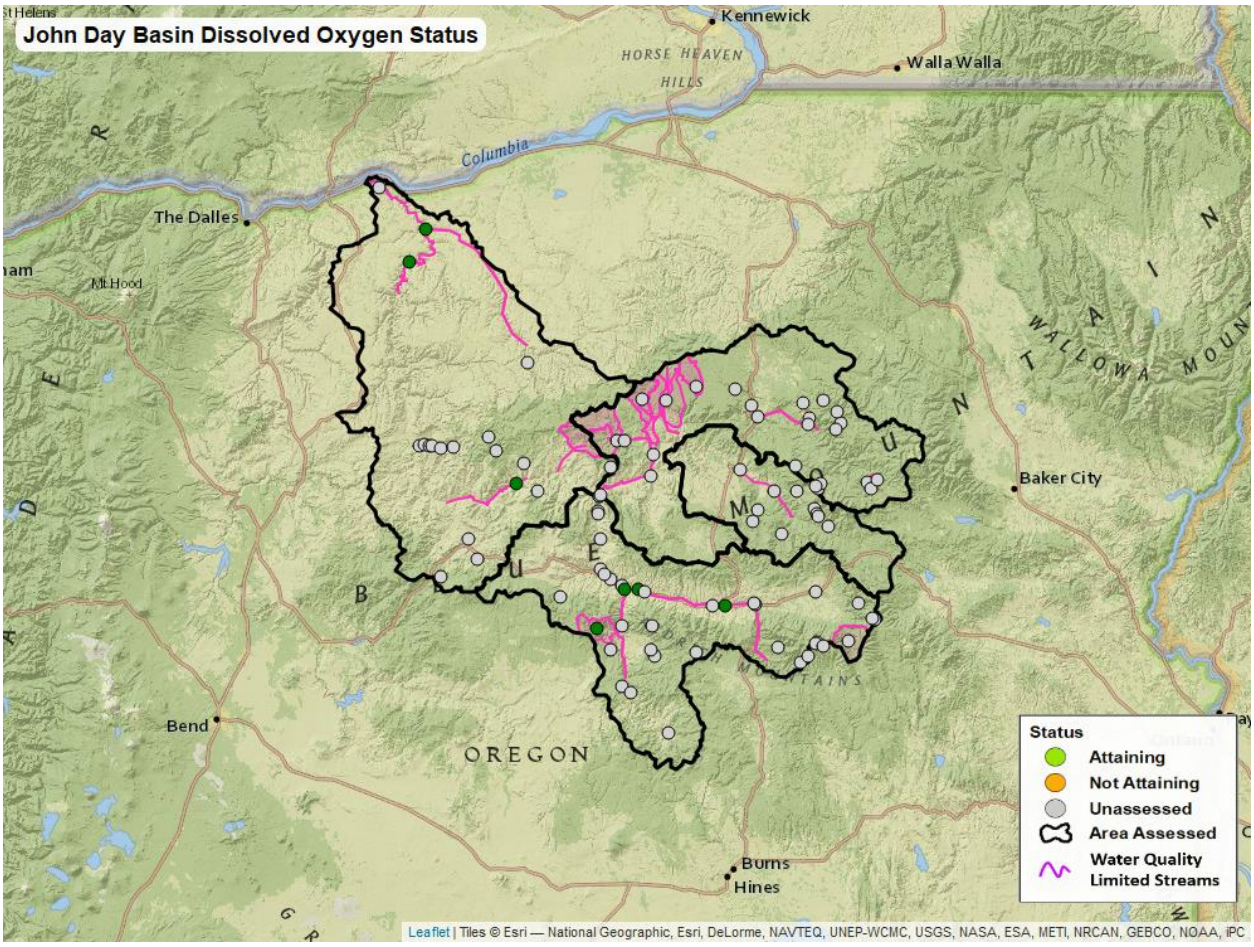

Figure 84: Summary map of the status of dissolved oxygen across the John Day Basin.

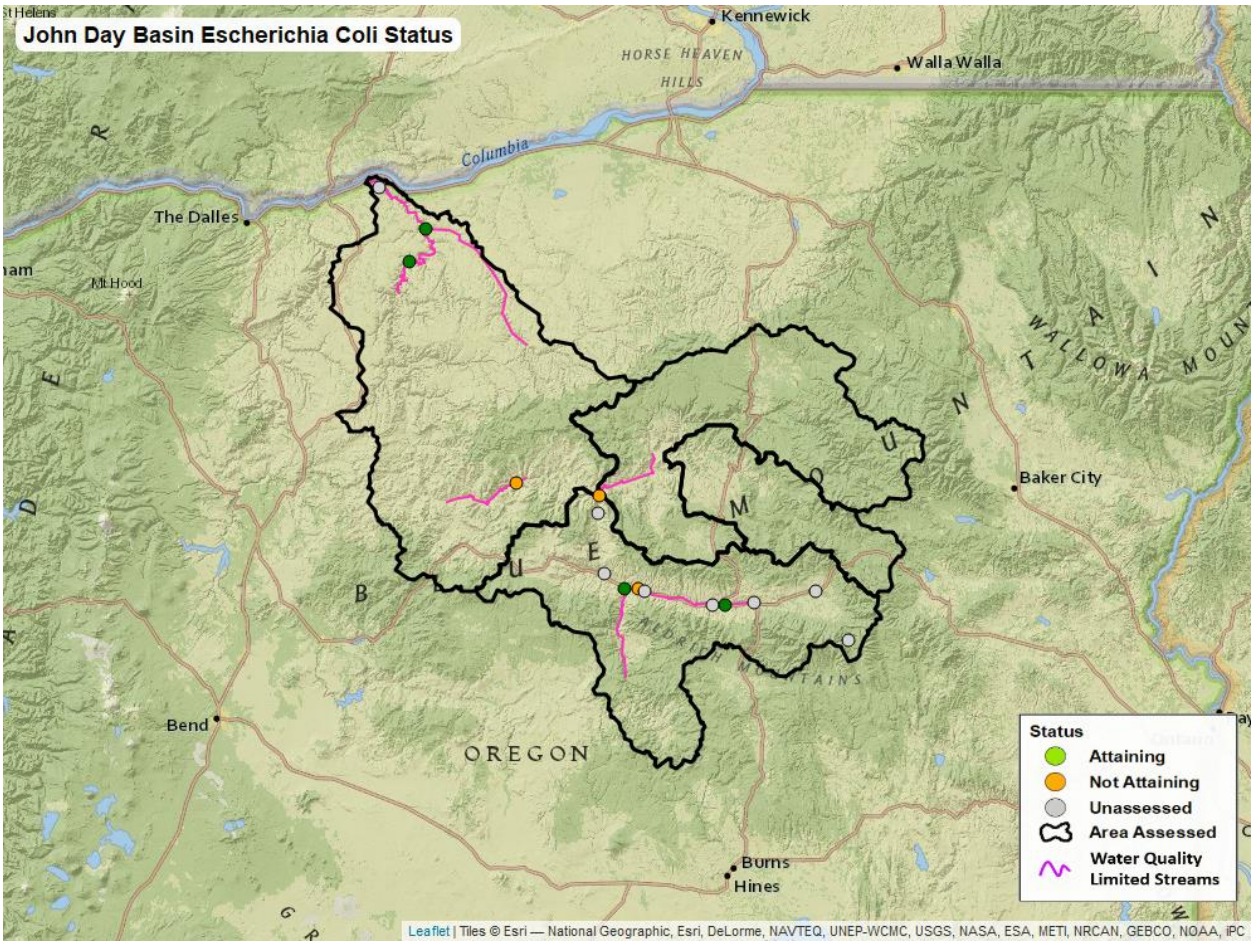

Figure 85: Summary map of the status of *Escherichia coli* across the John Day Basin.

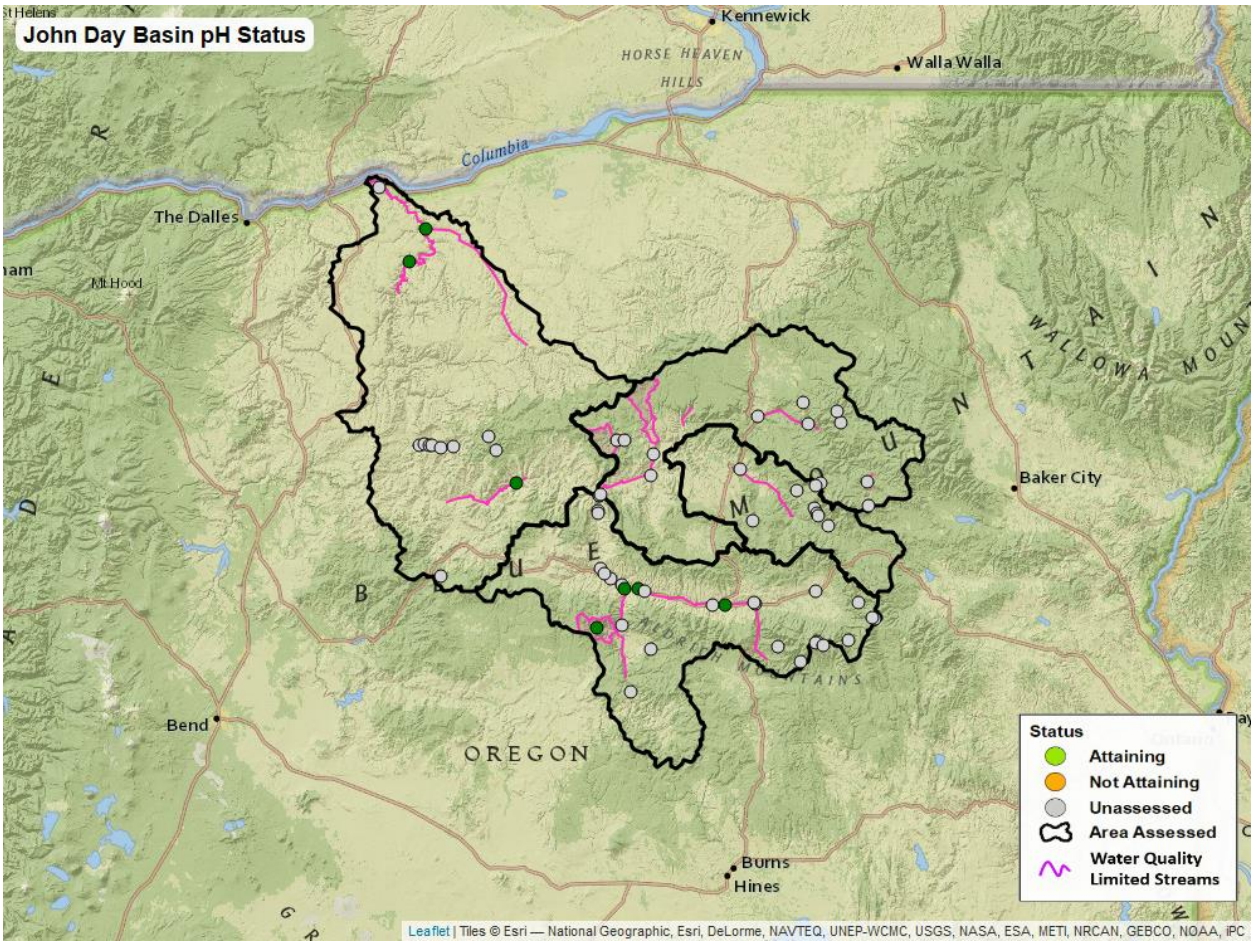

Figure 86: Summary map of the status of pH across the John Day Basin.

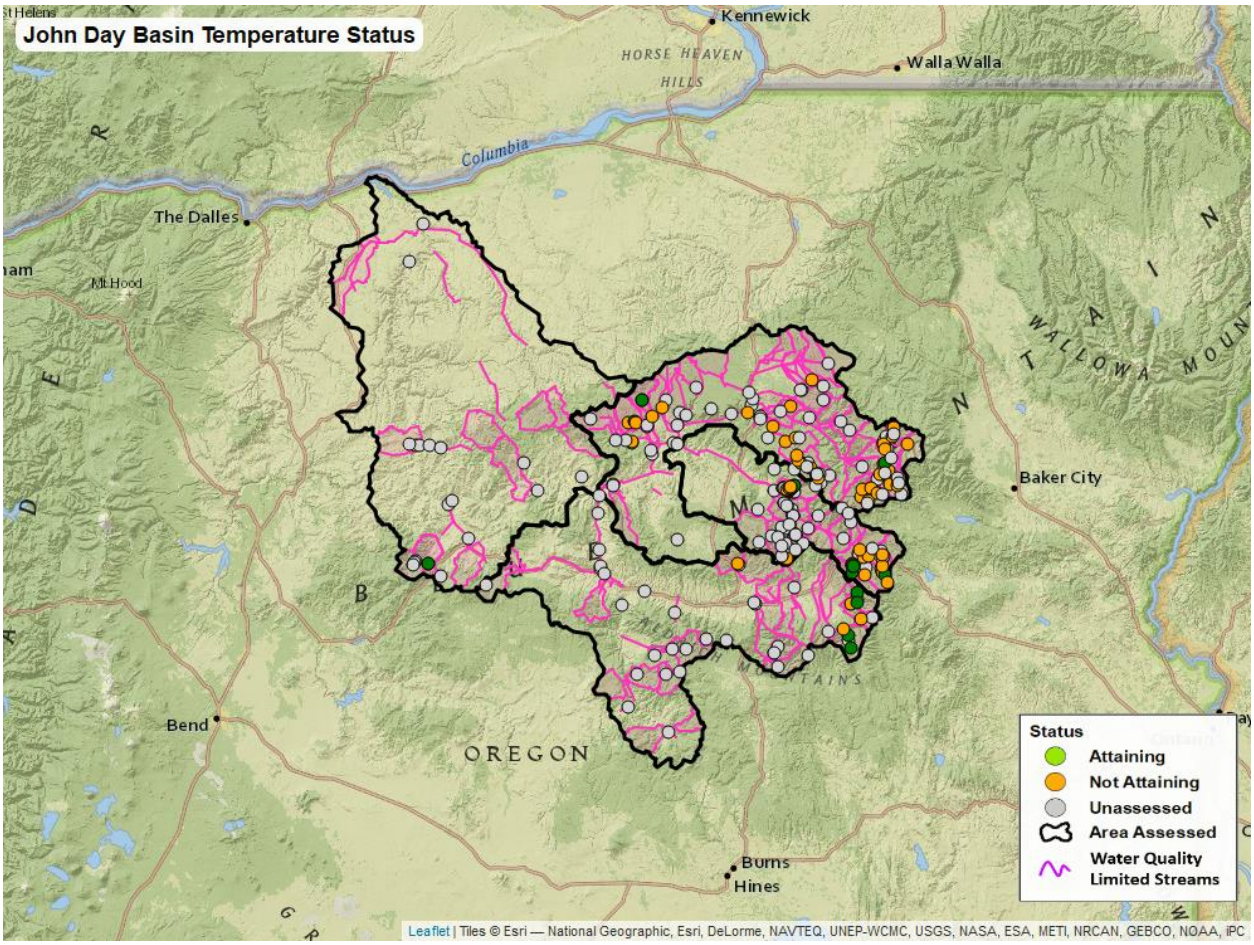

Figure 87: Summary map of the status of temperature across the John Day Basin.

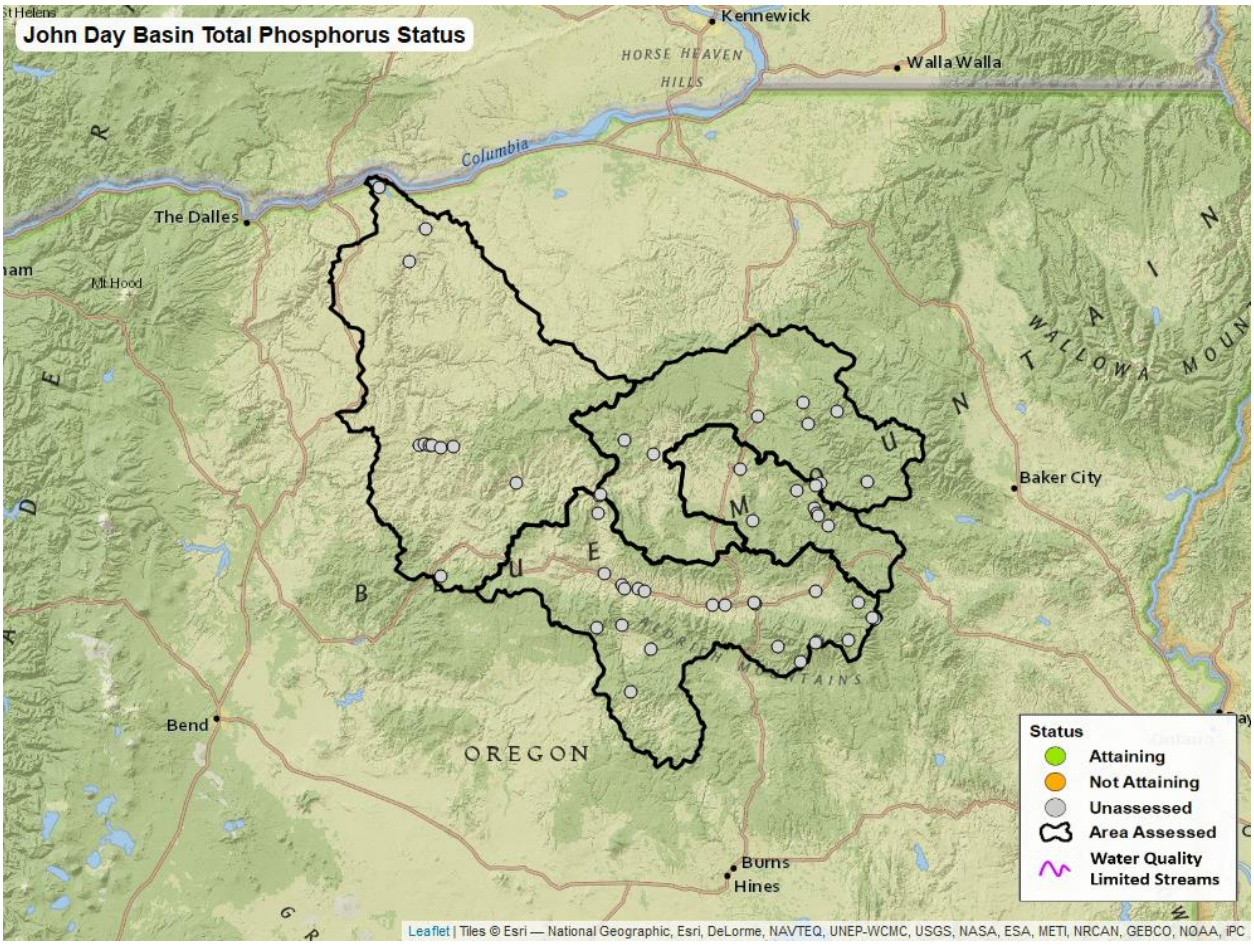

Figure 88: Summary map of the status of total phosphorus across the John Day Basin.

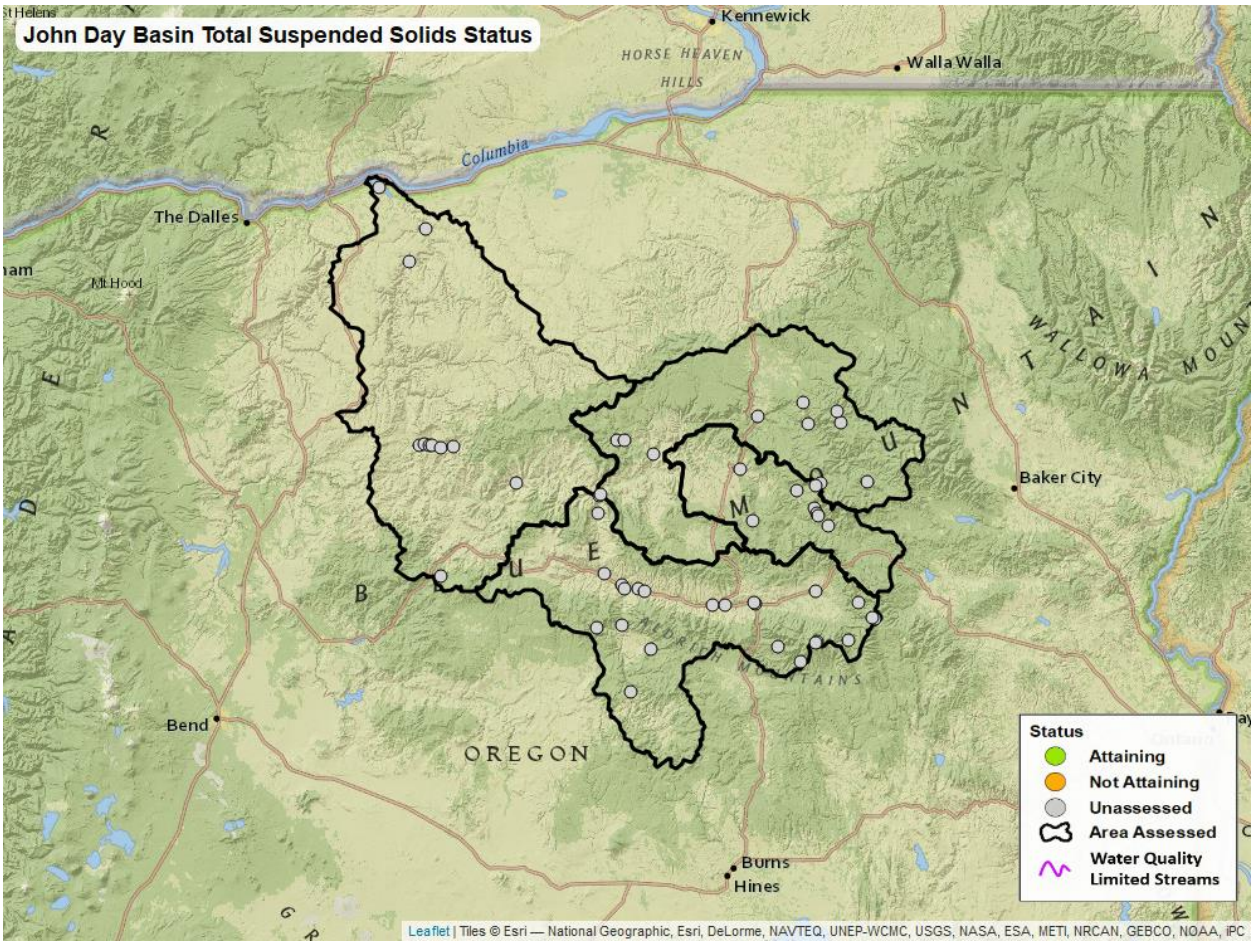

Figure 89: Summary map of the status of total suspended solids across the John Day Basin.

4.7.3 Status

There are 130 assessment units within the John Day Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 127 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 127: Summary of the 2016–2019 assessment unit status within the John Day Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	0	60
Escherichia coli	4	3	5
PH	8	0	34
Temperature	2	35	75
Total Phosphorus	0	0	37
Total Suspended Solids	0	0	38

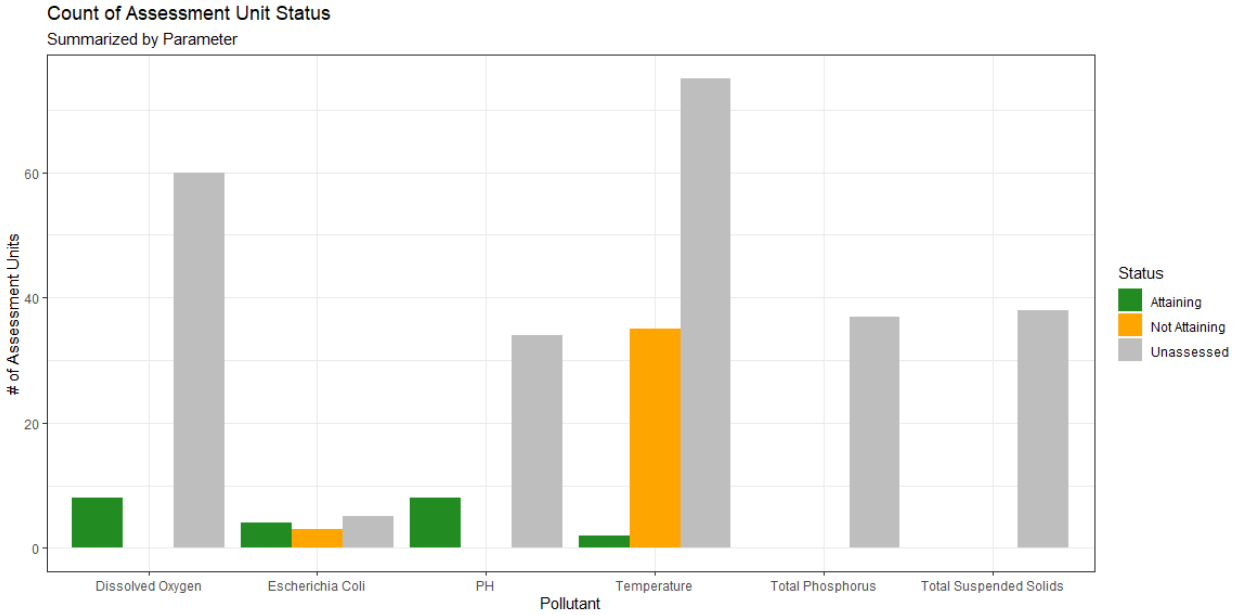

Figure 90: The number of assessment units in each status category by parameter for the 2016–2019 status period within the John Day Basin.

Table 128 and Figure 90 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the John Day Basin for the 2016–2019 status period.

Table 128: The number of assessment units in each status category by parameter for the 2016–2019 status period within the John Day Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	7	0	25
Stream	*Escherichia coli*	4	3	4
Stream	PH	7	0	17
Stream	Temperature	0	13	39
Stream	Total Phosphorus	0	0	22
Stream	Total Suspended Solids	0	0	23
Watershed Unit	Dissolved Oxygen	1	0	34
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	1	0	16
Watershed Unit	Temperature	2	22	36
Watershed Unit	Total Phosphorus	0	0	14
Watershed Unit	Total Suspended Solids	0	0	14

Table 129 and Figure 91 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix F.

Table 129: Summary of the 2016–2019 status at monitoring stations within the John Day Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	0	84
Escherichia coli	4	3	8
PH	8	0	55
Temperature	14	68	163
Total Phosphorus	0	0	52
Total Suspended Solids	0	0	54

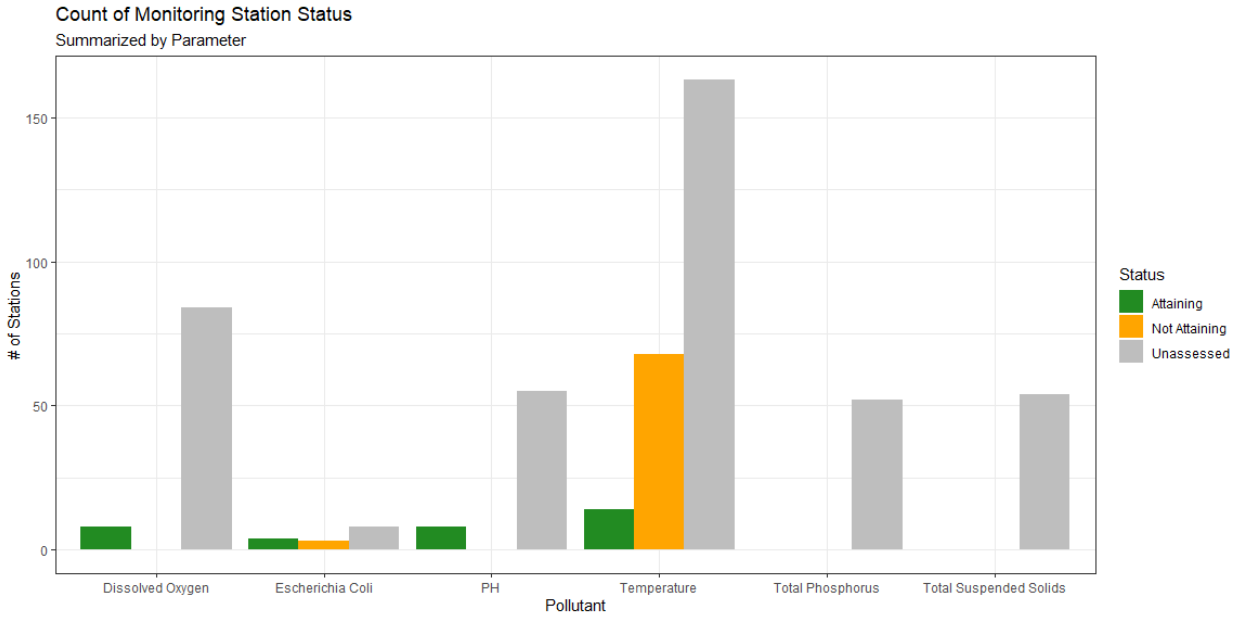

Figure 91: Summary plot of the 2016–2019 station status within the John Day Basin by parameter.

4.7.4 Trend

A summary of the trends across parameters is shown in Table 130. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 130: John Day Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	5	86
Escherichia coli	0	2	0	3	10
PH	0	1	2	3	57
Temperature	11	9	0	1	224

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	5	46
Total Suspended Solids	1	2	2	1	48

4.7.5 Subbasin Summary

4.7.5.1 Upper John Day Subbasin

4.7.5.1.1 Water Quality Limited Assessment Units

Table 131: Number of water quality limited assessment units in the Upper John Day Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	7

4.7.5.1.2 Status

There are 37 assessment units within the Upper John Day Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 132 and Figure 92 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 132: Summary of the 2016–2019 assessment unit status within the Upper John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	24
Escherichia coli	2	1	4
PH	4	0	15
Temperature	0	5	22
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	18

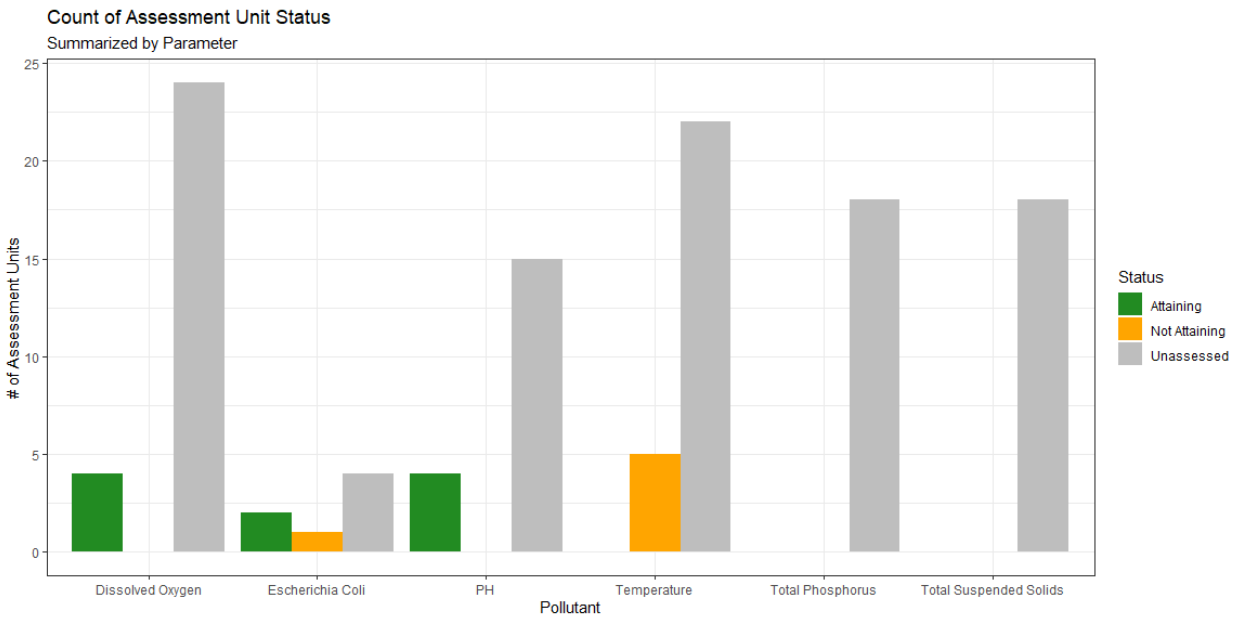

Figure 92: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper John Day Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 133 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper John Day Subbasin for the 2016 – 2019 status period.

Table 133: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper John Day Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	3	0	9
Stream	*Escherichia coli*	2	1	3
Stream	PH	3	0	8
Stream	Temperature	0	0	13
Stream	Total Phosphorus	0	0	10
Stream	Total Suspended Solids	0	0	10
Watershed Unit	Dissolved Oxygen	1	0	14
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	1	0	6
Watershed Unit	Temperature	0	5	9
Watershed Unit	Total Phosphorus	0	0	7
Watershed Unit	Total Suspended Solids	0	0	7

There are 64 stations within the Upper John Day Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix F**. Table 134 and Figure 93 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 134: Summary of the 2016–2019 status at monitoring stations within the Upper John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	32
Escherichia coli	2	1	7
PH	4	0	23
Temperature	4	4	32
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	23

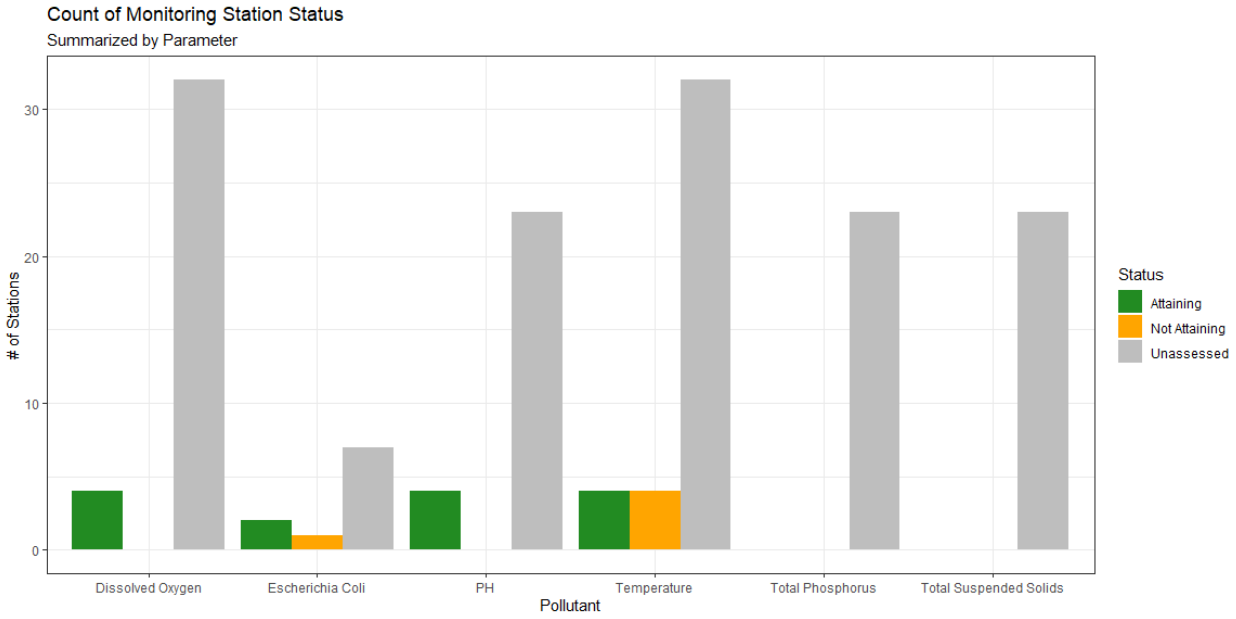

Figure 93: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper John Day Subbasin.

4.7.5.1.3 Trend

A summary of the trends within parameters is shown in Table 135. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 135: Subbasin Summary of trend results at stations across the Upper John Day.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	34
Escherichia coli	0	1	0	1	8
PH	0	0	0	2	25

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	2	2	0	0	36
Total Phosphorus	0	0	1	1	21
Total Suspended Solids	0	2	0	0	21

4.7.5.2 North Fork John Day Subbasin

4.7.5.2.1 Water Quality Limited Assessment Units

Table 136: Number of water quality limited assessment units in the North Fork John Day Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	3

4.7.5.2.2 Status

There are 49 assessment units within the North Fork John Day Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 137 and Figure 94 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 137: Summary of the 2016–2019 assessment unit status within the North Fork John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	18
Escherichia coli	0	1	0
PH	1	0	9
Temperature	1	20	26
Total Phosphorus	0	0	8
Total Suspended Solids	0	0	9

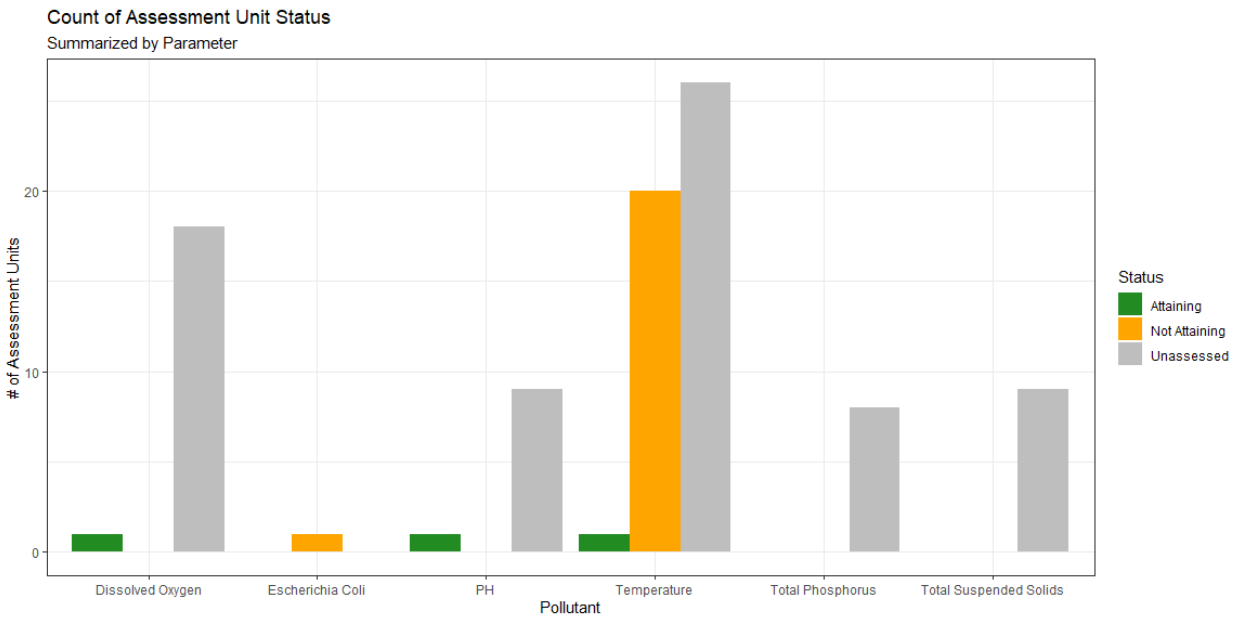

Figure 94: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the North Fork John Day Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 138 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the North Fork John Day Subbasin for the 2016 – 2019 status period.

Table 138: The number of assessment units in each status category by parameter for the 2016–2019 status period within the North Fork John Day Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	9
Stream	*Escherichia coli*	0	1	0
Stream	PH	1	0	5
Stream	Temperature	0	8	15
Stream	Total Phosphorus	0	0	5
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	9
Watershed Unit	PH	0	0	4
Watershed Unit	Temperature	1	12	11
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	3

There are 116 stations within the North Fork John Day Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix F**. Table 139 and Figure 95 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 139: Summary of the 2016–2019 status at monitoring stations within the North Fork John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	24
Escherichia coli	0	1	0
PH	1	0	14
Temperature	4	33	62
Total Phosphorus	0	0	10
Total Suspended Solids	0	0	12

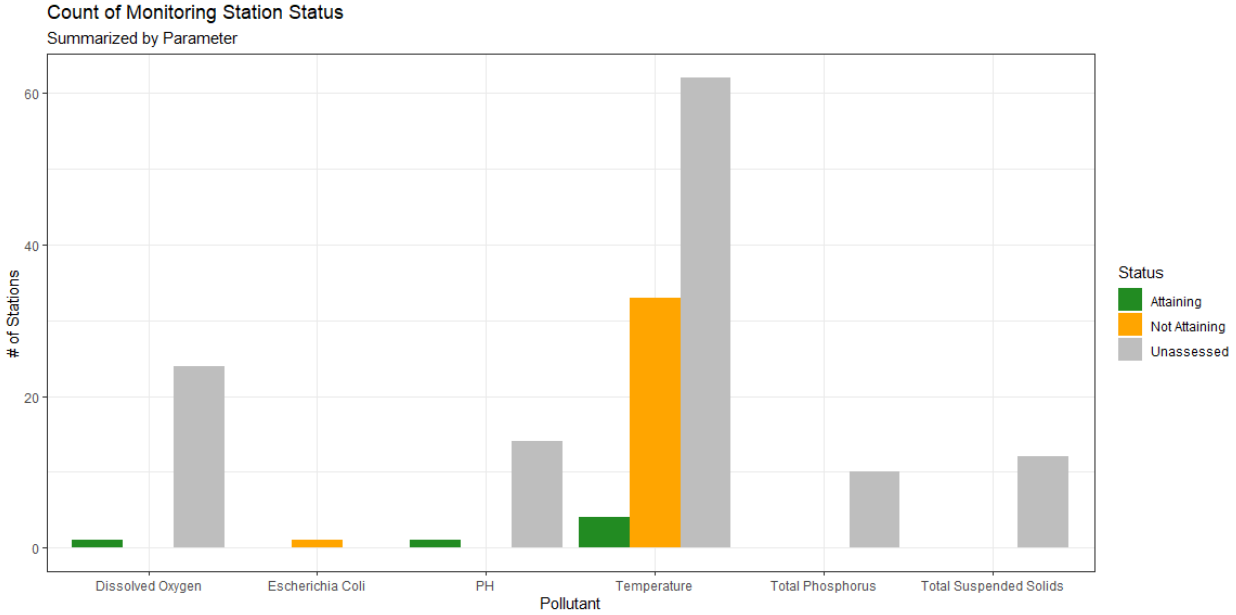

Figure 95: The number of stations in each status category by parameter for the 2016–2019 status period within the North Fork John Day Subbasin.

4.7.5.2.3 Trend

A summary of the trends within parameters is shown in Table 140. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 140: Subbasin Summary of trend results at stations across the North Fork John Day.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	24
Escherichia coli	0	1	0	0	0
PH	0	0	0	1	14
Temperature	7	4	0	0	88
Total Phosphorus	0	0	0	1	9
Total Suspended Solids	0	0	1	0	11

4.7.5.3 Lower John Day Subbasin

4.7.5.3.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.7.5.3.2 Status

There are 20 assessment units within the Lower John Day Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 141 and Figure 96 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 141: Summary of the 2016–2019 assessment unit status within the Lower John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	12
Escherichia coli	2	1	1
PH	3	0	6
Temperature	1	1	12
Total Phosphorus	0	0	7
Total Suspended Solids	0	0	7

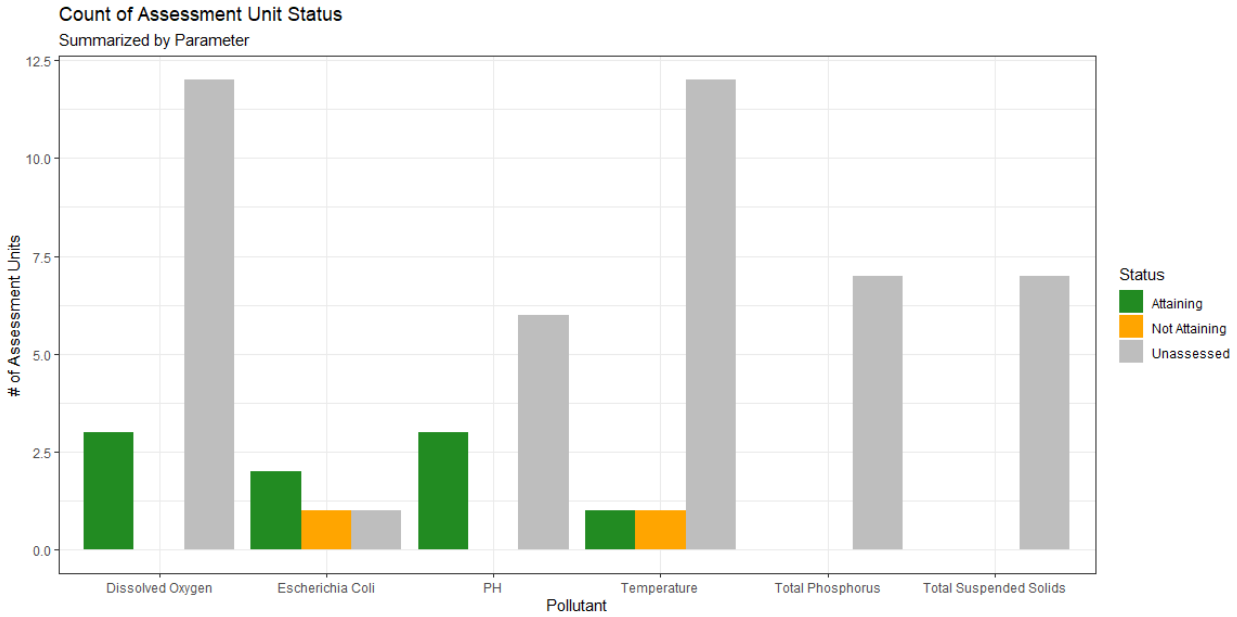

Figure 96: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower John Day Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 142 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower John Day Subbasin for the 2016 – 2019 status period.

Table 142: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower John Day Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	3	0	5
Stream	*Escherichia coli*	2	1	1
Stream	PH	3	0	3
Stream	Temperature	0	1	8
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	7
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	1	0	4
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	1

There are 30 stations within the Lower John Day Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix F**. Table 143 and Figure 97 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 143: Summary of the 2016–2019 status at monitoring stations within the Lower John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	16
Escherichia coli	2	1	1
PH	3	0	10
Temperature	1	1	17
Total Phosphorus	0	0	11
Total Suspended Solids	0	0	11

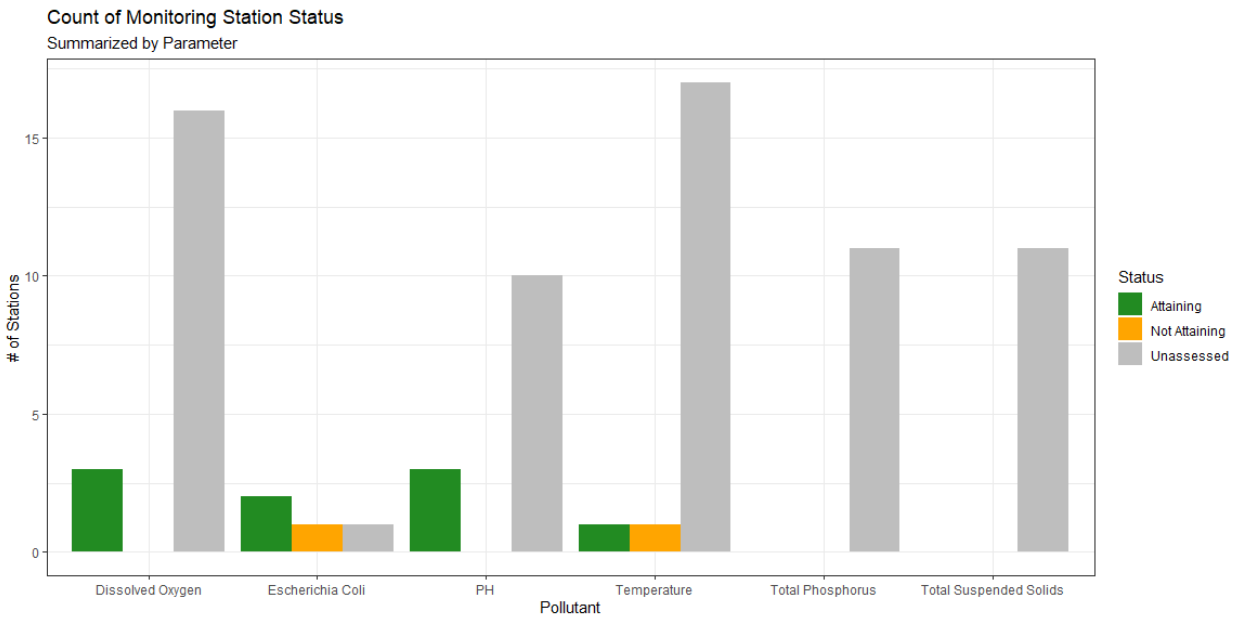

Figure 97: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower John Day Subbasin.

4.7.5.3.3 Trend

A summary of the trends within parameters is shown in Table 144. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 144: Subbasin Summary of trend results at stations across the Lower John Day.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	3	16
Escherichia coli	0	0	0	2	2
PH	0	1	2	0	10
Temperature	1	1	0	0	17
Total Phosphorus	0	0	0	3	8
Total Suspended Solids	1	0	1	1	8

4.7.5.4 Middle Fork John Day Subbasin

4.7.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.7.5.4.2 Status

There are 25 assessment units within the Middle Fork John Day Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 145 and Figure 98

summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 145: Summary of the 2016–2019 assessment unit status within the Middle Fork John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	7
PH	0	0	5
Temperature	0	10	15
Total Phosphorus	0	0	5
Total Suspended Solids	0	0	5

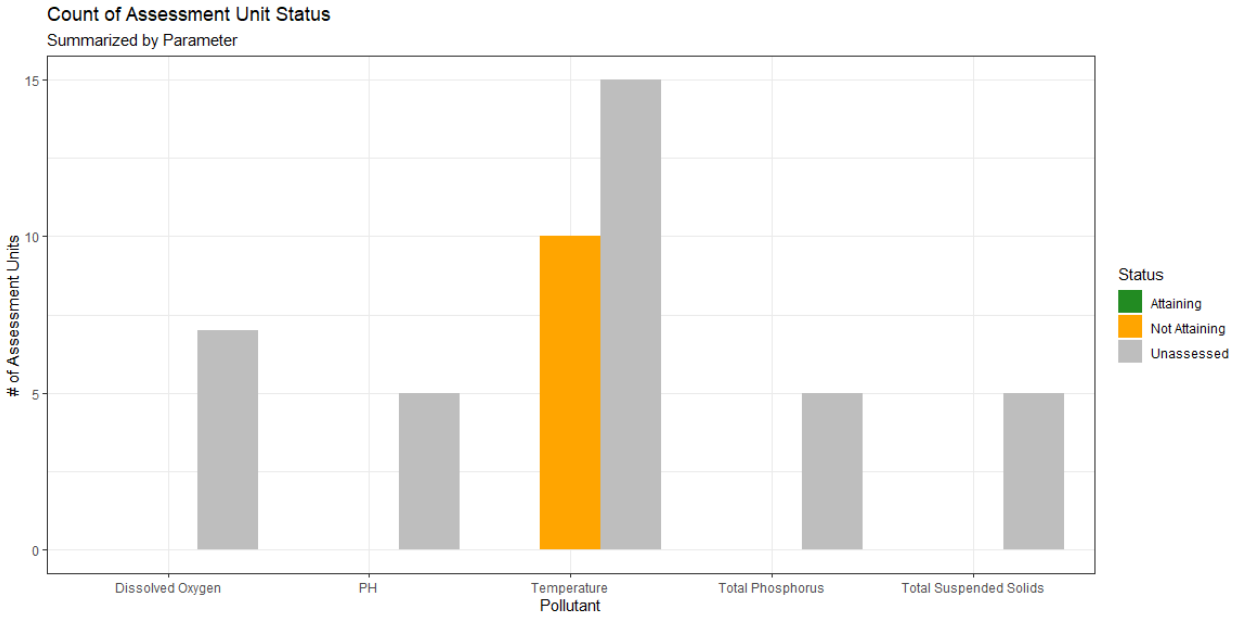

Figure 98: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Fork John Day Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 146 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Fork John Day Subbasin for the 2016 – 2019 status period.

Table 146: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Fork John Day Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	2
Stream	PH	0	0	1
Stream	Temperature	0	4	3
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Dissolved Oxygen	0	0	5
Watershed Unit	PH	0	0	4

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Temperature	0	6	12
Watershed Unit	Total Phosphorus	0	0	4
Watershed Unit	Total Suspended Solids	0	0	4

There are 95 stations within the Middle Fork John Day Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix F**. Table 147 and Figure 99 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 147: Summary of the 2016–2019 status at monitoring stations within the Middle Fork John Day Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	12
PH	0	0	8
Temperature	5	30	52
Total Phosphorus	0	0	8
Total Suspended Solids	0	0	8

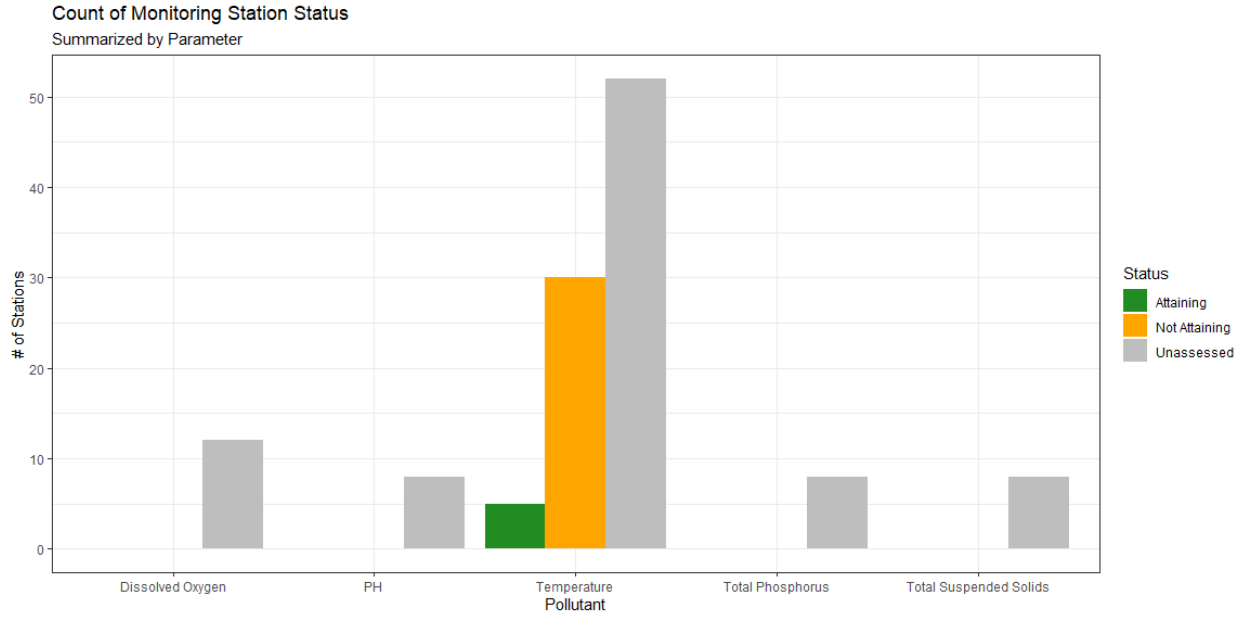

Figure 99: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Fork John Day Subbasin.

4.7.5.4.3 Trend

A summary of the trends within parameters is shown in Table 148. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 148: Subbasin Summary of trend results at stations across the Middle Fork John Day.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	12
PH	0	0	0	0	8
Temperature	1	2	0	1	83
Total Phosphorus	0	0	0	0	8
Total Suspended Solids	0	0	0	0	8

4.8 Klamath Basin

A summary of status and trend results for the Klamath Basin and all subbasins within the Klamath Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix G**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Klamath Basin are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 286 stations within the Klamath Basin. These stations were located across 62 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.8.1 Land Use

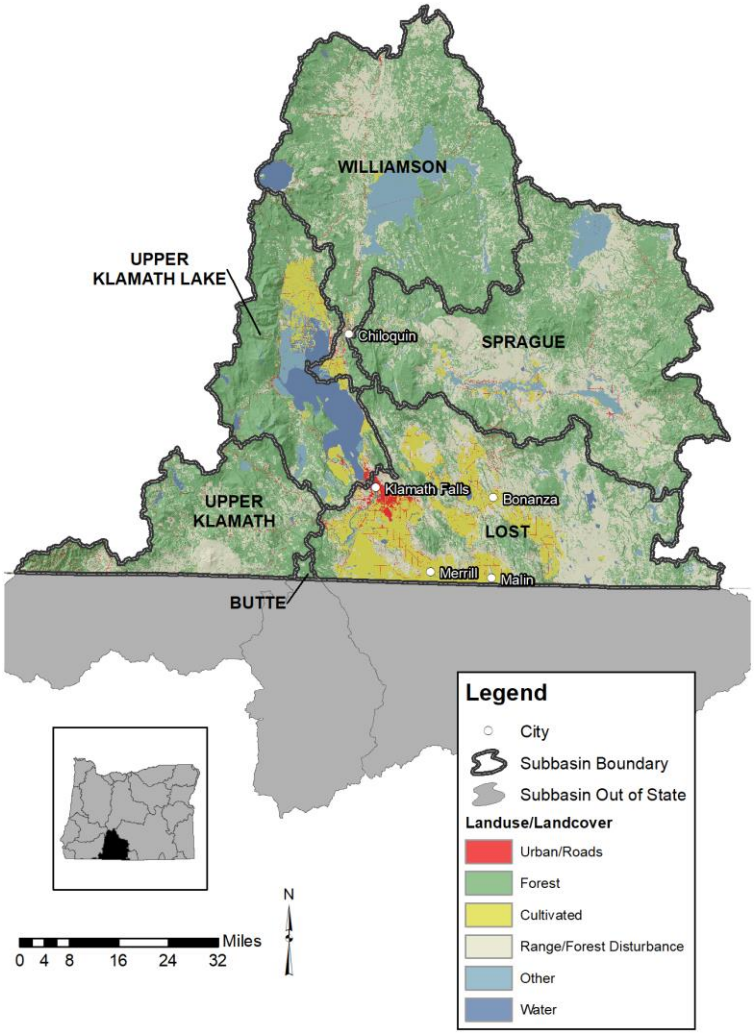

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 149: Land use within the Klamath Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Williamson	3726	0.7	62.2	0.9	25.6	10.6
Sprague	4171	0.7	55.5	1.2	36.5	6.1
Upper Klamath Lake	1875	1.8	54.9	10.4	8.9	24.0
Lost	3380	3.3	31.1	22.7	40.0	2.9

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Klamath	1479	2.0	63.4	0.1	33.0	1.7

4.8.2 Parameter Maps

The maps in Figure 100 through Figure 105 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

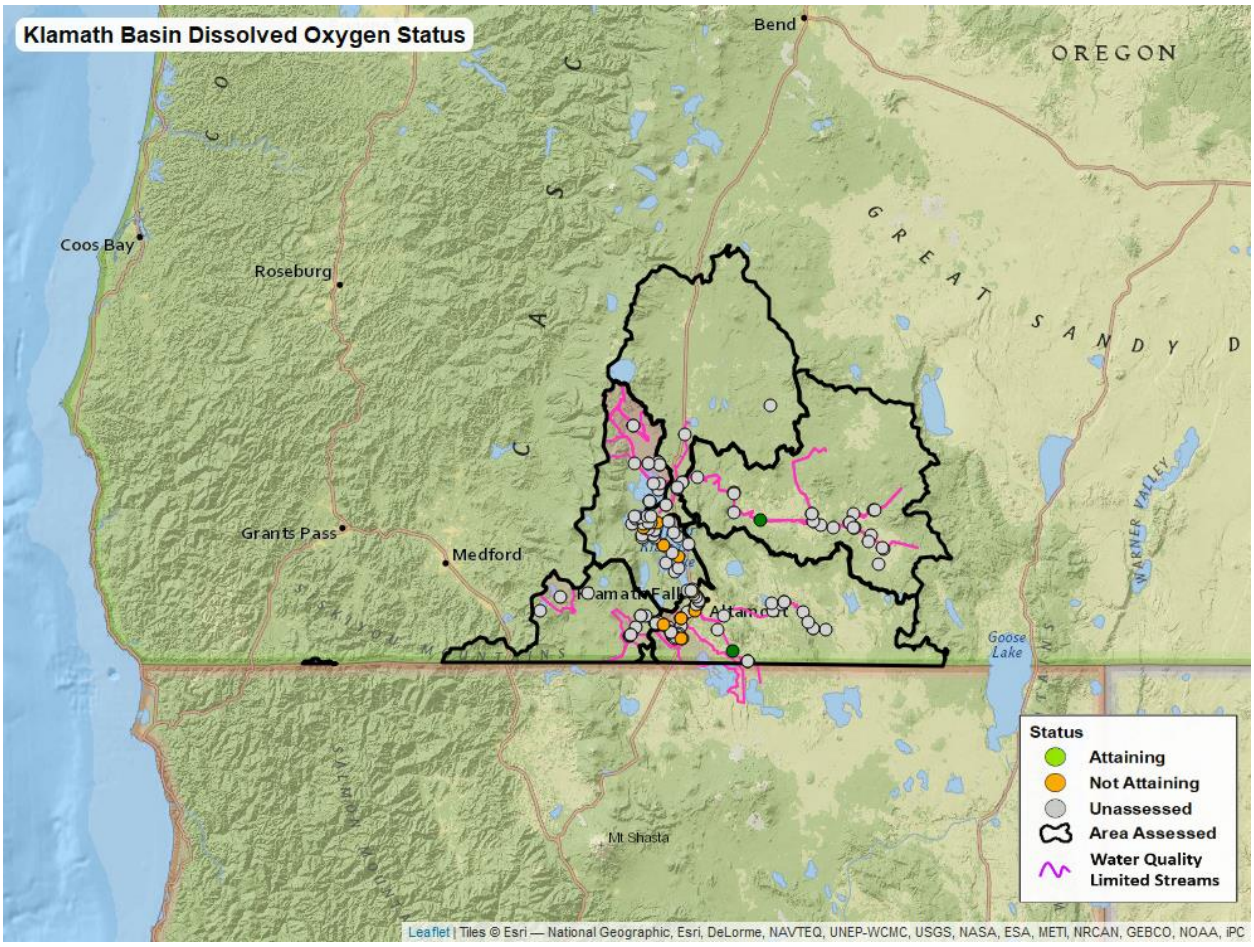

Figure 100: Summary map of the status of dissolved oxygen across the Klamath Basin.

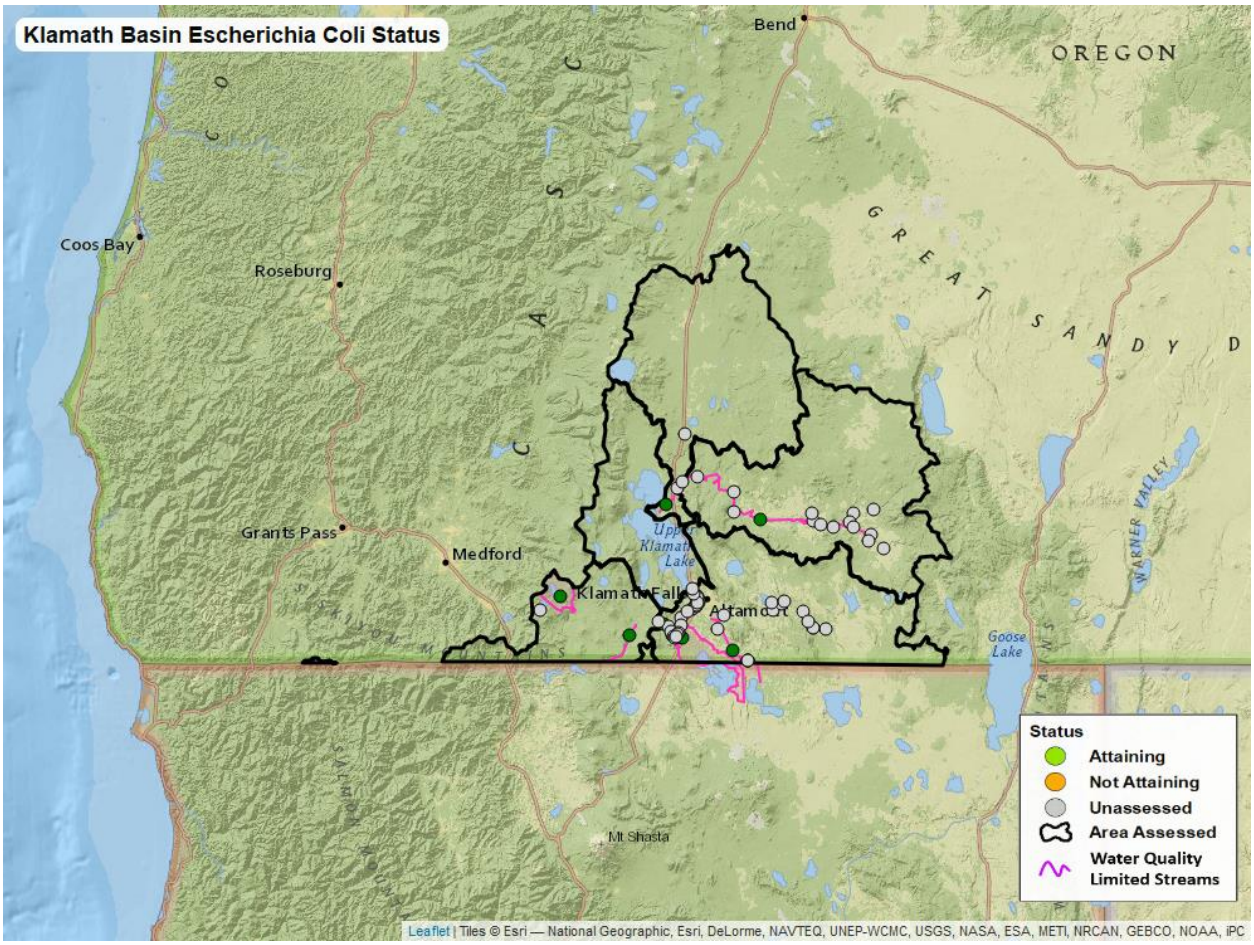

Figure 101: Summary map of the status of *Escherichia coli* across the Klamath Basin.

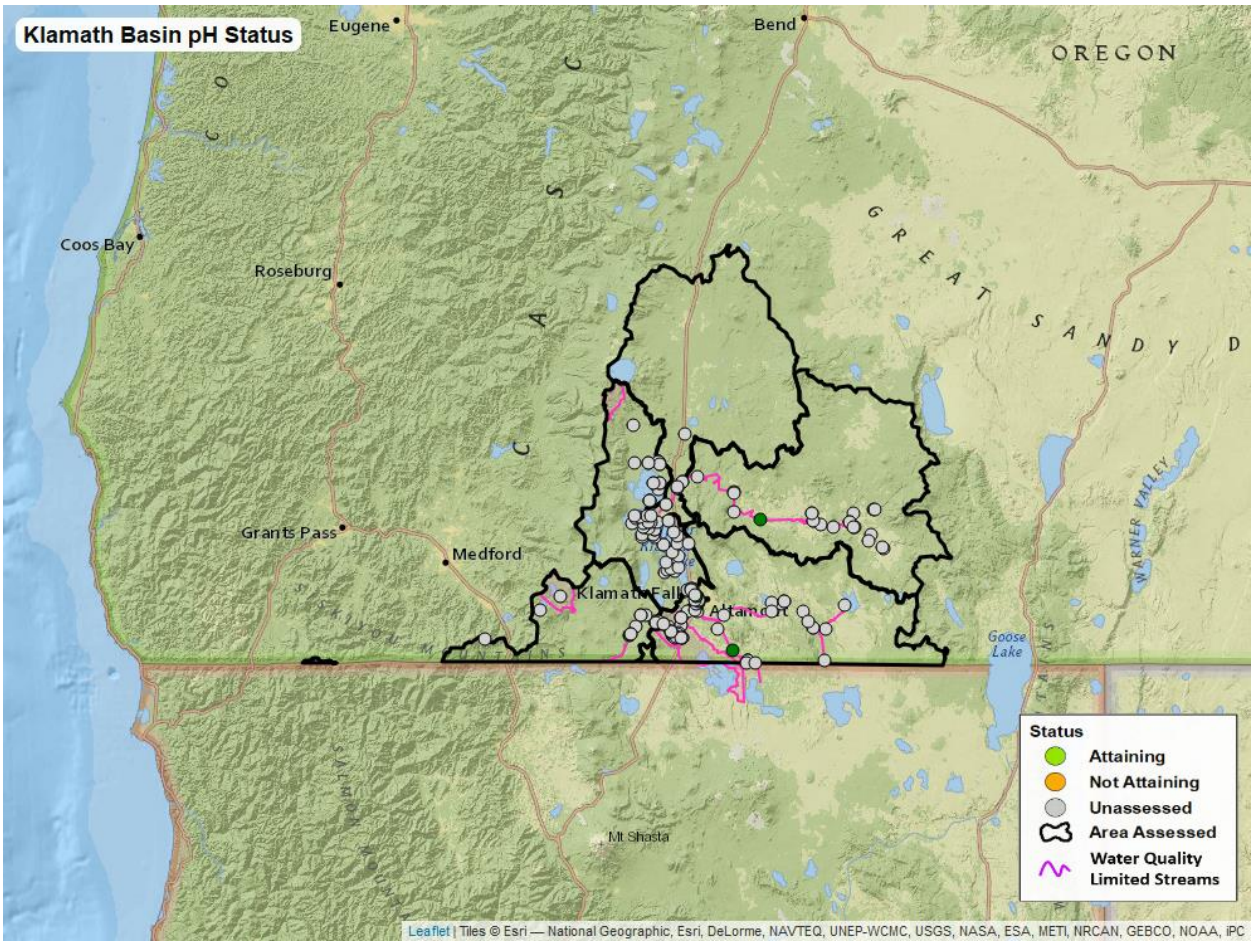

Figure 102: Summary map of the status of pH across the Klamath Basin.

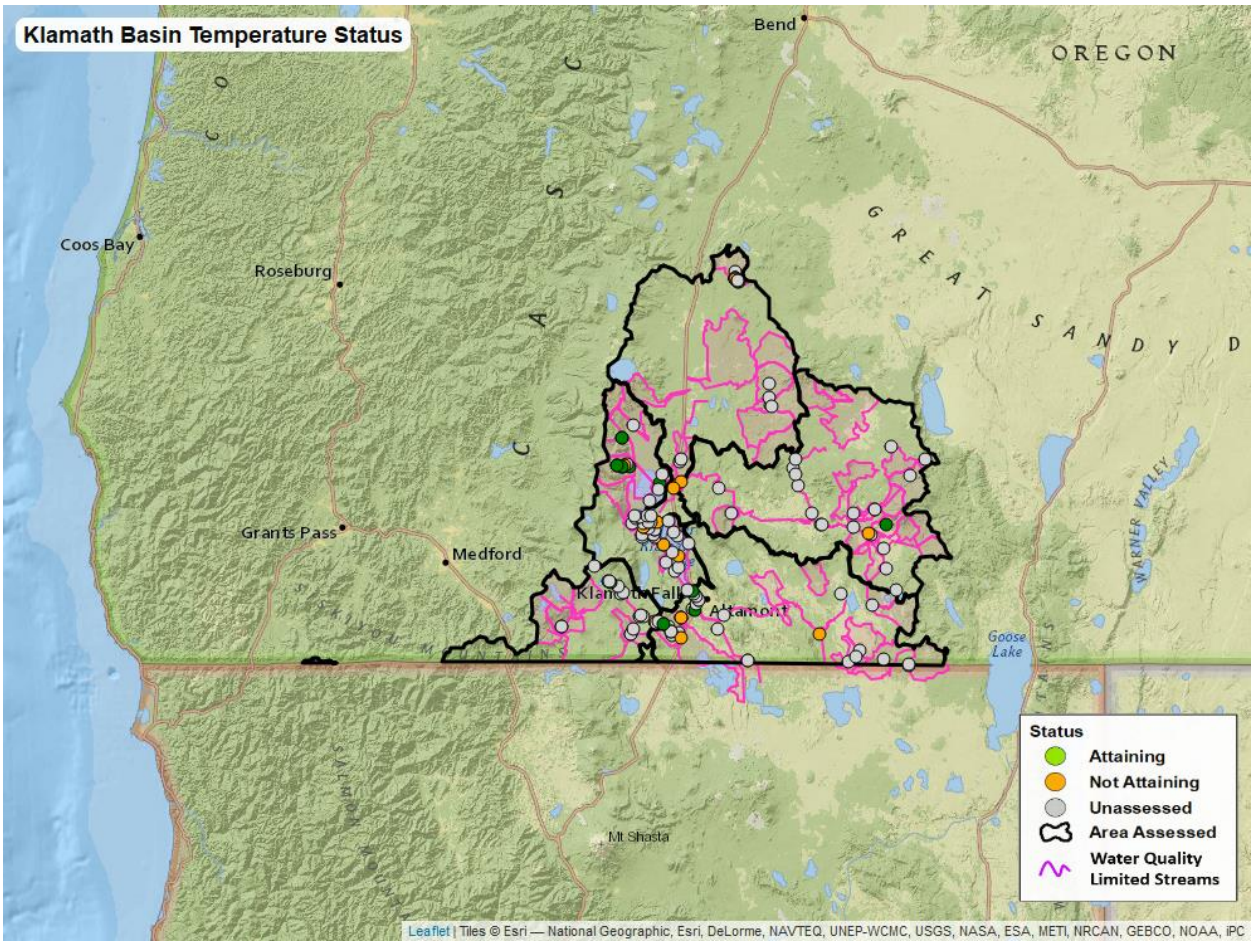

Figure 103: Summary map of the status of temperature across the Klamath Basin.

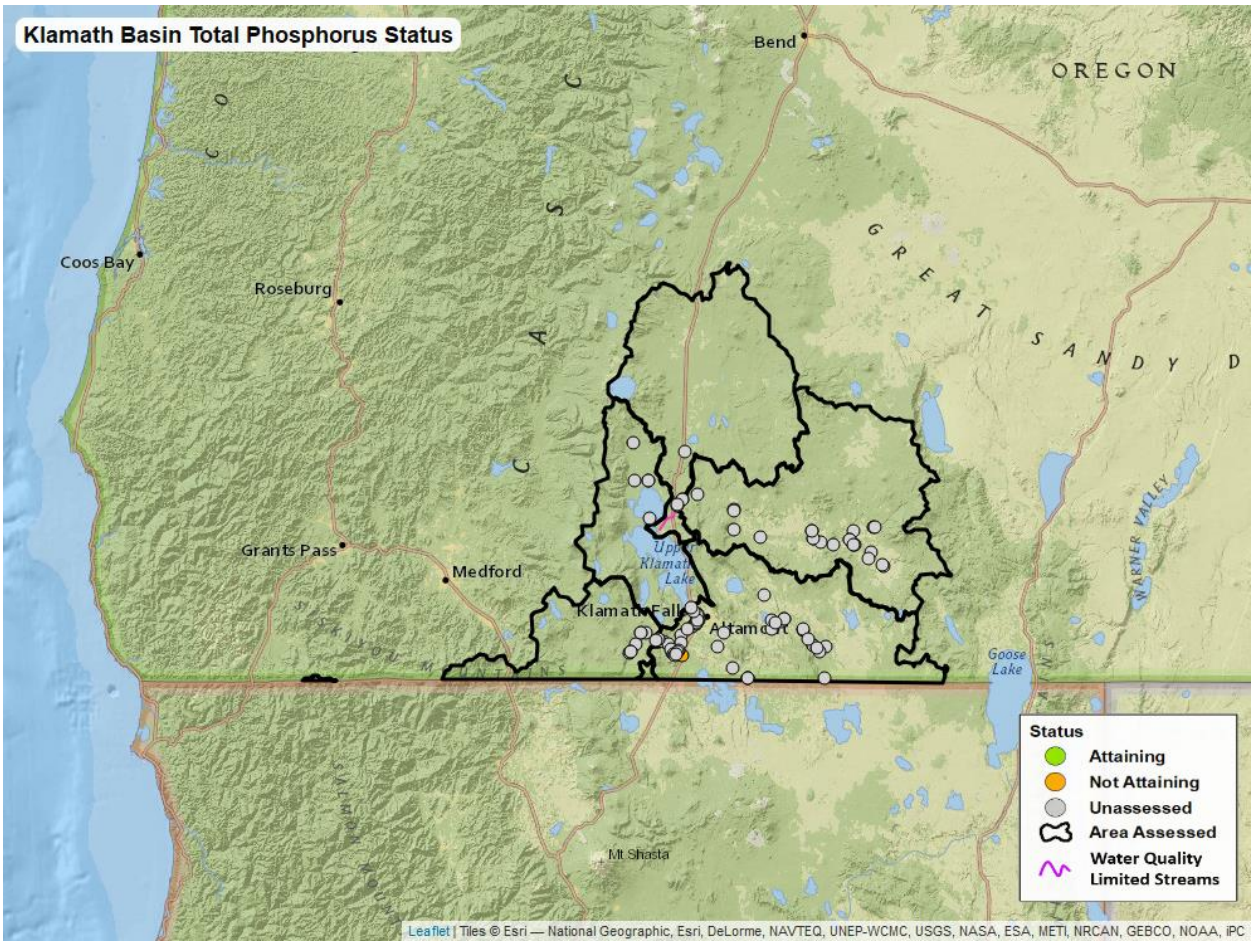

Figure 104: Summary map of the status of total phosphorus across the Klamath Basin.

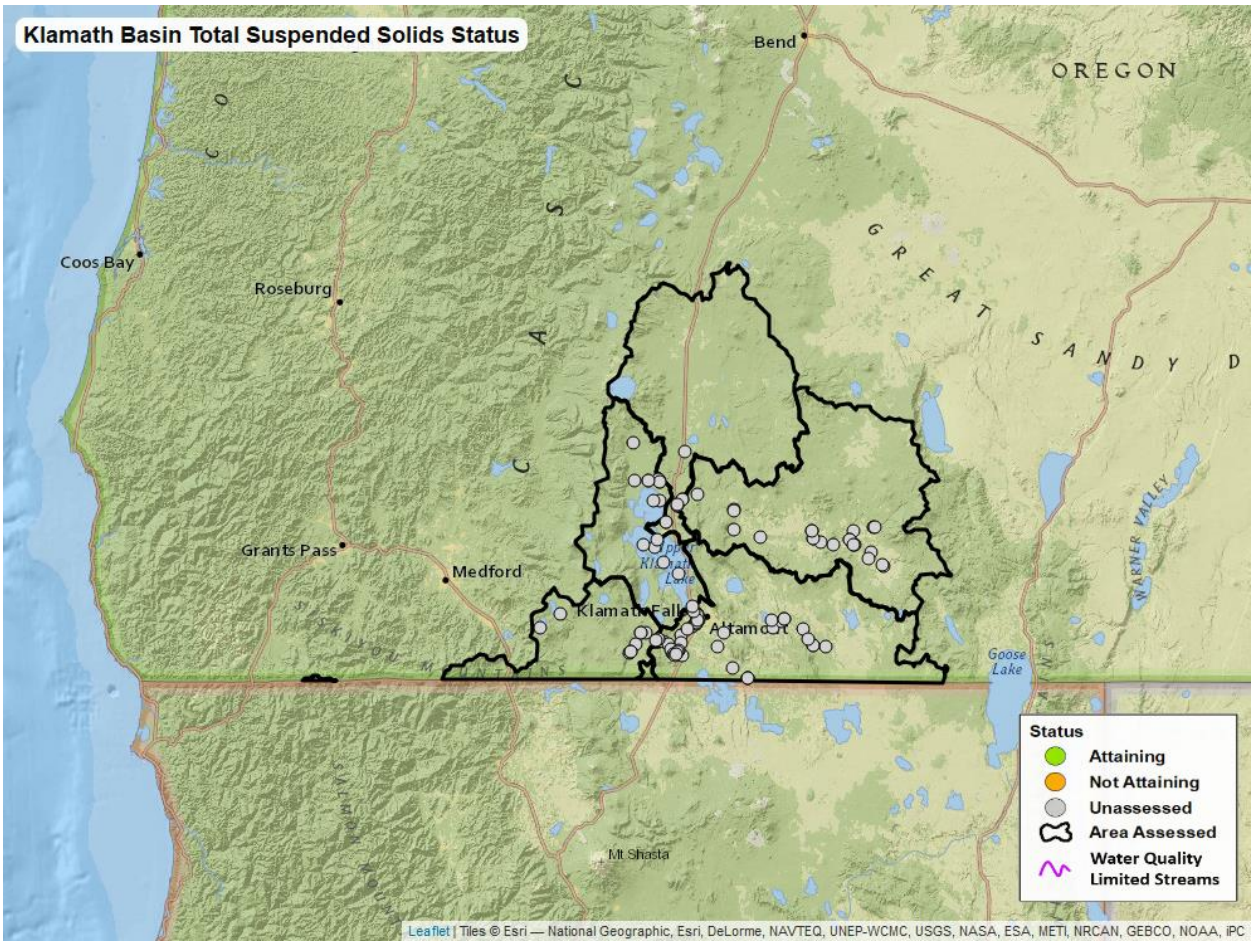

Figure 105: Summary map of the status of total suspended solids across the Klamath Basin.

4.8.3 Status

There are 62 assessment units within the Klamath Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 150 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 150: Summary of the 2016–2019 assessment unit status within the Klamath Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	6	27
Escherichia coli	8	0	17
PH	7	1	32
Temperature	7	9	30
Total Phosphorus	0	2	32
Total Suspended Solids	0	0	33

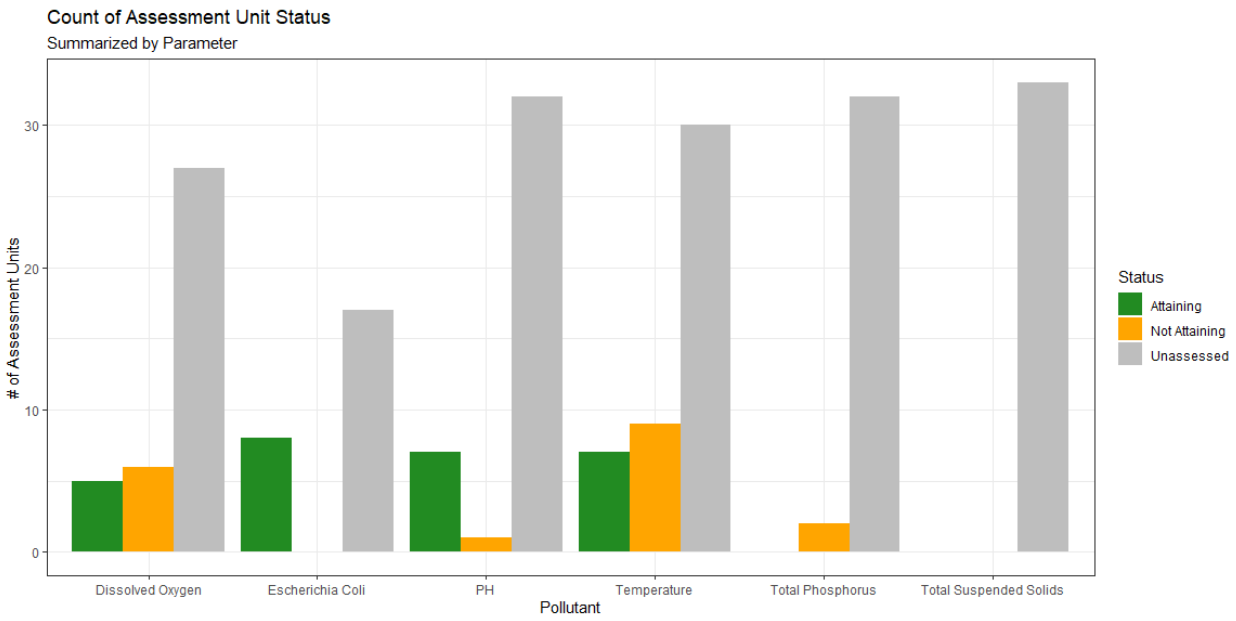

Figure 106: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Klamath Basin.

Table 151 and Figure 106 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Klamath Basin for the 2016–2019 status period.

Table 151: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Klamath Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	1	4
Lake	*Escherichia coli*	0	0	3
Lake	PH	1	0	4
Lake	Temperature	0	1	4
Lake	Total Phosphorus	0	0	4
Lake	Total Suspended Solids	0	0	4
Stream	Dissolved Oxygen	5	3	13
Stream	*Escherichia coli*	6	0	11
Stream	PH	5	1	16
Stream	Temperature	4	4	8
Stream	Total Phosphorus	0	1	20
Stream	Total Suspended Solids	0	0	20
Watershed Unit	Dissolved Oxygen	0	2	10
Watershed Unit	*Escherichia coli*	2	0	3
Watershed Unit	PH	1	0	12
Watershed Unit	Temperature	3	4	18
Watershed Unit	Total Phosphorus	0	1	8

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	9

Table 152 and Figure 107 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix G.

Table 152: Summary of the 2016–2019 status at monitoring stations within the Klamath Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	15	160
Escherichia coli	8	0	58
PH	8	2	187
Temperature	16	16	133
Total Phosphorus	0	2	113
Total Suspended Solids	0	0	104

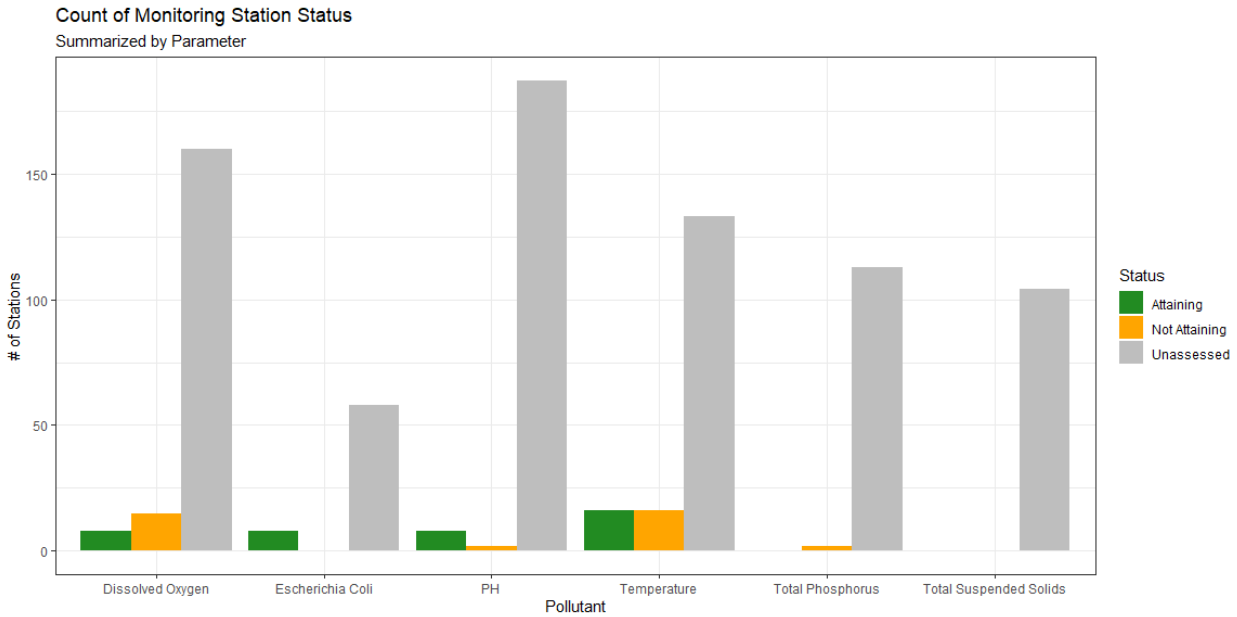

Figure 107: Summary plot of the 2016–2019 station status within the Klamath Basin by parameter.

4.8.4 Trend

A summary of the trends across parameters is shown in Table 153. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 153: Klamath Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	29	6	4	6	138

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	1	1	0	6	58
PH	0	20	5	13	159
Temperature	2	17	0	1	145
Total Phosphorus	10	8	0	8	89
Total Suspended Solids	0	3	0	5	96

4.8.5 Subbasin Summary

4.8.5.1 Lost Subbasin

4.8.5.1.1 Water Quality Limited Assessment Units

Table 154: Number of water quality limited assessment units in the Lost Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	4

4.8.5.1.2 Status

There are 22 assessment units within the Lost Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 155 and Figure 108 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 155: Summary of the 2016–2019 assessment unit status within the Lost Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	5	7
Escherichia coli	4	0	8
PH	4	1	10
Temperature	3	2	10
Total Phosphorus	0	1	13
Total Suspended Solids	0	0	12

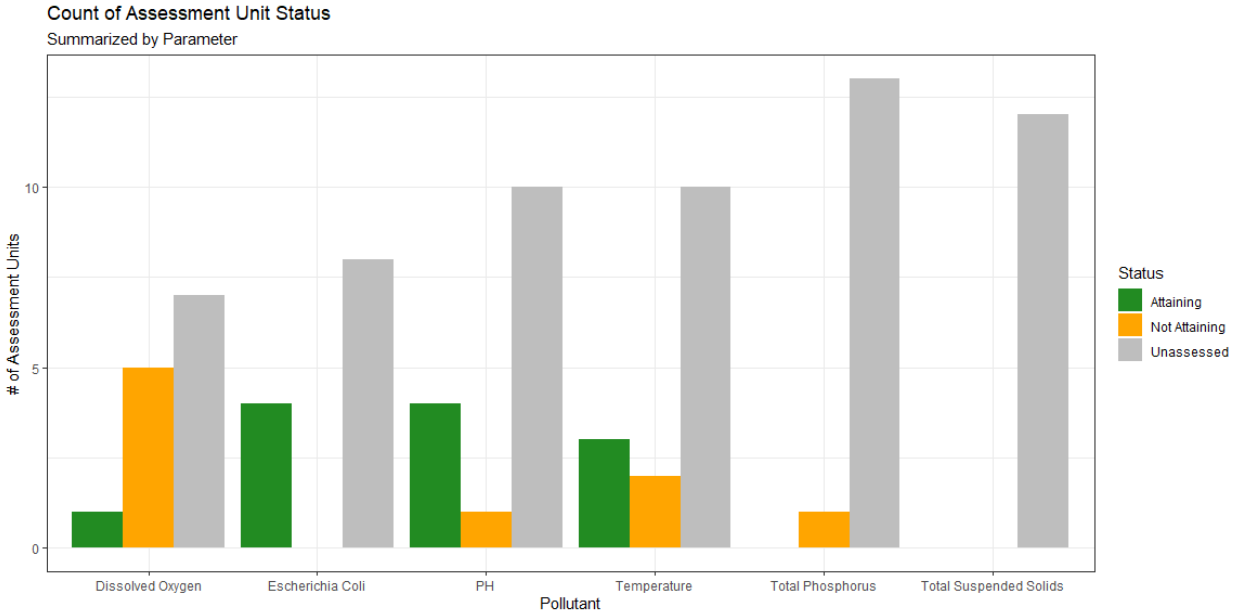

Figure 108: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lost Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 156 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lost Subbasin for the 2016 – 2019 status period.

Table 156: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lost Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	0	0	2
Lake	PH	1	0	1
Lake	Temperature	0	0	3
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	1	3	4
Stream	*Escherichia coli*	3	0	4
Stream	PH	2	1	6
Stream	Temperature	3	1	2
Stream	Total Phosphorus	0	0	8
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	0	2	1
Watershed Unit	*Escherichia coli*	1	0	2
Watershed Unit	PH	1	0	3
Watershed Unit	Temperature	0	1	5

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	1	3
Watershed Unit	Total Suspended Solids	0	0	3

There are 88 stations within the Lost Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix G**. Table 157 and Figure 109 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 157: Summary of the 2016–2019 status at monitoring stations within the Lost Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	7	47
Escherichia coli	4	0	39
PH	5	2	62
Temperature	5	4	33
Total Phosphorus	0	1	50
Total Suspended Solids	0	0	44

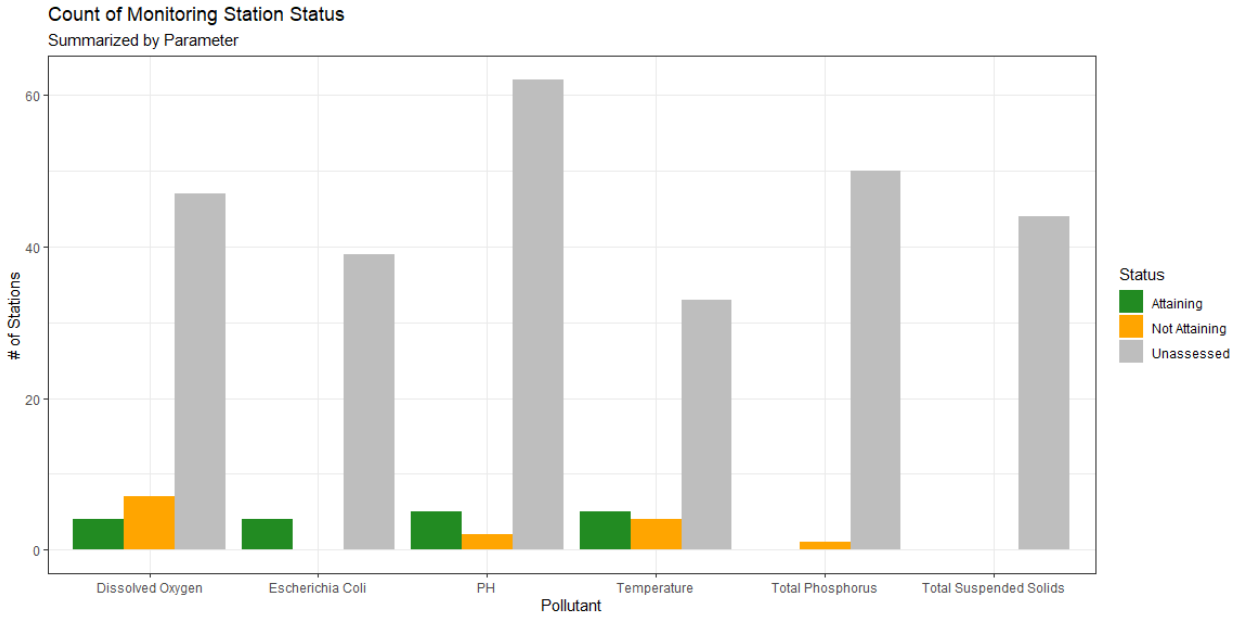

Figure 109: The number of stations in each status category by parameter for the 2016–2019 status period within the Lost Subbasin.

4.8.5.1.3 Trend

A summary of the trends within parameters is shown in Table 158. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 158: Subbasin Summary of trend results at stations across the Lost.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	5	2	4	2	45
Escherichia coli	1	1	0	2	39
PH	0	2	3	3	61
Temperature	2	8	0	0	32
Total Phosphorus	1	0	0	3	47
Total Suspended Solids	0	2	0	2	40

4.8.5.2 Upper Klamath Subbasin

4.8.5.2.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.8.5.2.2 Status

There are 11 assessment units within the Upper Klamath Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 159 and Figure 110 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 159: Summary of the 2016–2019 assessment unit status within the Upper Klamath Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	5
Escherichia coli	2	0	1
PH	1	0	6
Temperature	1	1	5
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	6

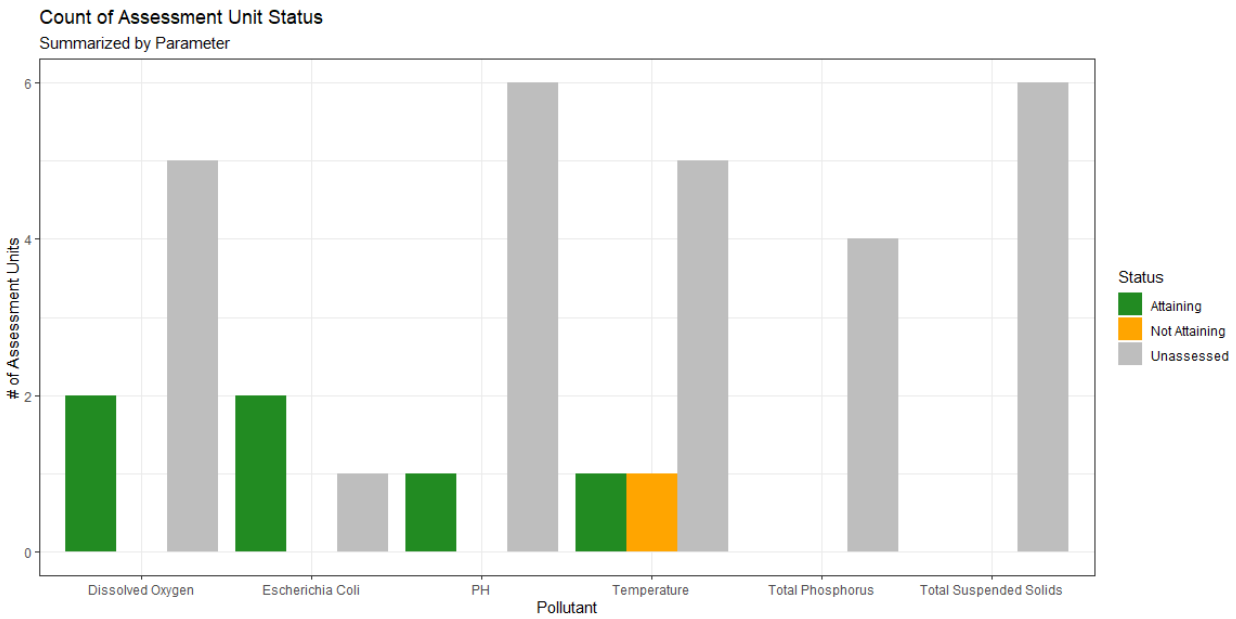

Figure 110: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Klamath Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 160 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Klamath Subbasin for the 2016 – 2019 status period.

Table 160: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Klamath Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	2	0	1
Stream	*Escherichia coli*	1	0	0
Stream	PH	1	0	2
Stream	Temperature	1	1	1
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	3
Watershed Unit	Dissolved Oxygen	0	0	3
Watershed Unit	*Escherichia coli*	1	0	0
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	0	0	4
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	2

There are 27 stations within the Upper Klamath Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix G**. Table 161 and Figure 111 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 161: Summary of the 2016–2019 status at monitoring stations within the Upper Klamath Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	11
Escherichia coli	2	0	1
PH	1	0	12
Temperature	1	1	15
Total Phosphorus	0	0	9
Total Suspended Solids	0	0	11

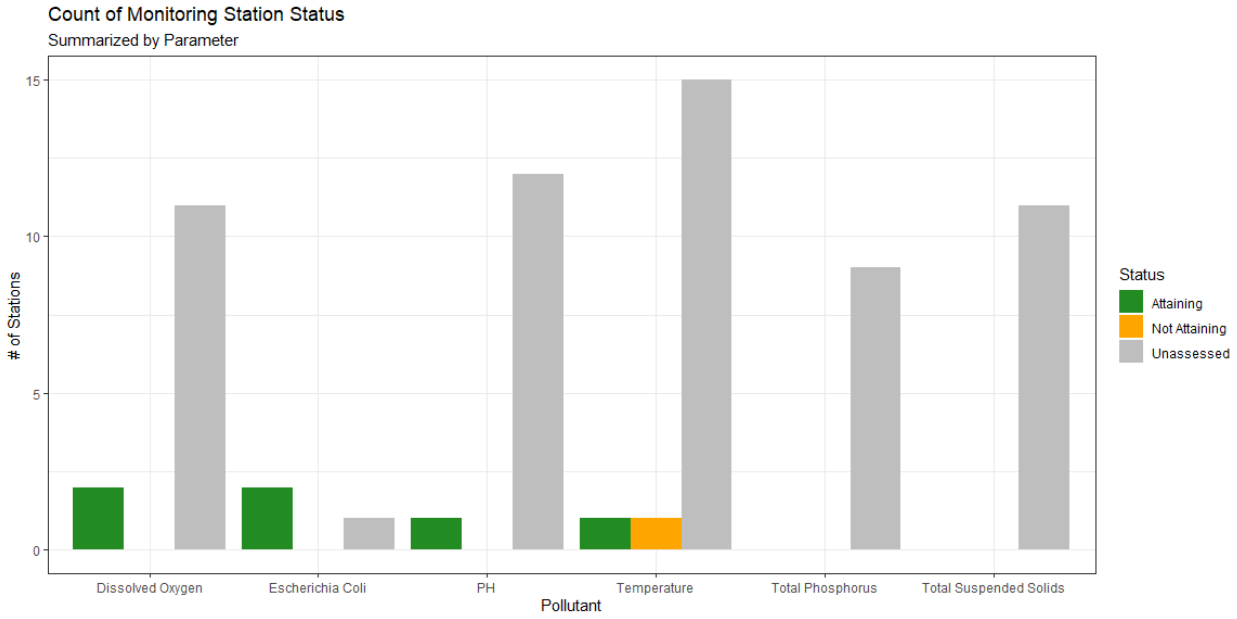

Figure 111: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Klamath Subbasin.

4.8.5.2.3 Trend

A summary of the trends within parameters is shown in Table 162. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 162: Subbasin Summary of trend results at stations across the Upper Klamath.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	11
Escherichia coli	0	0	0	2	1
PH	0	0	0	1	12

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	0	1	0	0	16
Total Phosphorus	1	0	0	0	8
Total Suspended Solids	0	1	0	1	9

4.8.5.3 Williamson Subbasin

4.8.5.3.1 Water Quality Limited Assessment Units

Table 163: Number of water quality limited assessment units in the Williamson Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	1

4.8.5.3.2 Status

There are 6 assessment units within the Williamson Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 164 and Figure 112 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 164: Summary of the 2016–2019 assessment unit status within the Williamson Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	1	0	1
PH	1	0	1
Temperature	0	2	4
Total Phosphorus	0	1	1
Total Suspended Solids	0	0	2

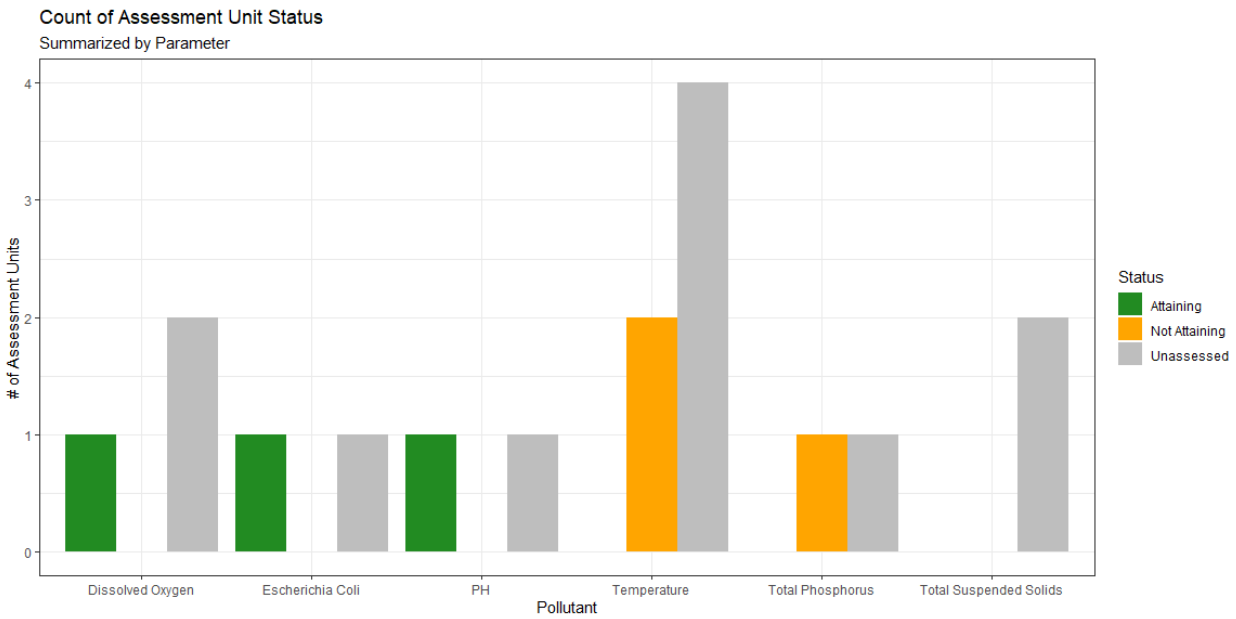

Figure 112: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Williamson Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 165 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Williamson Subbasin for the 2016 – 2019 status period.

Table 165: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Williamson Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	1	0	1
Stream	PH	1	0	1
Stream	Temperature	0	1	1
Stream	Total Phosphorus	0	1	1
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	Temperature	0	1	3

There are 21 stations within the Williamson Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix G**. Table 166 and Figure 113 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 166: Summary of the 2016–2019 status at monitoring stations within the Williamson Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	3

Pollutant	Attaining	Not Attaining	Unassessed
Escherichia coli	1	0	1
PH	1	0	2
Temperature	2	2	14
Total Phosphorus	0	1	2
Total Suspended Solids	0	0	3

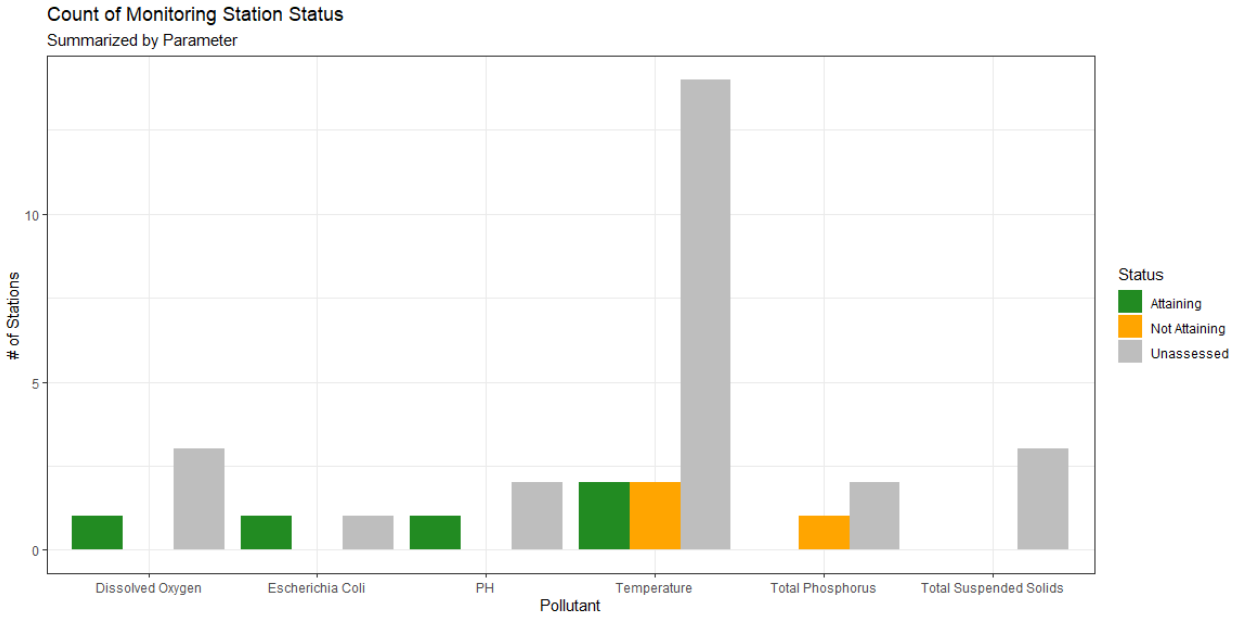

Figure 113: The number of stations in each status category by parameter for the 2016–2019 status period within the Williamson Subbasin.

4.8.5.3.3 Trend

A summary of the trends within parameters is shown in Table 167. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 167: Subbasin Summary of trend results at stations across the Williamson.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	2
Escherichia coli	0	0	0	1	1
PH	0	1	1	0	1
Temperature	0	1	0	0	17
Total Phosphorus	0	0	0	0	3
Total Suspended Solids	0	0	0	1	2

4.8.5.4 Sprague Subbasin

4.8.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.8.5.4.2 Status

There are 13 assessment units within the Sprague Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 168 and Figure 114 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 168: Summary of the 2016–2019 assessment unit status within the Sprague Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	8
Escherichia coli	1	0	6
PH	1	0	7
Temperature	1	2	8
Total Phosphorus	0	0	8
Total Suspended Solids	0	0	8

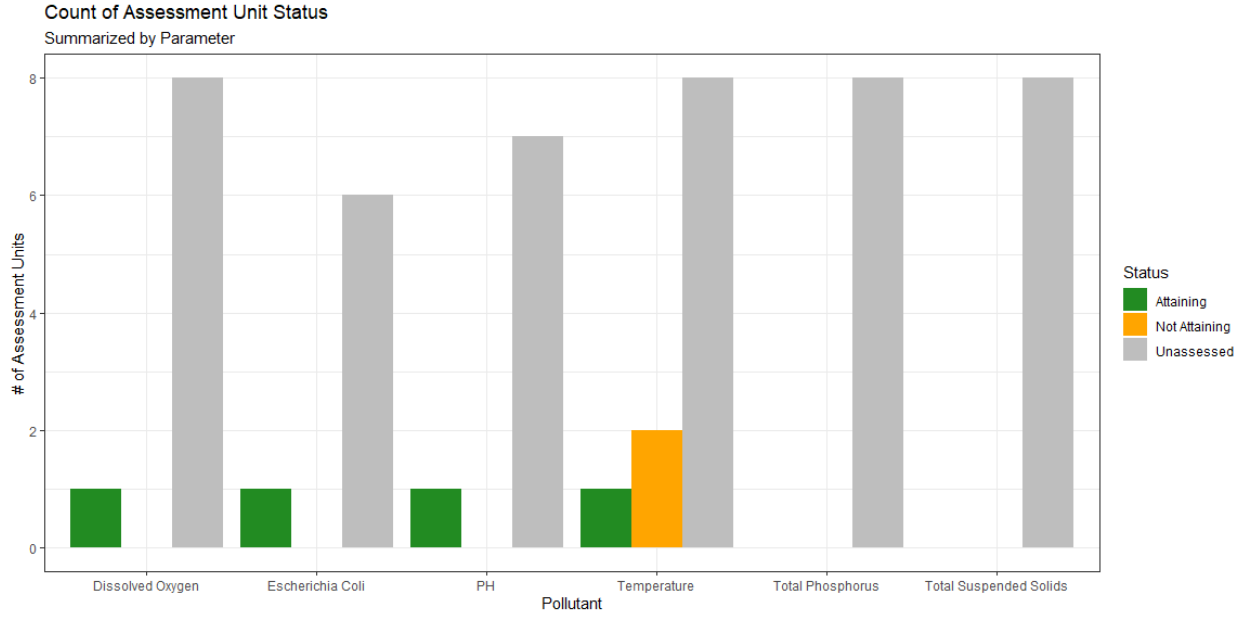

Figure 114: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Sprague Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 169 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Sprague Subbasin for the 2016 – 2019 status period.

Table 169: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Sprague Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	5
Stream	*Escherichia coli*	1	0	5
Stream	PH	1	0	5
Stream	Temperature	0	1	4
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	3
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	1	1	4
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 51 stations within the Sprague Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix G**. Table 170 and Figure 115 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 170: Summary of the 2016–2019 status at monitoring stations within the Sprague Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	27
Escherichia coli	1	0	16
PH	1	0	26
Temperature	1	2	20
Total Phosphorus	0	0	27
Total Suspended Solids	0	0	27

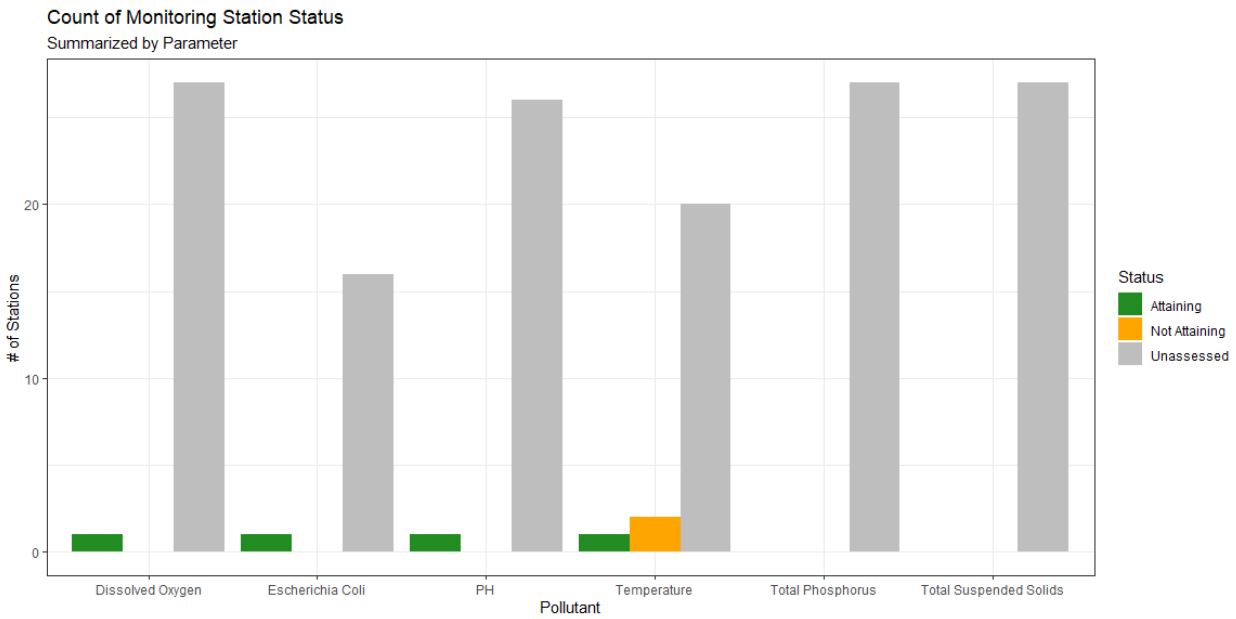

Figure 115: The number of stations in each status category by parameter for the 2016–2019 status period within the Sprague Subbasin.

4.8.5.4.3 Trend

A summary of the trends within parameters is shown in Table 171. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 171: Subbasin Summary of trend results at stations across the Sprague.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	8	0	0	1	19
Escherichia coli	0	0	0	1	16
PH	0	5	0	4	18
Temperature	0	1	0	0	22
Total Phosphorus	7	0	0	2	18
Total Suspended Solids	0	0	0	1	26

4.8.5.5 Upper Klamath Lake Subbasin

4.8.5.5.1 Water Quality Limited Assessment Units

Table 172: Number of water quality limited assessment units in the Upper Klamath Lake Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	2

4.8.5.5.2 Status

There are 11 assessment units within the Upper Klamath Lake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 173 and Figure 116 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 173: Summary of the 2016–2019 assessment unit status within the Upper Klamath Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	2	5
Escherichia coli	1	0	1
PH	0	1	8
Temperature	3	2	3
Total Phosphorus	0	0	7
Total Suspended Solids	0	0	6

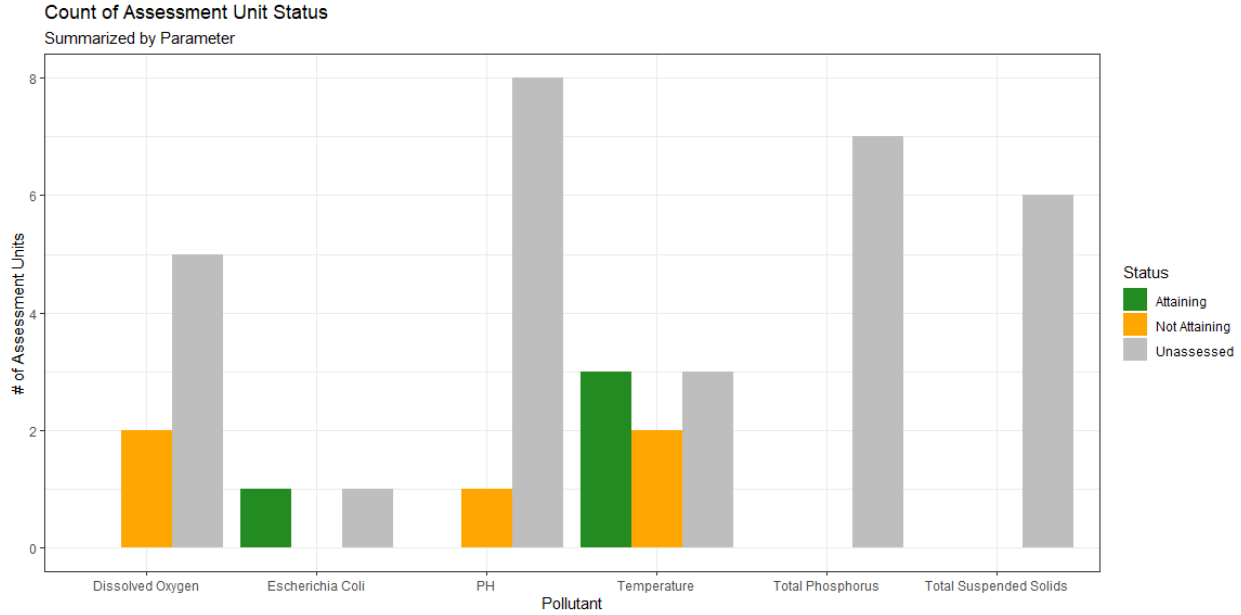

Figure 116: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Klamath Lake Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 174 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Klamath Lake Subbasin for the 2016 – 2019 status period.

Table 174: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Klamath Lake Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	1	1
Lake	PH	0	0	2

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Temperature	0	1	1
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	0	1	2
Stream	*Escherichia coli*	1	0	1
Stream	PH	0	1	2
Stream	Temperature	1	0	0
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	3
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	PH	0	0	4
Watershed Unit	Temperature	2	1	2
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 99 stations within the Upper Klamath Lake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix G**. Table 175 and Figure 117 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 175: Summary of the 2016–2019 status at monitoring stations within the Upper Klamath Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	8	72
Escherichia coli	0	0	1
PH	0	0	85
Temperature	7	7	51
Total Phosphorus	0	0	25
Total Suspended Solids	0	0	19

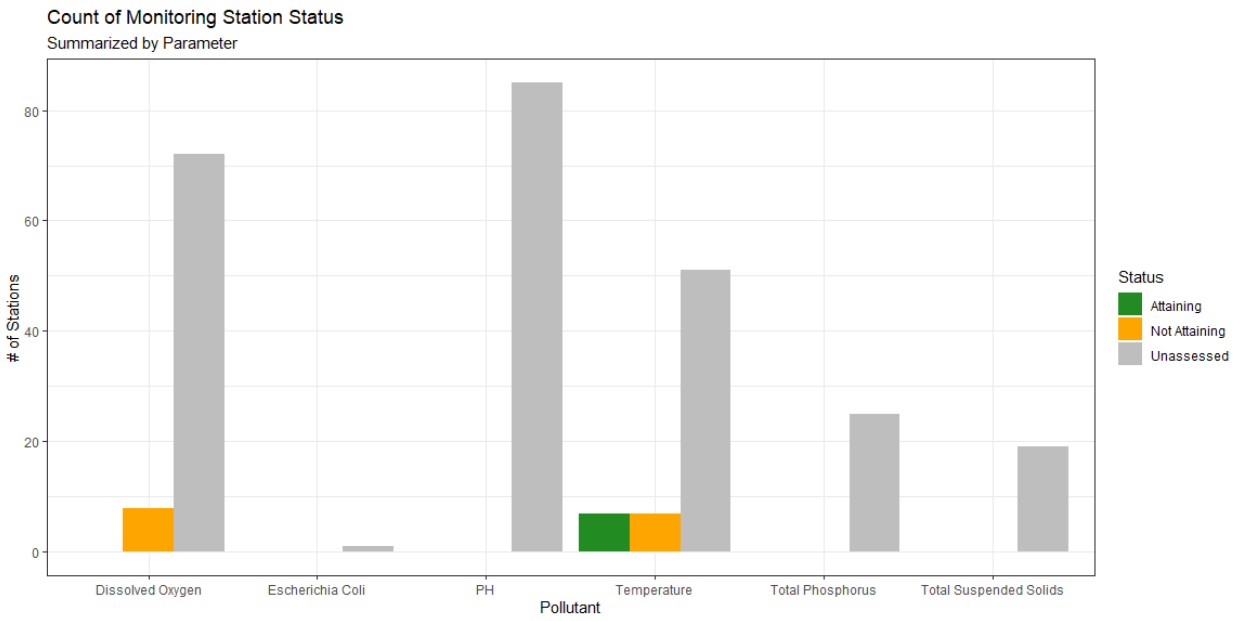

Figure 117: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Klamath Lake Subbasin.

4.8.5.5.3 Trend

A summary of the trends within parameters is shown in Table 176. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 176: Subbasin Summary of trend results at stations across the Upper Klamath Lake.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	15	4	0	0	61
Escherichia coli	0	0	0	0	1
PH	0	12	1	5	67
Temperature	0	6	0	1	58
Total Phosphorus	1	8	0	3	13
Total Suspended Solids	0	0	0	0	19

4.9 Malheur

A summary of status and trend results for the Malheur and all subbasins within the Malheur are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix H**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Malheur are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 159 stations within the Malheur. These stations were located across 61 assessment units consisting of 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.9.1 Land Use

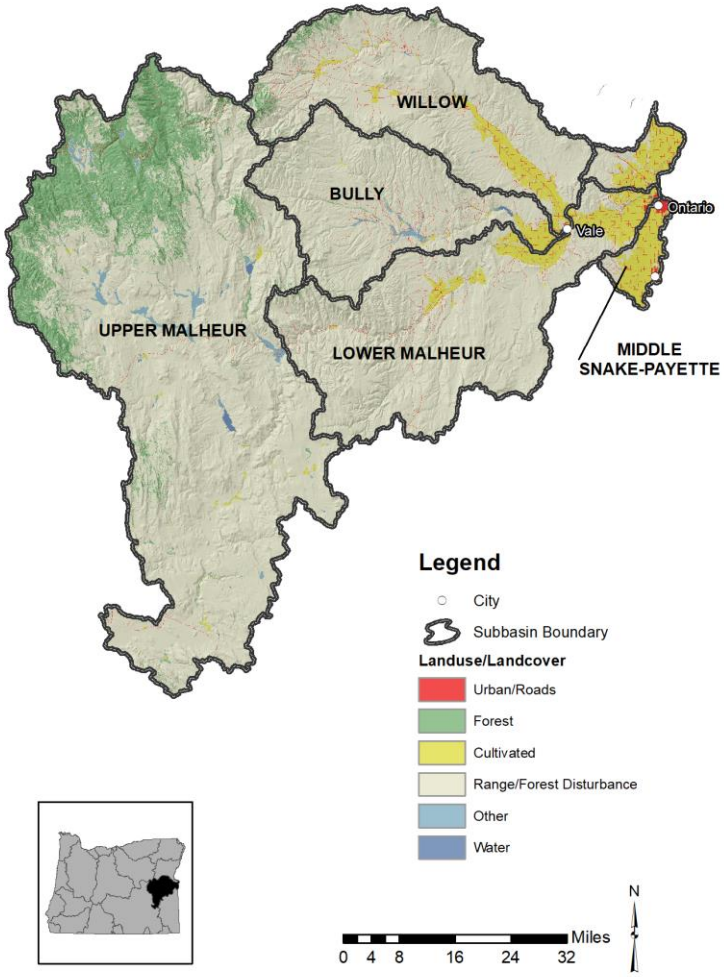

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 177: Land use within the Malheur Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Snake-Payette	414	8.7	0.0	61.5	29.4	0.5
Upper Malheur	6289	0.2	18.3	0.3	79.6	1.5

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Malheur	2457	1.4	0.3	9.1	89.0	0.2
Bully	1518	1.0	0.7	3.2	93.7	1.4
Willow	1968	1.6	2.6	7.4	88.0	0.3

4.9.2 Parameter Maps

The maps in Figure 118 through Figure 123 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

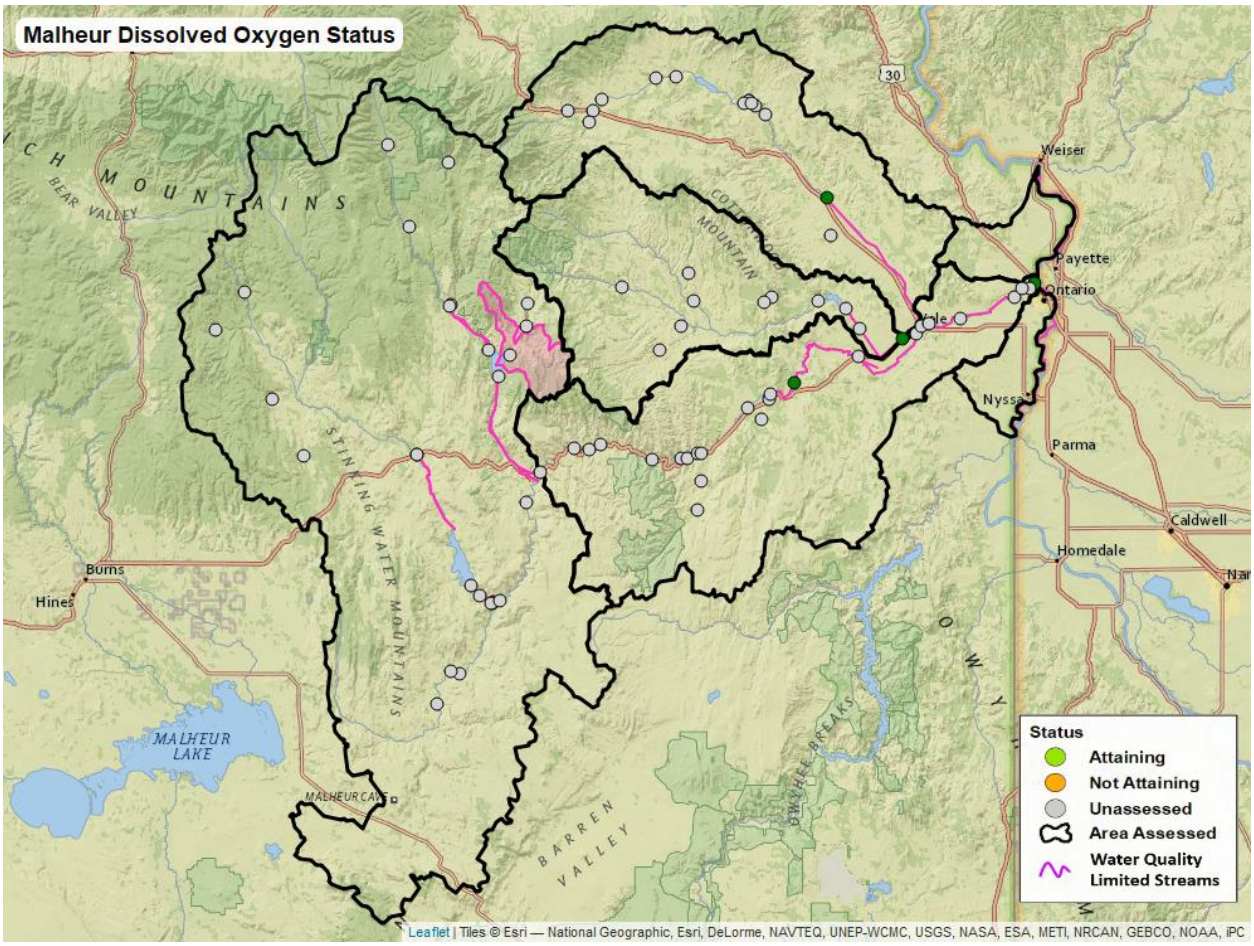

Figure 118: Summary map of the status of dissolved oxygen across the Malheur.

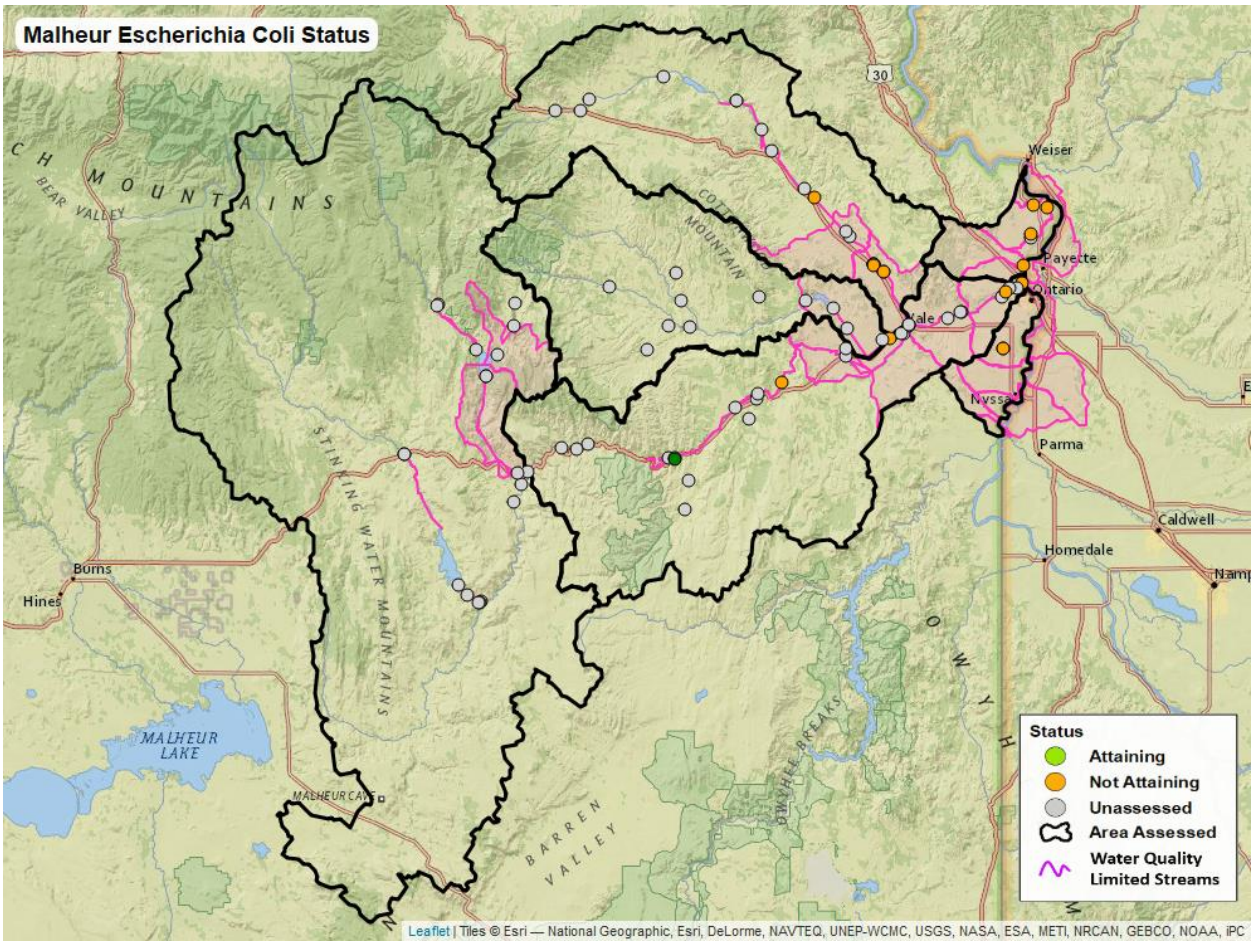

Figure 119: Summary map of the status of *Escherichia coli* across the Malheur.

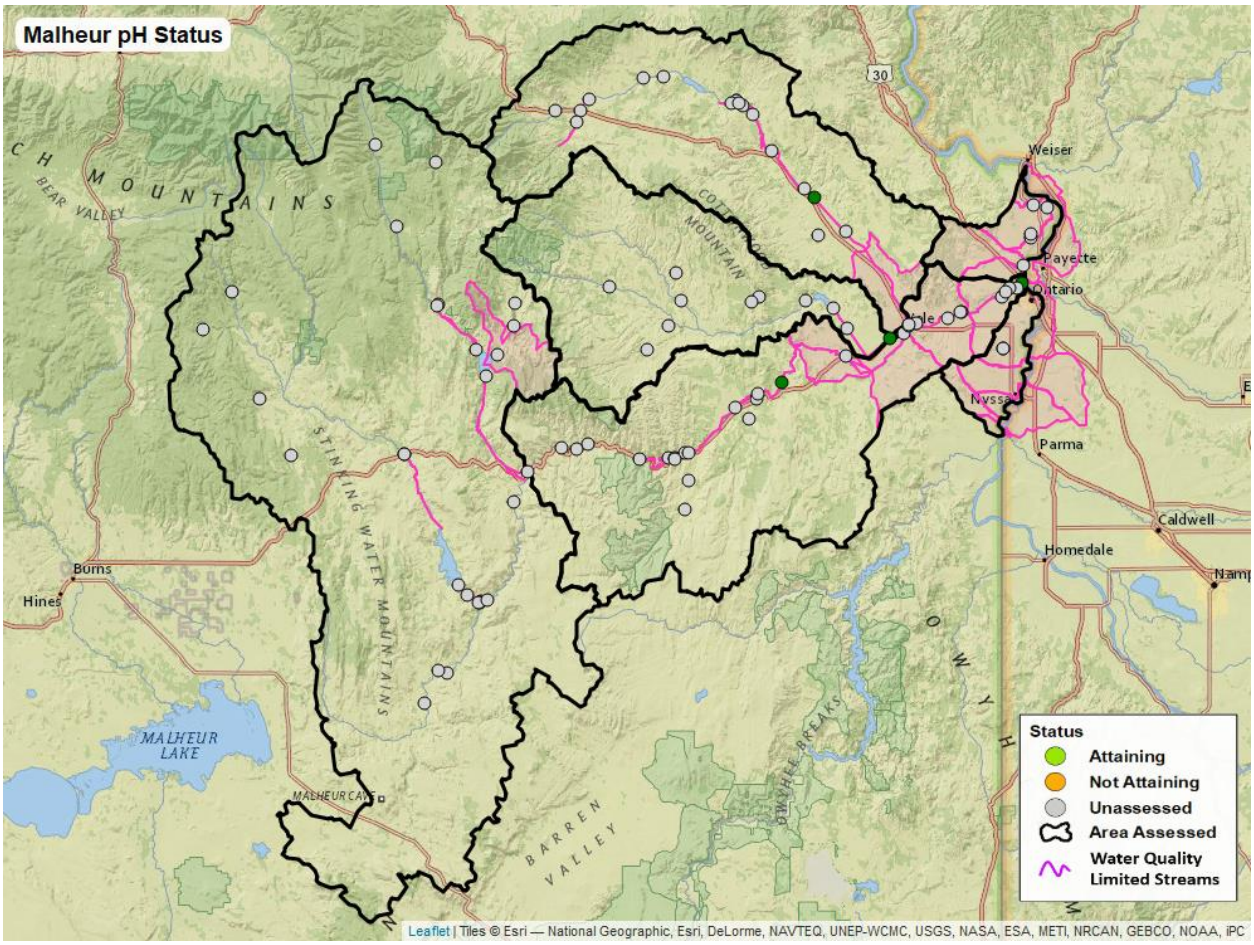

Figure 120: Summary map of the status of pH across the Malheur.

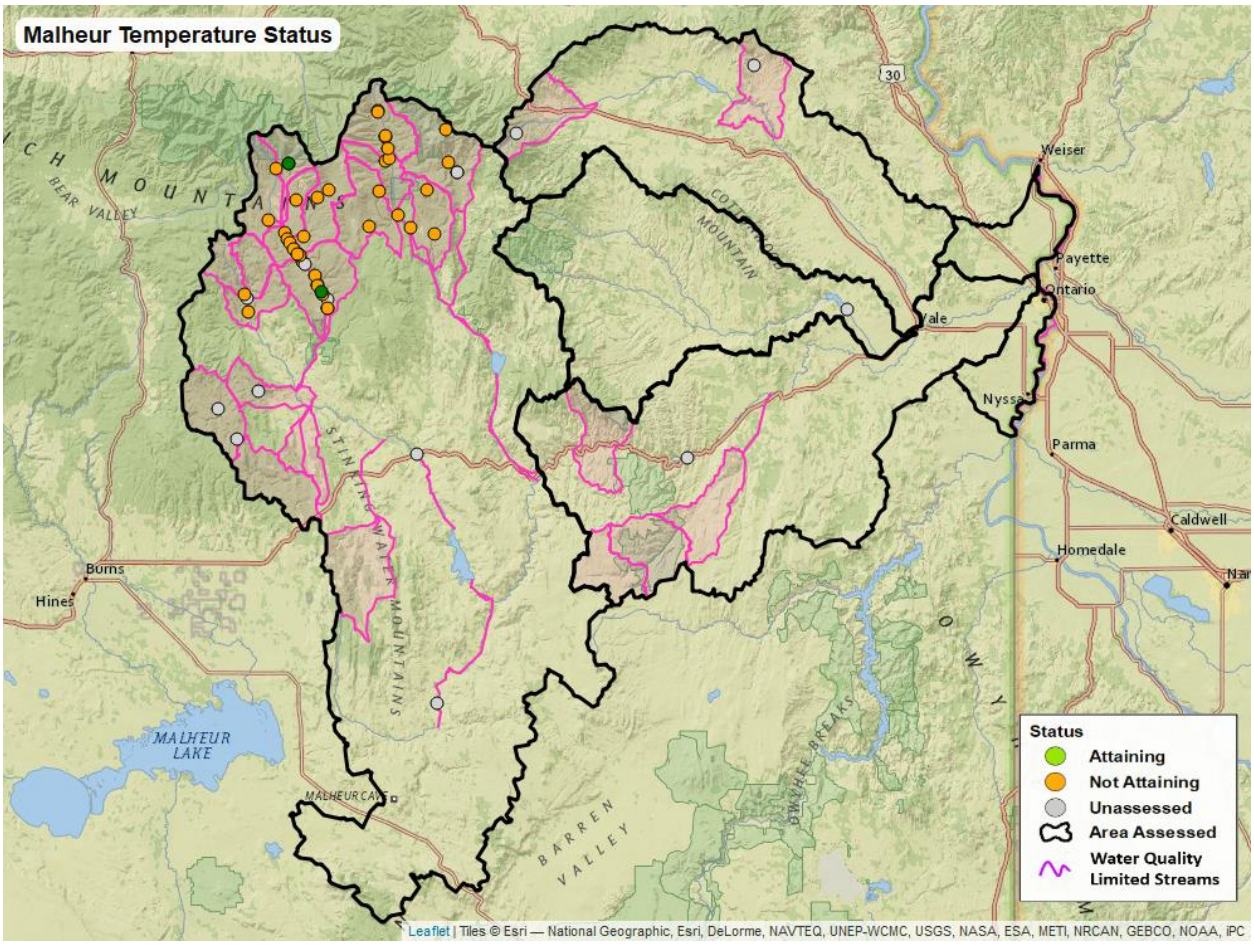

Figure 121: Summary map of the status of temperature across the Malheur.

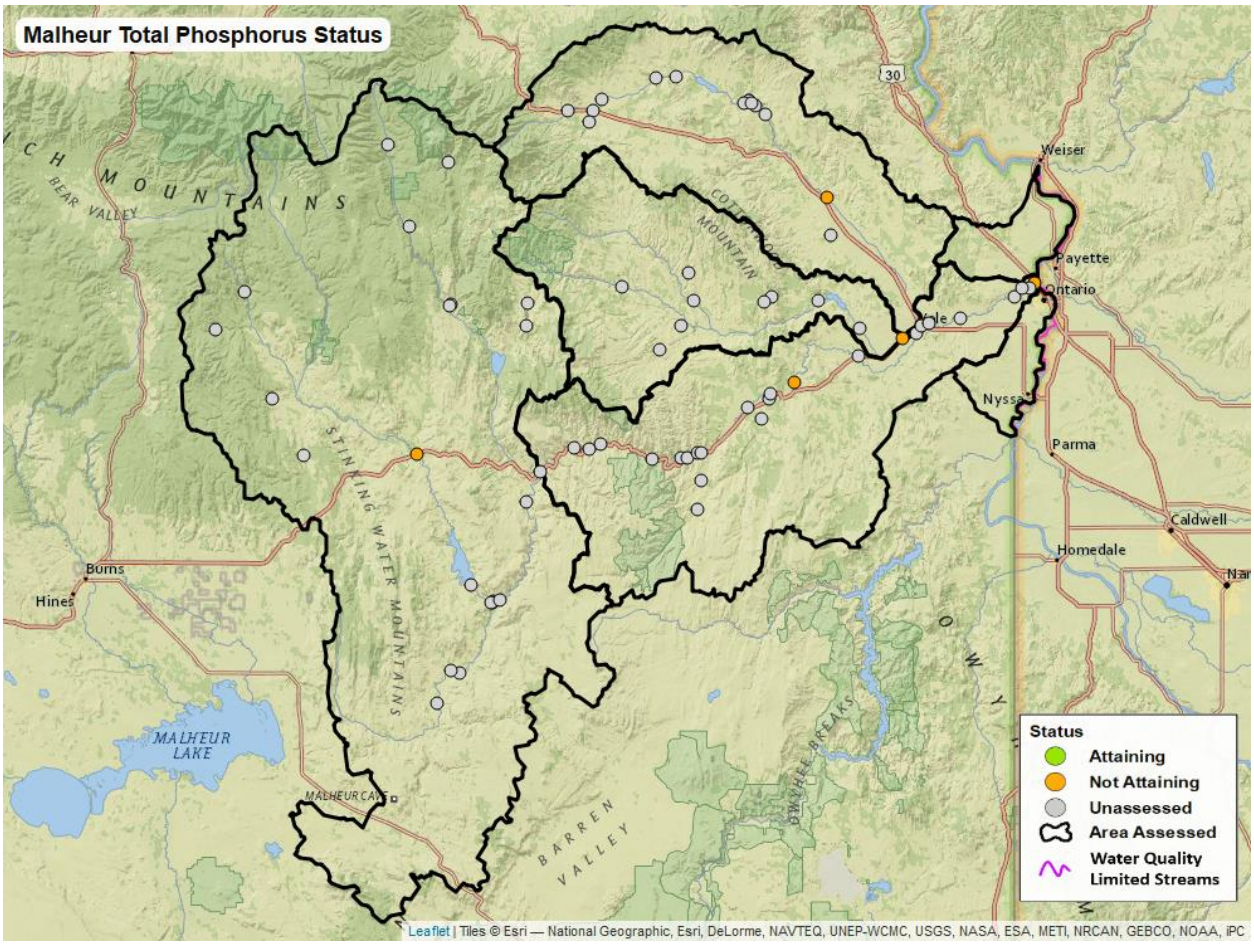

Figure 122: Summary map of the status of total phosphorus across the Malheur.

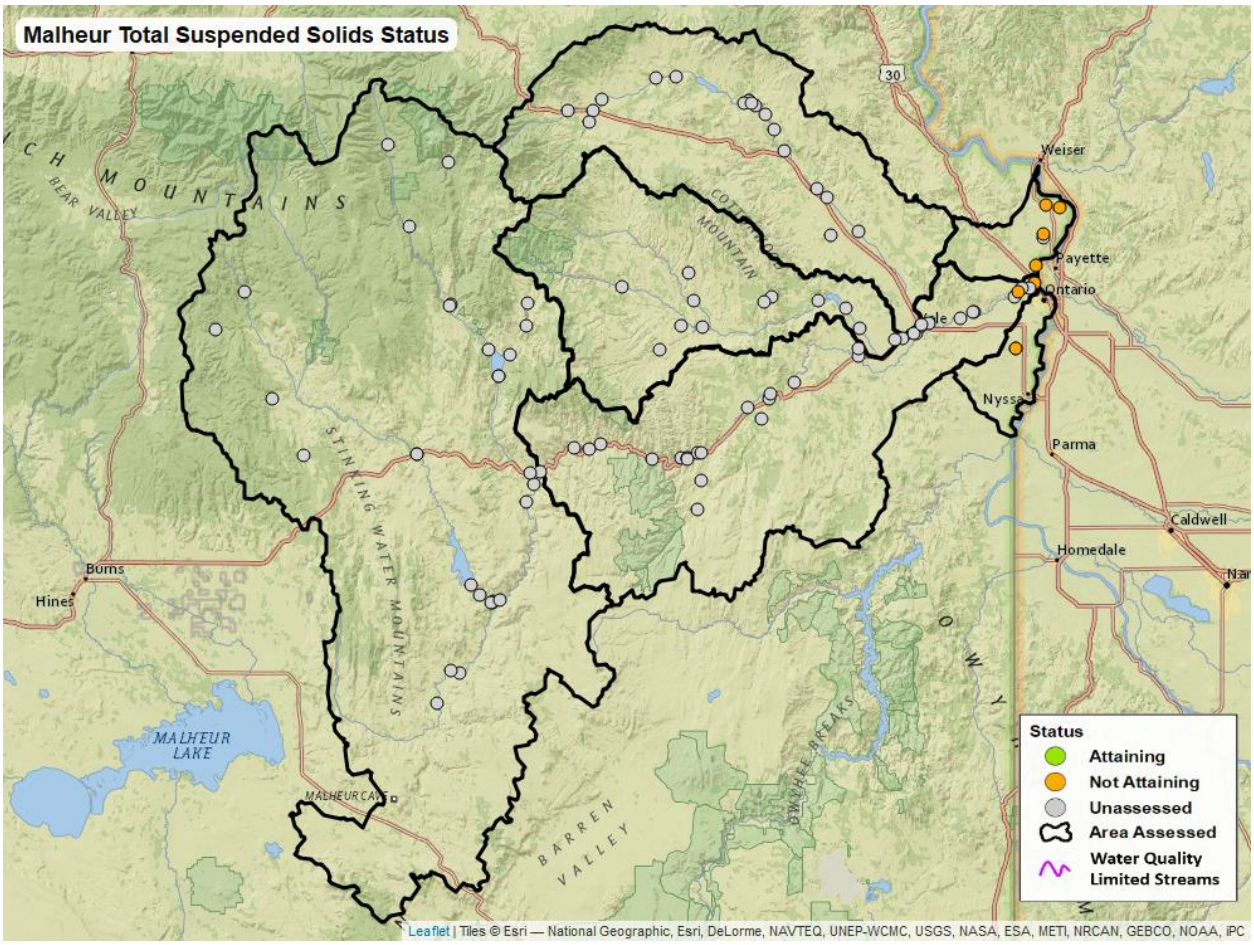

Figure 123: Summary map of the status of total suspended solids across the Malheur.

4.9.3 Status

There are 61 assessment units within the Malheur containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 178 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 178: Summary of the 2016–2019 assessment unit status within the Malheur.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	0	37
Escherichia coli	2	7	32
PH	5	0	41
Temperature	2	12	9
Total Phosphorus	0	5	36
Total Suspended Solids	0	4	45

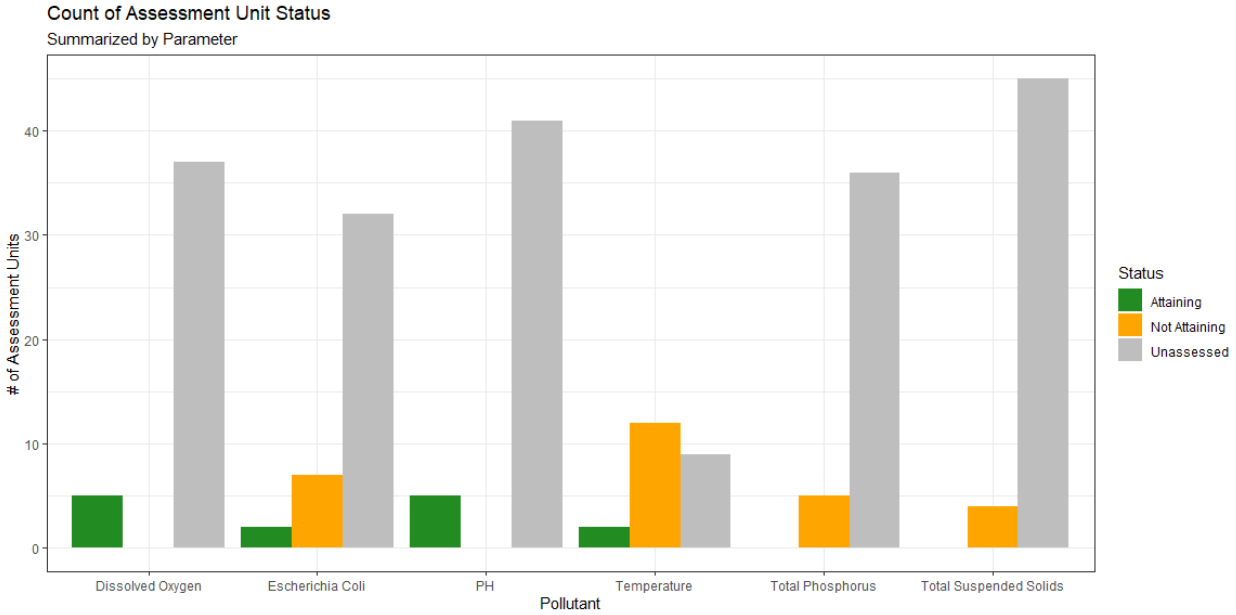

Figure 124: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Malheur.

Table 179 and Figure 124 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Malheur for the 2016–2019 status period.

Table 179: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Malheur.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	5	0	18
Stream	*Escherichia coli*	2	4	16
Stream	PH	5	0	18
Stream	Temperature	0	2	4
Stream	Total Phosphorus	0	5	18
Stream	Total Suspended Solids	0	1	22
Watershed Unit	Dissolved Oxygen	0	0	19
Watershed Unit	*Escherichia coli*	0	3	16
Watershed Unit	PH	0	0	23
Watershed Unit	Temperature	2	10	5
Watershed Unit	Total Phosphorus	0	0	18
Watershed Unit	Total Suspended Solids	0	3	23

Table 180 and Figure 125 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix H.

Table 180: Summary of the 2016–2019 status at monitoring stations within the Malheur.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	71
Escherichia coli	2	18	64
PH	6	0	86
Temperature	3	36	15
Total Phosphorus	0	6	65
Total Suspended Solids	0	8	92

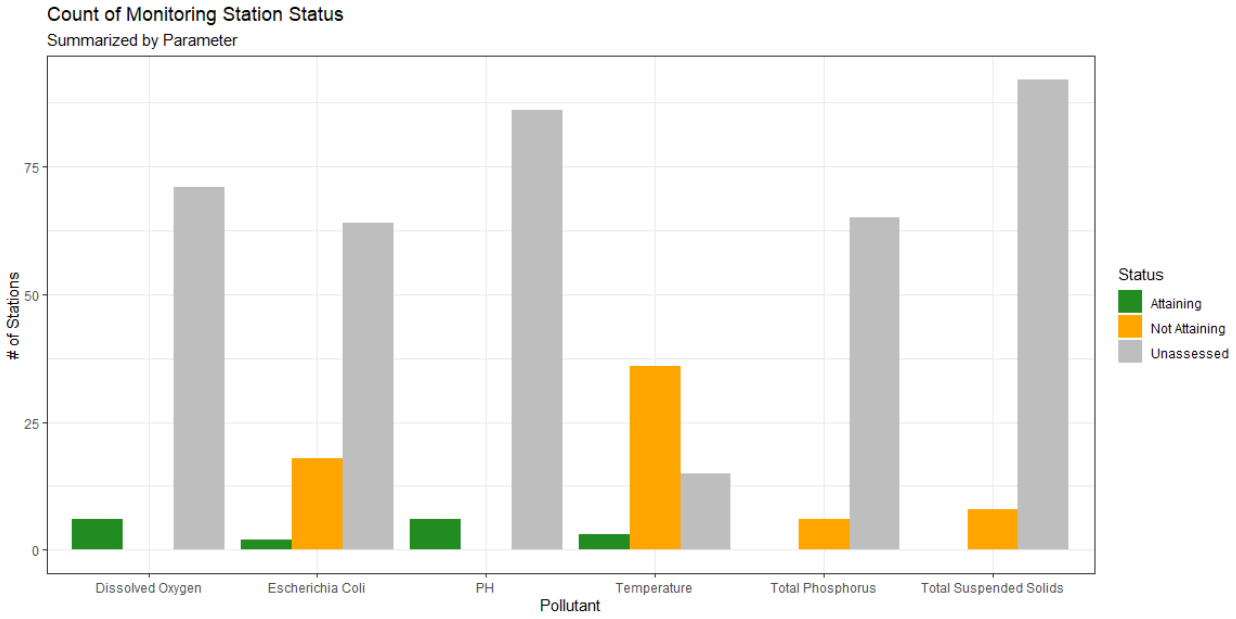

Figure 125: Summary plot of the 2016–2019 station status within the Malheur by parameter.

4.9.4 Trend

A summary of the trends across parameters is shown in Table 181. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 181: Malheur summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	1	0	3	70
Escherichia coli	7	2	0	10	65
PH	0	1	2	6	83
Temperature	1	5	0	1	47
Total Phosphorus	3	1	0	2	65
Total Suspended Solids	4	4	0	4	88

4.9.5 Subbasin Summary

4.9.5.1 Lower Malheur Subbasin

4.9.5.1.1 Water Quality Limited Assessment Units

Table 182: Number of water quality limited assessment units in the Lower Malheur Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	3

4.9.5.1.2 Status

There are 14 assessment units within the Lower Malheur Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 183 and Figure 126 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 183: Summary of the 2016–2019 assessment unit status within the Lower Malheur Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	9
Escherichia coli	1	3	10
PH	3	0	10
Temperature	0	0	2
Total Phosphorus	0	3	9
Total Suspended Solids	0	1	13

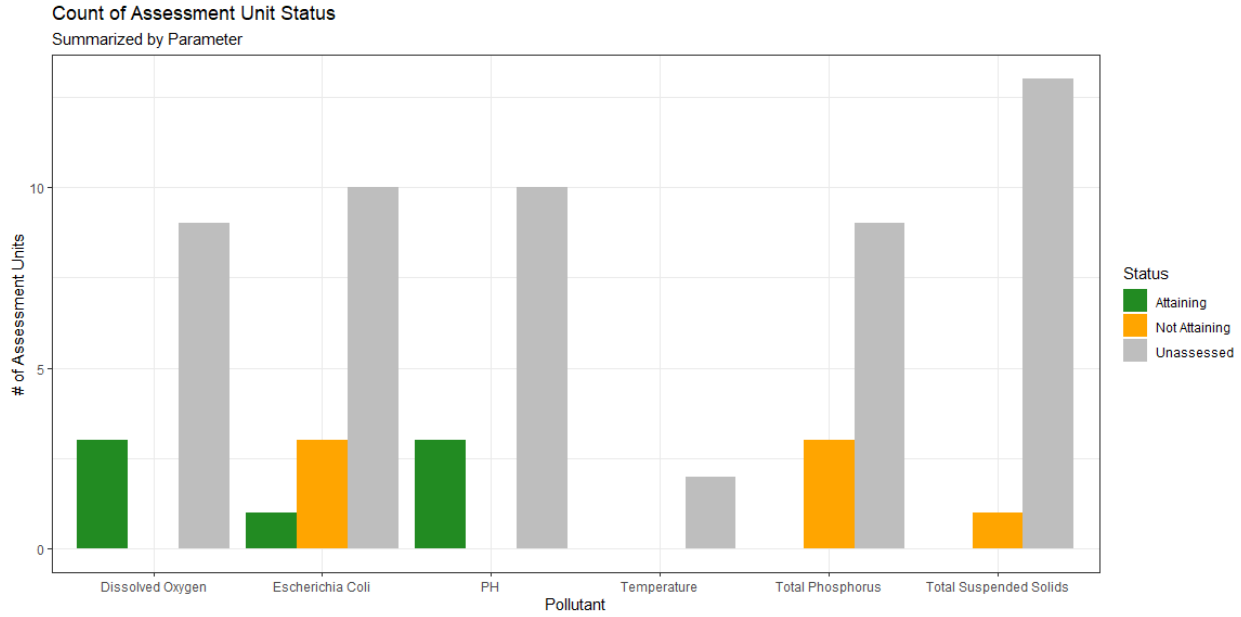

Figure 126: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Malheur Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 184 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Malheur Subbasin for the 2016 – 2019 status period.

Table 184: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Malheur Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	3	0	3
Stream	*Escherichia coli*	1	3	2
Stream	PH	3	0	3
Stream	Temperature	0	0	2
Stream	Total Phosphorus	0	3	3
Stream	Total Suspended Solids	0	1	5
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	*Escherichia coli*	0	0	8
Watershed Unit	PH	0	0	7
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	8

There are 29 stations within the Lower Malheur Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix H**. Table 185 and Figure 127 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 185: Summary of the 2016–2019 status at monitoring stations within the Lower Malheur Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	22
Escherichia coli	1	3	21
PH	2	0	26
Temperature	0	0	1
Total Phosphorus	0	2	22
Total Suspended Solids	0	2	27

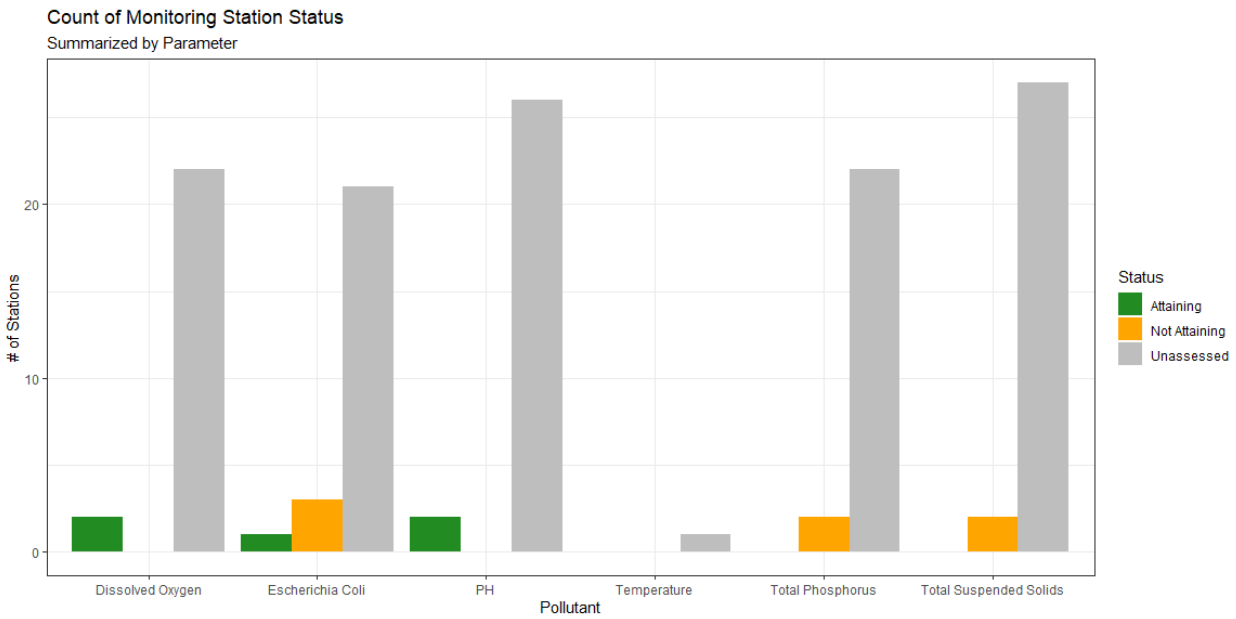

Figure 127: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Malheur Subbasin.

4.9.5.1.3 Trend

A summary of the trends within parameters is shown in Table 186. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 186: Subbasin Summary of trend results at stations across the Lower Malheur.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	1	0	0	22
Escherichia coli	1	1	0	1	22
PH	0	0	1	1	26
Temperature	0	0	0	0	1
Total Phosphorus	1	0	0	1	22
Total Suspended Solids	0	3	0	0	26

4.9.5.2 Willow Subbasin

4.9.5.2.1 Water Quality Limited Assessment Units

Table 187: Number of water quality limited assessment units in the Willow Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2

4.9.5.2.2 Status

There are 8 assessment units within the Willow Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 188 and Figure 128 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 188: Summary of the 2016–2019 assessment unit status within the Willow Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	7
Escherichia coli	0	1	6
PH	1	0	7
Temperature	0	0	2
Total Phosphorus	0	1	7
Total Suspended Solids	0	0	8

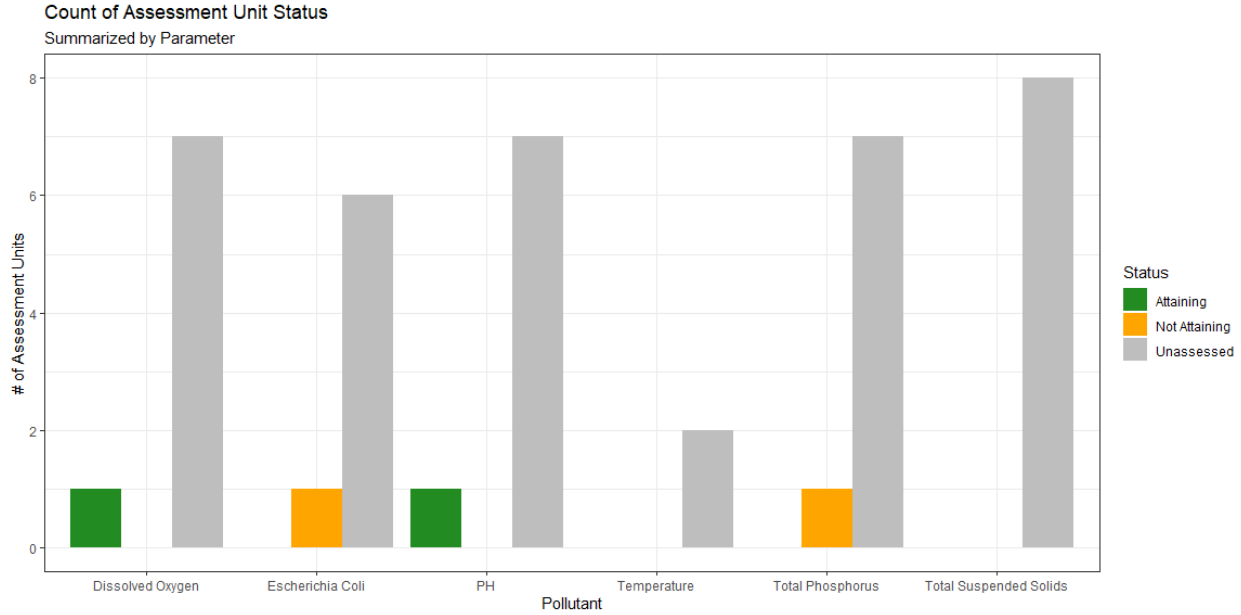

Figure 128: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 189 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Willow Subbasin for the 2016 – 2019 status period.

Table 189: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	4
Stream	*Escherichia coli*	0	1	4

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	PH	1	0	4
Stream	Total Phosphorus	0	1	4
Stream	Total Suspended Solids	0	0	5
Watershed Unit	Dissolved Oxygen	0	0	3
Watershed Unit	*Escherichia coli*	0	0	2
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	0	0	2
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	3

There are 29 stations within the Willow Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix H**. Table 190 and Figure 129 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 190: Summary of the 2016–2019 status at monitoring stations within the Willow Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	13
Escherichia coli	0	8	12
PH	2	0	17
Temperature	0	0	2
Total Phosphorus	0	2	13
Total Suspended Solids	0	0	20

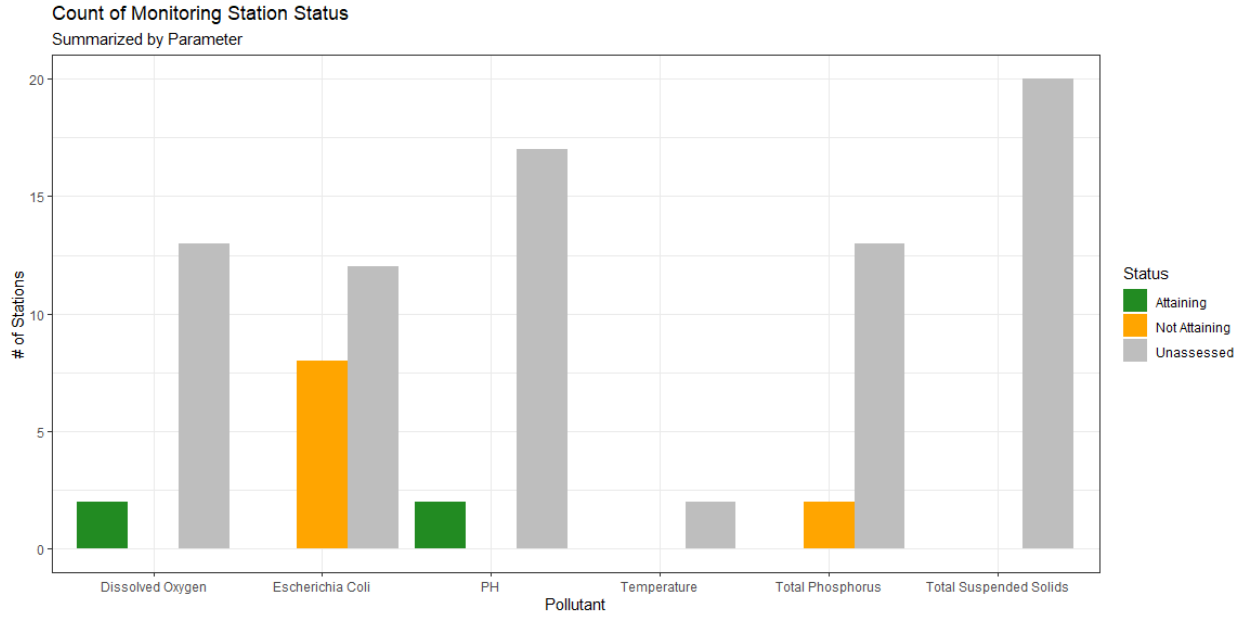

Figure 129: The number of stations in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

4.9.5.2.3 Trend

A summary of the trends within parameters is shown in Table 191. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 191: Subbasin Summary of trend results at stations across the Willow.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	13
Escherichia coli	4	1	0	4	11
PH	0	0	0	2	17
Temperature	0	0	0	0	2
Total Phosphorus	1	0	0	1	13
Total Suspended Solids	2	1	0	0	17

4.9.5.3 Bully Subbasin

4.9.5.3.1 Water Quality Limited Assessment Units

Table 192: Number of water quality limited assessment units in the Bully Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	4

4.9.5.3.2 Status

There are 10 assessment units within the Bully Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 193 and Figure 130 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 193: Summary of the 2016–2019 assessment unit status within the Bully Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	8
Escherichia coli	0	1	8
PH	1	0	8
Temperature	0	0	1
Total Phosphorus	0	1	8
Total Suspended Solids	0	0	10

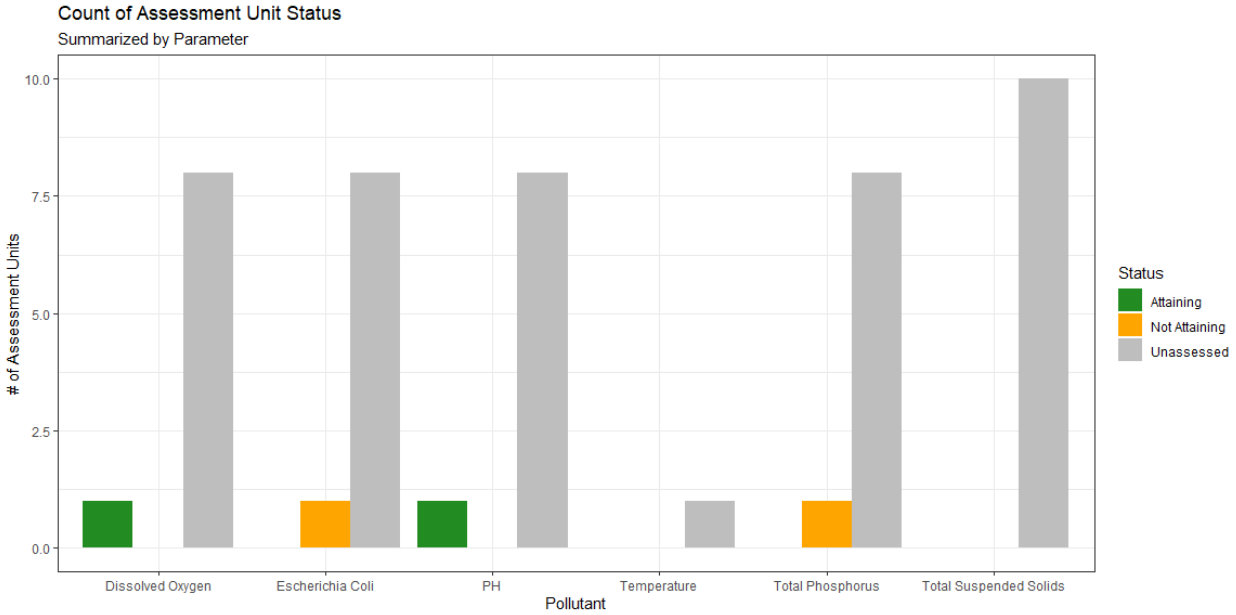

Figure 130: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Bully Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 194 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Bully Subbasin for the 2016 – 2019 status period.

Table 194: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Bully Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	5
Stream	*Escherichia coli*	0	1	5
Stream	PH	1	0	5
Stream	Temperature	0	0	1
Stream	Total Phosphorus	0	1	5
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	3
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	3
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	4

There are 15 stations within the Bully Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix H**. Table 195 and Figure 131 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 195: Summary of the 2016–2019 status at monitoring stations within the Bully Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	10
Escherichia coli	0	1	12
PH	1	0	10
Temperature	0	0	1
Total Phosphorus	0	1	9
Total Suspended Solids	0	0	14

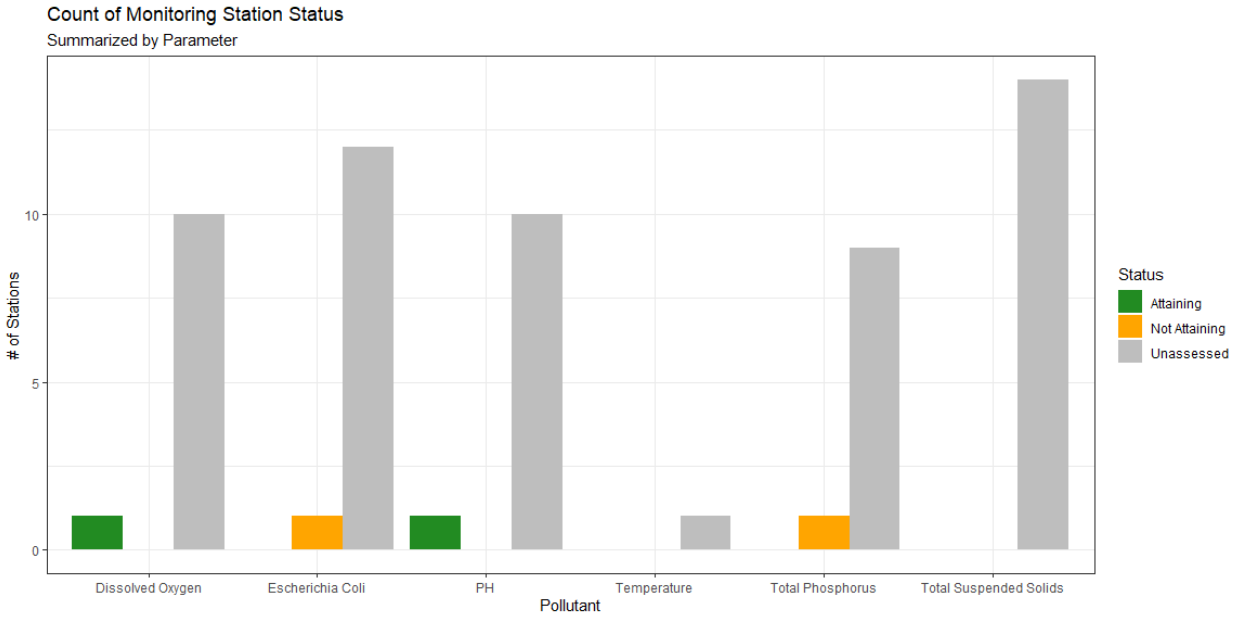

Figure 131: The number of stations in each status category by parameter for the 2016–2019 status period within the Bully Subbasin.

4.9.5.3.3 Trend

A summary of the trends within parameters is shown in Table 196. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 196: Subbasin Summary of trend results at stations across the Bully.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	10
Escherichia coli	0	0	0	1	12
PH	0	0	0	1	10
Temperature	0	0	0	0	1
Total Phosphorus	1	0	0	0	9
Total Suspended Solids	1	0	0	0	13

4.9.5.4 Upper Malheur Subbasin

4.9.5.4.1 Water Quality Limited Assessment Units

Table 197: Number of water quality limited assessment units in the Upper Malheur Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2

4.9.5.4.2 Status

There are 27 assessment units within the Upper Malheur Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 198 and Figure 132 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 198: Summary of the 2016–2019 assessment unit status within the Upper Malheur Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	13
Escherichia coli	1	0	8
PH	1	0	13
Temperature	2	12	5
Total Phosphorus	0	1	12
Total Suspended Solids	0	0	15

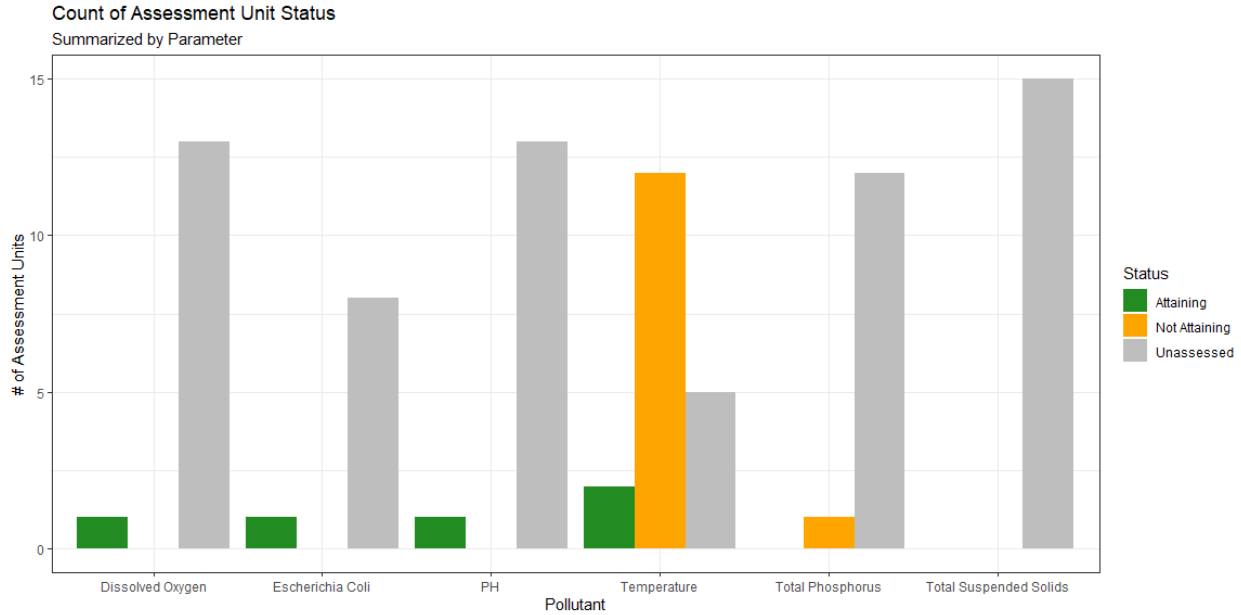

Figure 132: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Malheur Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 199 summarizes of the number of attaining, not attaining, and unassessed

assessment units by parameter and assessment unit type within the Upper Malheur Subbasin for the 2016 – 2019 status period.

Table 199: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Malheur Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	6
Stream	*Escherichia coli*	1	0	5
Stream	PH	1	0	6
Stream	Temperature	0	2	2
Stream	Total Phosphorus	0	1	6
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	0	0	7
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	7
Watershed Unit	Temperature	2	10	3
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	8

There are 79 stations within the Upper Malheur Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix H**. Table 200 and Figure 133 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 200: Summary of the 2016–2019 status at monitoring stations within the Upper Malheur Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	26
Escherichia coli	1	0	18
PH	1	0	26
Temperature	3	36	11
Total Phosphorus	0	1	21
Total Suspended Solids	0	0	30

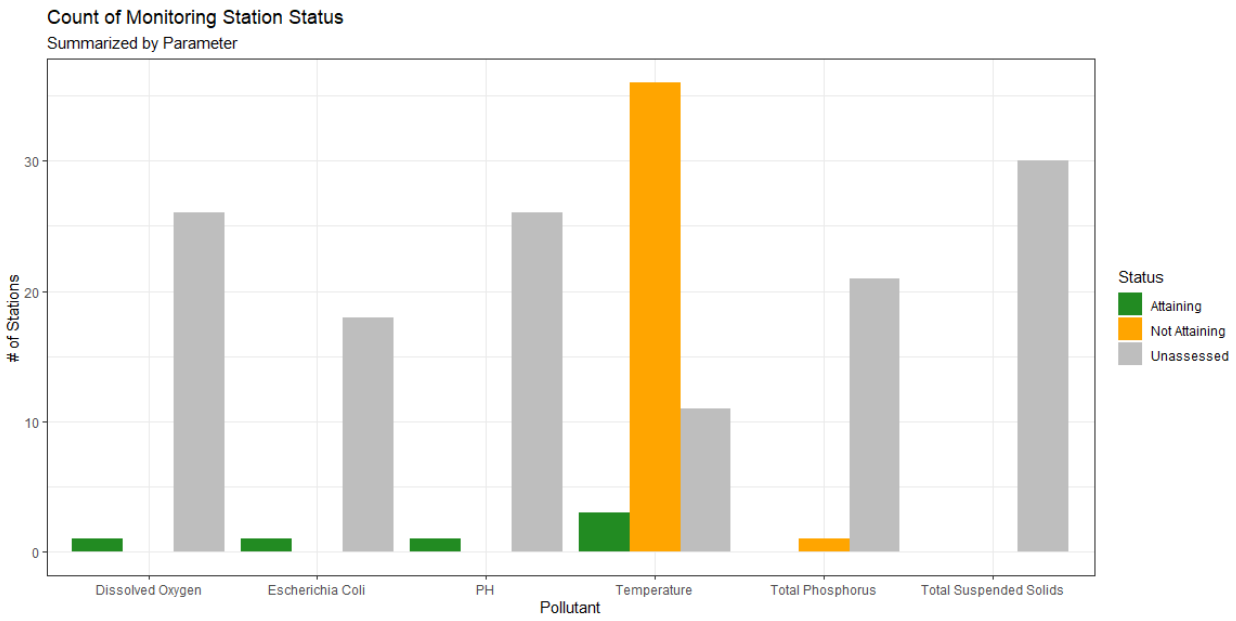

Figure 133: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Malheur Subbasin.

4.9.5.4.3 Trend

A summary of the trends within parameters is shown in Table 201. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 201: Subbasin Summary of trend results at stations across the Upper Malheur.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	25
Escherichia coli	0	0	0	2	17
PH	0	0	0	2	25
Temperature	1	5	0	1	43
Total Phosphorus	0	1	0	0	21
Total Suspended Solids	1	0	0	0	29

4.9.5.5 Middle Snake-Payette Subbasin

4.9.5.5.1 Water Quality Limited Assessment Units

Table 202: Number of water quality limited assessment units in the Middle Snake-Payette Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2
Total Phosphorus, mixed forms	2

4.9.5.5.2 Status

There are 3 assessment units within the Middle Snake-Payette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 203 and Figure 134 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 203: Summary of the 2016–2019 assessment unit status within the Middle Snake-Payette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Escherichia coli	0	3	0
PH	0	0	3
Total Suspended Solids	0	3	0

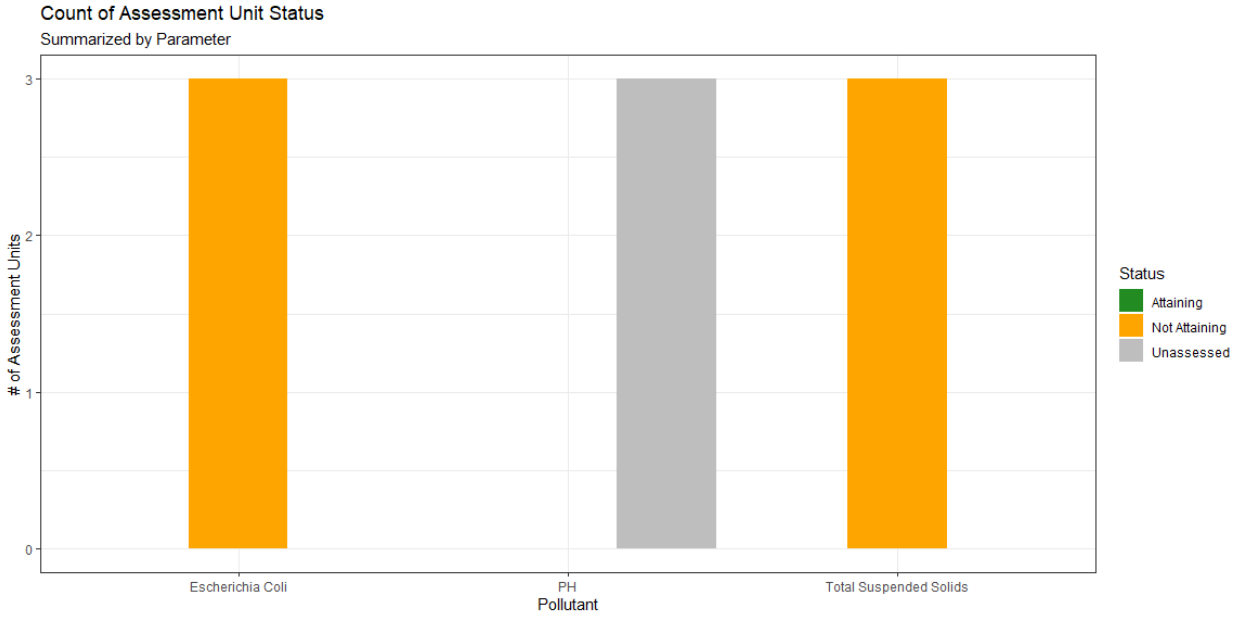

Figure 134: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 204 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Snake-Payette Subbasin for the 2016 – 2019 status period.

Table 204: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	*Escherichia coli*	0	3	0
Watershed Unit	PH	0	0	3
Watershed Unit	Total Suspended Solids	0	3	0

There are 7 stations within the Middle Snake-Payette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The

reason for a station's unassessed status can be found in **Appendix H**. Table 205 and Figure 135 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 205: Summary of the 2016–2019 status at monitoring stations within the Middle Snake-Payette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Escherichia coli	0	6	1
PH	0	0	7
Total Suspended Solids	0	6	1

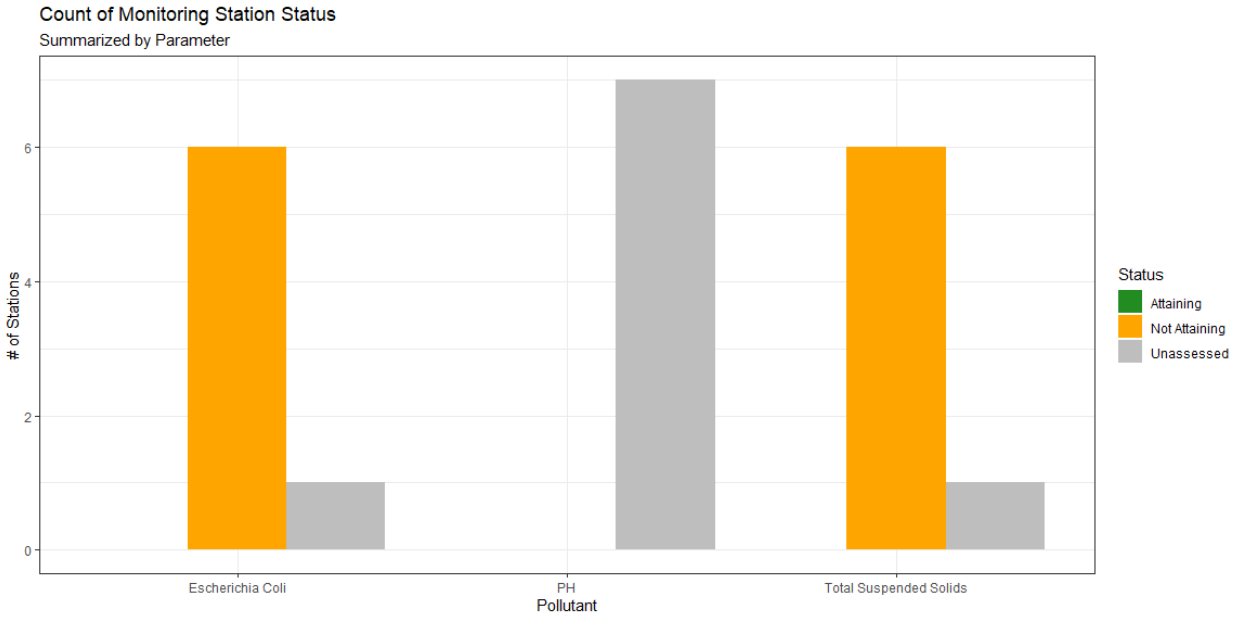

Figure 135: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

4.9.5.5.3 Trend

A summary of the trends within parameters is shown in Table 206. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 206: Subbasin Summary of trend results at stations across the Middle Snake-Payette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	2	0	0	2	3
PH	0	1	1	0	5
Total Suspended Solids	0	0	0	4	3

4.10 Mid-Coast

A summary of status and trend results for the Mid-Coast and all subbasins within the Mid-Coast are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix I**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Mid-Coast are water quality limited for 5 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 521 stations within the Mid-Coast. These stations were located across 159 assessment units consisting of 'Estuary or Bays', 'Lakes', 'Streams', 'Watershed Units' and 'Coastlines'. Data for dissolved oxygen, enterococcus, *Escherichia coli*, fecal coliform, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.10.1 Land Use

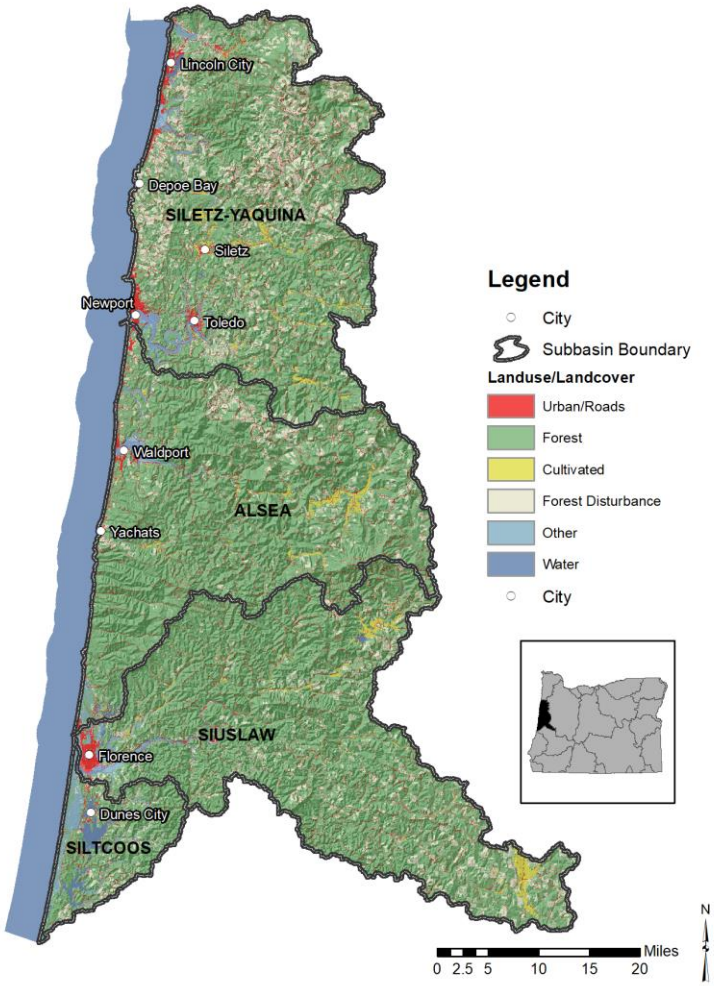

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 207: Land use within the Mid-Coast Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Siletz-Yaquina	2263	5.5	59.1	1.4	17.9	16.1
Alsea	2163	4.0	68.5	1.2	6.9	19.5
Siuslaw	2008	4.6	80.2	1.8	11.3	2.1
Siltcoos	526	2.4	41.6	0.0	7.2	48.8

4.10.2 Parameter Maps

The maps in Figure 136 through Figure 143 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

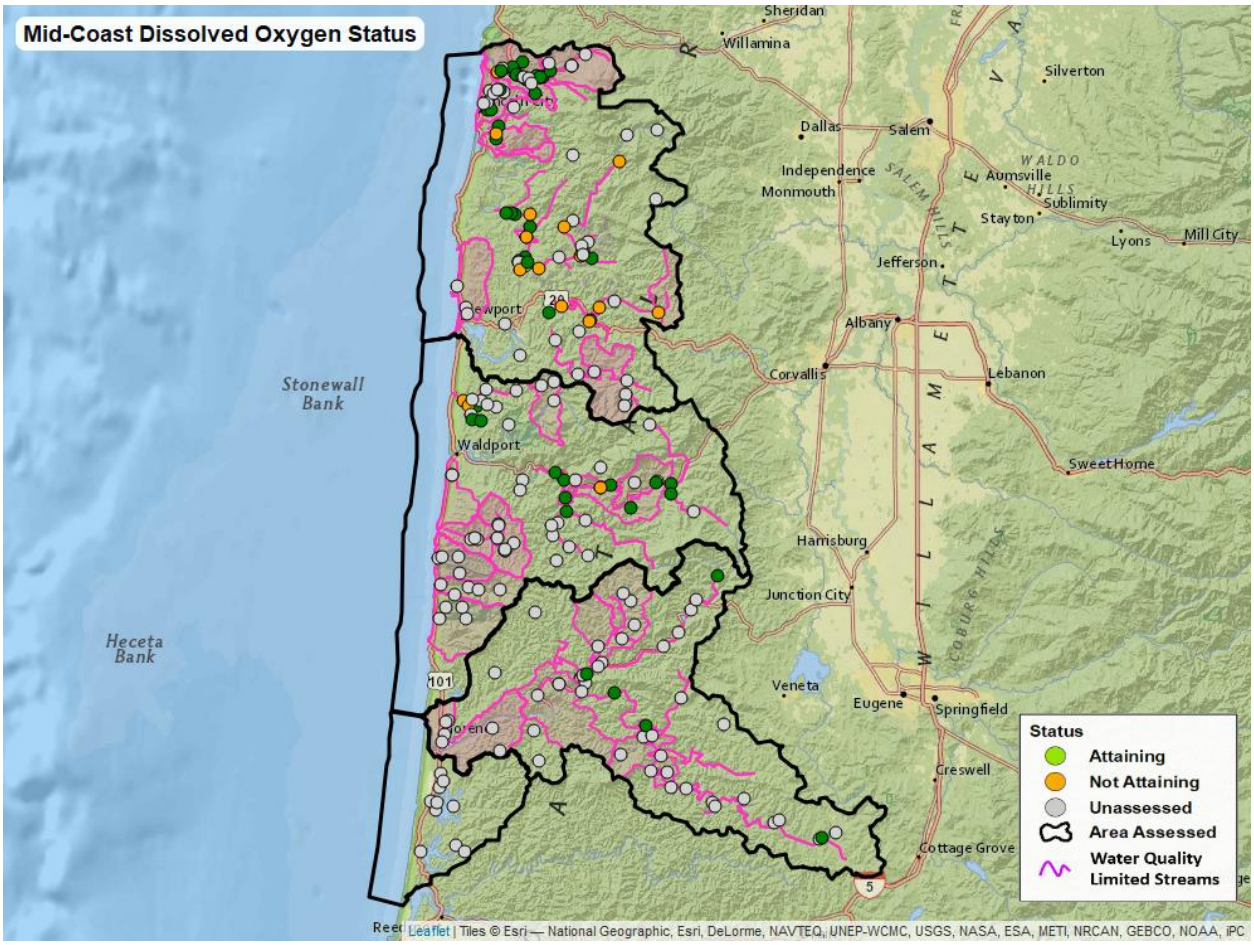

Figure 136: Summary map of the status of dissolved oxygen across the Mid-Coast.

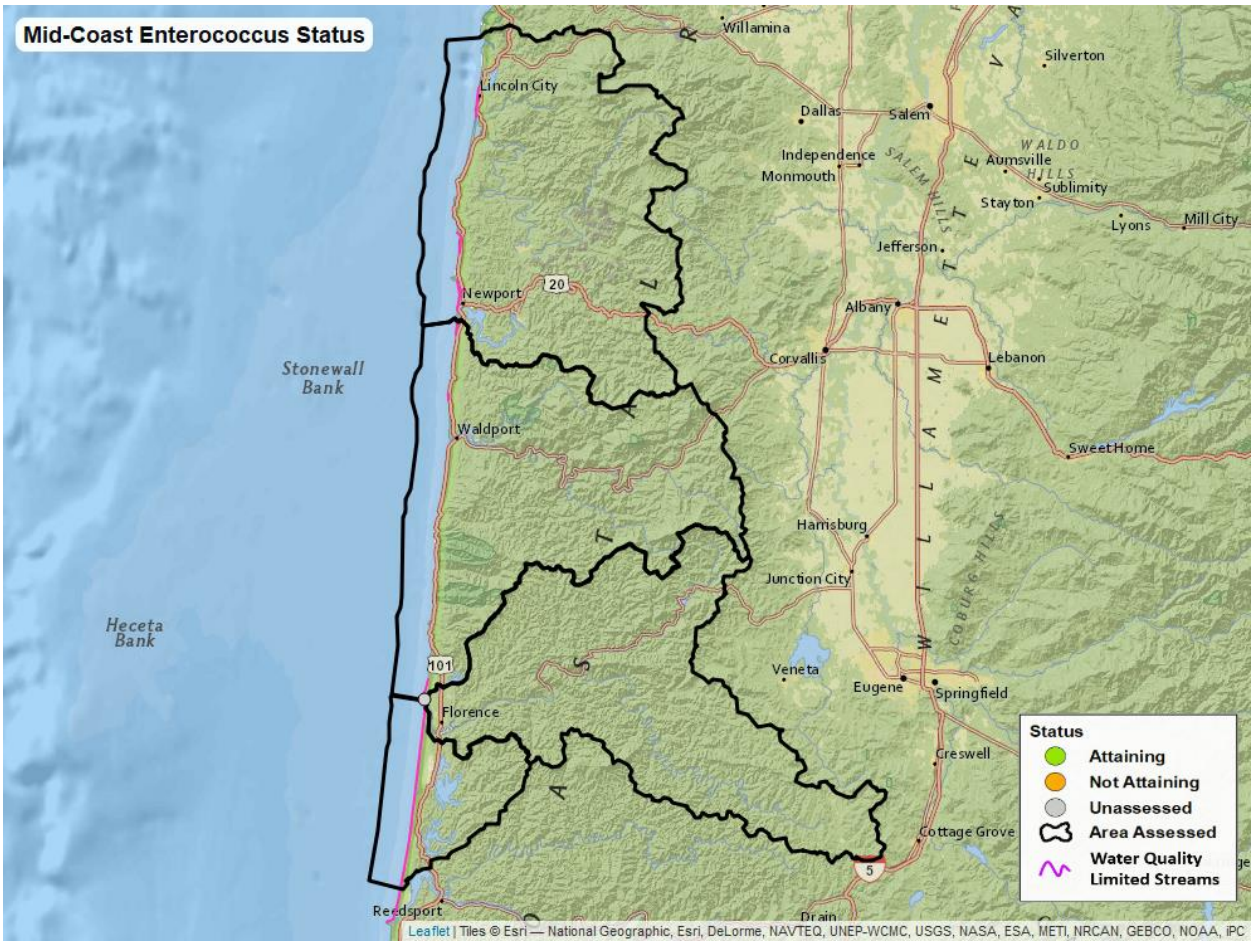

Figure 137: Summary map of the status of enterococcus across the Mid-Coast.

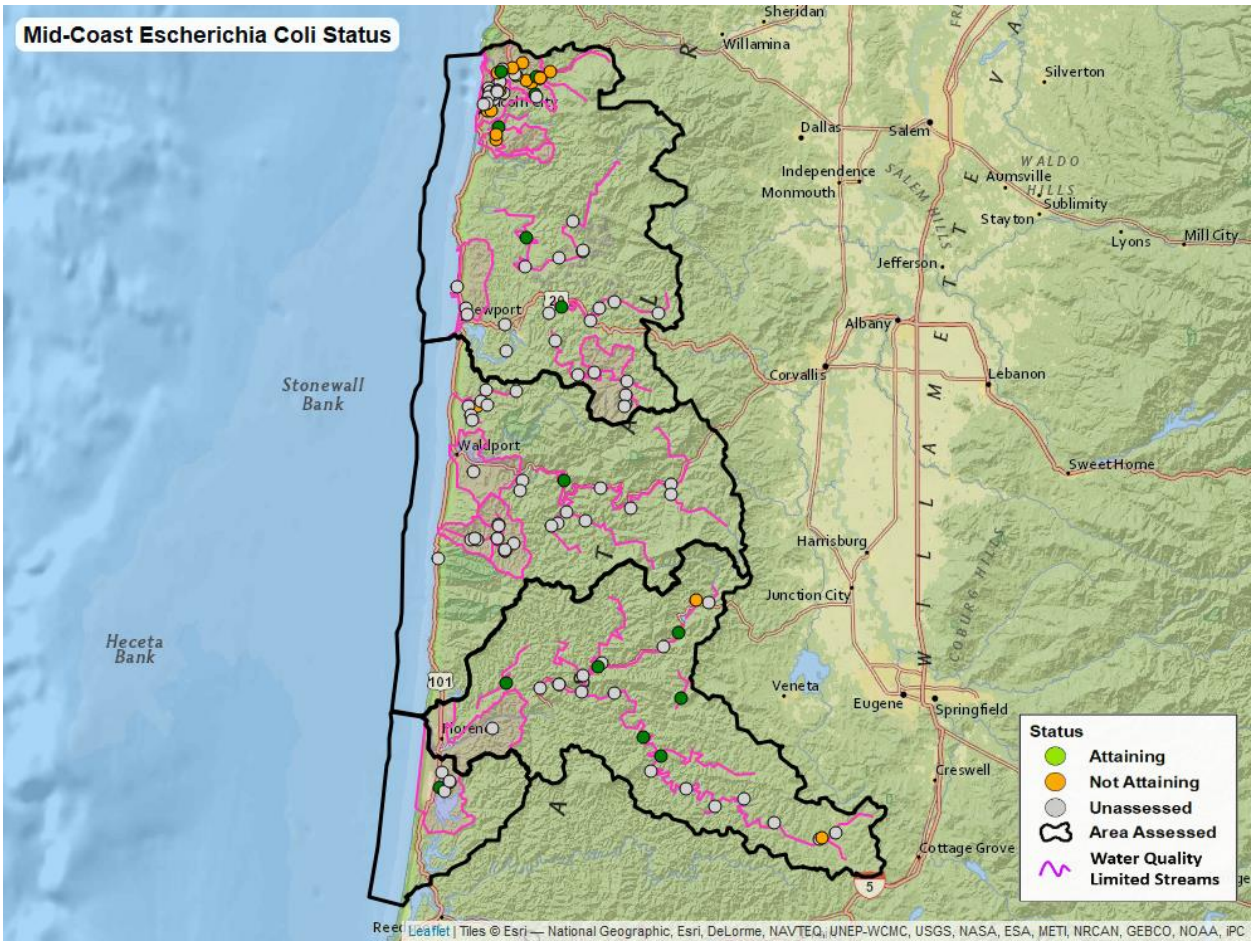

Figure 138: Summary map of the status of *Escherichia coli* across the Mid-Coast.

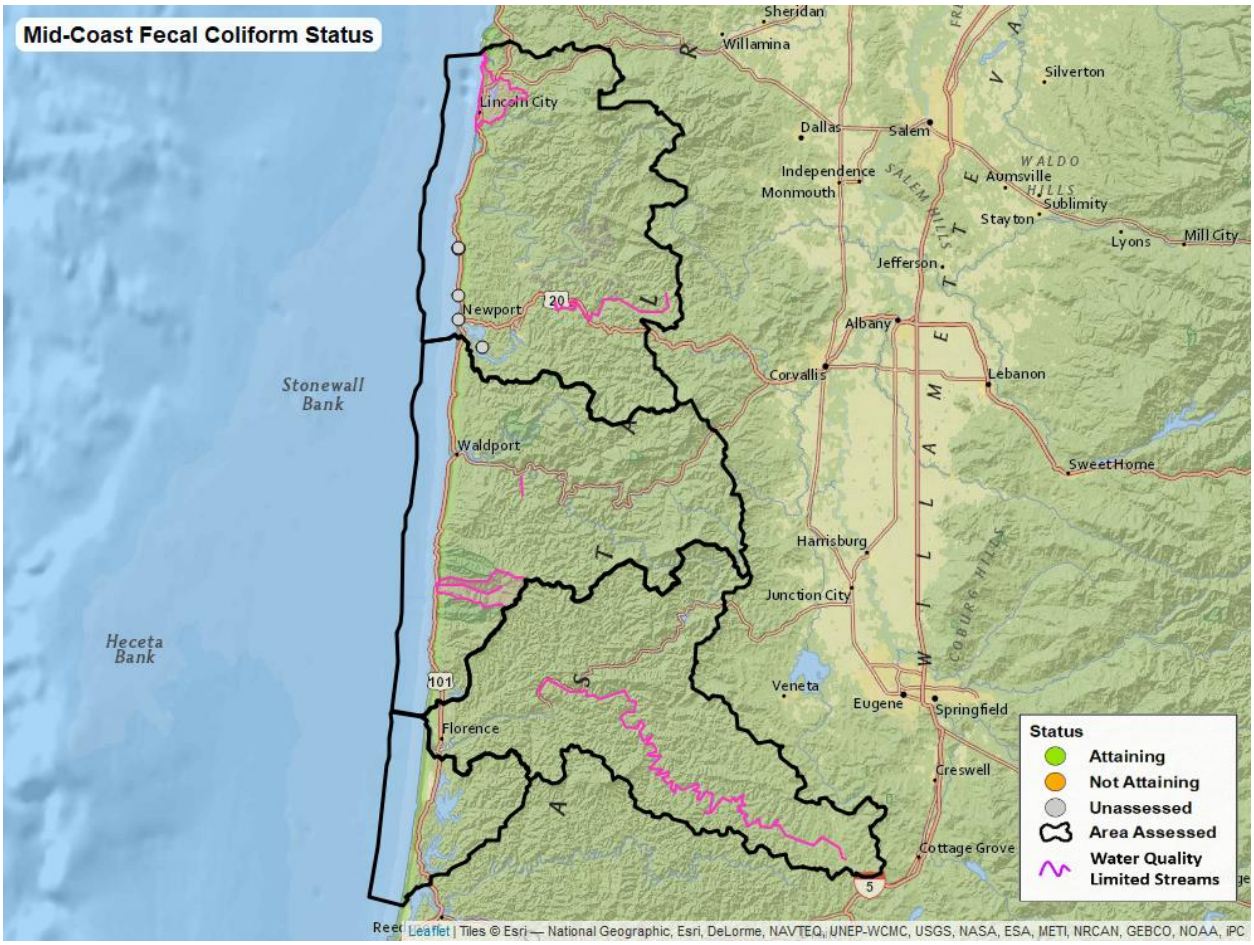

Figure 139: Summary map of the status of fecal coliform across the Mid-Coast.

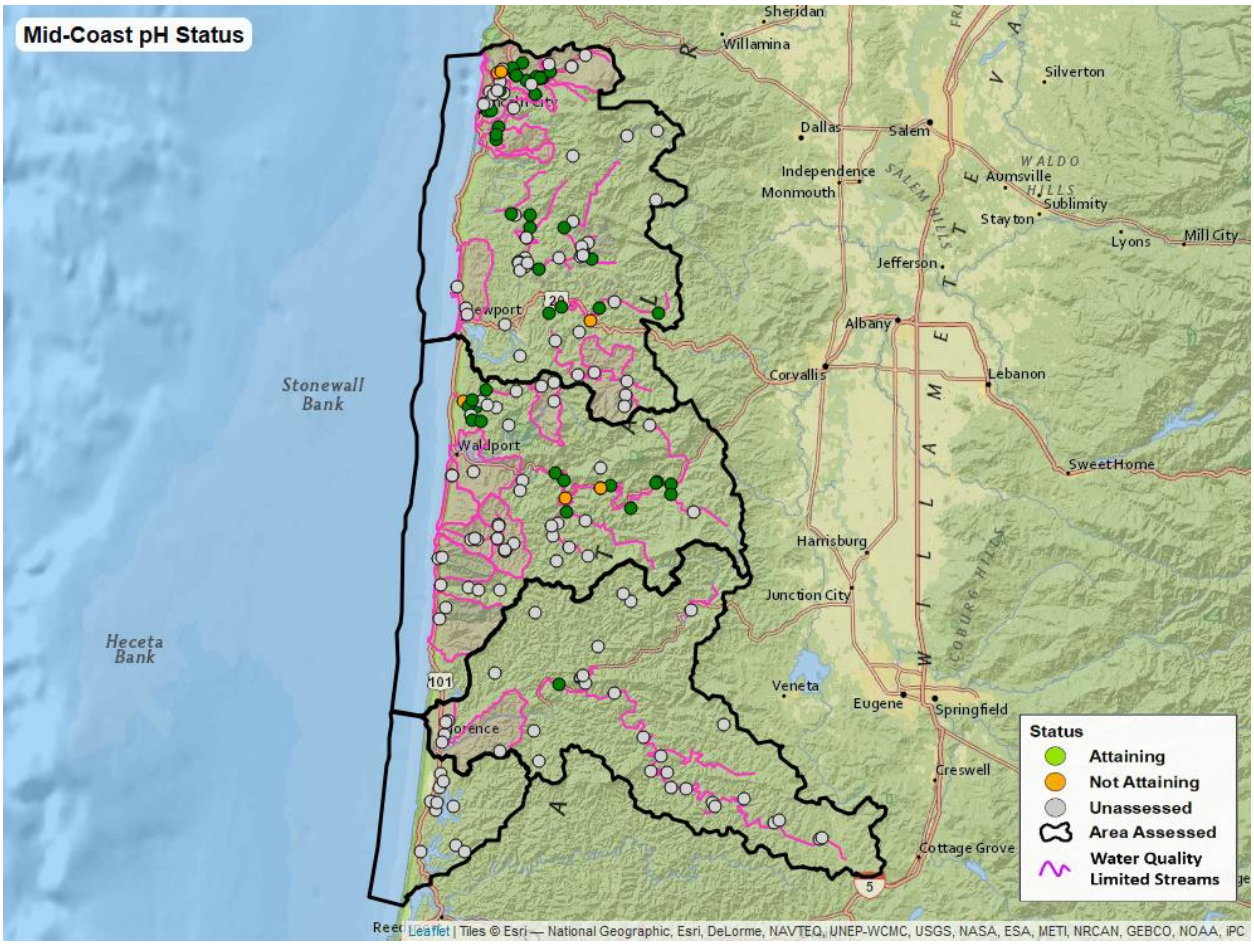

Figure 140: Summary map of the status of pH across the Mid-Coast.

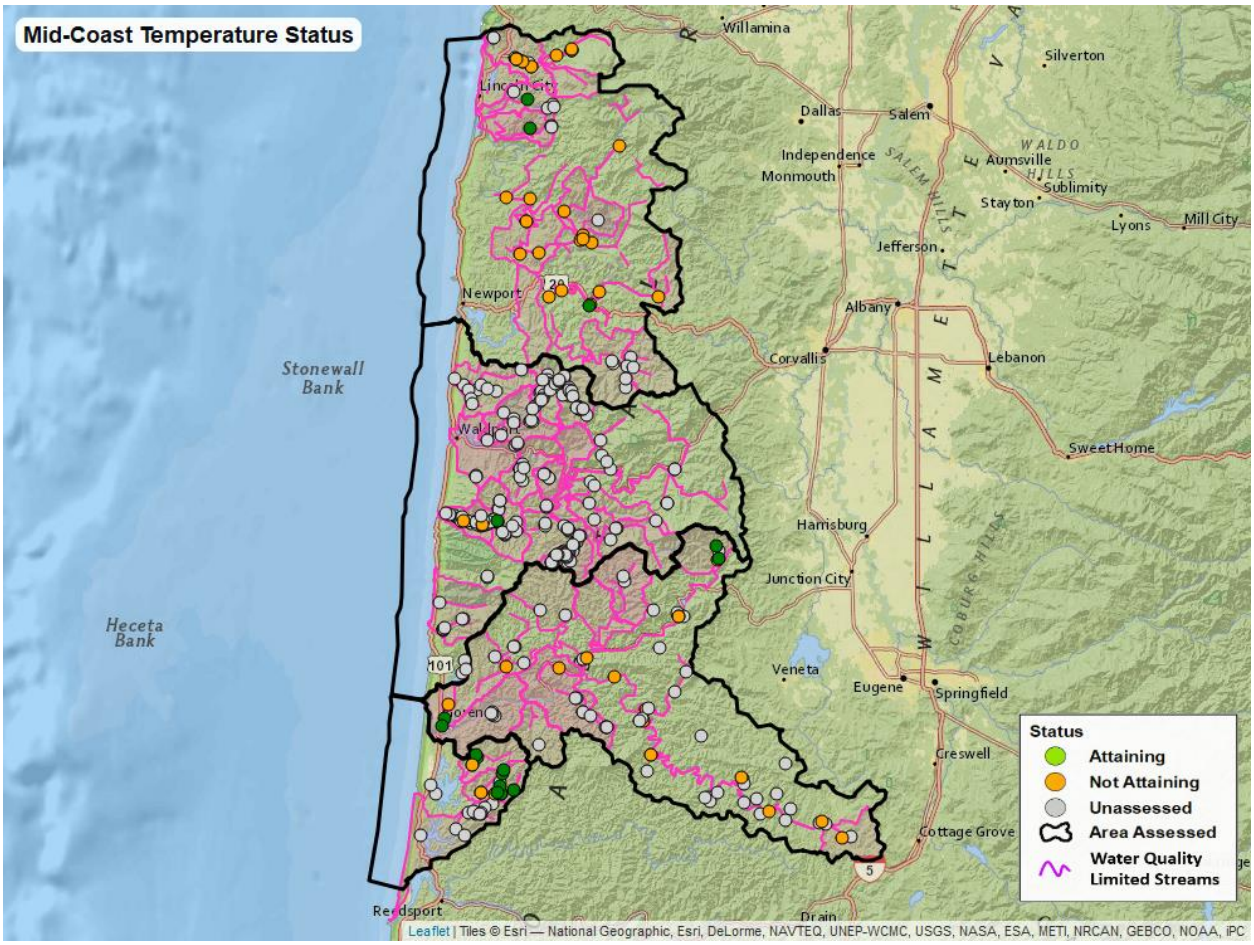

Figure 141: Summary map of the status of temperature across the Mid-Coast.

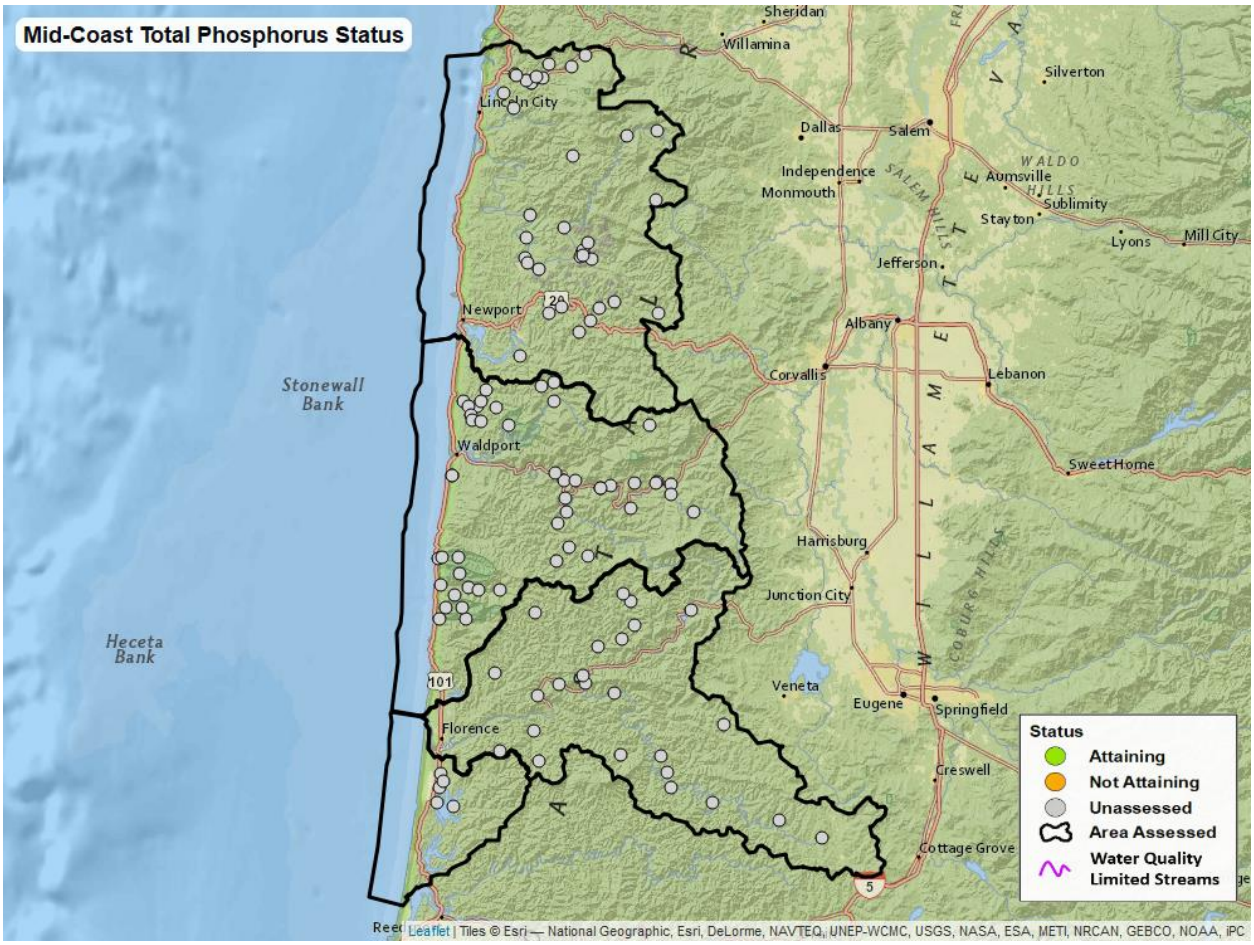

Figure 142: Summary map of the status of total phosphorus across the Mid-Coast.

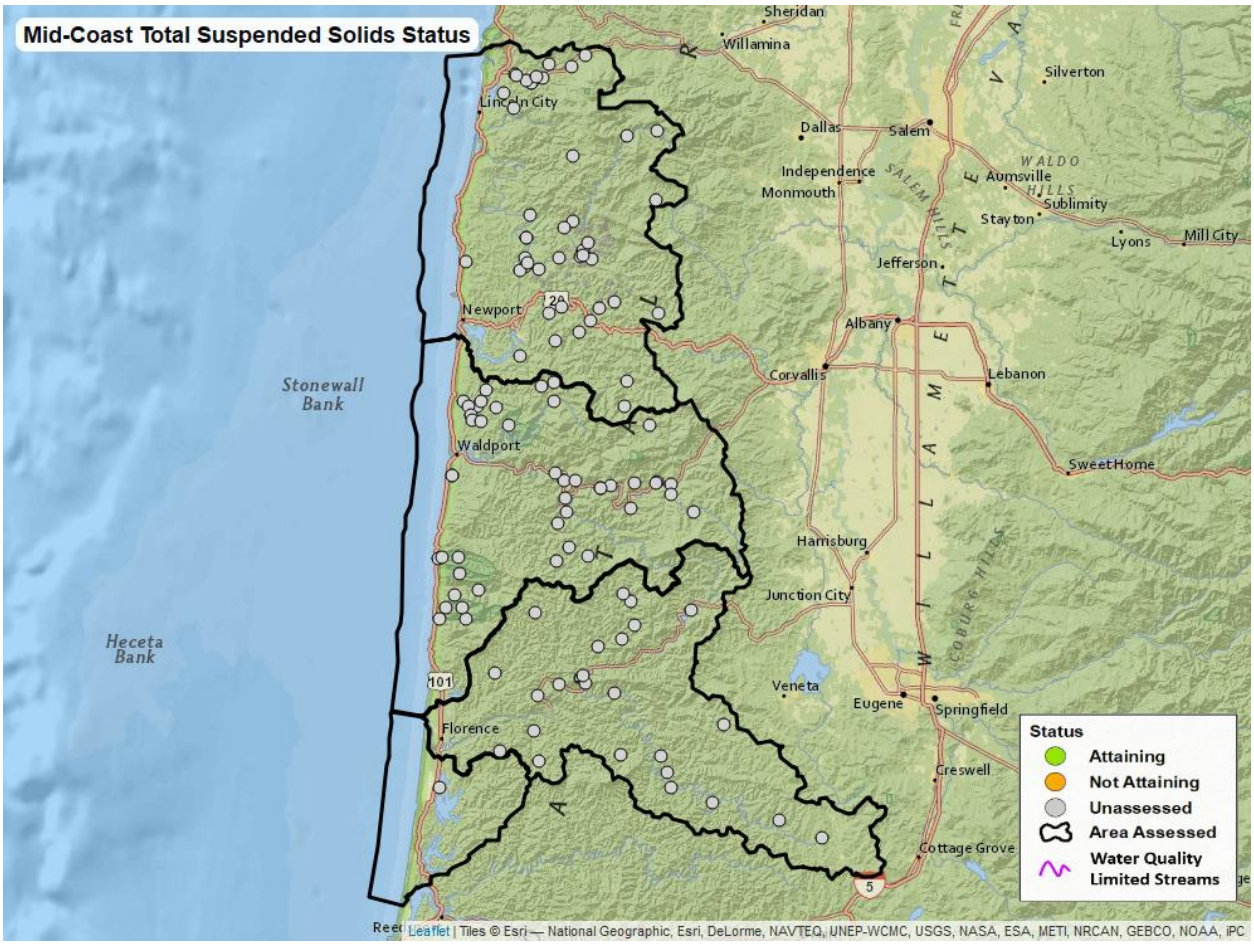

Figure 143: Summary map of the status of total suspended solids across the Mid-Coast.

4.10.3 Status

There are 159 assessment units within the Mid-Coast containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 208 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 208: Summary of the 2016–2019 assessment unit status within the Mid-Coast.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	21	11	66
Enterococcus	0	0	1
Escherichia coli	13	10	38
Fecal Coliform	0	0	5
PH	22	5	61
Temperature	10	23	82
Total Phosphorus	0	0	66
Total Suspended Solids	0	0	68

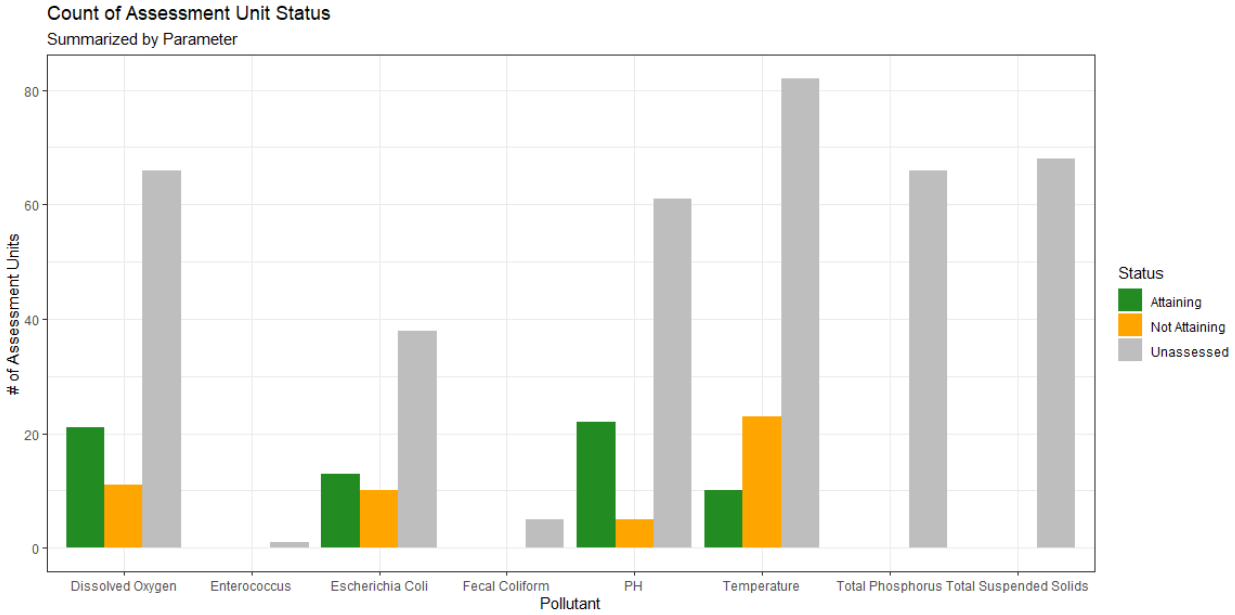

Figure 144: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Mid-Coast.

Table 209 and Figure 144 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Mid-Coast for the 2016–2019 status period.

Table 209: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Mid-Coast.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Coastline	Fecal Coliform	0	0	4
Estuary or Bay	Dissolved Oxygen	1	0	1
Estuary or Bay	*Enterococcus*	0	0	1
Estuary or Bay	*Escherichia coli*	0	0	3
Estuary or Bay	Fecal Coliform	0	0	1
Estuary or Bay	PH	1	0	1
Estuary or Bay	Temperature	0	1	3
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	2
Lake	Dissolved Oxygen	0	0	4
Lake	*Escherichia coli*	1	0	1
Lake	PH	0	0	4
Lake	Temperature	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	19	9	32
Stream	*Escherichia coli*	12	7	25

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	PH	20	3	31
Stream	Temperature	4	20	47
Stream	Total Phosphorus	0	0	37
Stream	Total Suspended Solids	0	0	39
Watershed Unit	Dissolved Oxygen	1	2	29
Watershed Unit	*Escherichia coli*	0	3	9
Watershed Unit	PH	1	2	25
Watershed Unit	Temperature	6	2	30
Watershed Unit	Total Phosphorus	0	0	25
Watershed Unit	Total Suspended Solids	0	0	26

Table 210 and Figure 145 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix I.

Table 210: Summary of the 2016–2019 status at monitoring stations within the Mid-Coast.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	48	19	156
Enterococcus	0	0	1
Escherichia coli	16	17	92
Fecal Coliform	0	0	5
PH	47	7	138
Temperature	22	44	276
Total Phosphorus	0	0	113
Total Suspended Solids	0	0	115

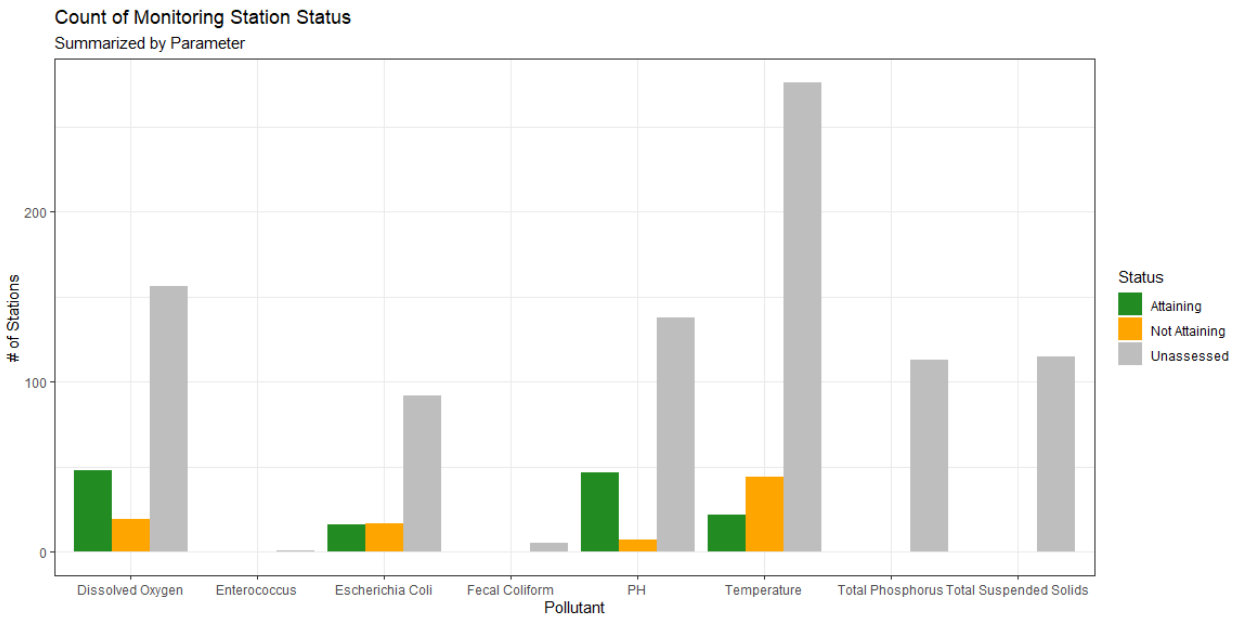

Figure 145: Summary plot of the 2016–2019 station status within the Mid-Coast by parameter.

4.10.4 Trend

A summary of the trends across parameters is shown in Table 211. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 211: Mid-Coast summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	21	2	0	6	194
Enterococcus	0	0	0	0	1
Escherichia coli	19	7	0	20	79
Fecal Coliform	0	0	0	0	5
PH	0	25	3	9	155
Temperature	0	4	0	2	336
Total Phosphorus	0	0	5	0	108
Total Suspended Solids	2	0	2	1	110

4.10.5 Subbasin Summary

4.10.5.1 Siletz-Yaquina Subbasin

4.10.5.1.1 Water Quality Limited Assessment Units

Table 212: Number of water quality limited assessment units in the Siletz-Yaquina Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Enterococcus	1
Fecal Coliform	8
pH	1

4.10.5.1.2 Status

There are 44 assessment units within the Siletz-Yaquina Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 213 and Figure 146 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 213: Summary of the 2016–2019 assessment unit status within the Siletz-Yaquina Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	10	8	17
Escherichia coli	4	7	12
Fecal Coliform	0	0	5
PH	14	3	17
Temperature	3	8	9
Total Phosphorus	0	0	22
Total Suspended Solids	0	0	25

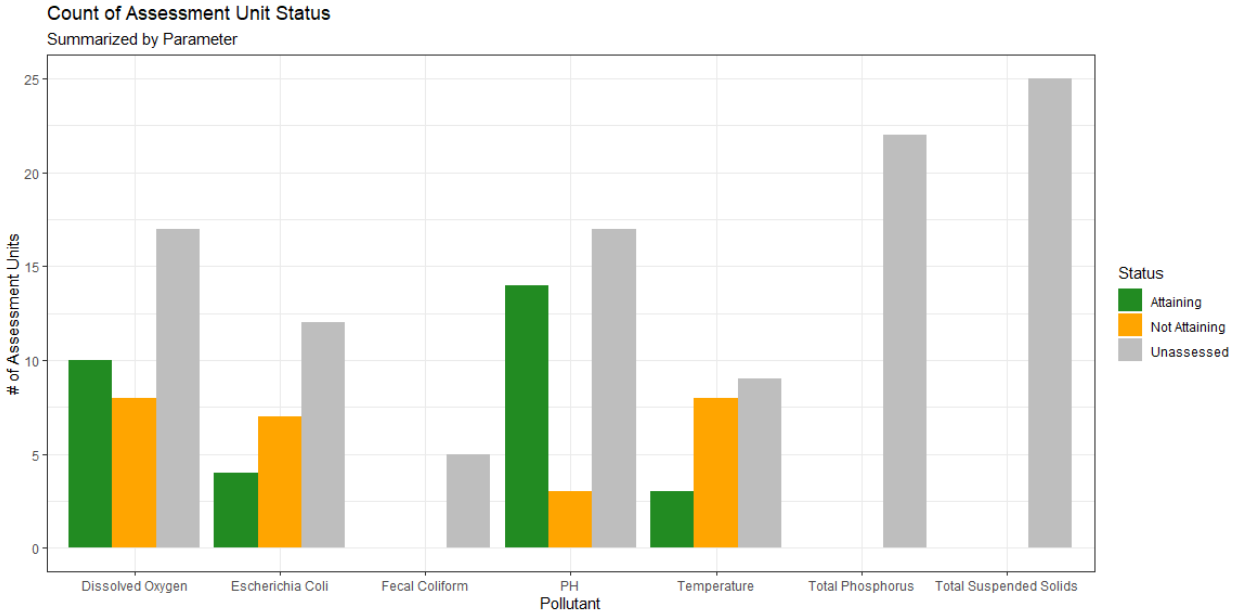

Figure 146: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Siletz-Yaquina Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 214 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Siletz-Yaquina Subbasin for the 2016 – 2019 status period.

Table 214: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Siletz-Yaquina Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Coastline	Fecal Coliform	0	0	4
Estuary or Bay	Dissolved Oxygen	1	0	1
Estuary or Bay	*Escherichia coli*	0	0	3
Estuary or Bay	Fecal Coliform	0	0	1
Estuary or Bay	PH	1	0	1
Estuary or Bay	Temperature	0	1	1
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	2
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	1
Stream	Dissolved Oxygen	8	6	6
Stream	*Escherichia coli*	4	4	6
Stream	PH	12	1	6
Stream	Temperature	1	7	5
Stream	Total Phosphorus	0	0	11

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Total Suspended Solids	0	0	13
Watershed Unit	Dissolved Oxygen	1	2	9
Watershed Unit	*Escherichia coli*	0	3	2
Watershed Unit	PH	1	2	9
Watershed Unit	Temperature	2	0	3
Watershed Unit	Total Phosphorus	0	0	9
Watershed Unit	Total Suspended Solids	0	0	10

There are 133 stations within the Siletz-Yaquina Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix I**. Table 215 and Figure 147 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 215: Summary of the 2016–2019 status at monitoring stations within the Siletz-Yaquina Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	30	16	50
Escherichia coli	7	14	42
Fecal Coliform	0	0	5
PH	31	4	54
Temperature	3	22	26
Total Phosphorus	0	0	36
Total Suspended Solids	0	0	45

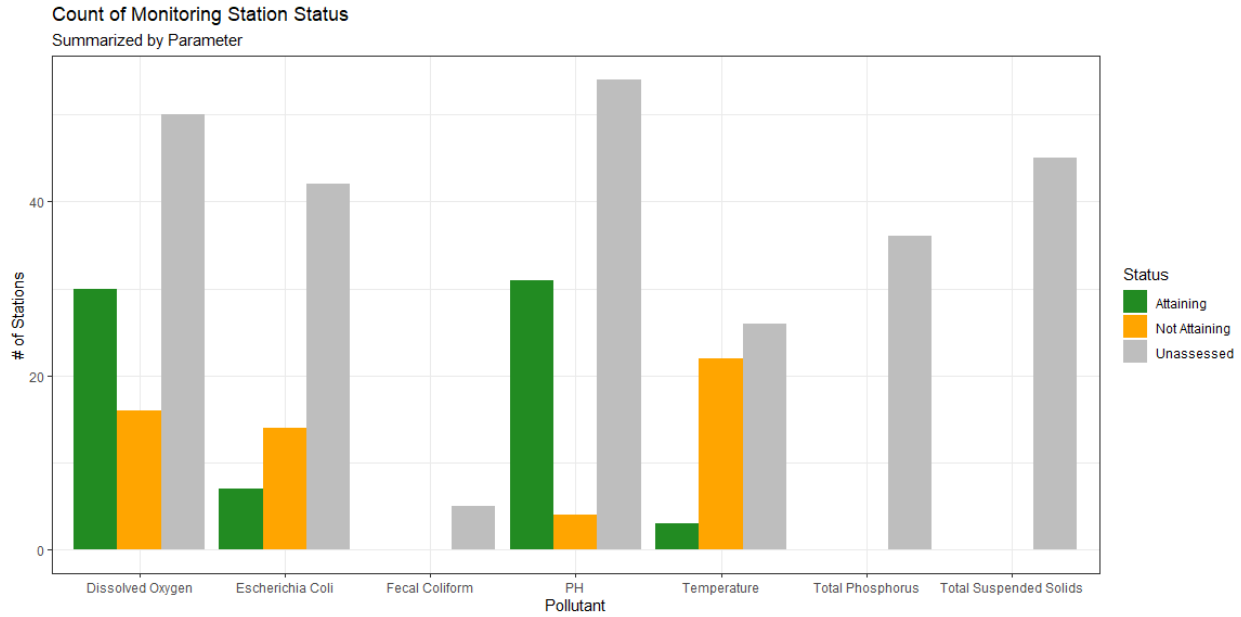

Figure 147: The number of stations in each status category by parameter for the 2016–2019 status period within the Siletz-Yaquina Subbasin.

4.10.5.1.3 Trend

A summary of the trends within parameters is shown in Table 216. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 216: Subbasin Summary of trend results at stations across the Siletz-Yaquina.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	8	2	0	3	83
Escherichia coli	13	3	0	9	38
Fecal Coliform	0	0	0	0	5
PH	0	15	1	6	67
Temperature	0	0	0	0	51
Total Phosphorus	0	0	2	0	34
Total Suspended Solids	1	0	1	0	43

4.10.5.2 Alsea Subbasin

4.10.5.2.1 Water Quality Limited Assessment Units

Table 217: Number of water quality limited assessment units in the Alsea Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	6
pH	1

4.10.5.2.2 Status

There are 55 assessment units within the Alsea Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 218 and Figure 148 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 218: Summary of the 2016–2019 assessment unit status within the Alsea Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	3	26
Escherichia coli	1	1	19
PH	7	2	24
Temperature	2	1	42
Total Phosphorus	0	0	24
Total Suspended Solids	0	0	24

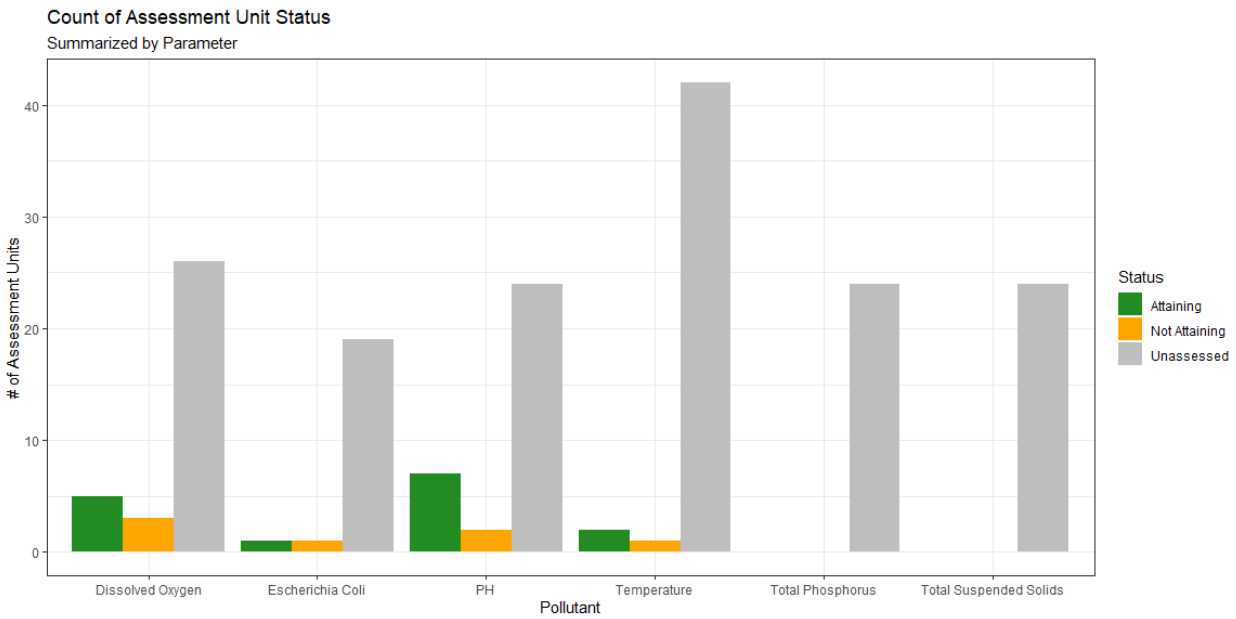

Figure 148: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Alsea Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 219 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Alsea Subbasin for the 2016 – 2019 status period.

Table 219: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Alsea Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Temperature	0	0	1
Stream	Dissolved Oxygen	5	3	15
Stream	*Escherichia coli*	1	1	14
Stream	PH	7	2	14
Stream	Temperature	1	1	25
Stream	Total Phosphorus	0	0	16
Stream	Total Suspended Solids	0	0	16
Watershed Unit	Dissolved Oxygen	0	0	11
Watershed Unit	*Escherichia coli*	0	0	5
Watershed Unit	PH	0	0	10
Watershed Unit	Temperature	1	0	16
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	8

There are 239 stations within the Alsea Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for

a station's unassessed status can be found in **Appendix I**. Table 220 and Figure 149 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 220: Summary of the 2016–2019 status at monitoring stations within the Alsea Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	12	3	53
Escherichia coli	1	1	30
PH	15	3	44
Temperature	4	2	184
Total Phosphorus	0	0	48
Total Suspended Solids	0	0	45

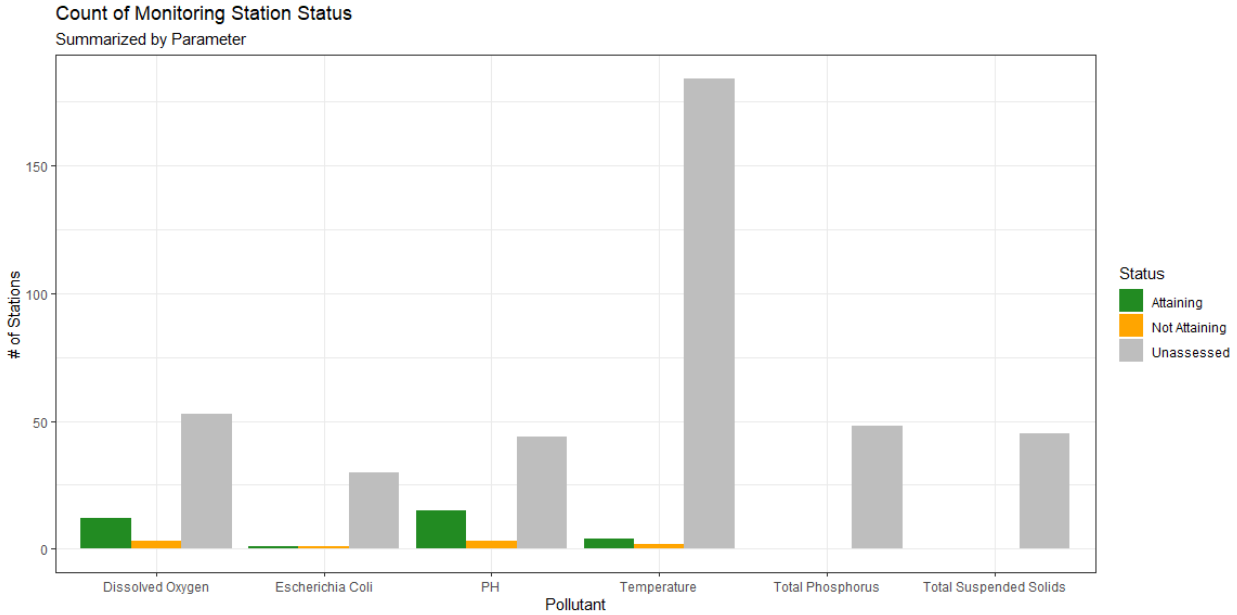

Figure 149: The number of stations in each status category by parameter for the 2016–2019 status period within the Alsea Subbasin.

4.10.5.2.3 Trend

A summary of the trends within parameters is shown in Table 221. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 221: Subbasin Summary of trend results at stations across the Alsea.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	12	0	0	3	53
Escherichia coli	6	1	0	7	18
PH	0	9	2	3	48
Temperature	0	4	0	2	184
Total Phosphorus	0	0	2	0	46

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	1	0	1	0	43

4.10.5.3 Siuslaw Subbasin

4.10.5.3.1 Water Quality Limited Assessment Units

Table 222: Number of water quality limited assessment units in the Siuslaw Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	6
pH	1
Total Phosphorus, mixed forms	2

4.10.5.3.2 Status

There are 44 assessment units within the Siuslaw Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 223 and Figure 150 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 223: Summary of the 2016–2019 assessment unit status within the Siuslaw Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	18
Enterococcus	0	0	1
Escherichia coli	7	2	5
PH	1	0	15
Temperature	2	11	24
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	18

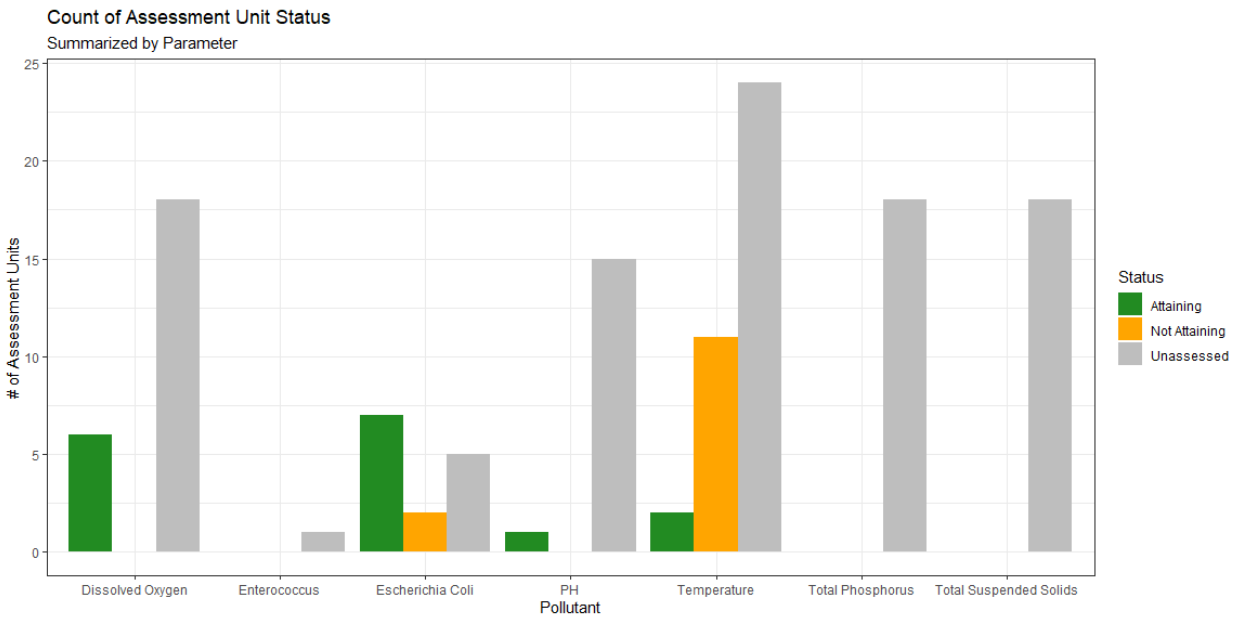

Figure 150: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Siuslaw Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 224 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Siuslaw Subbasin for the 2016 – 2019 status period.

Table 224: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Siuslaw Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	*Enterococcus*	0	0	1
Estuary or Bay	Temperature	0	0	1
Stream	Dissolved Oxygen	6	0	10
Stream	*Escherichia coli*	7	2	4
Stream	PH	1	0	10
Stream	Temperature	1	9	13
Stream	Total Phosphorus	0	0	10
Stream	Total Suspended Solids	0	0	10
Watershed Unit	Dissolved Oxygen	0	0	8
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	5
Watershed Unit	Temperature	1	2	10
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	8

There are 110 stations within the Siuslaw Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix I**. Table 225 and Figure 151 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 225: Summary of the 2016–2019 status at monitoring stations within the Siuslaw Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	43
Enterococcus	0	0	1
Escherichia coli	7	2	16
PH	1	0	30
Temperature	4	16	51
Total Phosphorus	0	0	24
Total Suspended Solids	0	0	24

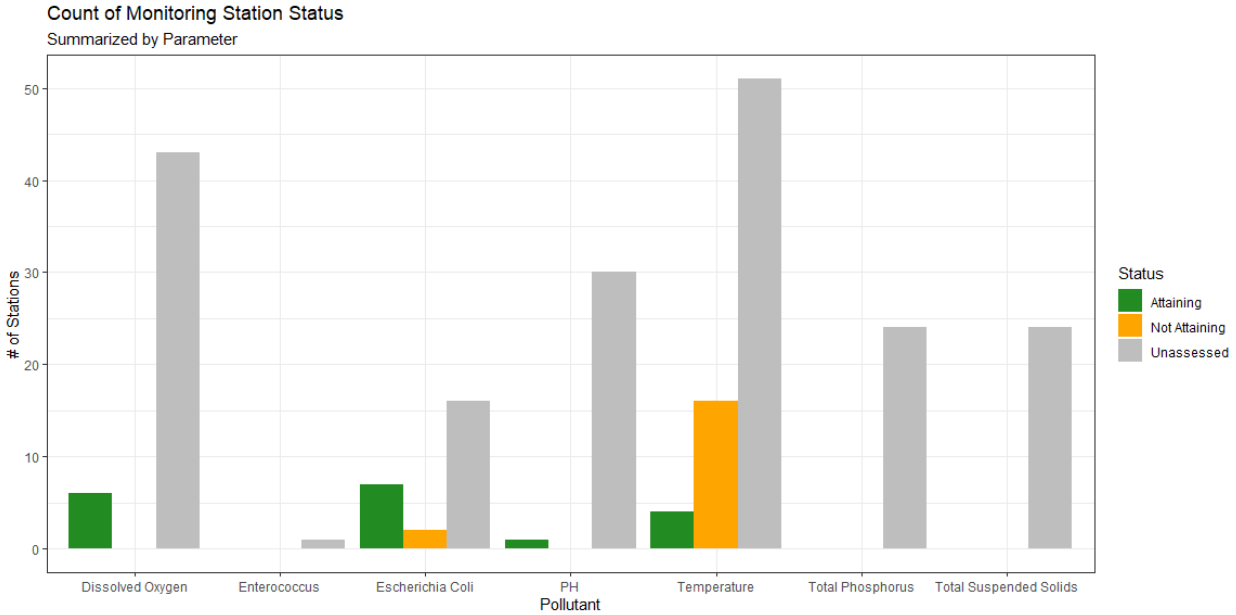

Figure 151: The number of stations in each status category by parameter for the 2016–2019 status period within the Siuslaw Subbasin.

4.10.5.3.3 Trend

A summary of the trends within parameters is shown in Table 226. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 226: Subbasin Summary of trend results at stations across the Siuslaw.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	48
Enterococcus	0	0	0	0	1
Escherichia coli	0	3	0	4	18

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
PH	0	1	0	0	30
Temperature	0	0	0	0	71
Total Phosphorus	0	0	1	0	23
Total Suspended Solids	0	0	0	1	23

4.10.5.4 Siltcoos Subbasin

4.10.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.10.5.4.2 Status

There are 16 assessment units within the Siltcoos Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 227 and Figure 152 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 227: Summary of the 2016–2019 assessment unit status within the Siltcoos Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	5
Escherichia coli	1	0	2
PH	0	0	5
Temperature	3	3	7
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	1

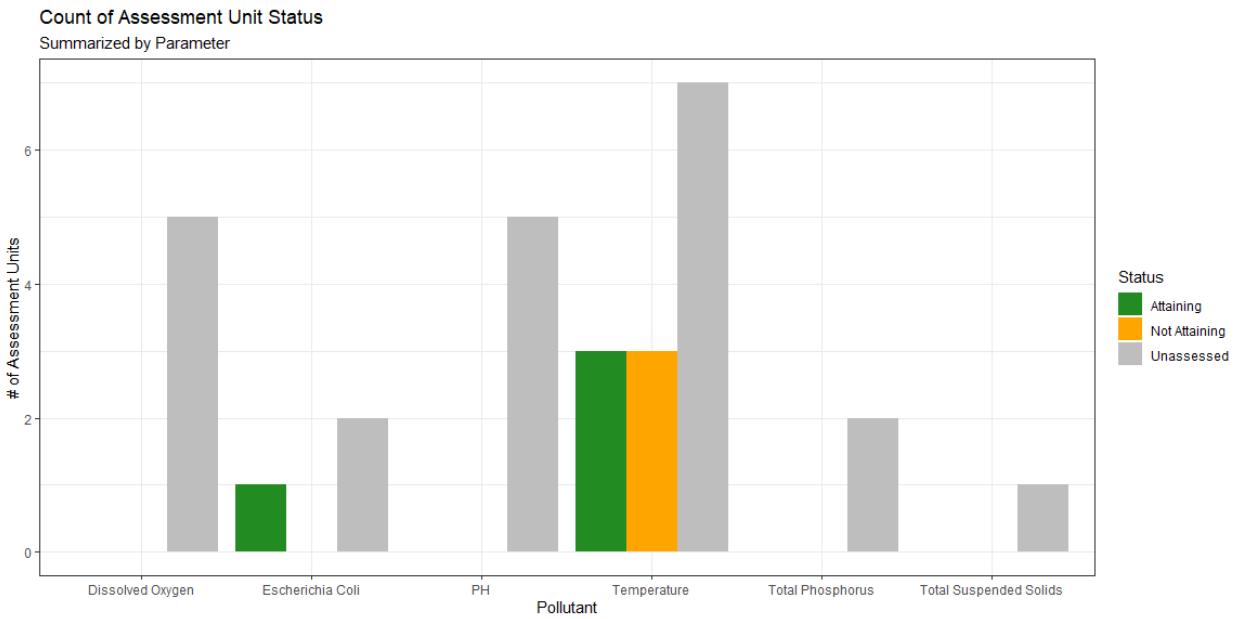

Figure 152: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Siltcoos Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 228 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Siltcoos Subbasin for the 2016 – 2019 status period.

Table 228: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Siltcoos Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	3
Lake	*Escherichia coli*	1	0	0
Lake	PH	0	0	3
Lake	Temperature	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	0	0	1
Stream	*Escherichia coli*	0	0	1
Stream	PH	0	0	1
Stream	Temperature	1	3	4
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	1
Watershed Unit	Temperature	2	0	1

There are 39 stations within the Siltcoos Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix I**. Table 229 and Figure 153 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 229: Summary of the 2016–2019 status at monitoring stations within the Siltcoos Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	10
Escherichia coli	1	0	4
PH	0	0	10
Temperature	11	4	15
Total Phosphorus	0	0	5
Total Suspended Solids	0	0	1

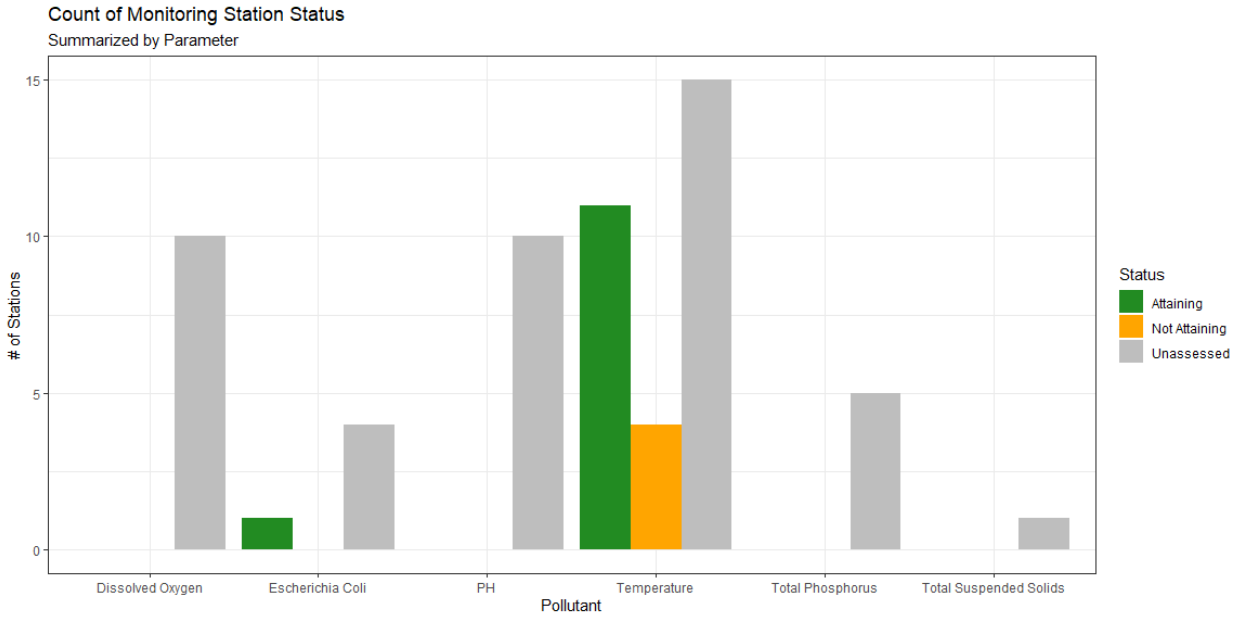

Figure 153: The number of stations in each status category by parameter for the 2016–2019 status period within the Siltcoos Subbasin.

4.10.5.4.3 Trend

A summary of the trends within parameters is shown in Table 230. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 230: Subbasin Summary of trend results at stations across the Siltcoos.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	10
Escherichia coli	0	0	0	0	5
PH	0	0	0	0	10
Temperature	0	0	0	0	30

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	0	0	5
Total Suspended Solids	0	0	0	0	1

4.11 Middle Columbia-Hood

A summary of status and trend results for the Middle Columbia-Hood and all subbasins within the Middle Columbia-Hood are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix J**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Middle Columbia-Hood are water quality limited for 1 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 281 stations within the Middle Columbia-Hood. These stations were located across 44 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.11.1 Land Use

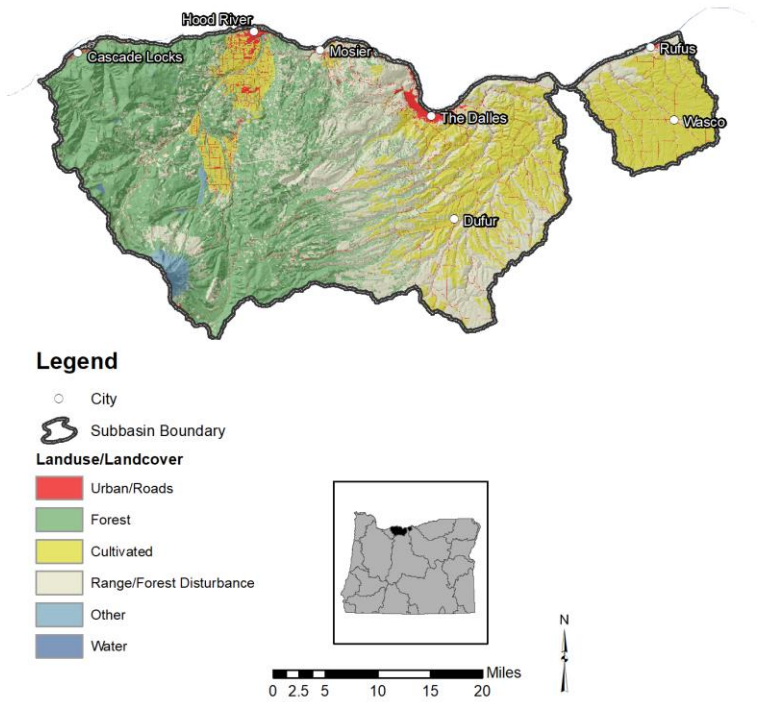

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 231: Land use within the Middle Columbia-Hood Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Columbia-Hood	2959	3.6	38.3	24.3	32.4	1.3

4.11.2 Parameter Maps

The maps in Figure 154 through Figure 159 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

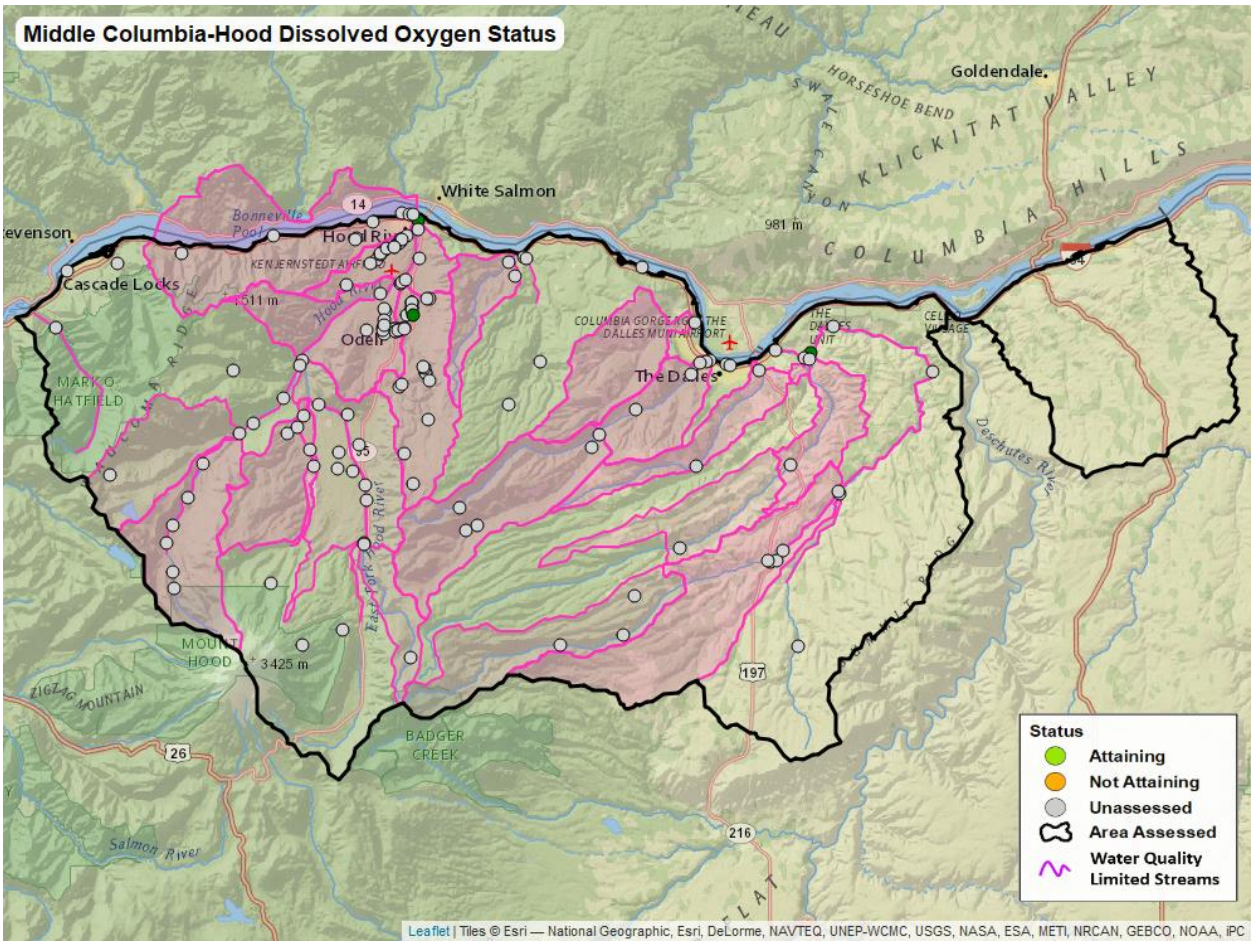

Figure 154: Summary map of the status of dissolved oxygen across the Middle Columbia-Hood.

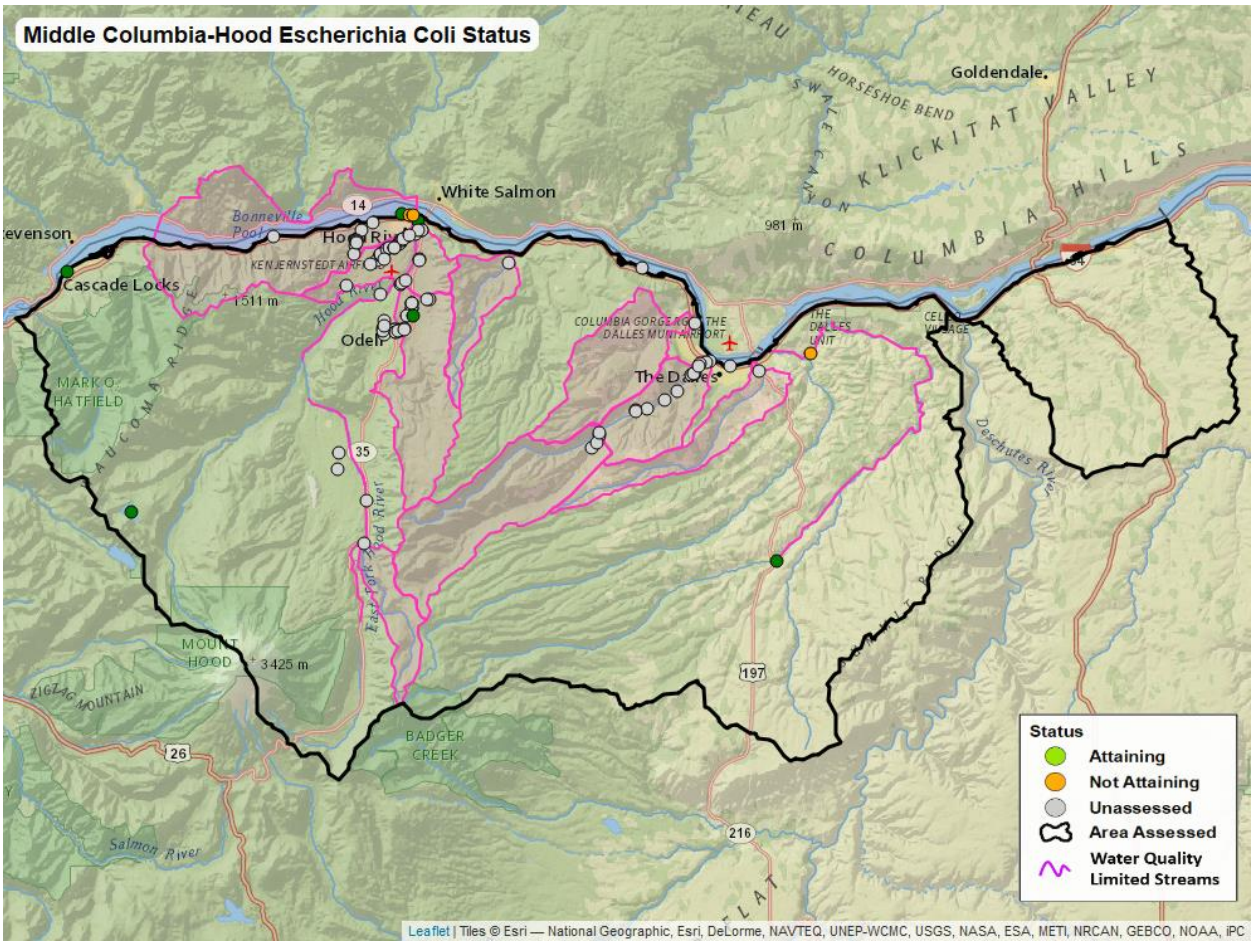

Figure 155: Summary map of the status of *Escherichia coli* across the Middle Columbia-Hood.

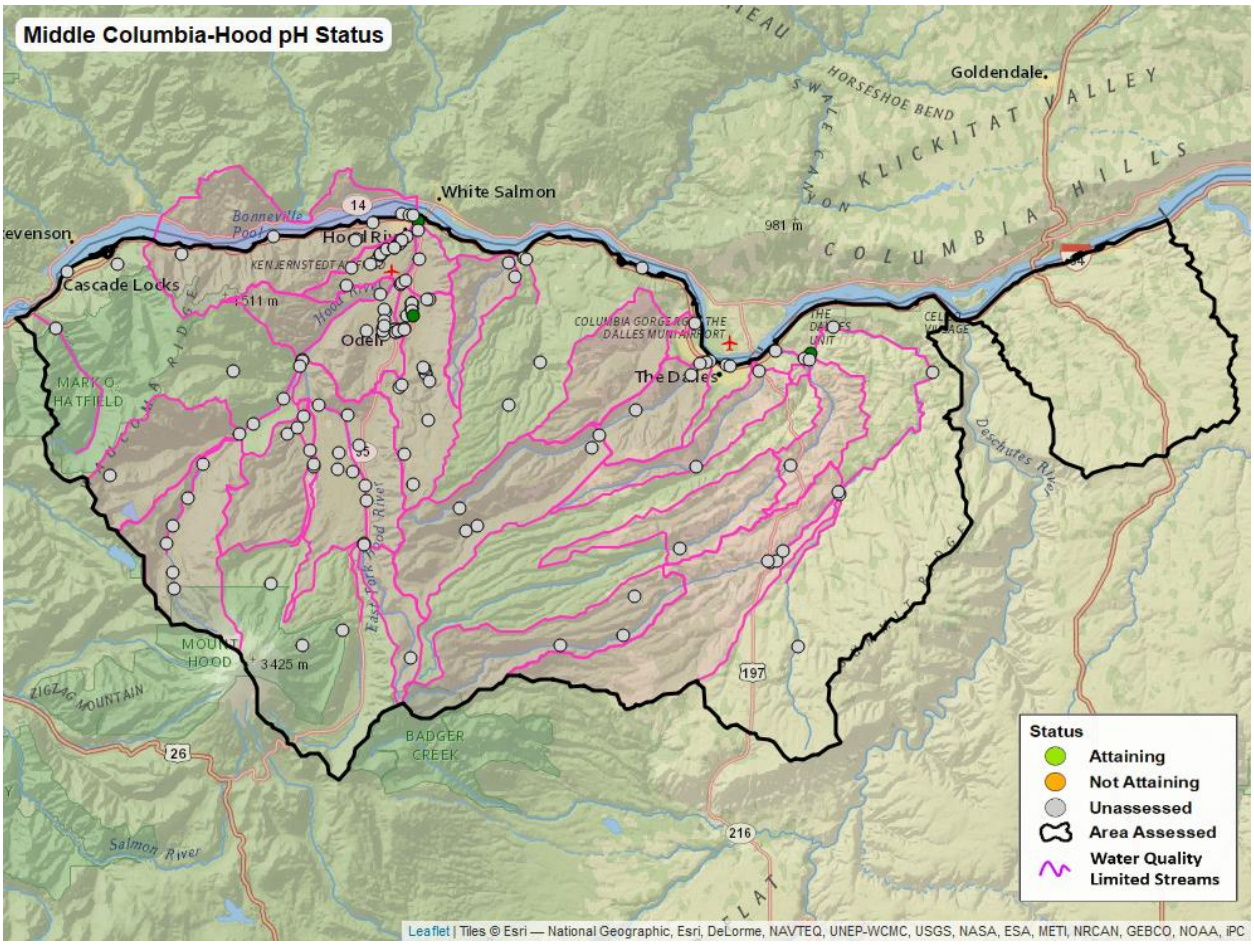

Figure 156: Summary map of the status of pH across the Middle Columbia-Hood.

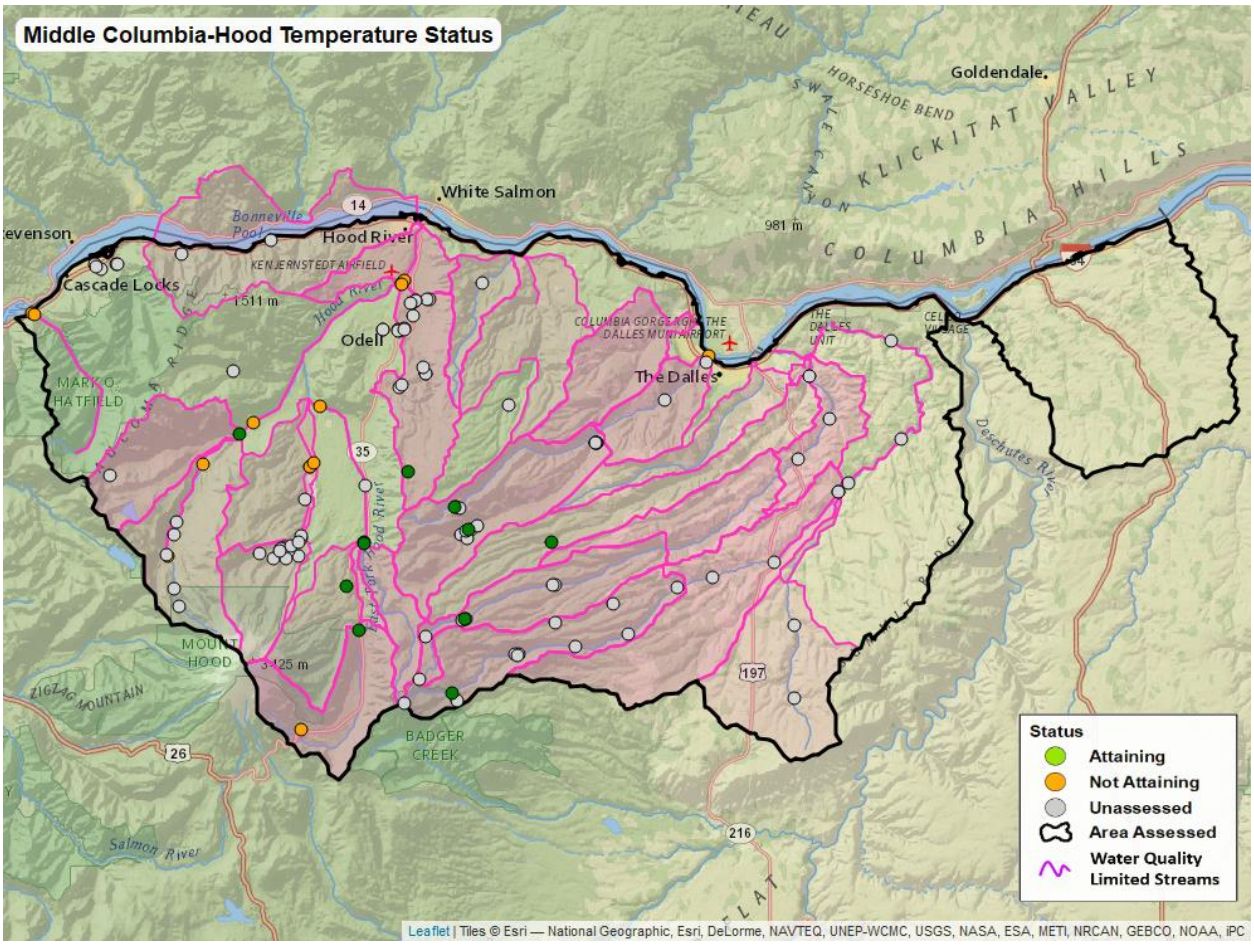

Figure 157: Summary map of the status of temperature across the Middle Columbia-Hood.

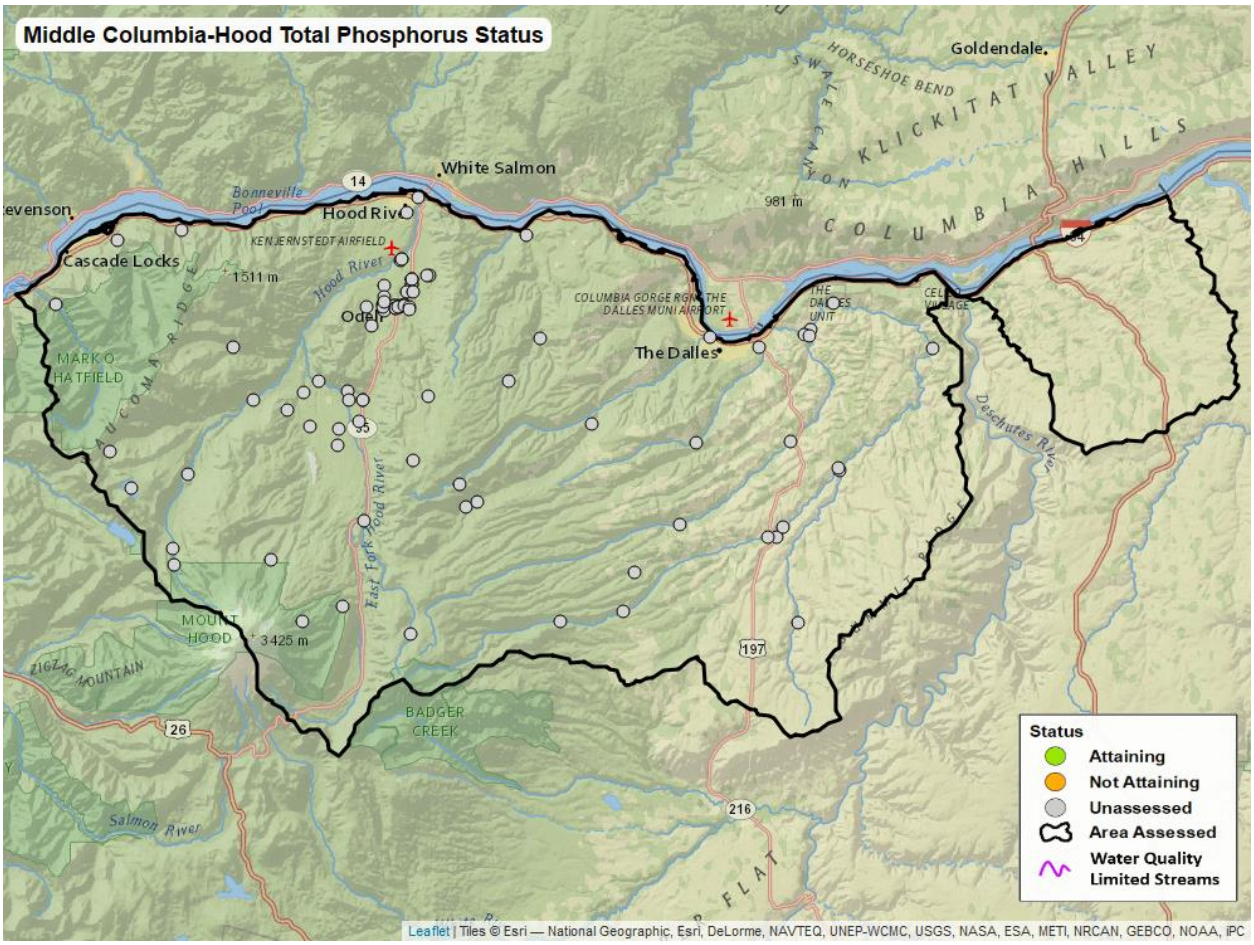

Figure 158: Summary map of the status of total phosphorus across the Middle Columbia-Hood.

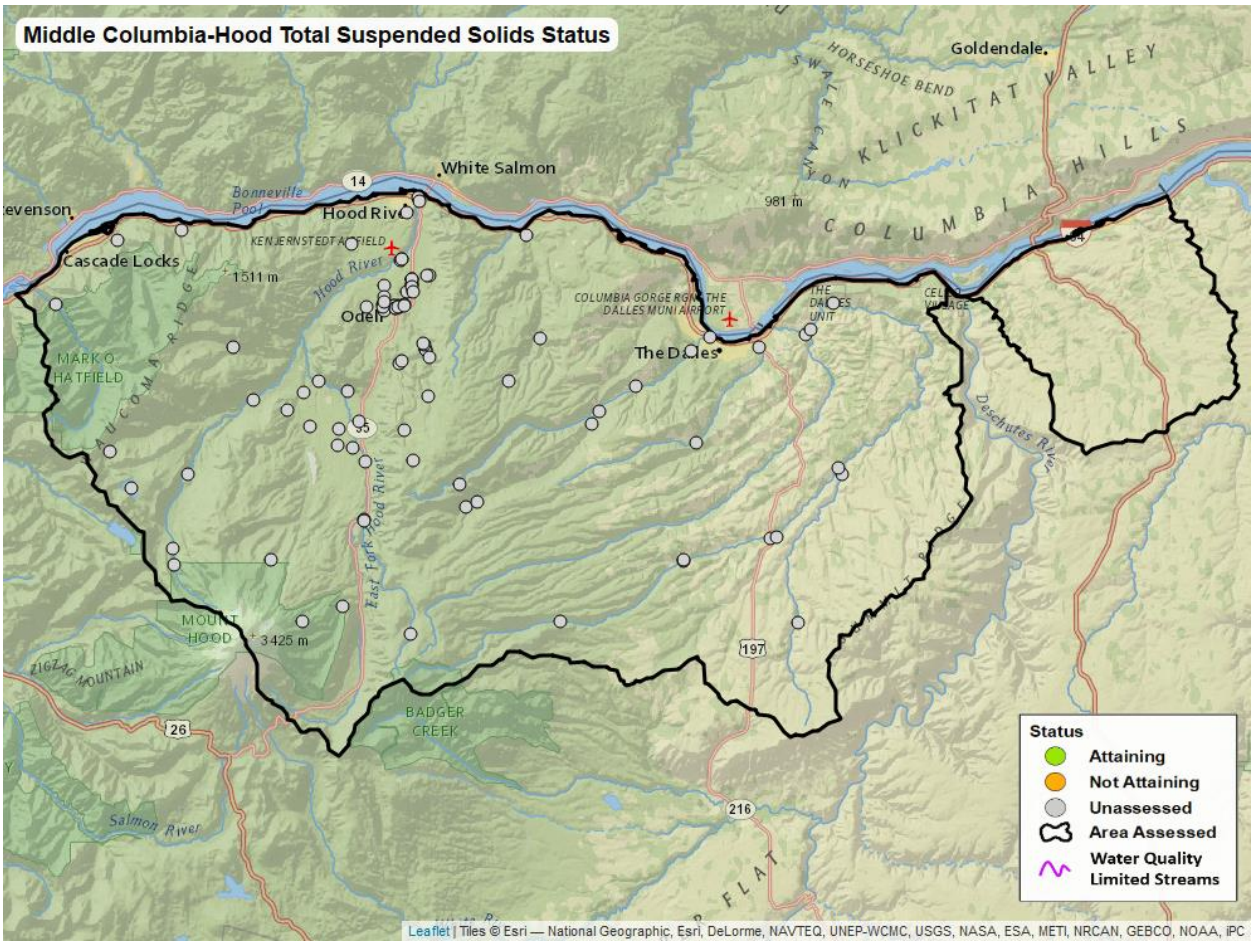

Figure 159: Summary map of the status of total suspended solids across the Middle Columbia-Hood.

4.11.3 Status

There are 44 assessment units within the Middle Columbia-Hood containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 41 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 41: Summary of the 2016–2019 assessment unit status within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	36
Escherichia coli	5	3	11
PH	3	0	36
Temperature	7	11	16
Total Phosphorus	0	0	35
Total Suspended Solids	0	0	33

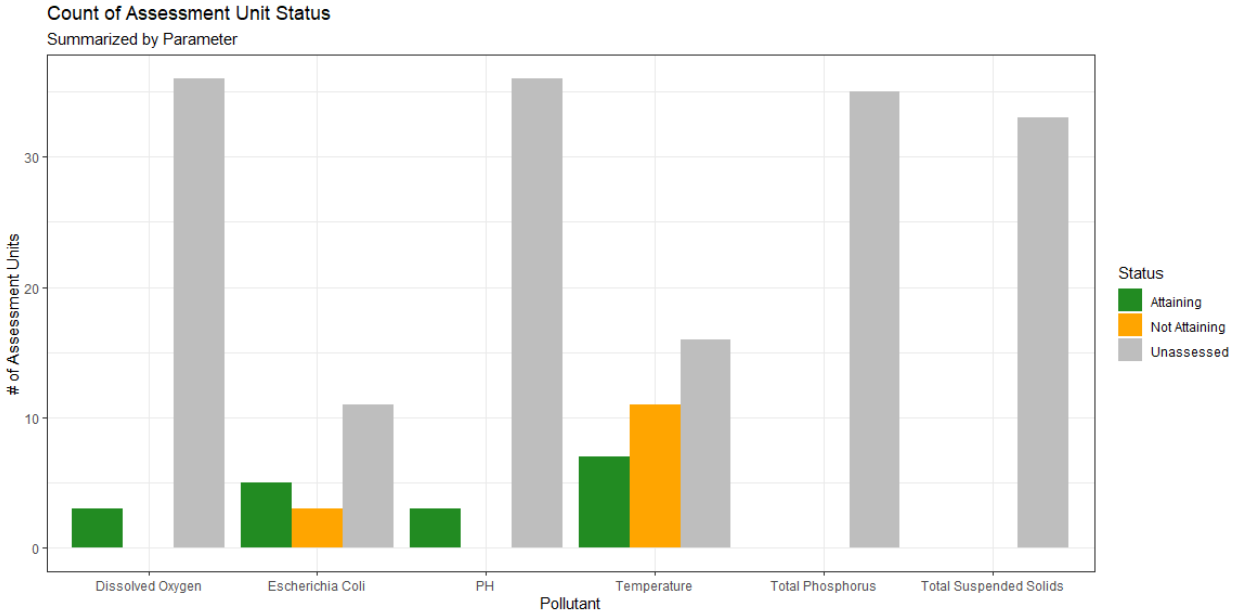

Figure 29: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

Table 42 and Figure 29 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Columbia-Hood for the 2016–2019 status period.

Table 42: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	4
Lake	*Escherichia coli*	2	1	1
Lake	PH	0	0	4
Lake	Temperature	0	2	1
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	2	0	9
Stream	*Escherichia coli*	2	1	1
Stream	PH	2	0	9
Stream	Temperature	0	5	4
Stream	Total Phosphorus	0	0	11
Stream	Total Suspended Solids	0	0	11
Watershed Unit	Dissolved Oxygen	1	0	23
Watershed Unit	*Escherichia coli*	1	1	9
Watershed Unit	PH	1	0	23
Watershed Unit	Temperature	7	4	11

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	22
Watershed Unit	Total Suspended Solids	0	0	20

Table 43 and Figure 30 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix J.

Table 43: Summary of the 2016–2019 status at monitoring stations within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	142
Escherichia coli	6	4	93
PH	3	0	146
Temperature	11	12	98
Total Phosphorus	0	0	90
Total Suspended Solids	0	0	96

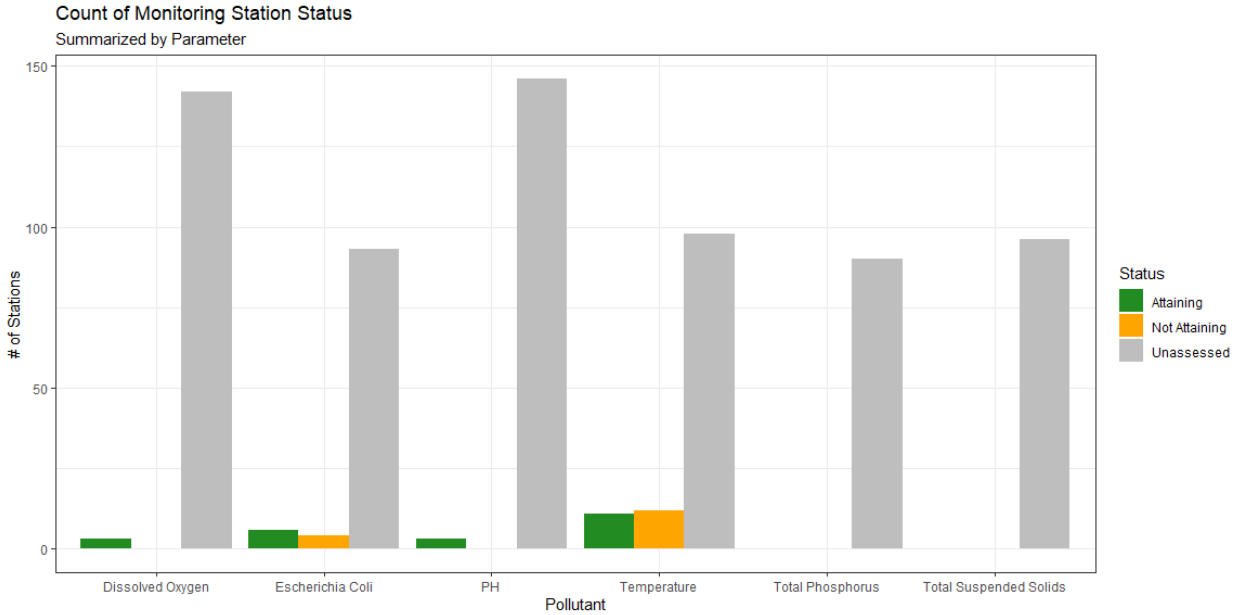

Figure 30: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

4.11.4 Trend

A summary of the trends across parameters is shown in Table 44. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 44: Subbasin Summary of trend results at stations across the Middle Columbia-Hood.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	0	0	4	139
Escherichia coli	0	1	0	2	100
PH	0	7	0	1	141
Temperature	0	8	0	0	113
Total Phosphorus	0	0	1	2	87
Total Suspended Solids	3	0	0	1	92

4.11.5 Subbasin Summary

4.11.5.1 Middle Columbia-Hood Subbasin

4.11.5.1.1 Water Quality Limited Assessment Units

Table 40: Number of water quality limited assessment units in the Middle Columbia-Hood Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	2

4.11.5.1.2 Status

There are 44 assessment units within the Middle Columbia-Hood Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 41 and Figure 29 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 41: Summary of the 2016–2019 assessment unit status within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	36
Escherichia coli	5	3	11
PH	3	0	36
Temperature	7	11	16
Total Phosphorus	0	0	35
Total Suspended Solids	0	0	33

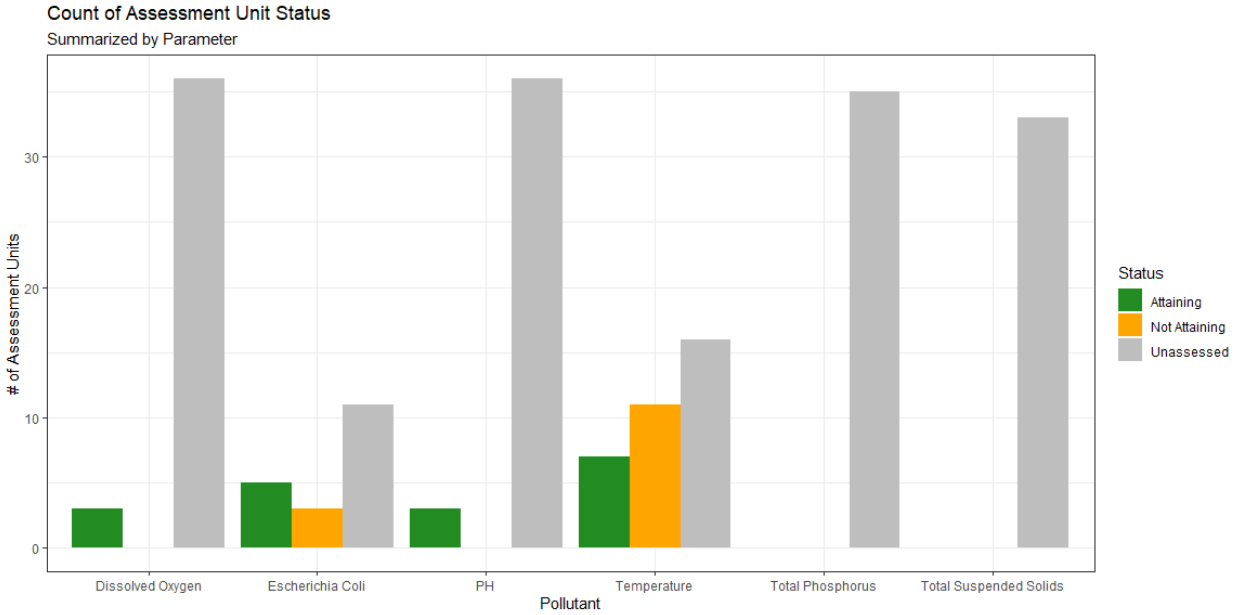

Figure 29: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 42 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Columbia-Hood Subbasin for the 2016 – 2019 status period.

Table 42: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	4
Lake	*Escherichia coli*	2	1	1
Lake	PH	0	0	4
Lake	Temperature	0	2	1
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	2	0	9
Stream	*Escherichia coli*	2	1	1
Stream	PH	2	0	9
Stream	Temperature	0	5	4
Stream	Total Phosphorus	0	0	11
Stream	Total Suspended Solids	0	0	11
Watershed Unit	Dissolved Oxygen	1	0	23
Watershed Unit	*Escherichia coli*	1	1	9
Watershed Unit	PH	1	0	23
Watershed Unit	Temperature	7	4	11

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	22
Watershed Unit	Total Suspended Solids	0	0	20

There are 281 stations within the Middle Columbia-Hood Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix J**. Table 43 and Figure 30 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 43: Summary of the 2016–2019 status at monitoring stations within the Middle Columbia-Hood Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	142
Escherichia coli	6	4	93
PH	3	0	146
Temperature	11	12	98
Total Phosphorus	0	0	90
Total Suspended Solids	0	0	96

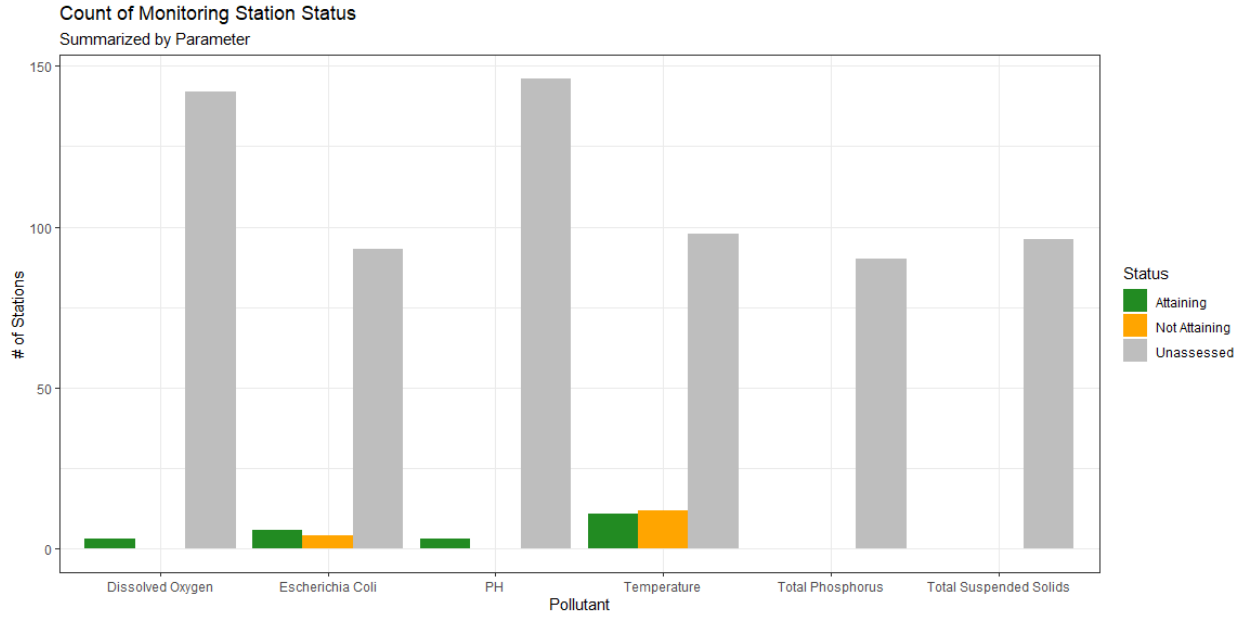

Figure 30: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Columbia-Hood Subbasin.

4.11.5.1.3 Trend

A summary of the trends within parameters is shown in Table 44. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 44: Subbasin Summary of trend results at stations across the Middle Columbia-Hood.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	0	0	4	139
Escherichia coli	0	1	0	2	100
PH	0	7	0	1	141
Temperature	0	8	0	0	113
Total Phosphorus	0	0	1	2	87
Total Suspended Solids	3	0	0	1	92

4.12 North Coast-Lower Columbia

A summary of status and trend results for the North Coast-Lower Columbia and all subbasins within the North Coast-Lower Columbia are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix K**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the North Coast-Lower Columbia are water quality limited for 4 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 409 stations within the North Coast-Lower Columbia. These stations were located across 155 assessment units consisting of 'Coastlines', 'Estuary or Bays', 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.12.1 Land Use

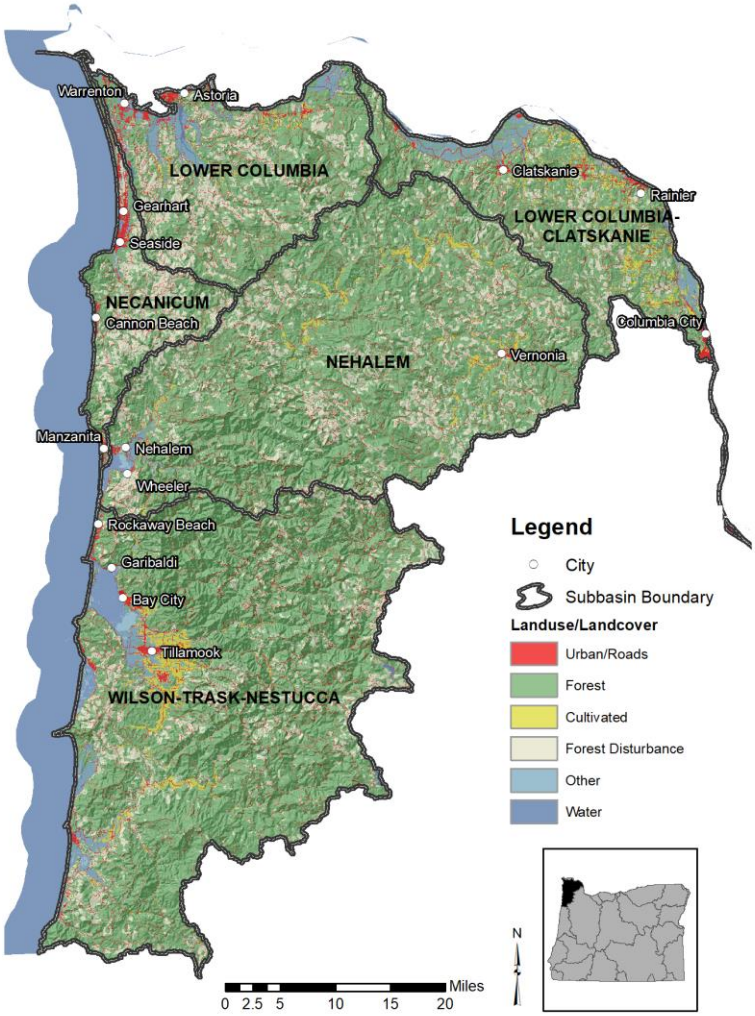

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 232: Land use within the North Coast-Lower Columbia Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Columbia-Clatskanie	780	7.6	62.0	6.4	15.0	9.0
Lower Columbia	847	7.6	59.3	1.1	23.8	8.2
Necanicum	803	4.0	22.8	0.1	15.4	57.8

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Nehalem	2214	4.7	72.8	1.7	19.7	1.2
Wilson-Trusk-Nestuccu	2941	4.6	61.9	2.1	12.2	19.3

4.12.2 Parameter Maps

The maps in Figure 160 through Figure 165 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

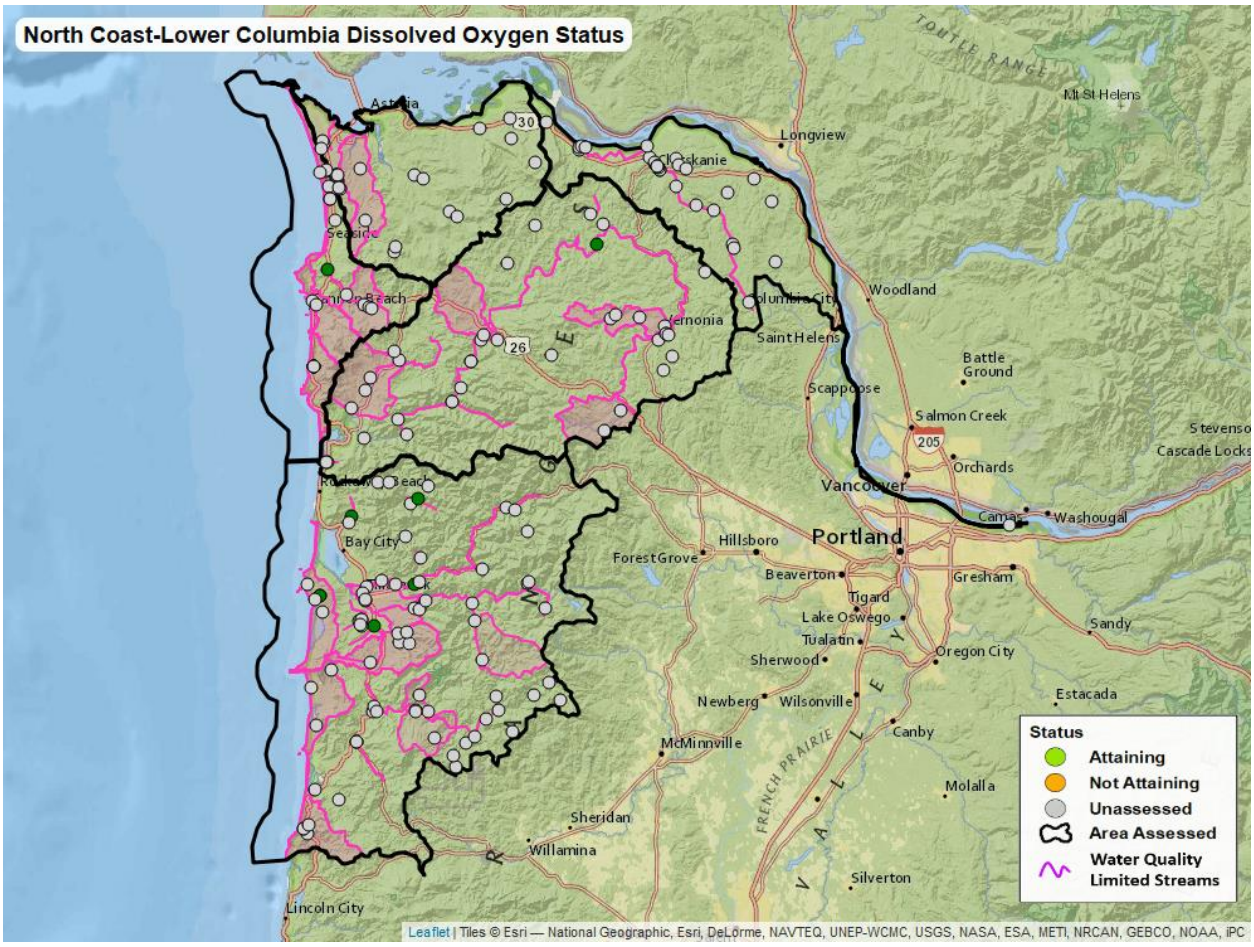

Figure 160: Summary map of the status of dissolved oxygen across the North Coast-Lower Columbia.

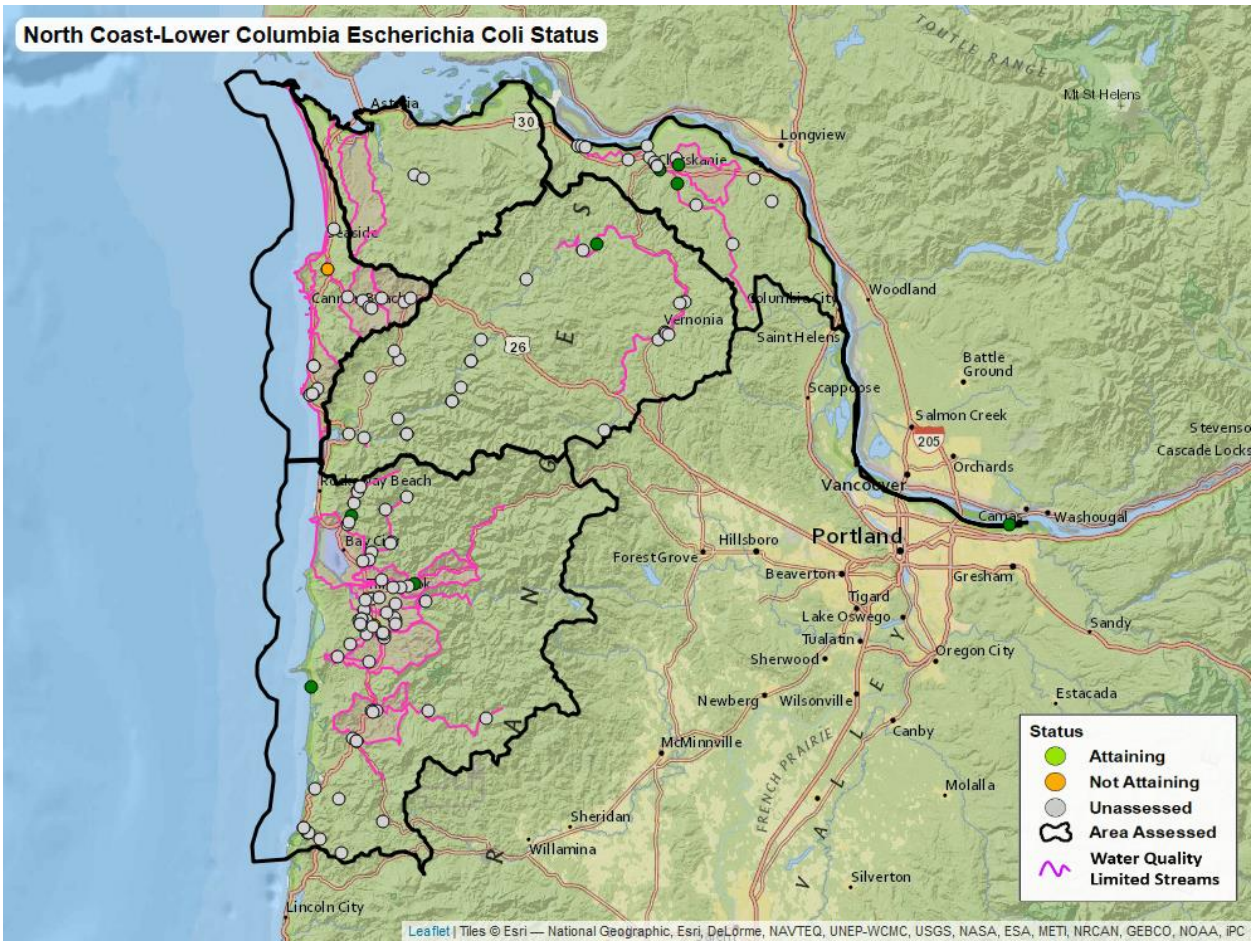

Figure 161: Summary map of the status of *Escherichia coli* across the North Coast-Lower Columbia.

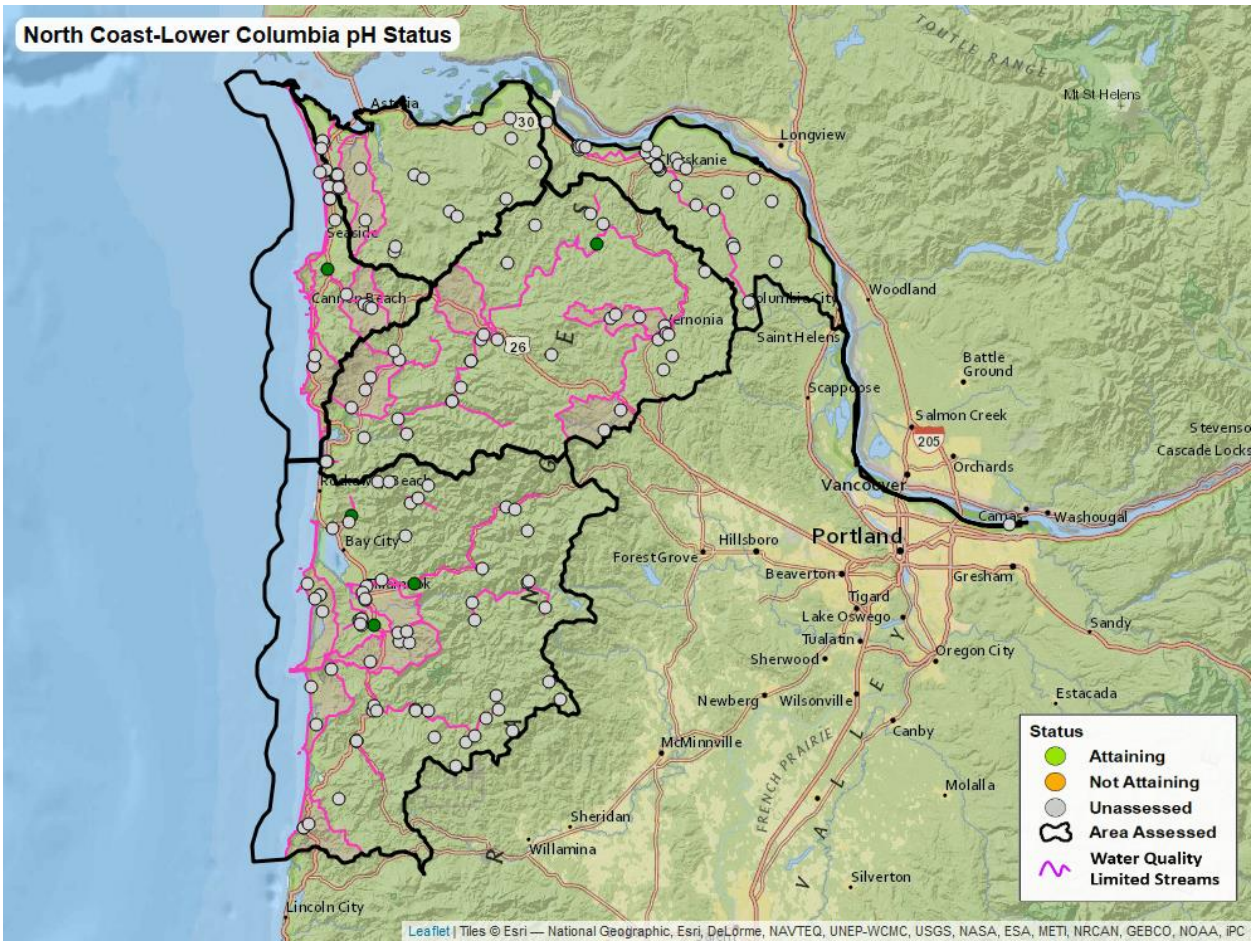

Figure 162: Summary map of the status of pH across the North Coast-Lower Columbia.

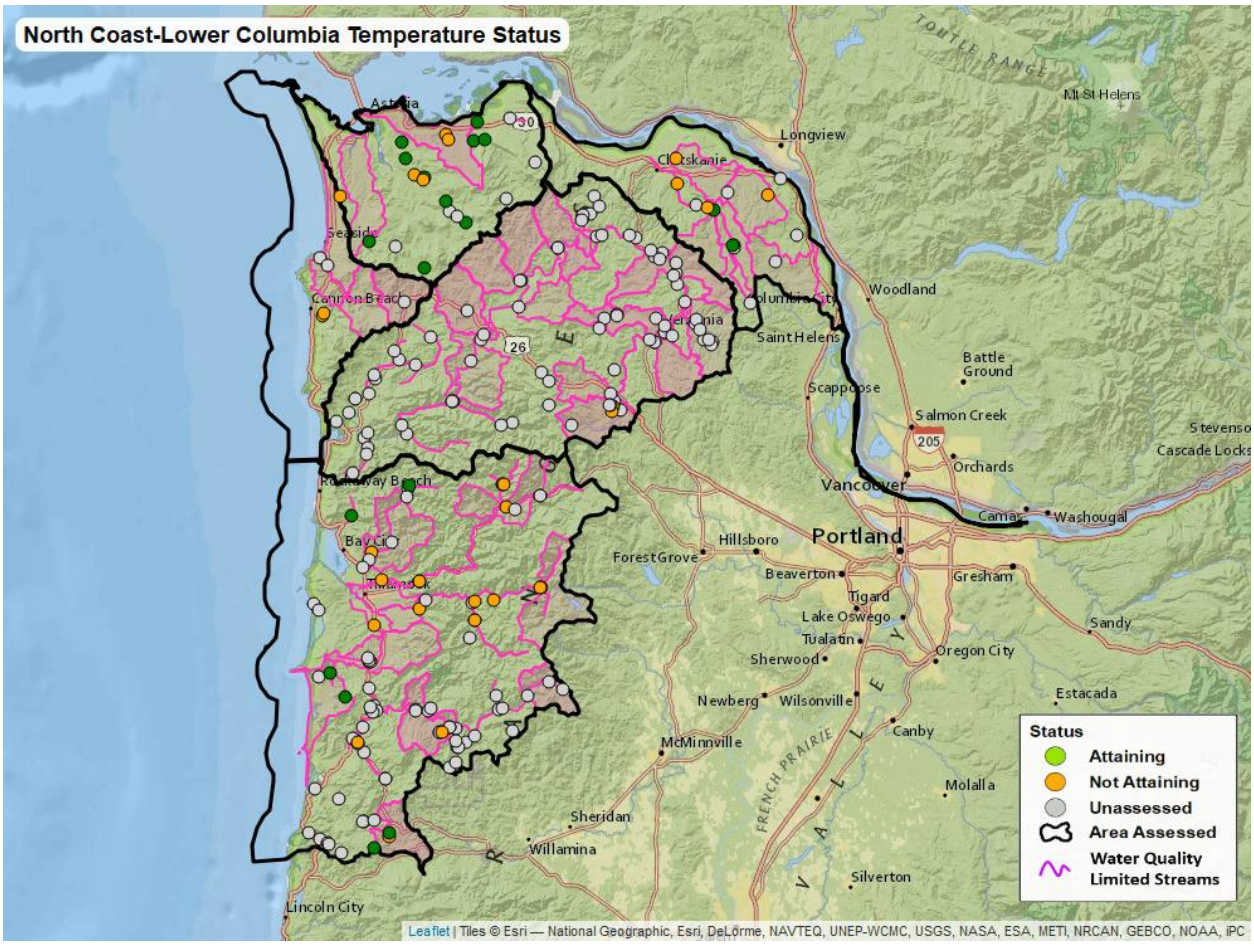

Figure 163: Summary map of the status of temperature across the North Coast-Lower Columbia.

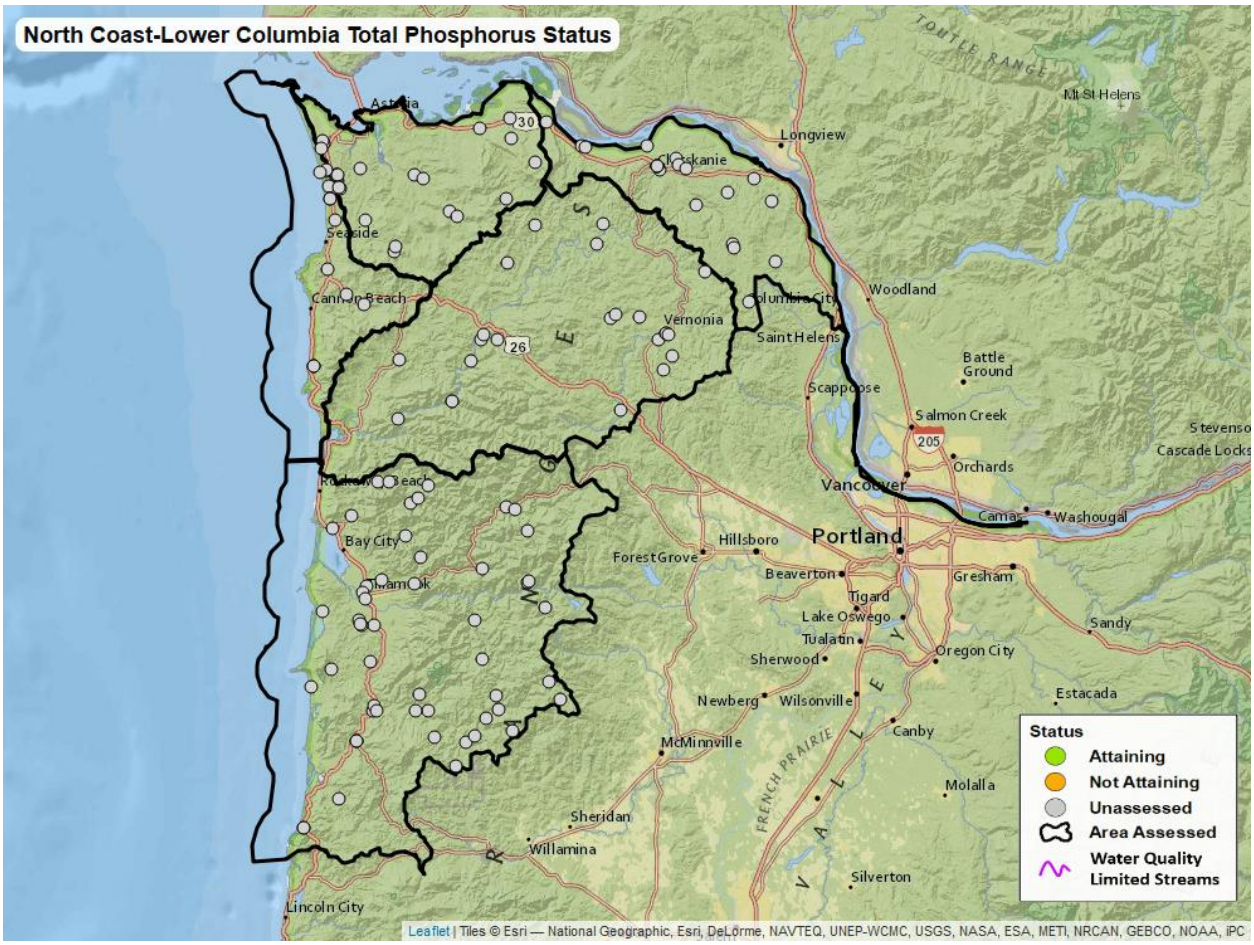

Figure 164: Summary map of the status of total phosphorus across the North Coast-Lower Columbia.

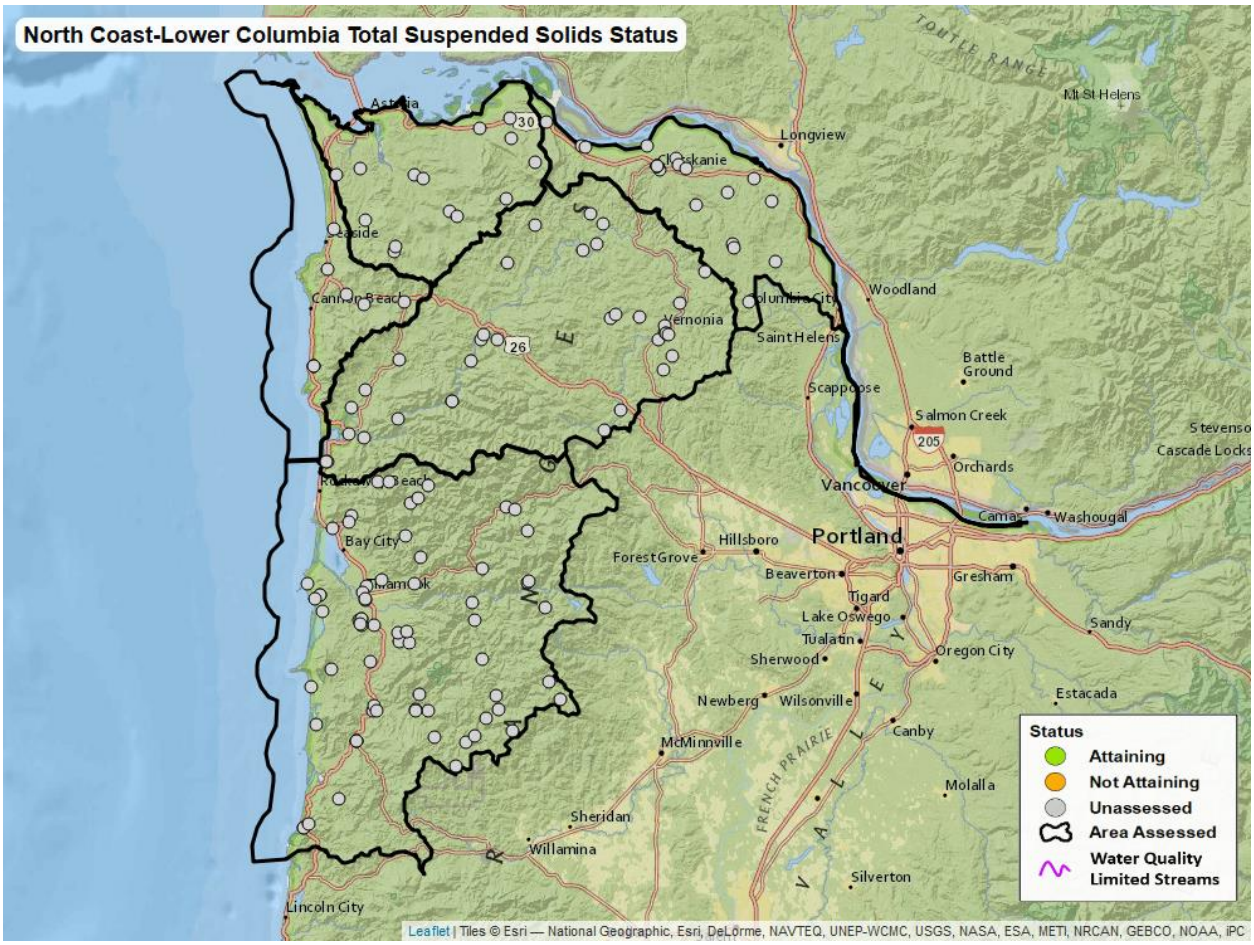

Figure 165: Summary map of the status of total suspended solids across the North Coast-Lower Columbia.

4.12.3 Status

There are 155 assessment units within the North Coast-Lower Columbia containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 233 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 233: Summary of the 2016–2019 assessment unit status within the North Coast-Lower Columbia.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	0	90
Escherichia coli	7	2	48
PH	6	0	88
Temperature	13	26	74
Total Phosphorus	0	0	79
Total Suspended Solids	0	0	85

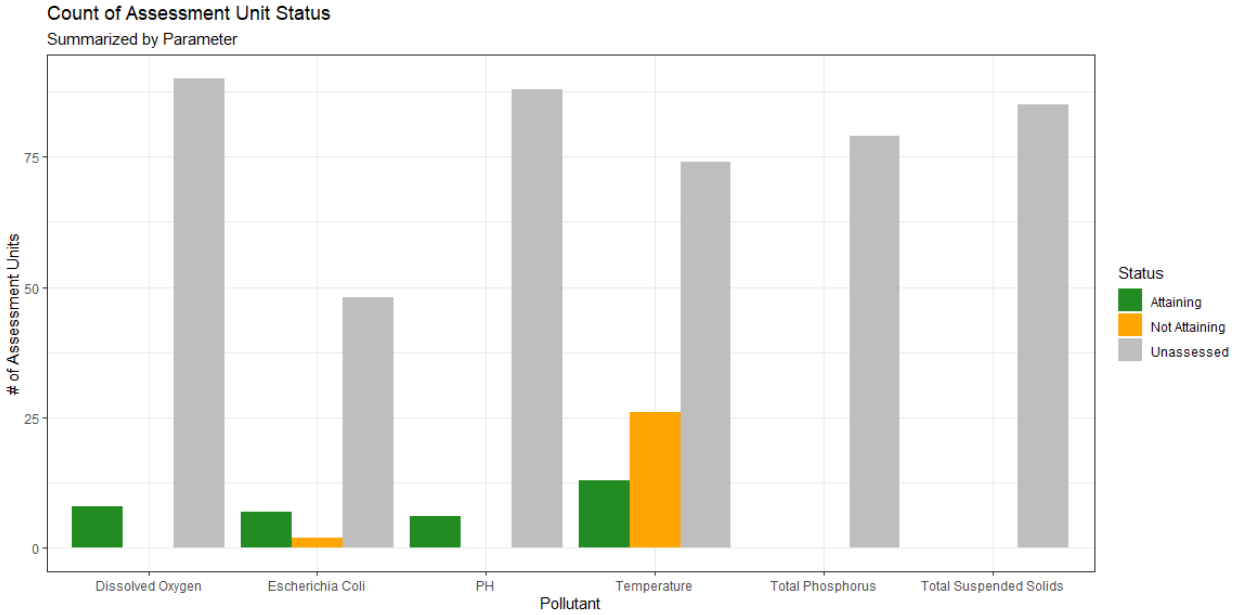

Figure 166: The number of assessment units in each status category by parameter for the 2016–2019 status period within the North Coast-Lower Columbia.

Table 234 and Figure 166 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the North Coast-Lower Columbia for the 2016–2019 status period.

Table 234: The number of assessment units in each status category by parameter for the 2016–2019 status period within the North Coast-Lower Columbia.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Coastline	Dissolved Oxygen	0	0	1
Coastline	PH	0	0	1
Coastline	Total Phosphorus	0	0	1
Estuary or Bay	Dissolved Oxygen	0	0	5
Estuary or Bay	*Escherichia coli*	0	0	4
Estuary or Bay	PH	0	0	3
Estuary or Bay	Temperature	0	0	3
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	4
Lake	Dissolved Oxygen	0	0	3
Lake	PH	0	0	3
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	3
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	7	0	39
Stream	*Escherichia coli*	5	2	29

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	PH	6	0	39
Stream	Temperature	7	17	32
Stream	Total Phosphorus	0	0	37
Stream	Total Suspended Solids	0	0	41
Watershed Unit	Dissolved Oxygen	1	0	42
Watershed Unit	*Escherichia coli*	2	0	15
Watershed Unit	PH	0	0	42
Watershed Unit	Temperature	6	9	38
Watershed Unit	Total Phosphorus	0	0	36
Watershed Unit	Total Suspended Solids	0	0	39

Table 235 and Figure 167 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix K.

Table 235: Summary of the 2016–2019 status at monitoring stations within the North Coast-Lower Columbia.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	0	184
Escherichia coli	8	2	121
PH	6	0	175
Temperature	18	33	161
Total Phosphorus	0	0	134
Total Suspended Solids	0	0	147

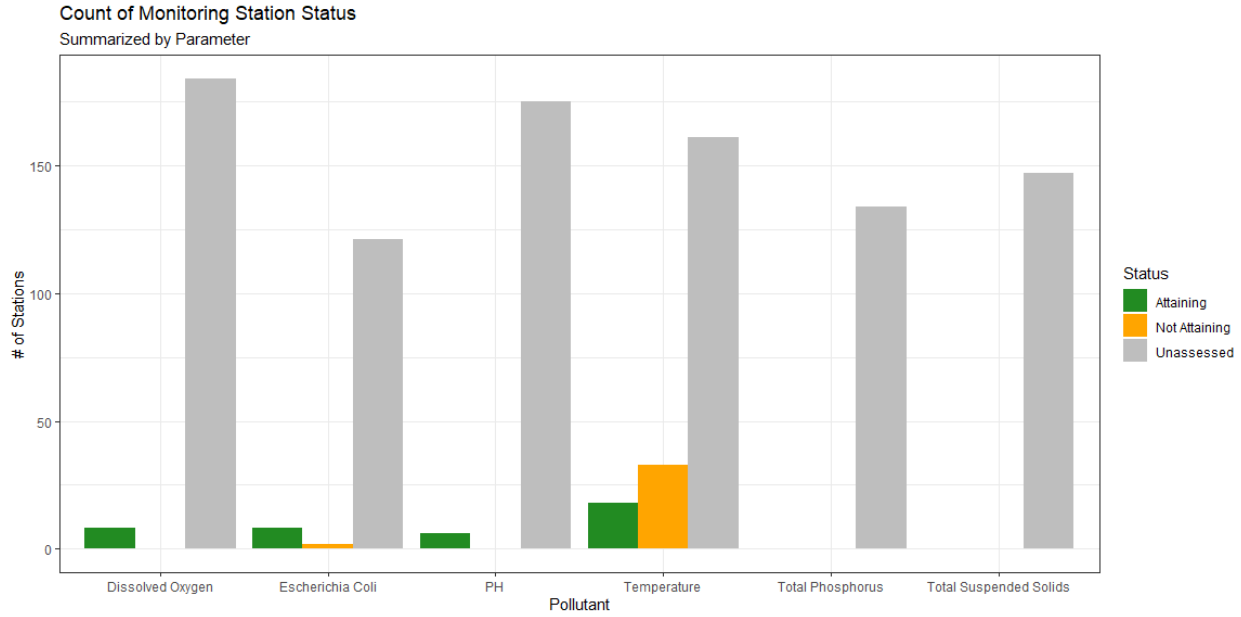

Figure 167: Summary plot of the 2016–2019 station status within the North Coast-Lower Columbia by parameter.

4.12.4 Trend

A summary of the trends across parameters is shown in Table 236. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 236: North Coast-Lower Columbia summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	4	0	0	2	186
Escherichia coli	2	1	0	5	123
PH	0	2	3	1	175
Temperature	0	4	0	0	208
Total Phosphorus	0	0	6	0	128
Total Suspended Solids	0	0	0	6	141

4.12.5 Subbasin Summary

4.12.5.1 Necanicum Subbasin

4.12.5.1.1 Water Quality Limited Assessment Units

Table 237: Number of water quality limited assessment units in the Necanicum Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Enterococcus	4
Fecal Coliform	5

4.12.5.1.2 Status

There are 14 assessment units within the Necanicum Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 238 and Figure 168 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 238: Summary of the 2016–2019 assessment unit status within the Necanicum Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	8
Escherichia coli	0	1	6
PH	1	0	6
Temperature	0	2	2
Total Phosphorus	0	0	7

Pollutant	Attaining	Not Attaining	Unassessed
Total Suspended Solids	0	0	5

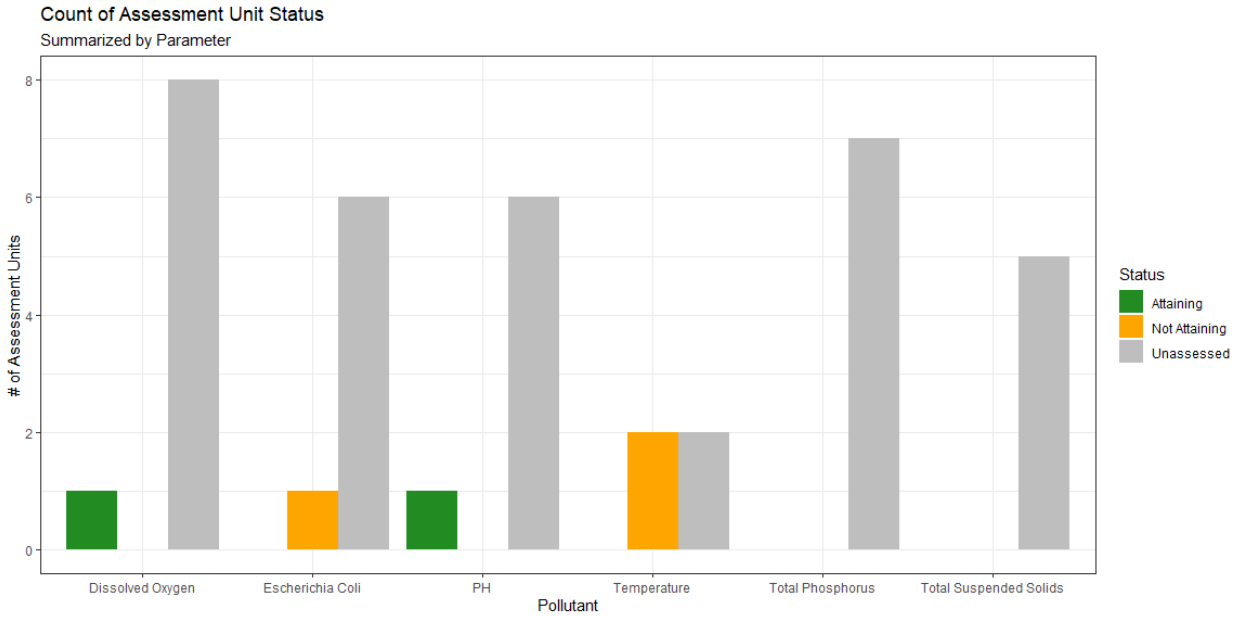

Figure 168: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Necanicum Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 239 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Necanicum Subbasin for the 2016 – 2019 status period.

Table 239: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Necanicum Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Coastline	Dissolved Oxygen	0	0	1
Coastline	PH	0	0	1
Coastline	Total Phosphorus	0	0	1
Estuary or Bay	Dissolved Oxygen	0	0	2
Estuary or Bay	*Escherichia coli*	0	0	1
Estuary or Bay	PH	0	0	1
Estuary or Bay	Total Phosphorus	0	0	1
Estuary or Bay	Total Suspended Solids	0	0	1
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Stream	Dissolved Oxygen	1	0	0
Stream	*Escherichia coli*	0	1	2
Stream	PH	1	0	0

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Temperature	0	1	0
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Dissolved Oxygen	0	0	4
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	0	1	2
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	3

There are 35 stations within the Necanicum Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix K**. Table 240 and Figure 169 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 240: Summary of the 2016–2019 status at monitoring stations within the Necanicum Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	18
Escherichia coli	0	1	16
PH	1	0	16
Temperature	0	2	3
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	8

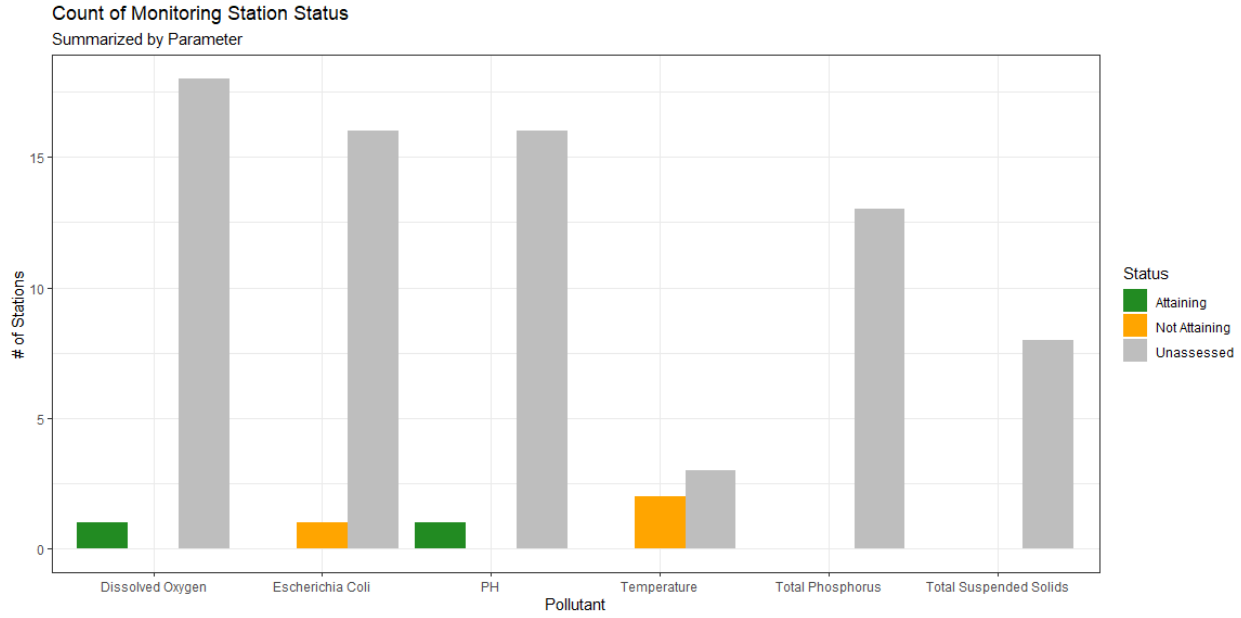

Figure 169: The number of stations in each status category by parameter for the 2016–2019 status period within the Necanicum Subbasin.

4.12.5.1.3 Trend

A summary of the trends within parameters is shown in Table 241. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 241: Subbasin Summary of trend results at stations across the Necanicum.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	18
Escherichia coli	0	0	0	1	16
PH	0	0	1	0	16
Temperature	0	0	0	0	5
Total Phosphorus	0	0	1	0	12
Total Suspended Solids	0	0	0	1	7

4.12.5.2 Lower Columbia Subbasin

4.12.5.2.1 Water Quality Limited Assessment Units

Table 242: Number of water quality limited assessment units in the Lower Columbia Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	2
Fecal Coliform	9

4.12.5.2.2 Status

There are 17 assessment units within the Lower Columbia Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 243 and Figure 170 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 243: Summary of the 2016–2019 assessment unit status within the Lower Columbia Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	12
Escherichia coli	0	0	1
PH	0	0	12
Temperature	8	3	3
Total Phosphorus	0	0	12
Total Suspended Solids	0	0	10

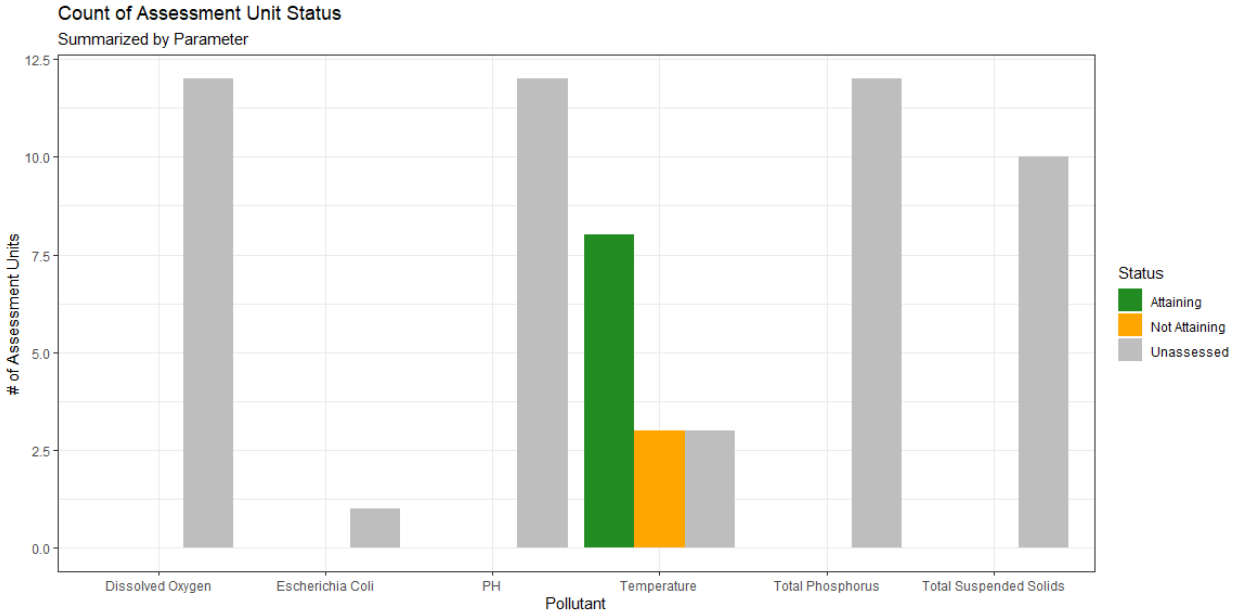

Figure 170: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 244 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Columbia Subbasin for the 2016 – 2019 status period.

Table 244: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	0	0	4
Stream	*Escherichia coli*	0	0	1
Stream	PH	0	0	4
Stream	Temperature	4	1	1
Stream	Total Phosphorus	0	0	4
Stream	Total Suspended Solids	0	0	4
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	PH	0	0	6
Watershed Unit	Temperature	4	2	2
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	5

There are 40 stations within the Lower Columbia Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix K**. Table 245 and Figure 171 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 245: Summary of the 2016–2019 status at monitoring stations within the Lower Columbia Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	26
Escherichia coli	0	0	2
PH	0	0	26
Temperature	10	5	6
Total Phosphorus	0	0	24
Total Suspended Solids	0	0	14

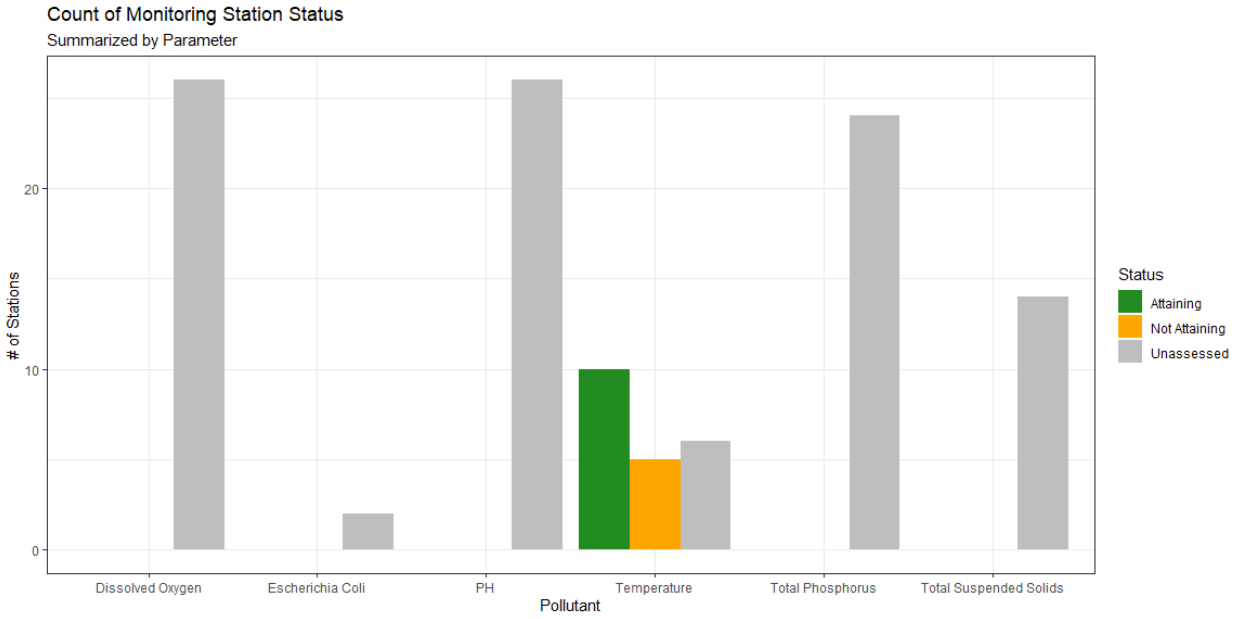

Figure 171: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Columbia Subbasin.

4.12.5.2.3 Trend

A summary of the trends within parameters is shown in Table 246. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 246: Subbasin Summary of trend results at stations across the Lower Columbia.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	26
Escherichia coli	0	0	0	0	2
PH	0	0	0	0	26

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	0	0	0	0	21
Total Phosphorus	0	0	0	0	24
Total Suspended Solids	0	0	0	0	14

4.12.5.3 Wilson-Trusk-Nestuccu Subbasin

4.12.5.3.1 Water Quality Limited Assessment Units

Table 247: Number of water quality limited assessment units in the Wilson-Trusk-Nestuccu Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	1
Enterococcus	1
Fecal Coliform	23

4.12.5.3.2 Status

There are 64 assessment units within the Wilson-Trusk-Nestuccu Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 248 and Figure 172 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 248: Summary of the 2016–2019 assessment unit status within the Wilson-Trusk-Nestuccu Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	0	40
Escherichia coli	3	1	24
PH	3	0	38
Temperature	4	16	26
Total Phosphorus	0	0	38
Total Suspended Solids	0	0	43

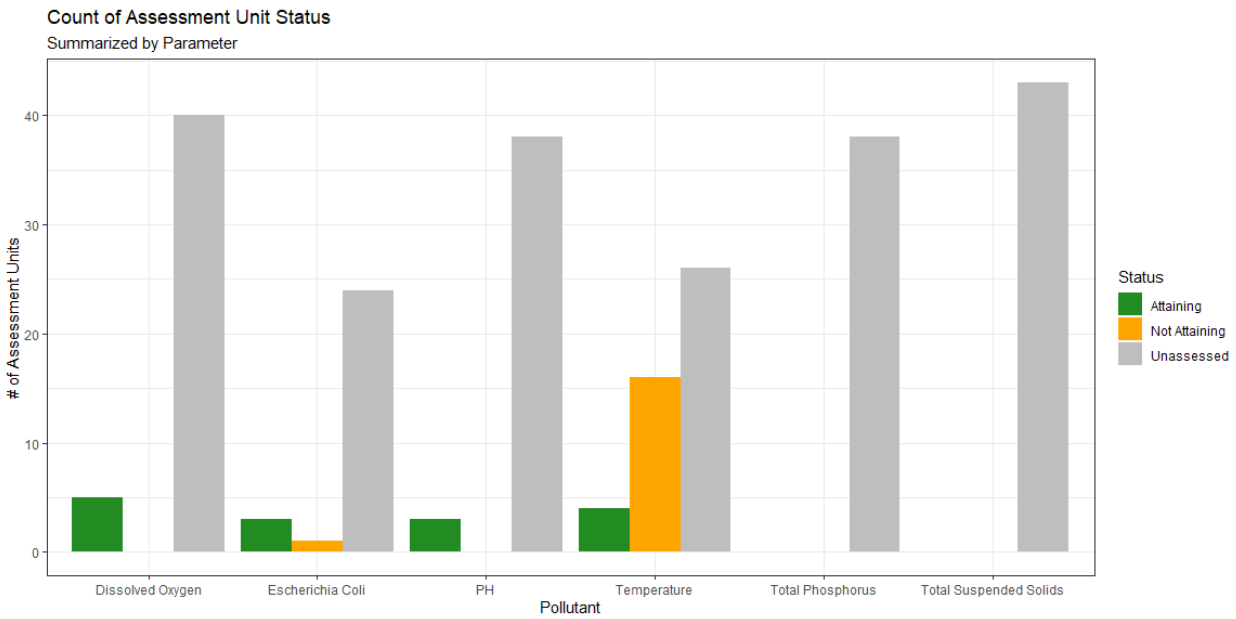

Figure 172: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Wilson-Trusk-Nestuccu Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 249 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Wilson-Trusk-Nestuccu Subbasin for the 2016 – 2019 status period.

Table 249: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Wilson-Trusk-Nestuccu Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	3
Estuary or Bay	*Escherichia coli*	0	0	2
Estuary or Bay	PH	0	0	2
Estuary or Bay	Temperature	0	0	3
Estuary or Bay	Total Phosphorus	0	0	1
Estuary or Bay	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	4	0	21
Stream	*Escherichia coli*	2	1	14
Stream	PH	3	0	20
Stream	Temperature	3	14	15
Stream	Total Phosphorus	0	0	23
Stream	Total Suspended Solids	0	0	24
Watershed Unit	Dissolved Oxygen	1	0	16
Watershed Unit	*Escherichia coli*	1	0	8
Watershed Unit	PH	0	0	16
Watershed Unit	Temperature	1	2	8

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	14
Watershed Unit	Total Suspended Solids	0	0	17

There are 174 stations within the Wilson-Trusk-Nestuccu Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix K**. Table 250 and Figure 173 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 250: Summary of the 2016–2019 status at monitoring stations within the Wilson-Trusk-Nestuccu Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	0	73
Escherichia coli	3	1	61
PH	3	0	63
Temperature	6	19	64
Total Phosphorus	0	0	53
Total Suspended Solids	0	0	69

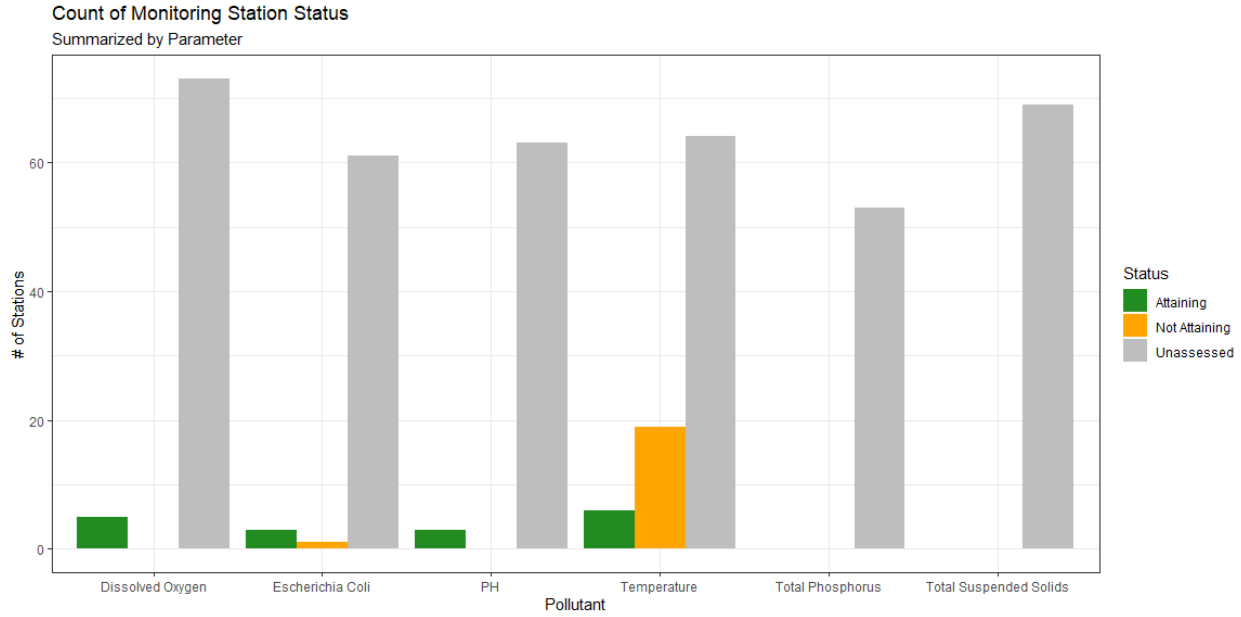

Figure 173: The number of stations in each status category by parameter for the 2016–2019 status period within the Wilson-Trusk-Nestuccu Subbasin.

4.12.5.3.3 Trend

A summary of the trends within parameters is shown in Table 251. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 251: Subbasin Summary of trend results at stations across the Wilson-Trusk-Nestuccu.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	0	75
Escherichia coli	2	0	0	3	60
PH	0	2	1	0	63
Temperature	0	2	0	0	87
Total Phosphorus	0	0	3	0	50
Total Suspended Solids	0	0	0	3	66

4.12.5.4 Nehalem Subbasin

4.12.5.4.1 Water Quality Limited Assessment Units

Table 252: Number of water quality limited assessment units in the Nehalem Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	7

4.12.5.4.2 Status

There are 45 assessment units within the Nehalem Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 253 and Figure 174 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 253: Summary of the 2016–2019 assessment unit status within the Nehalem Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	21
Escherichia coli	1	0	13
PH	1	0	21
Temperature	0	1	40
Total Phosphorus	0	0	14
Total Suspended Solids	0	0	19

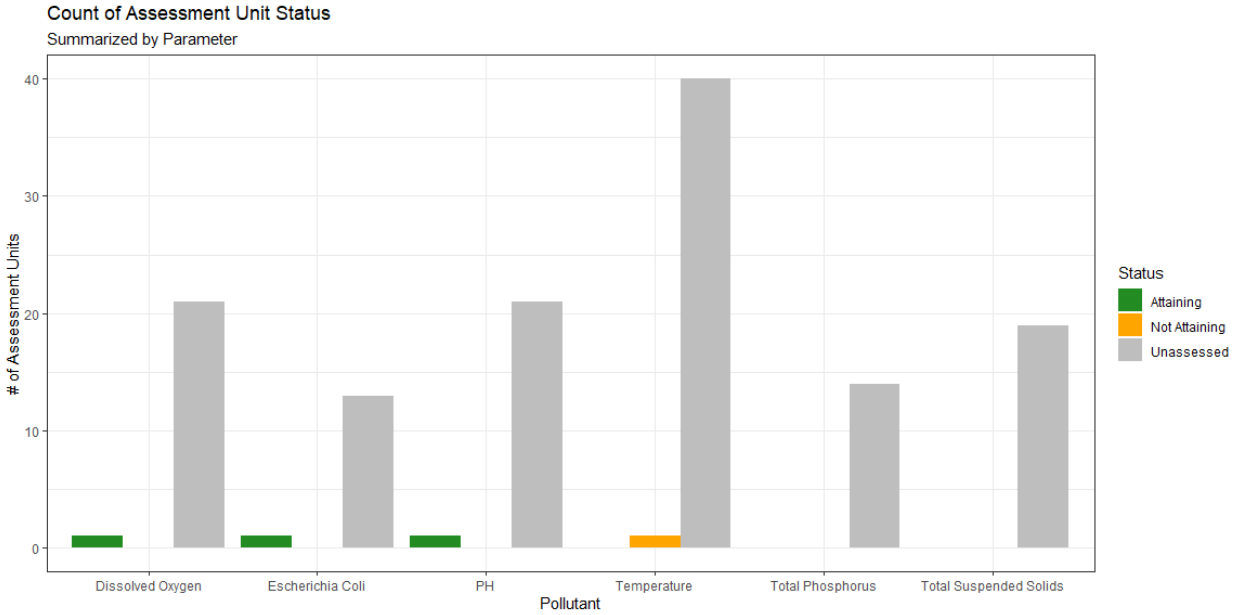

Figure 174: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Nehalem Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 254 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Nehalem Subbasin for the 2016 – 2019 status period.

Table 254: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Nehalem Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	*Escherichia coli*	0	0	1
Estuary or Bay	Total Suspended Solids	0	0	1
Lake	Temperature	0	0	1
Stream	Dissolved Oxygen	1	0	10
Stream	*Escherichia coli*	1	0	9
Stream	PH	1	0	10
Stream	Temperature	0	0	16
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	9
Watershed Unit	Dissolved Oxygen	0	0	11
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	11
Watershed Unit	Temperature	0	1	23
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	9

There are 113 stations within the Nehalem Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix K**. Table 255 and Figure 175 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 255: Summary of the 2016–2019 status at monitoring stations within the Nehalem Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	36
Escherichia coli	1	0	24
PH	1	0	36
Temperature	0	2	81
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	35

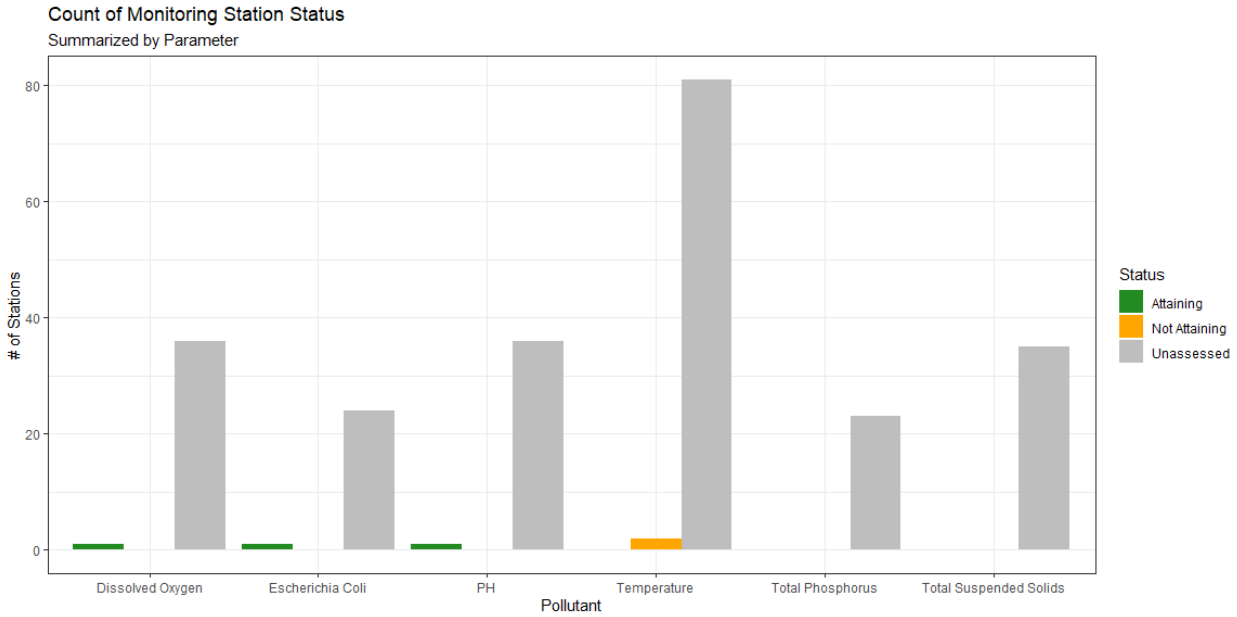

Figure 175: The number of stations in each status category by parameter for the 2016–2019 status period within the Nehalem Subbasin.

4.12.5.4.3 Trend

A summary of the trends within parameters is shown in Table 256. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 256: Subbasin Summary of trend results at stations across the Nehalem.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	36
Escherichia coli	0	1	0	0	24
PH	0	0	0	1	36
Temperature	0	2	0	0	81

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	0	22
Total Suspended Solids	0	0	0	1	34

4.12.5.5 Lower Columbia-Clatskanie Subbasin

4.12.5.5.1 Water Quality Limited Assessment Units

Table 49: Number of water quality limited assessment units in the Lower Columbia-Clatskanie Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2

4.12.5.5.2 Status

There are 15 assessment units within the Lower Columbia-Clatskanie Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 50 and Figure 33 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 50: Summary of the 2016–2019 assessment unit status within the Lower Columbia-Clatskanie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	9
Escherichia coli	3	0	4
PH	1	0	11
Temperature	1	4	3
Total Phosphorus	0	0	8
Total Suspended Solids	0	0	8

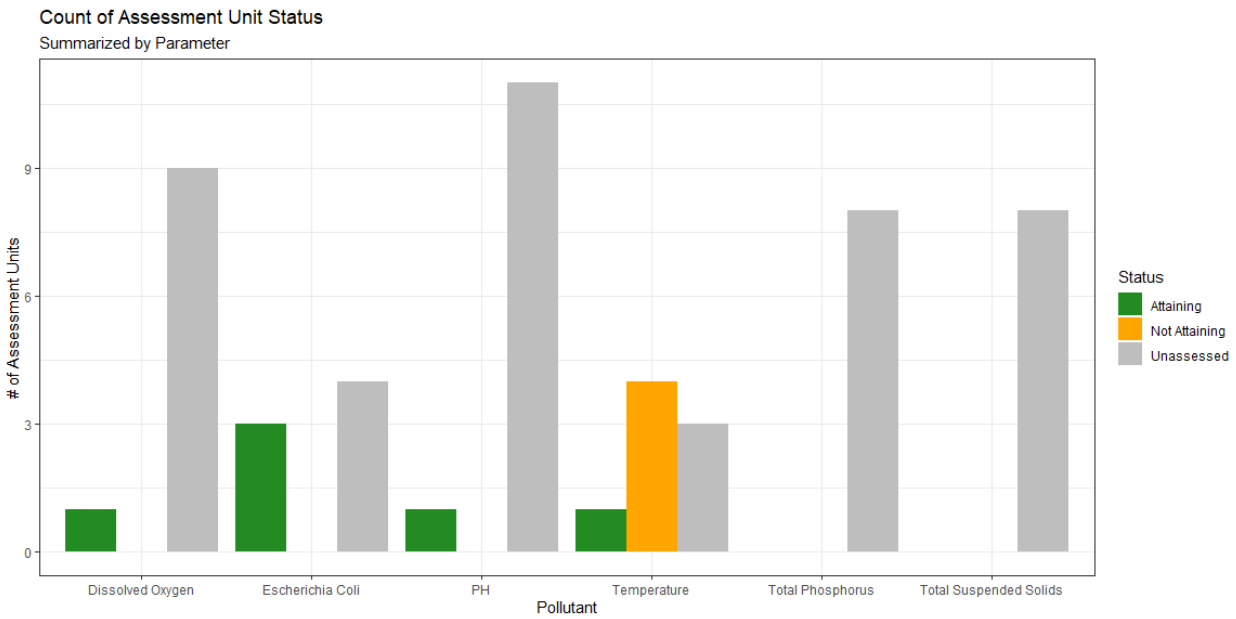

Figure 33: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 51 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Columbia-Clatskanie Subbasin for the 2016 – 2019 status period.

Table 51: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	4
Stream	*Escherichia coli*	2	0	3
Stream	PH	1	0	5
Stream	Temperature	0	1	0
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	3
Watershed Unit	Dissolved Oxygen	0	0	5
Watershed Unit	*Escherichia coli*	1	0	1
Watershed Unit	PH	0	0	6
Watershed Unit	Temperature	1	3	3
Watershed Unit	Total Phosphorus	0	0	5
Watershed Unit	Total Suspended Solids	0	0	5

There are 47 stations within the Lower Columbia-Clatskanie Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix K**. Table 52 and Figure 34

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 52: Summary of the 2016–2019 status at monitoring stations within the Lower Columbia-Clatskanie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	31
Escherichia coli	4	0	18
PH	1	0	34
Temperature	2	5	7
Total Phosphorus	0	0	21
Total Suspended Solids	0	0	21

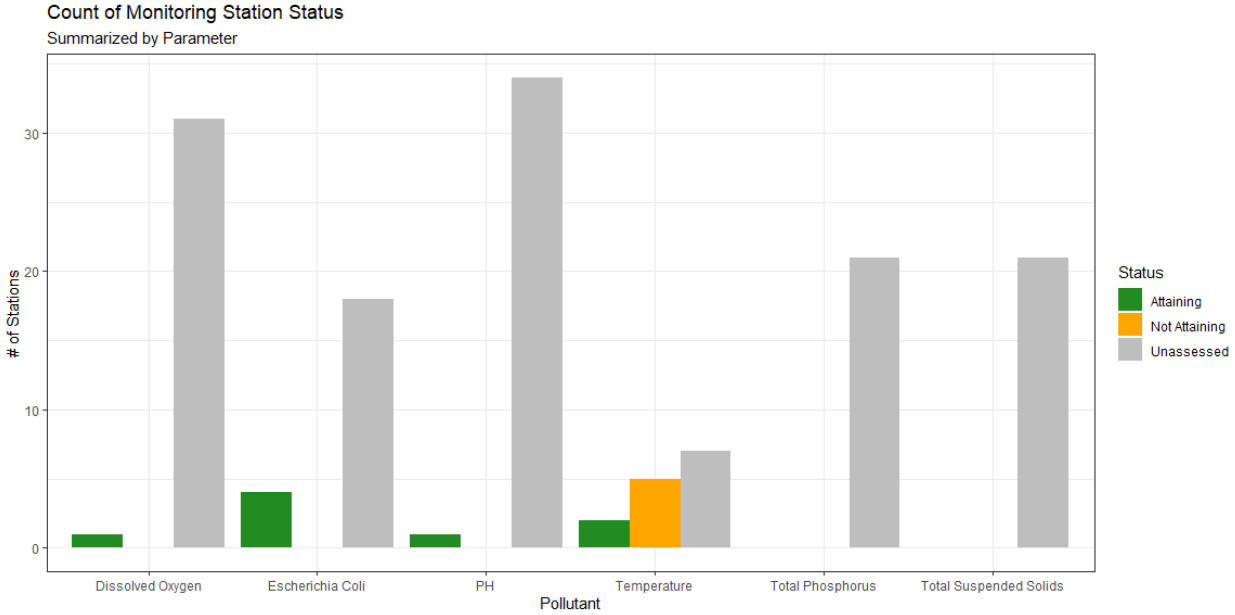

Figure 34: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Clatskanie Subbasin.

4.12.5.5.3 Trend

A summary of the trends within parameters is shown in Table 53. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 53: Subbasin Summary of trend results at stations across the Lower Columbia-Clatskanie.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	31
Escherichia coli	0	0	0	1	21
PH	0	0	1	0	34
Temperature	0	0	0	0	14
Total Phosphorus	0	0	1	0	20

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	0	1	20

4.13 Oregon Closed Basins

A summary of status and trend results for the Oregon Closed Basins and all subbasins within the Oregon Closed Basins are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix L**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Oregon Closed Basins are water quality limited for 2 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 163 stations within the Oregon Closed Basins. These stations were located across 77 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.13.1 Land Use

Table 257: Land use within the Oregon Closed Basins Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Harney-Malheur Lakes	3762	1.5	7.6	13.4	70.8	6.8
Silvies	3414	1.4	38.5	9.0	47.7	3.3
Donner und Blitzen	2045	0.4	8.4	2.2	82.0	7.1
Silver	4361	0.3	9.3	2.0	86.7	1.6
Summer Lake	10708	1.1	14.0	2.6	77.5	4.8
Lake Abert	2671	0.8	28.8	0.5	60.1	9.8
Warner Lakes	4444	0.5	11.6	0.2	81.5	6.2
Guano	6627	0.3	1.6	0.1	96.7	1.3
Alvord Lake	5165	0.4	1.4	0.6	93.3	4.3

4.13.2 Parameter Maps

The maps in Figure 176 through Figure 181 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

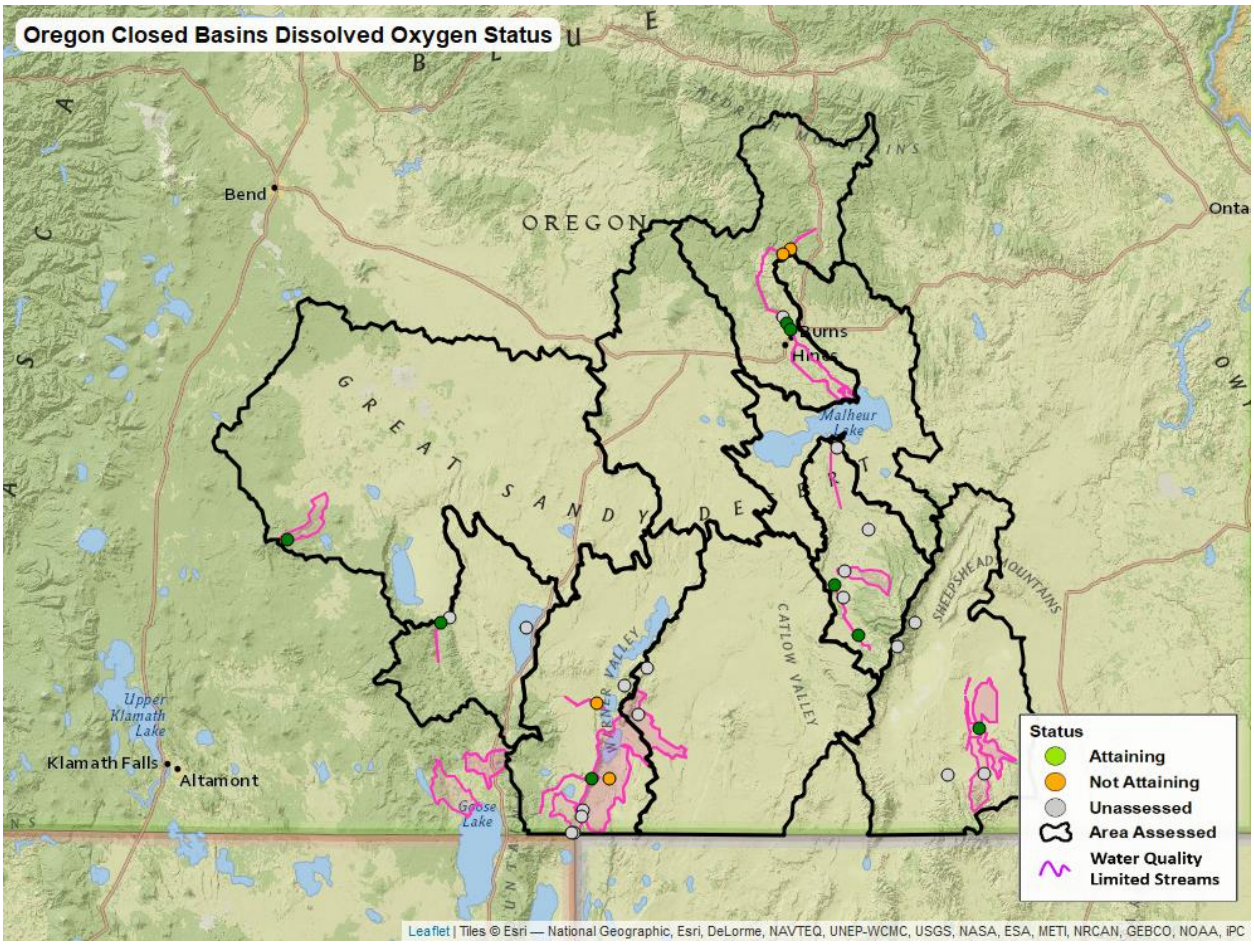

Figure 176: Summary map of the status of dissolved oxygen across the Oregon Closed Basins.

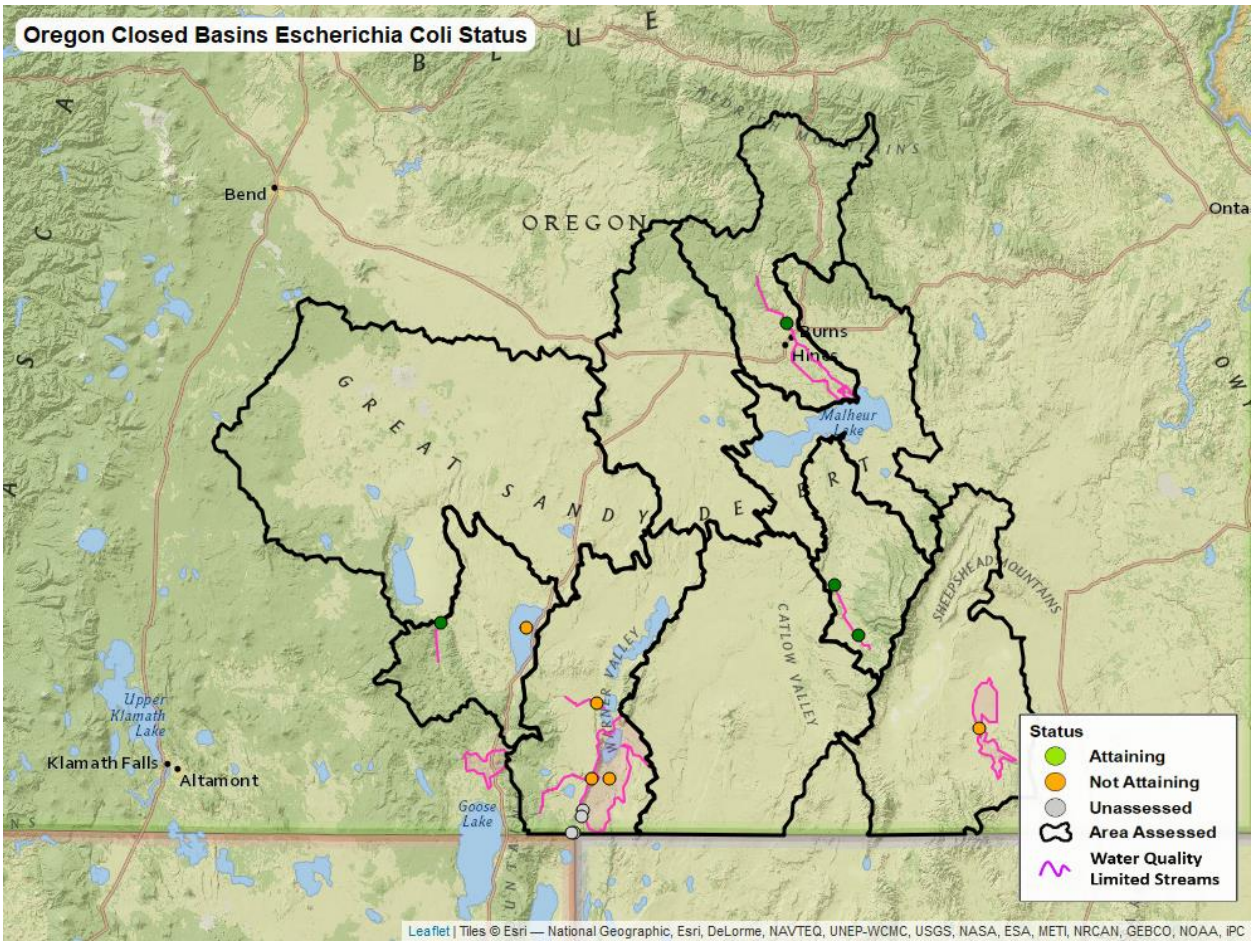

Figure 177: Summary map of the status of *Escherichia coli* across the Oregon Closed Basins.

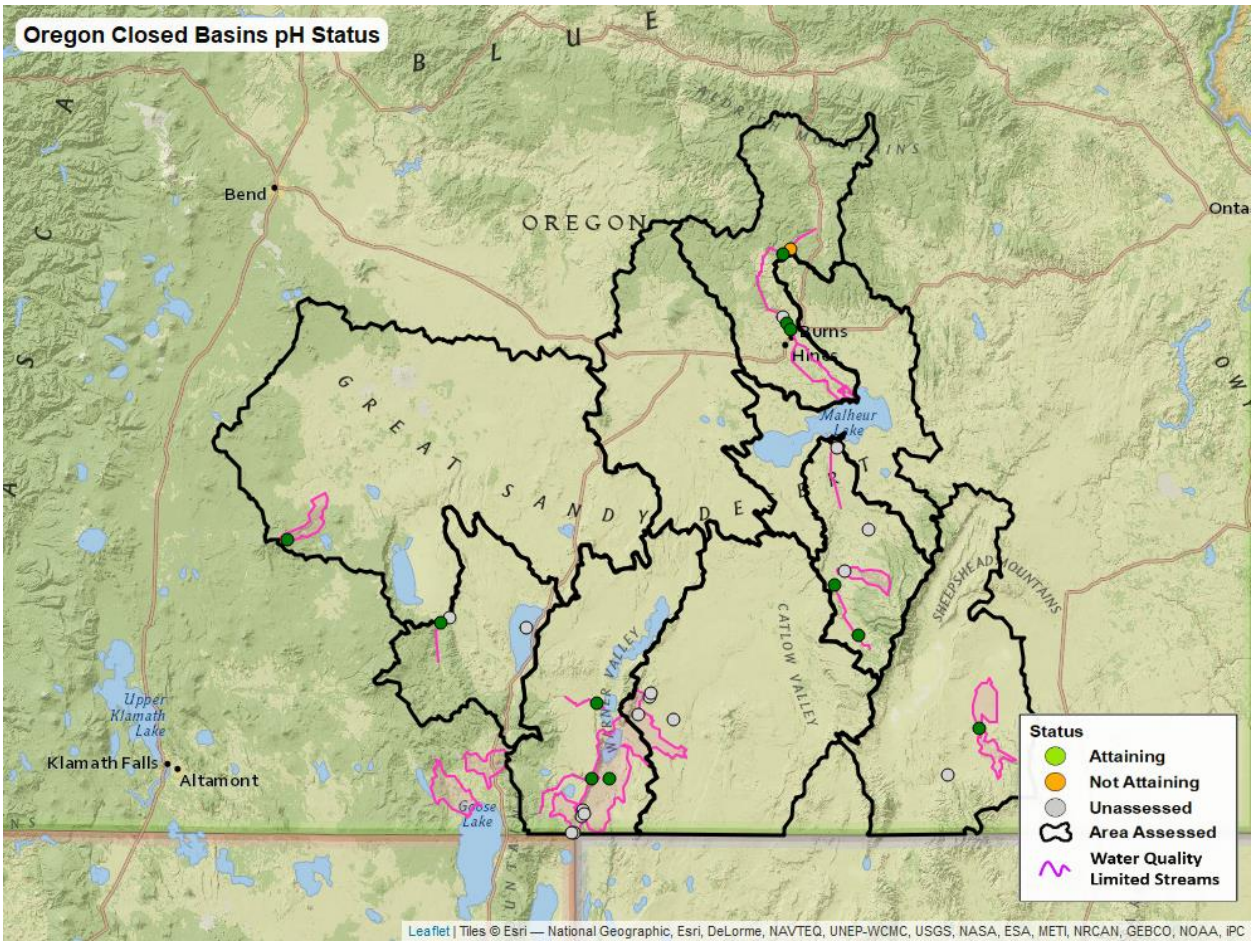

Figure 178: Summary map of the status of pH across the Oregon Closed Basins.

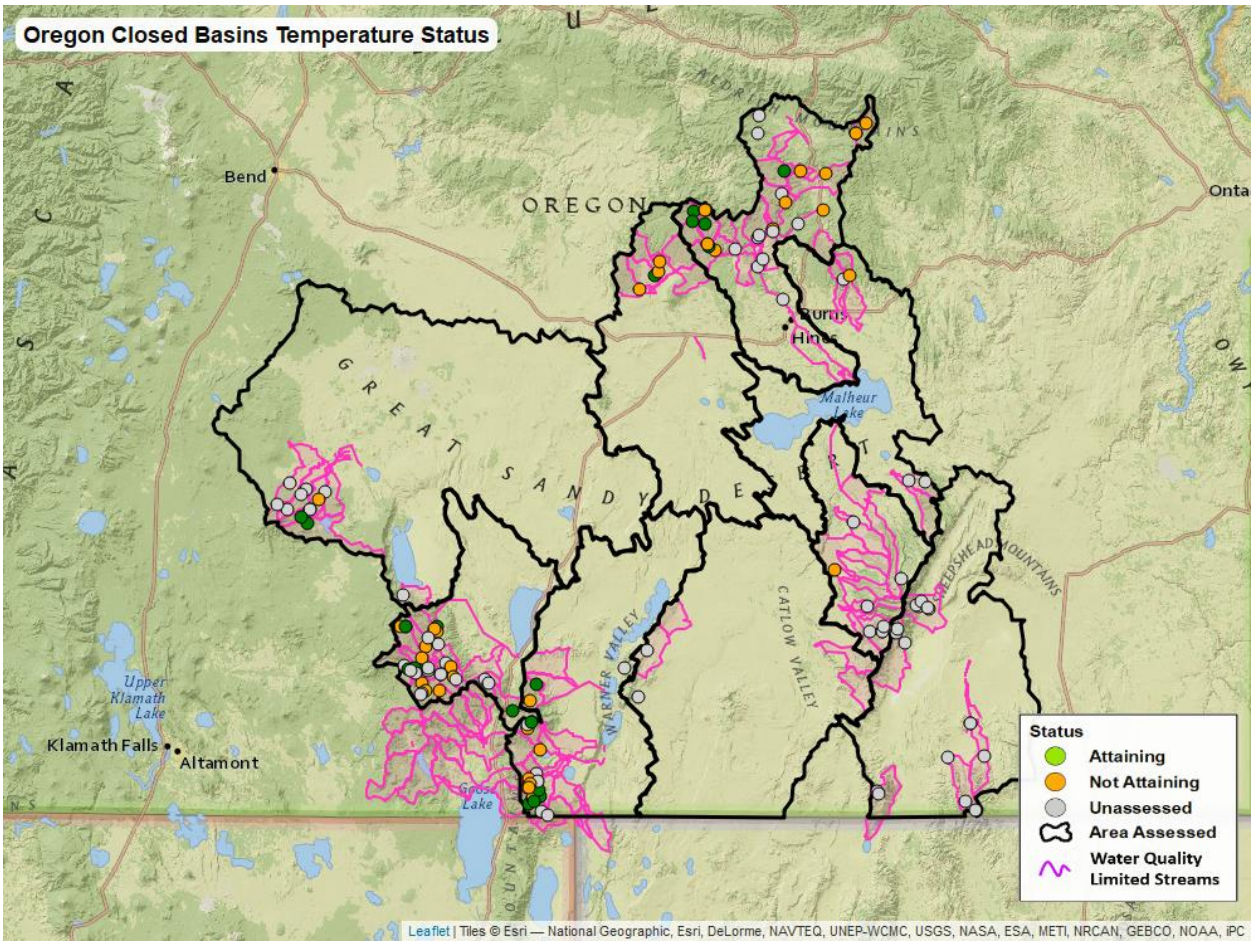

Figure 179: Summary map of the status of temperature across the Oregon Closed Basins.

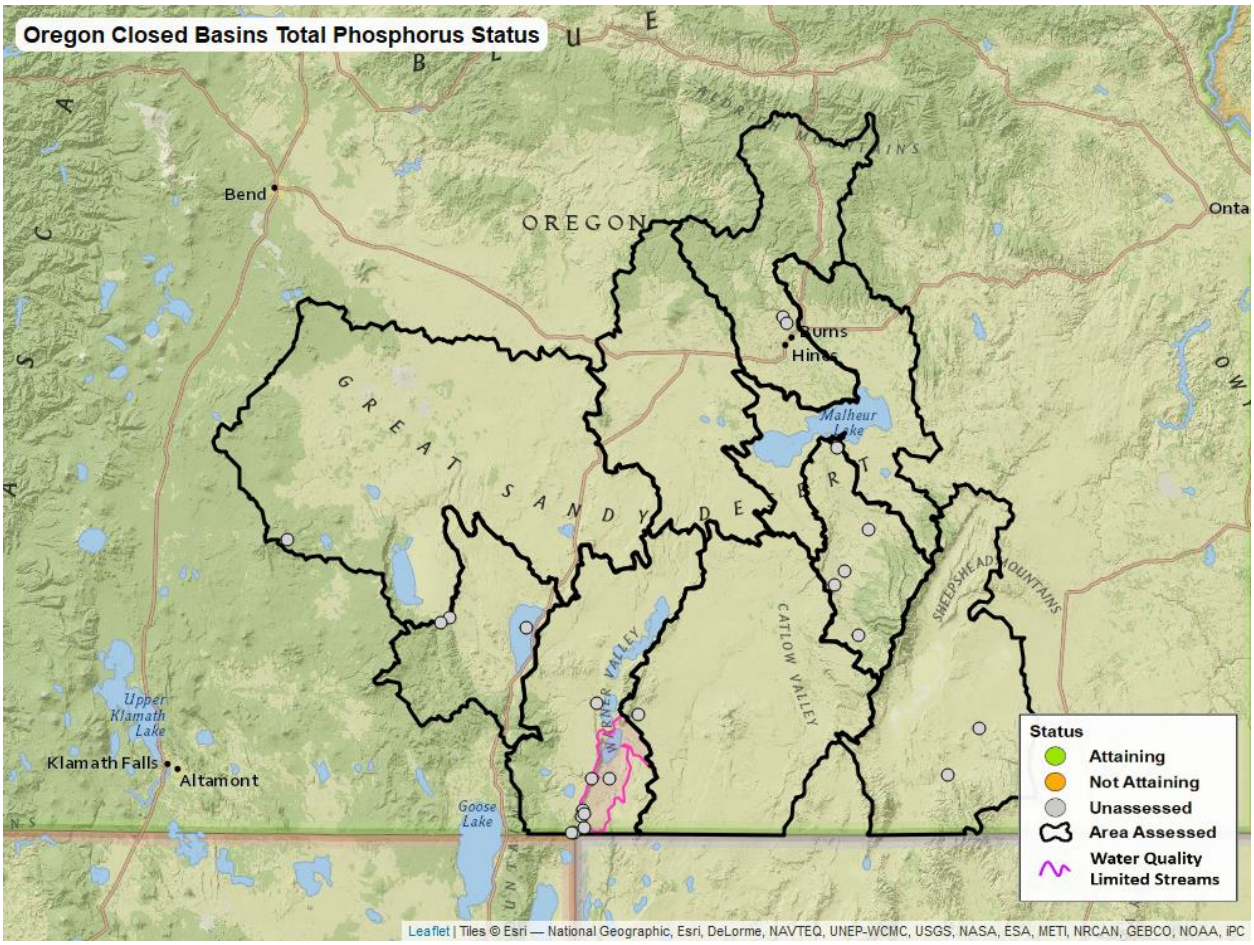

Figure 180: Summary map of the status of total phosphorus across the Oregon Closed Basins.

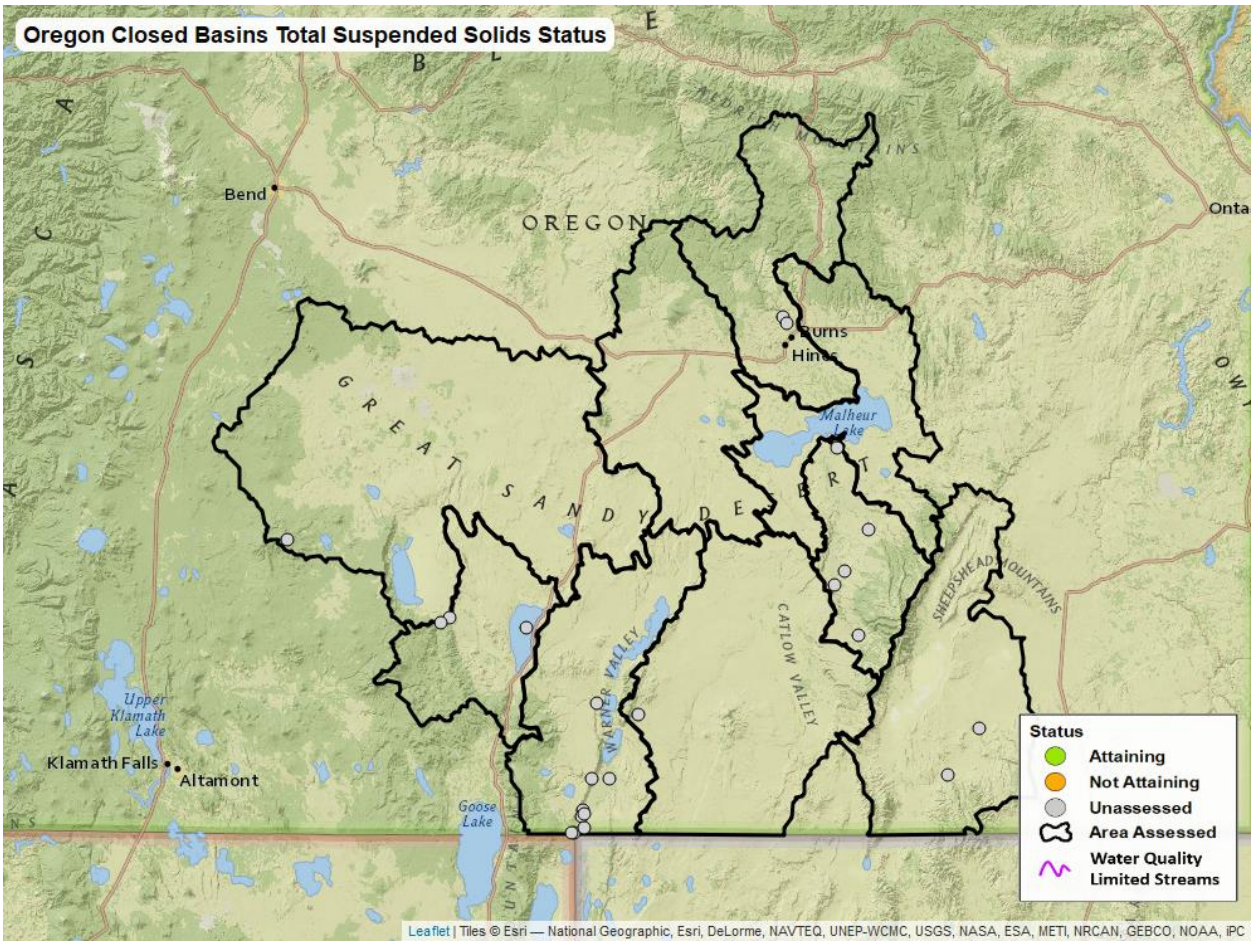

Figure 181: Summary map of the status of total suspended solids across the Oregon Closed Basins.

4.13.3 Status

There are 77 assessment units within the Oregon Closed Basins containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 258 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 258: Summary of the 2016–2019 assessment unit status within the Oregon Closed Basins.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	3	16
Escherichia coli	3	5	3
PH	8	1	12
Temperature	7	27	29
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	18

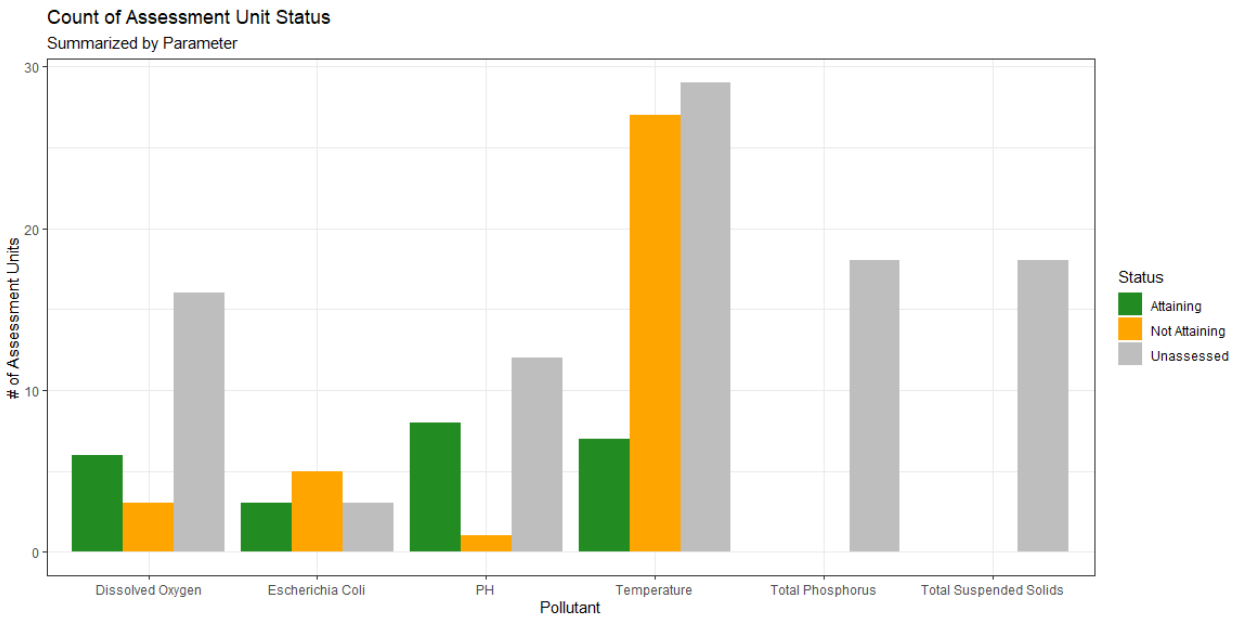

Figure 182: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Oregon Closed Basins.

Table 259 and Figure 182 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Oregon Closed Basins for the 2016–2019 status period.

Table 259: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Oregon Closed Basins.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	1	0
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	4	2	2
Stream	*Escherichia coli*	3	2	0
Stream	PH	5	1	2
Stream	Temperature	0	5	3
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	2	1	13
Watershed Unit	*Escherichia coli*	0	2	3
Watershed Unit	PH	3	0	9
Watershed Unit	Temperature	7	22	26
Watershed Unit	Total Phosphorus	0	0	10

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	10

Table 260 and Figure 183 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix L.

Table 260: Summary of the 2016–2019 status at monitoring stations within the Oregon Closed Basins.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	4	18
Escherichia coli	4	5	4
PH	11	1	16
Temperature	23	37	74
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	23

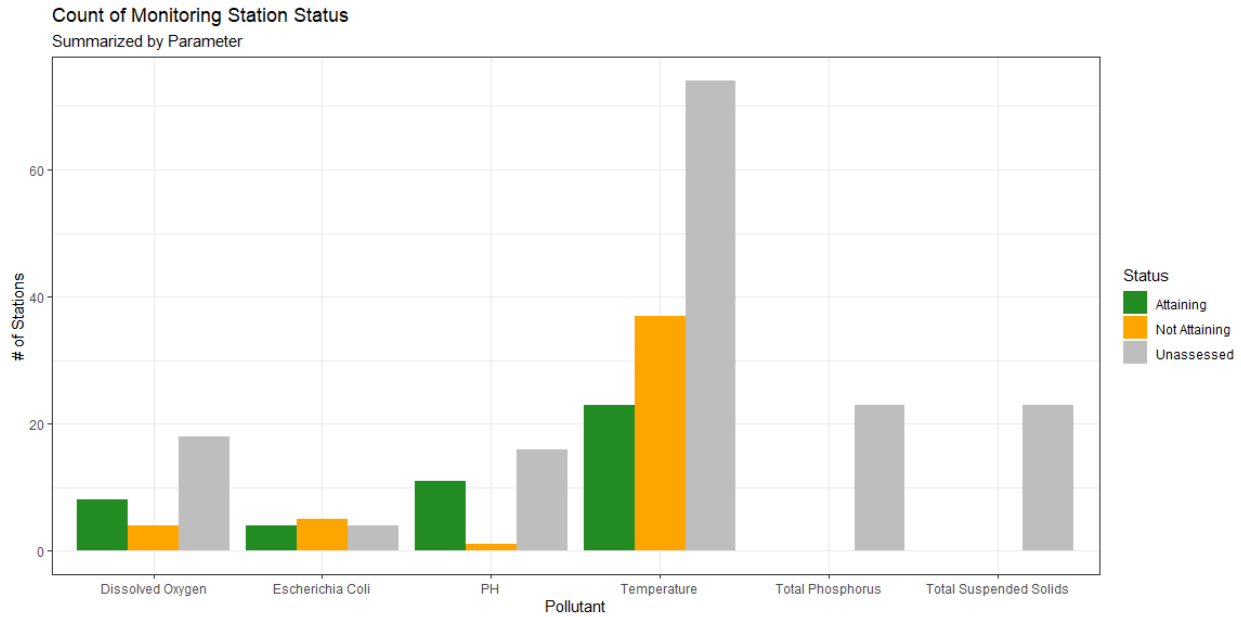

Figure 183: Summary plot of the 2016–2019 station status within the Oregon Closed Basins by parameter.

4.13.4 Trend

A summary of the trends across parameters is shown in Table 261. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 261: Oregon Closed Basins summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	5	0	0	6	19

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	0	0	0	13
PH	0	7	1	3	17
Temperature	6	2	0	1	125
Total Phosphorus	1	1	1	5	15
Total Suspended Solids	3	1	0	4	15

4.13.5 Subbasin Summary

4.13.5.1 Warner Lakes Subbasin

4.13.5.1.1 Water Quality Limited Assessment Units

Table 262: Number of water quality limited assessment units in the Warner Lakes Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	1

4.13.5.1.2 Status

There are 12 assessment units within the Warner Lakes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 263 and Figure 184 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 263: Summary of the 2016–2019 assessment unit status within the Warner Lakes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	2	4
Escherichia coli	0	3	3
PH	3	0	3
Temperature	0	5	2
Total Phosphorus	0	0	6
Total Suspended Solids	0	0	6

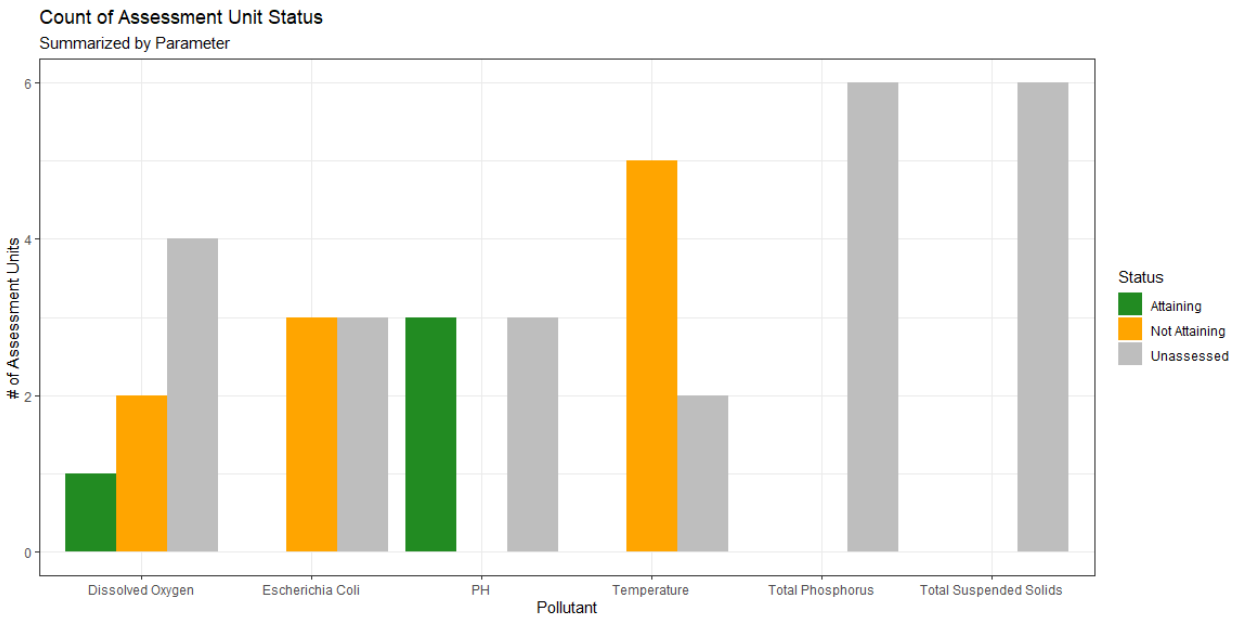

Figure 184: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Warner Lakes Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 264 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Warner Lakes Subbasin for the 2016 – 2019 status period.

Table 264: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Warner Lakes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	1	0
Stream	*Escherichia coli*	0	2	0
Stream	PH	2	0	0
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	1	4
Watershed Unit	*Escherichia coli*	0	1	3
Watershed Unit	PH	1	0	3
Watershed Unit	Temperature	0	5	2
Watershed Unit	Total Phosphorus	0	0	4
Watershed Unit	Total Suspended Solids	0	0	4

There are 34 stations within the Warner Lakes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 265 and Figure 185 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 265: Summary of the 2016–2019 status at monitoring stations within the Warner Lakes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	2	5
Escherichia coli	0	3	4
PH	3	0	5
Temperature	6	8	11
Total Phosphorus	0	0	9
Total Suspended Solids	0	0	9

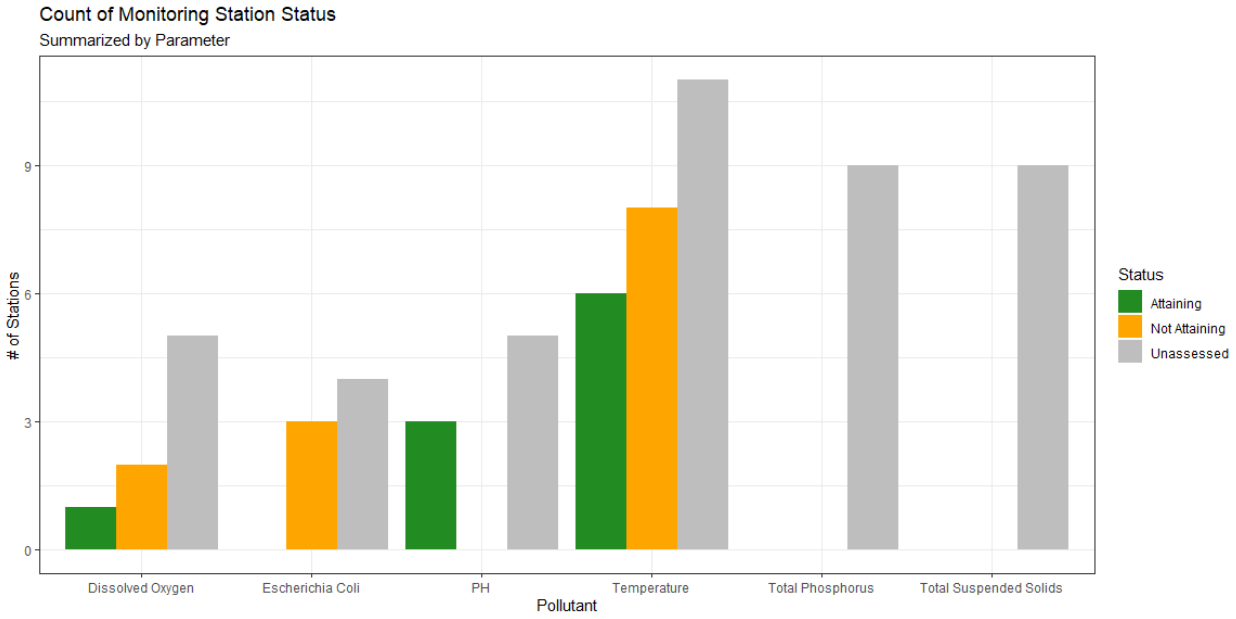

Figure 185: The number of stations in each status category by parameter for the 2016–2019 status period within the Warner Lakes Subbasin.

4.13.5.1.3 Trend

A summary of the trends within parameters is shown in Table 266. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 266: Subbasin Summary of trend results at stations across the Warner Lakes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	2	5
Escherichia coli	0	0	0	0	7
PH	0	2	1	0	5
Temperature	1	0	0	1	23
Total Phosphorus	0	0	0	3	6
Total Suspended Solids	1	0	0	2	6

4.13.5.2 Lake Abert Subbasin

4.13.5.2.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.2.2 Status

There are 15 assessment units within the Lake Abert Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 267 and Figure 186 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 267: Summary of the 2016–2019 assessment unit status within the Lake Abert Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	1	1	0
PH	1	0	2
Temperature	2	9	2
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

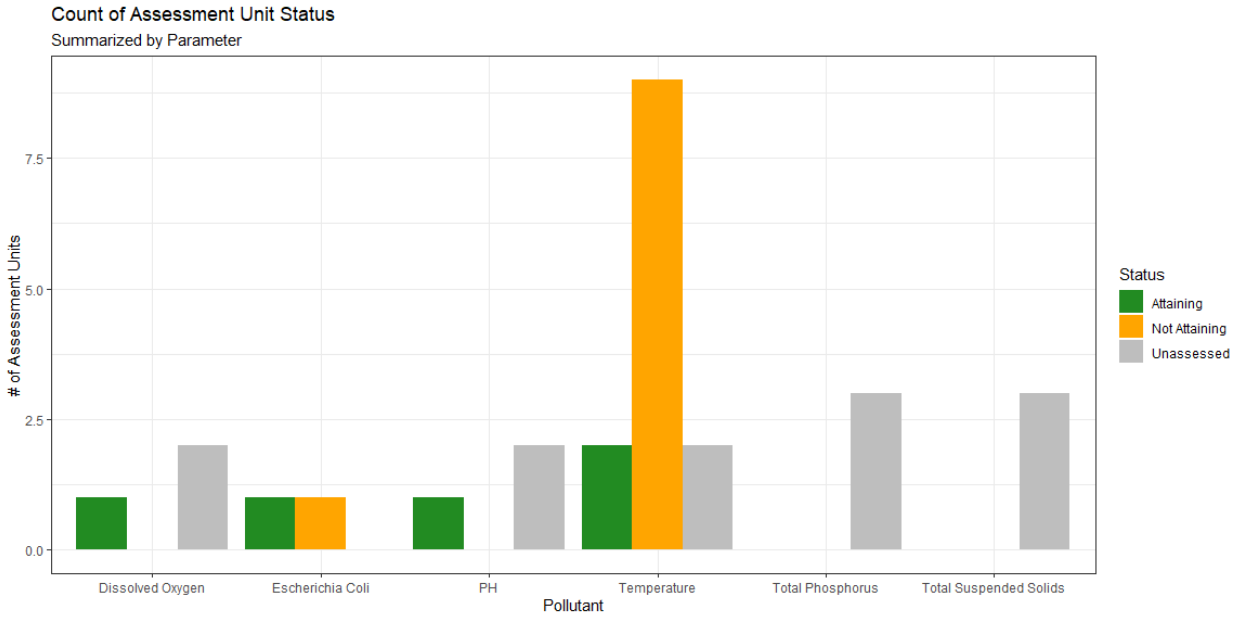

Figure 186: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lake Abert Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 268 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lake Abert Subbasin for the 2016 – 2019 status period.

Table 268: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lake Abert Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	1	0
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	1	0	0
Stream	PH	1	0	1
Stream	Temperature	0	2	1
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Temperature	2	7	1

There are 36 stations within the Lake Abert Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 269 and Figure 187 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 269: Summary of the 2016–2019 status at monitoring stations within the Lake Abert Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	1	1	0
PH	1	0	2
Temperature	6	13	14
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

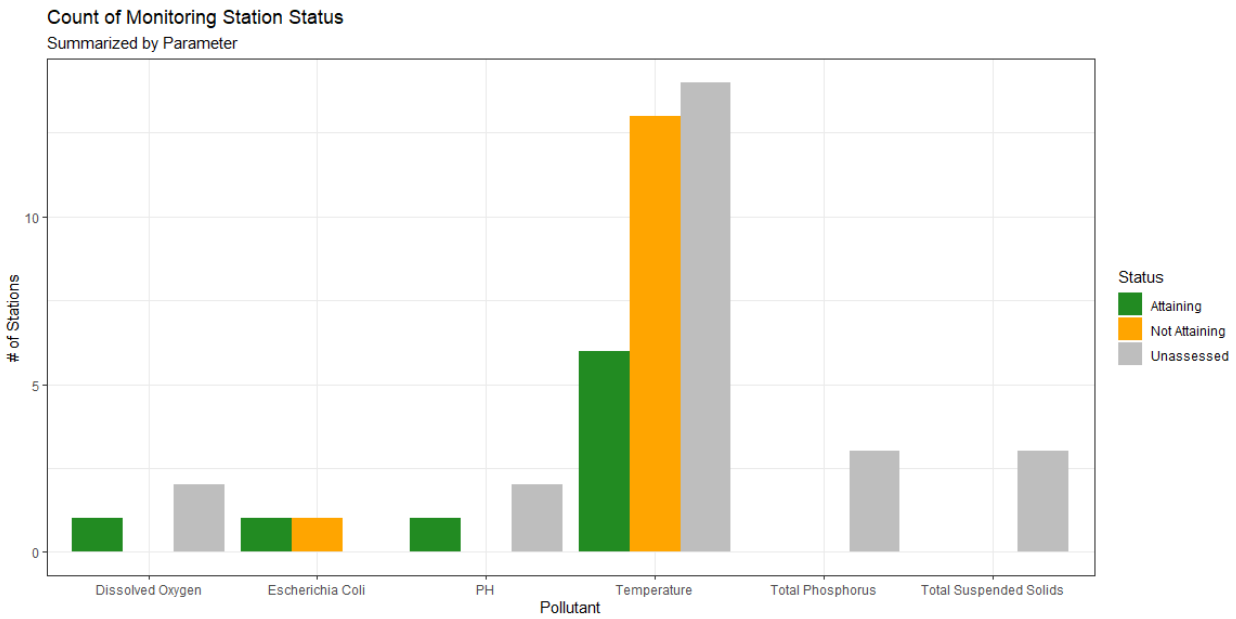

Figure 187: The number of stations in each status category by parameter for the 2016–2019 status period within the Lake Abert Subbasin.

4.13.5.2.3 Trend

A summary of the trends within parameters is shown in Table 270. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 270: Subbasin Summary of trend results at stations across the Lake Abert.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	2
Escherichia coli	0	0	0	0	2
PH	0	0	0	1	2
Temperature	3	1	0	0	29
Total Phosphorus	0	0	0	1	2
Total Suspended Solids	0	0	0	1	2

4.13.5.3 Silvies Subbasin

4.13.5.3.1 Water Quality Limited Assessment Units

Table 271: Number of water quality limited assessment units in the Silvies Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	2

4.13.5.3.2 Status

There are 16 assessment units within the Silvies Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 272 and Figure 188 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 272: Summary of the 2016–2019 assessment unit status within the Silvies Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	1	0
Escherichia coli	1	0	0
PH	1	1	0
Temperature	3	7	6
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

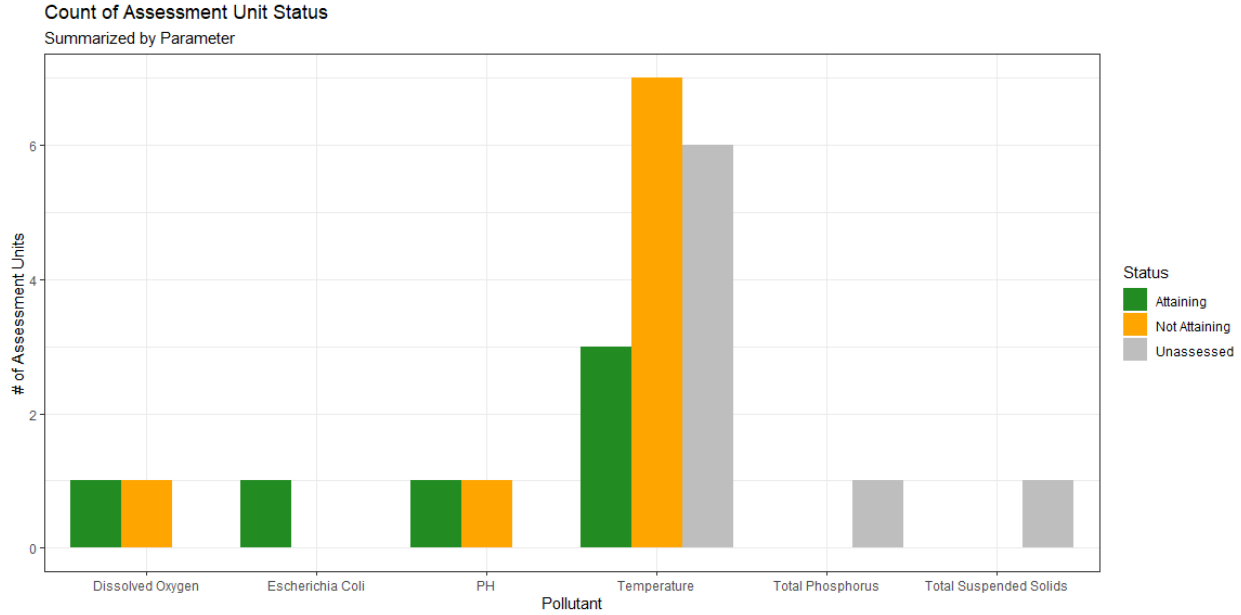

Figure 188: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Silvies Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 273 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Silvies Subbasin for the 2016 – 2019 status period.

Table 273: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Silvies Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	1	0
Stream	*Escherichia coli*	1	0	0

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	PH	1	1	0
Stream	Temperature	0	1	2
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Temperature	3	6	4

There are 33 stations within the Silvies Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 274 and Figure 189 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 274: Summary of the 2016–2019 status at monitoring stations within the Silvies Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	2	1
Escherichia coli	1	0	0
PH	3	1	1
Temperature	7	10	12
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

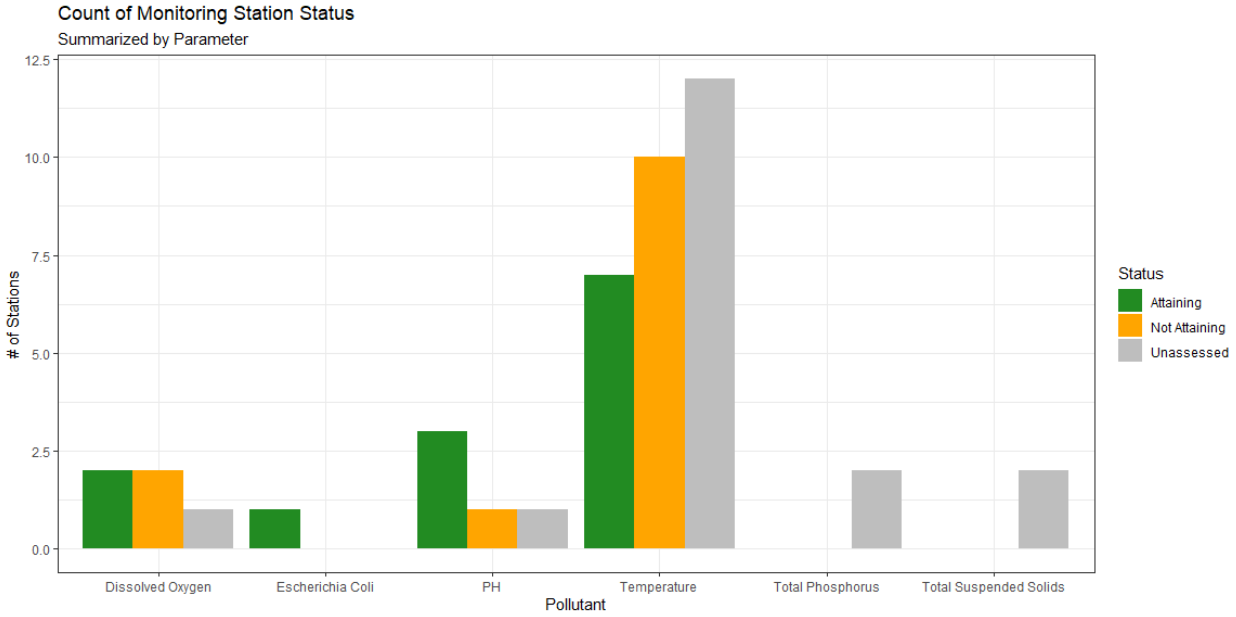

Figure 189: The number of stations in each status category by parameter for the 2016–2019 status period within the Silvies Subbasin.

4.13.5.3.3 Trend

A summary of the trends within parameters is shown in Table 275. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 275: Subbasin Summary of trend results at stations across the Silvies.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	1	1
Escherichia coli	0	0	0	0	1
PH	0	3	0	1	1
Temperature	0	0	0	0	29
Total Phosphorus	1	0	0	0	1
Total Suspended Solids	1	0	0	0	1

4.13.5.4 Alvord Lake Subbasin

4.13.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.4.2 Status

There are 7 assessment units within the Alvord Lake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 276 and Figure 190 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 276: Summary of the 2016–2019 assessment unit status within the Alvord Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	4
Escherichia coli	0	1	0
PH	1	0	1
Temperature	0	0	6
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

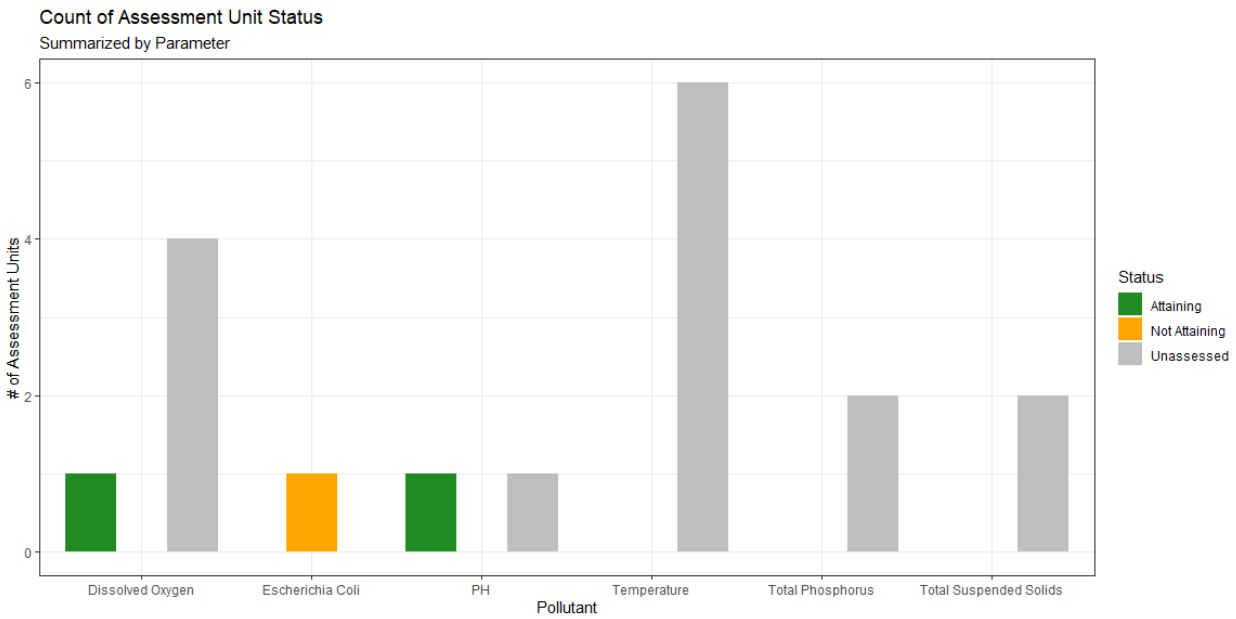

Figure 190: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Alvord Lake Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 277 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Alvord Lake Subbasin for the 2016 – 2019 status period.

Table 277: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Alvord Lake Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Dissolved Oxygen	1	0	4
Watershed Unit	*Escherichia coli*	0	1	0
Watershed Unit	PH	1	0	1
Watershed Unit	Temperature	0	0	6
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 19 stations within the Alvord Lake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 278 and Figure 191 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 278: Summary of the 2016–2019 status at monitoring stations within the Alvord Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	4
Escherichia coli	0	1	0
PH	1	0	1

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	0	0	16
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

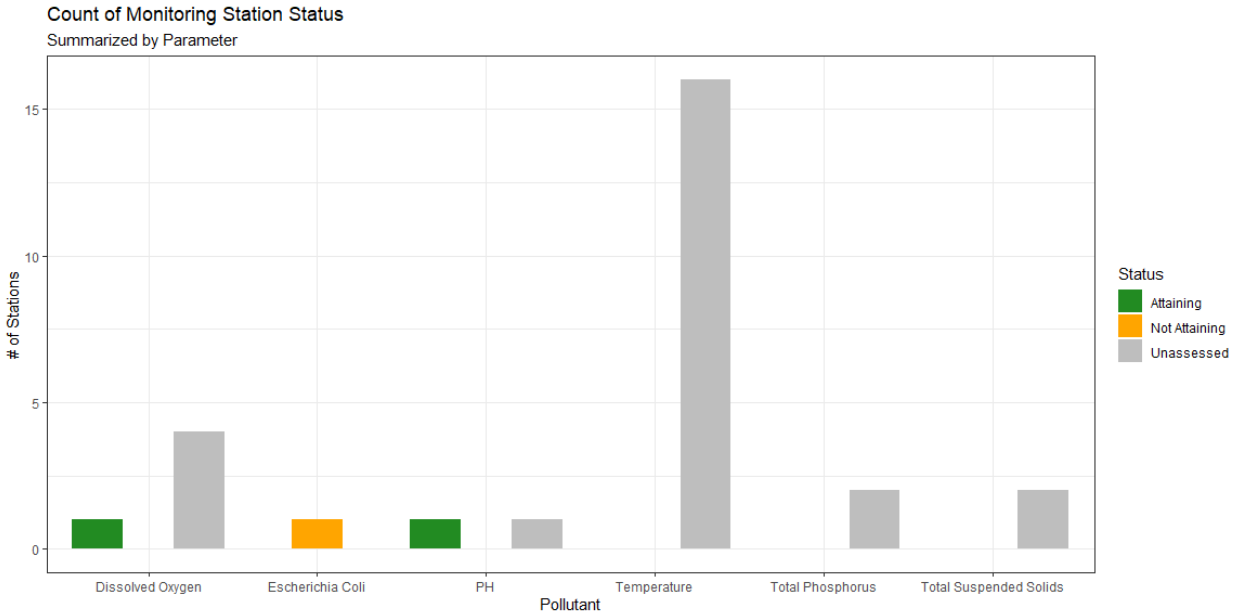

Figure 191: The number of stations in each status category by parameter for the 2016–2019 status period within the Alvord Lake Subbasin.

4.13.5.4.3 Trend

A summary of the trends within parameters is shown in Table 279. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 279: Subbasin Summary of trend results at stations across the Alvord Lake.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	4
Escherichia coli	0	0	0	0	1
PH	0	1	0	0	1
Temperature	0	0	0	0	16
Total Phosphorus	0	1	0	0	1
Total Suspended Solids	0	1	0	0	1

4.13.5.5 Donner und Blitzen Subbasin

4.13.5.5.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.5.2 Status

There are 9 assessment units within the Donner und Blitzen Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 280 and Figure 192 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 280: Summary of the 2016–2019 assessment unit status within the Donner und Blitzen Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	4
Escherichia coli	1	0	0
PH	1	0	3
Temperature	0	1	4
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

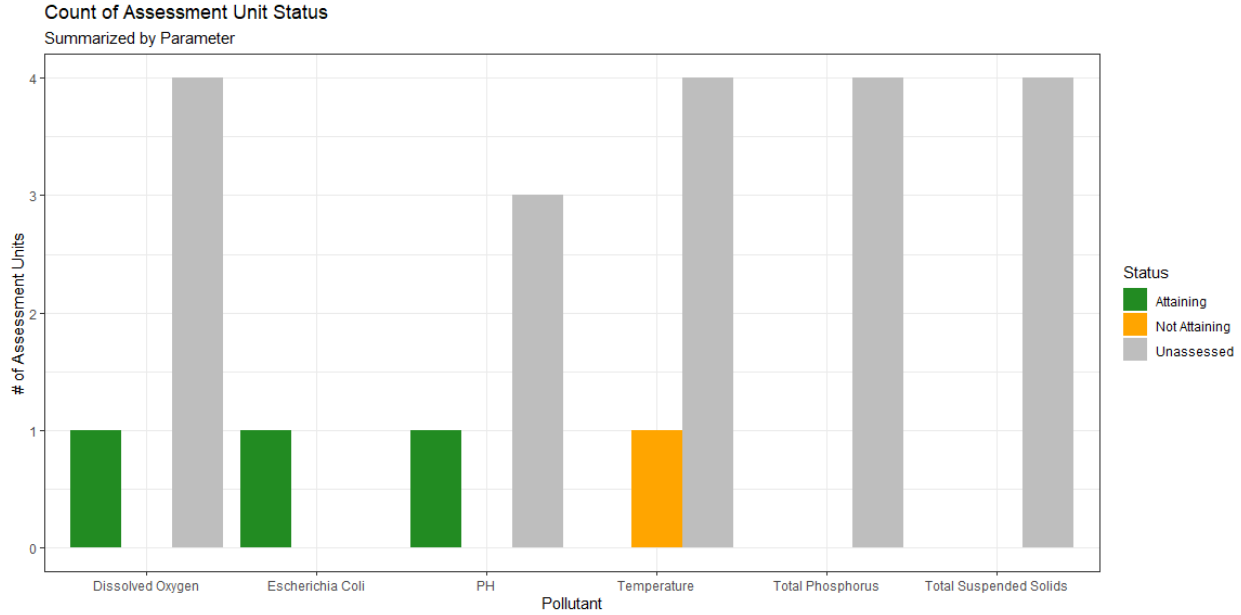

Figure 192: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Donner und Blitzen Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 281 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Donner und Blitzen Subbasin for the 2016 – 2019 status period.

Table 281: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Donner und Blitzen Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	1	0	0

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	PH	1	0	1
Stream	Temperature	0	1	0
Stream	Total Phosphorus	0	0	2
Stream	Total Suspended Solids	0	0	2
Watershed Unit	Dissolved Oxygen	0	0	3
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	0	0	4
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 14 stations within the Donner und Blitzen Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 282 and Figure 193 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 282: Summary of the 2016–2019 status at monitoring stations within the Donner und Blitzen Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	4
Escherichia coli	2	0	0
PH	2	0	3
Temperature	0	1	7
Total Phosphorus	0	0	5
Total Suspended Solids	0	0	5

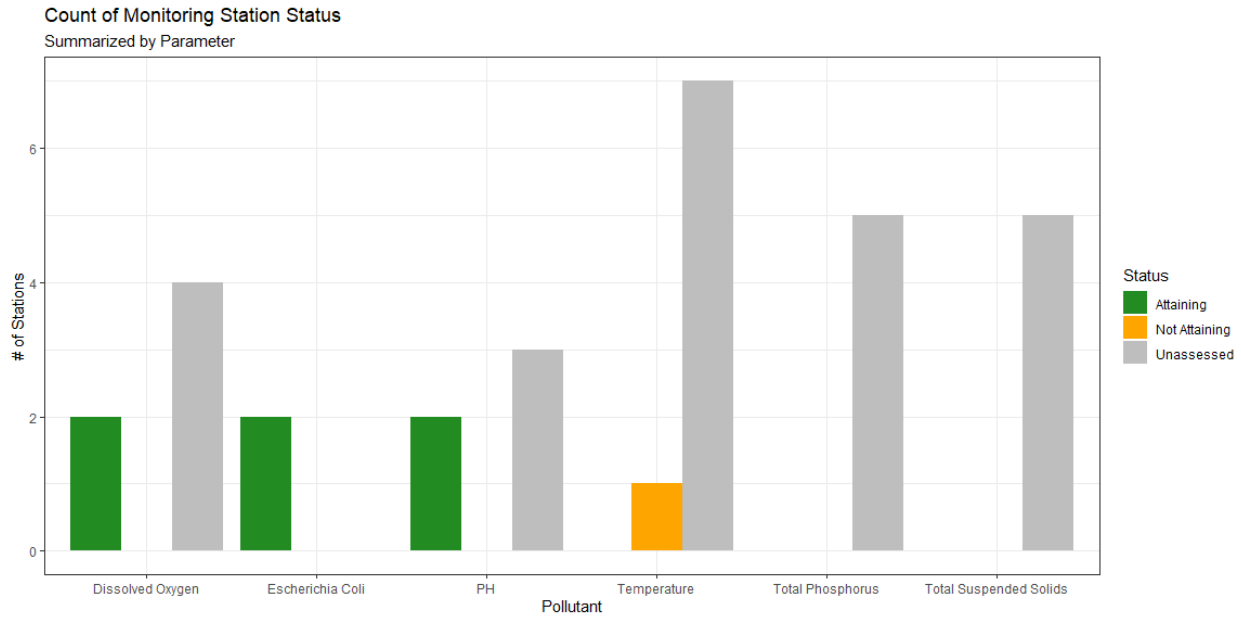

Figure 193: The number of stations in each status category by parameter for the 2016–2019 status period within the Donner und Blitzen Subbasin.

4.13.5.5.3 Trend

A summary of the trends within parameters is shown in Table 283. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 283: Subbasin Summary of trend results at stations across the Donner und Blitzen.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	4
Escherichia coli	0	0	0	0	2
PH	0	1	0	1	3
Temperature	0	1	0	0	7
Total Phosphorus	0	0	1	1	3
Total Suspended Solids	1	0	0	1	3

4.13.5.6 Summer Lake Subbasin

4.13.5.6.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.6.2 Status

There are 6 assessment units within the Summer Lake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 284 and Figure 194 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 284: Summary of the 2016–2019 assessment unit status within the Summer Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
PH	1	0	0
Temperature	1	1	4
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

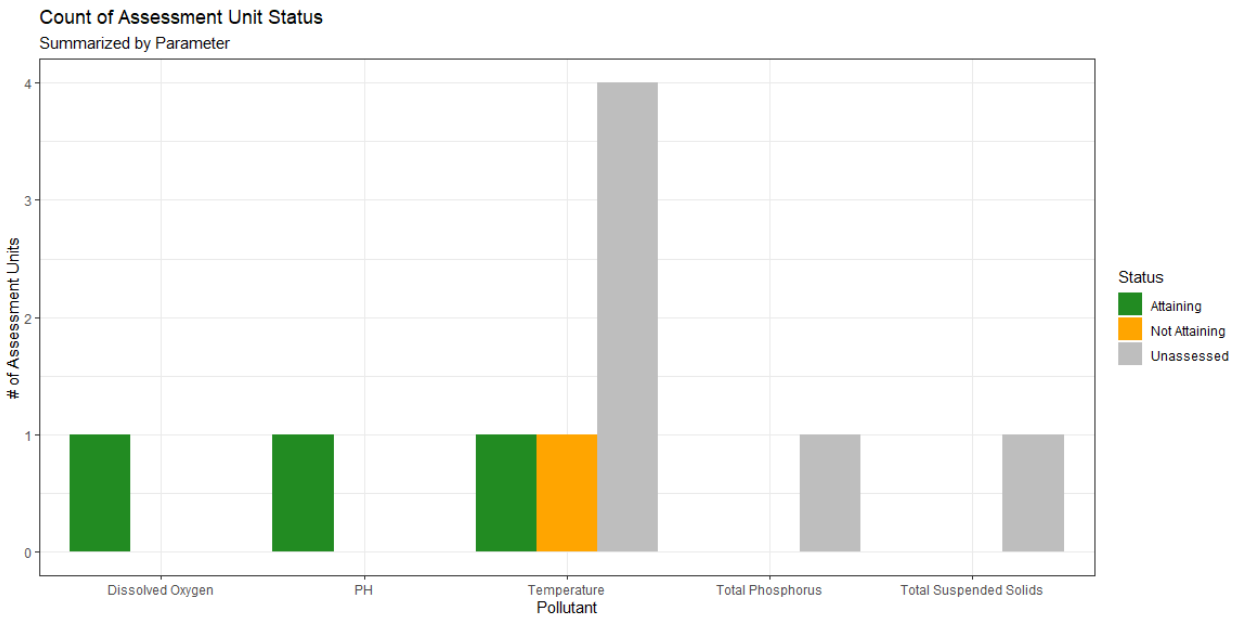

Figure 194: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Summer Lake Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 285 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Summer Lake Subbasin for the 2016 – 2019 status period.

Table 285: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Summer Lake Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Dissolved Oxygen	1	0	0
Watershed Unit	PH	1	0	0
Watershed Unit	Temperature	1	1	4
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	1

There are 13 stations within the Summer Lake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 286 and Figure 195 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 286: Summary of the 2016–2019 status at monitoring stations within the Summer Lake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
PH	1	0	0
Temperature	3	1	8
Total Phosphorus	0	0	1

Pollutant	Attaining	Not Attaining	Unassessed
Total Suspended Solids	0	0	1

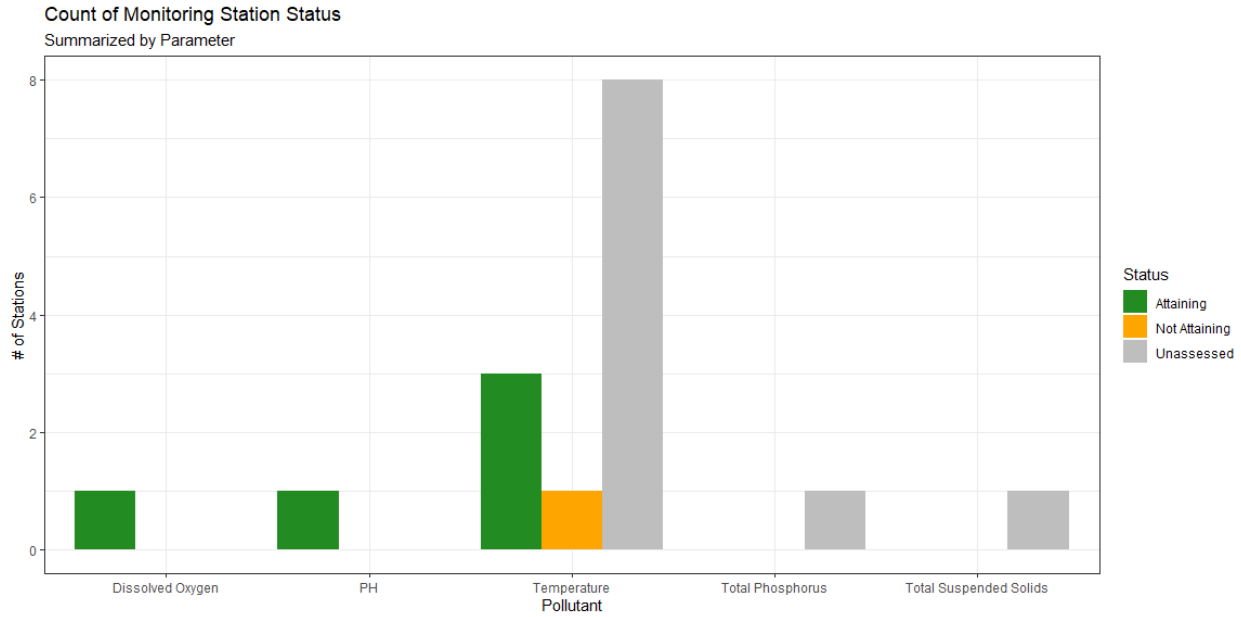

Figure 195: The number of stations in each status category by parameter for the 2016–2019 status period within the Summer Lake Subbasin.

4.13.5.6.3 Trend

A summary of the trends within parameters is shown in Table 287. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 287: Subbasin Summary of trend results at stations across the Summer Lake.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	1
PH	0	0	0	0	1
Temperature	2	0	0	0	10
Total Phosphorus	0	0	0	0	1
Total Suspended Solids	0	0	0	0	1

4.13.5.7 Guano Subbasin

4.13.5.7.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.7.2 Status

There are 4 assessment units within the Guano Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available

data to determine attainment status and are listed as unassessed. Table 288 and Figure 196 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 288: Summary of the 2016–2019 assessment unit status within the Guano Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	2
PH	0	0	3
Temperature	0	0	2
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

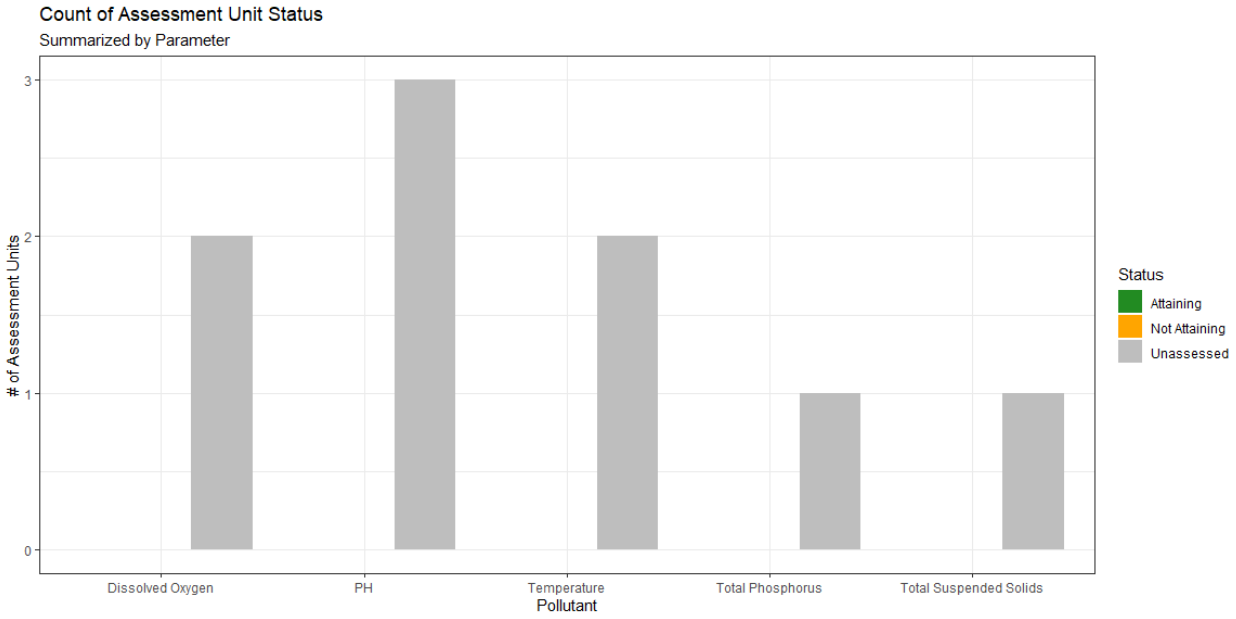

Figure 196: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Guano Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 289 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Guano Subbasin for the 2016 – 2019 status period.

Table 289: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Guano Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	0	0	2
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	1

There are 5 stations within the Guano Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 290 and Figure 197 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 290: Summary of the 2016–2019 status at monitoring stations within the Guano Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	2
PH	0	0	4
Temperature	0	0	2
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

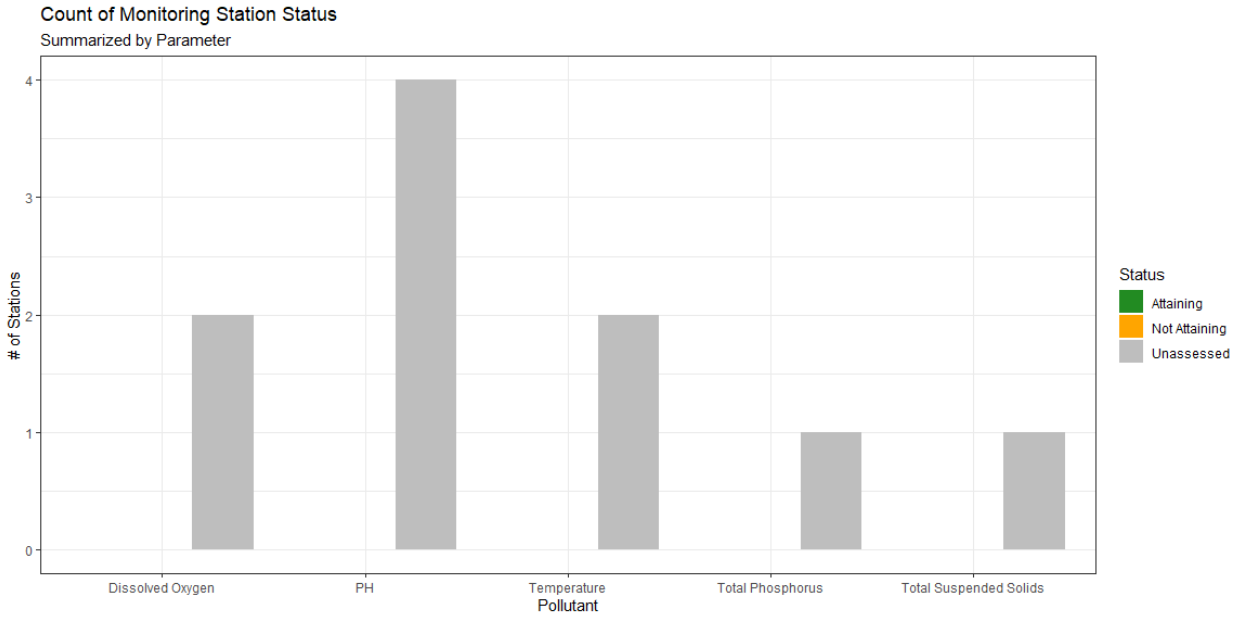

Figure 197: The number of stations in each status category by parameter for the 2016–2019 status period within the Guano Subbasin.

4.13.5.7.3 Trend

A summary of the trends within parameters is shown in Table 291. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 291: Subbasin Summary of trend results at stations across the Guano.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	2
PH	0	0	0	0	4
Temperature	0	0	0	0	2
Total Phosphorus	0	0	0	0	1

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	0	0	1

4.13.5.8 Harney-Malheur Lakes Subbasin

4.13.5.8.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.8.2 Status

There are 3 assessment units within the Harney-Malheur Lakes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 292 and Figure 198 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 292: Summary of the 2016–2019 assessment unit status within the Harney-Malheur Lakes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	0	1	2

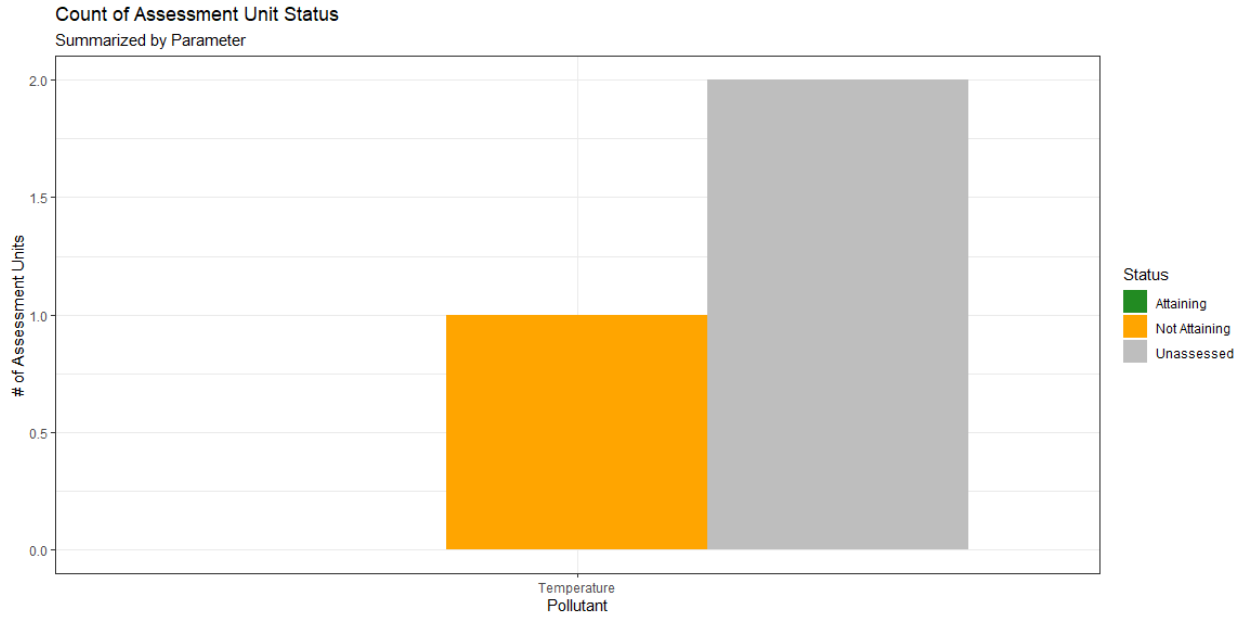

Figure 198: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Harney-Malheur Lakes Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 293 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Harney-Malheur Lakes Subbasin for the 2016 – 2019 status period.

Table 293: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Harney-Malheur Lakes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Temperature	0	1	2

There are 4 stations within the Harney-Malheur Lakes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix L**. Table 294 and Figure 199 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 294: Summary of the 2016–2019 status at monitoring stations within the Harney-Malheur Lakes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	0	1	3

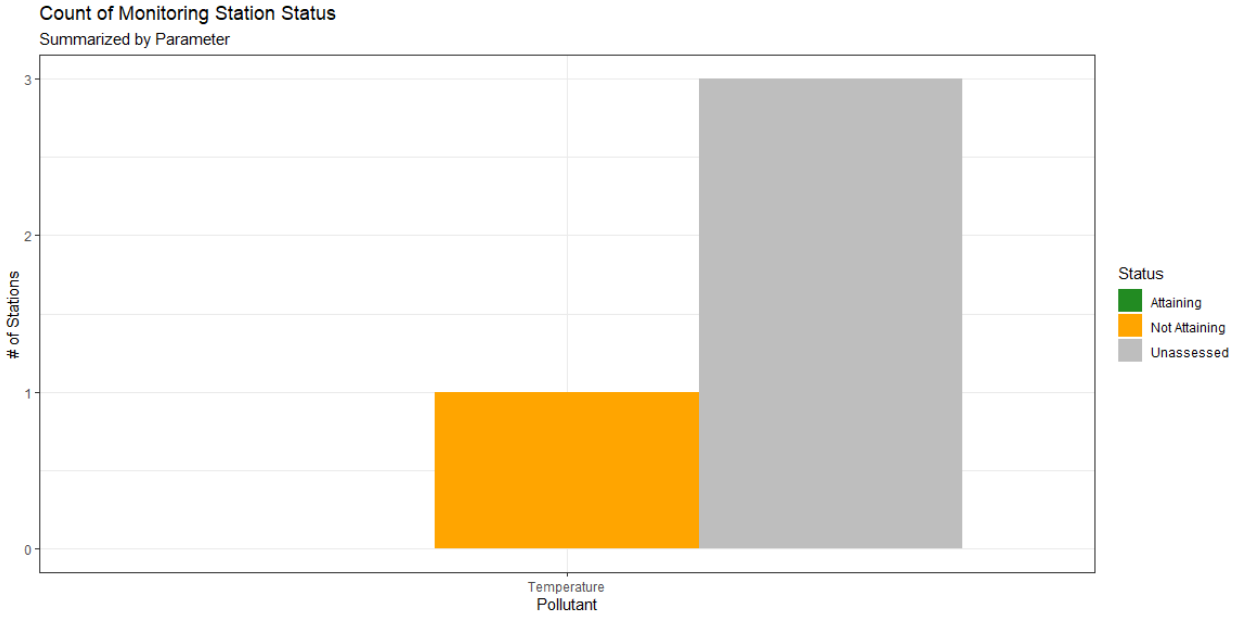

Figure 199: The number of stations in each status category by parameter for the 2016–2019 status period within the Harney-Malheur Lakes Subbasin.

4.13.5.8.3 Trend

A summary of the trends within parameters is shown in Table 295. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 295: Subbasin Summary of trend results at stations across the Harney-Malheur Lakes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	0	0	0	0	4

4.13.5.9 Goose Lake Subbasin

4.13.5.9.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.9.2 Status

There are 1 assessment units within the Goose Lake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 99 and Figure 66 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 99: Summary of the 2016–2019 assessment unit status within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	0	0	1

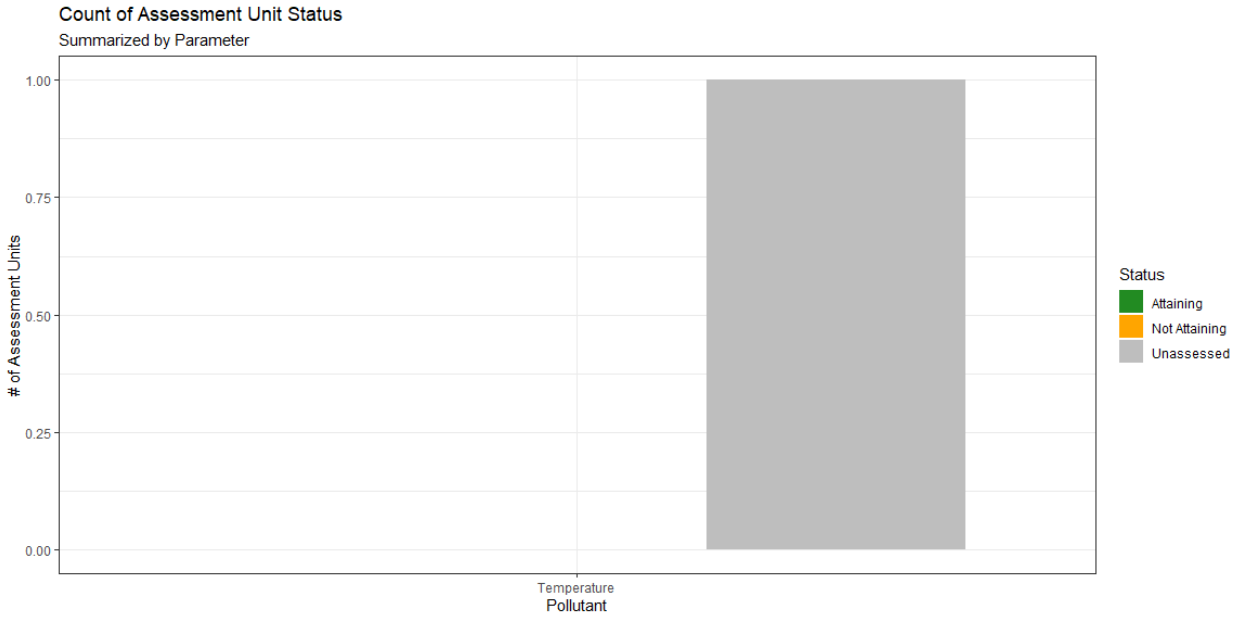

Figure 66: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 100 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Goose Lake Subbasin for the 2016 – 2019 status period.

Table 100: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Goose Lake.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Temperature	0	0	1

There are 1 stations within the Goose Lake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for

a station's unassessed status can be found in **Appendix L**. Table 101 and Figure 67 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 101: Summary of the 2016–2019 status at monitoring stations within the Goose Lake.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	0	0	1

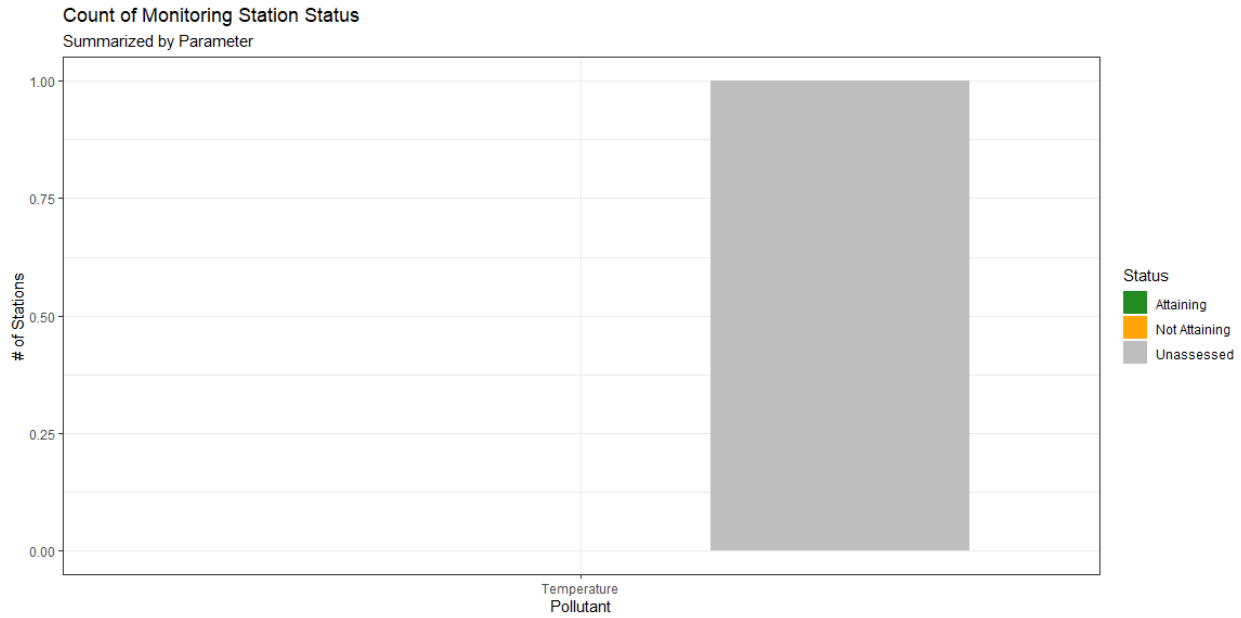

Figure 67: Summary plot of the 2016–2019 station status within the Goose Lake by parameter.

4.13.5.9.3 Trend

A summary of the trends within parameters is shown in Table 102. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 102: Goose Lake summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	0	0	0	0	1

4.13.5.10 Silver Subbasin

4.13.5.10.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.13.5.10.2 Status

There are 4 assessment units within the Silver Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 296 and Figure 200 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 296: Summary of the 2016–2019 assessment unit status within the Silver Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	1	3	0

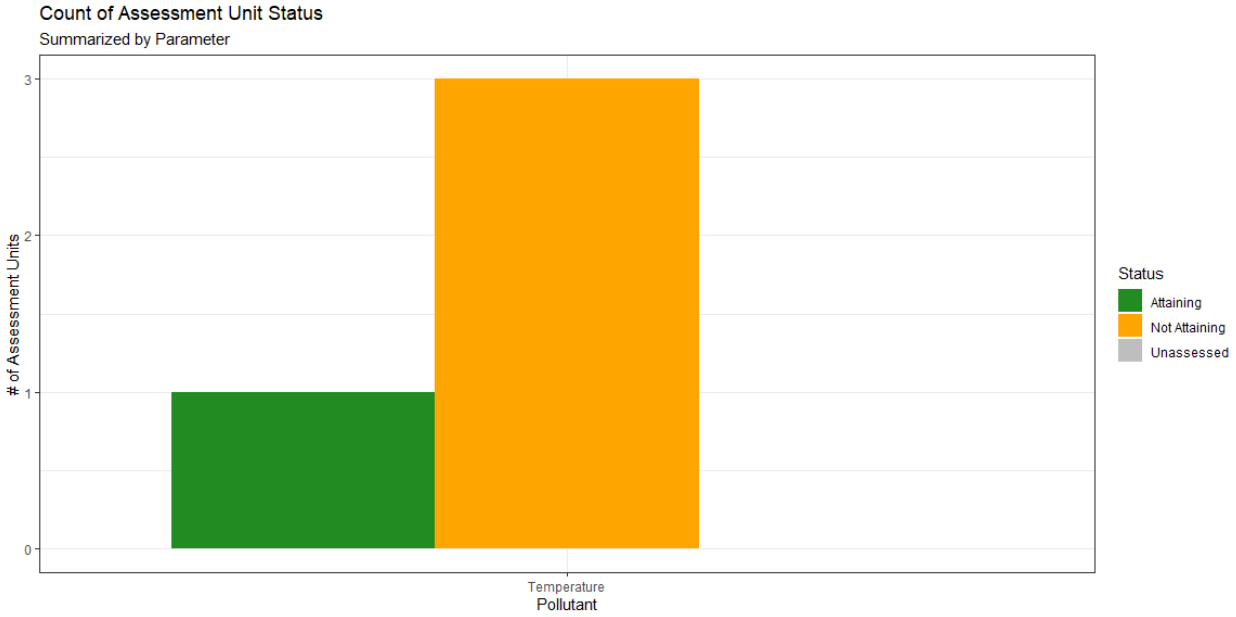

Figure 200: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Silver Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 297 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Silver Subbasin for the 2016 – 2019 status period.

Table 297: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Silver Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Temperature	0	1	0
Watershed Unit	Temperature	1	2	0

There are 4 stations within the Silver Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix L**. Table 298 and Figure 201 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 298: Summary of the 2016–2019 status at monitoring stations within the Silver Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Temperature	1	3	0

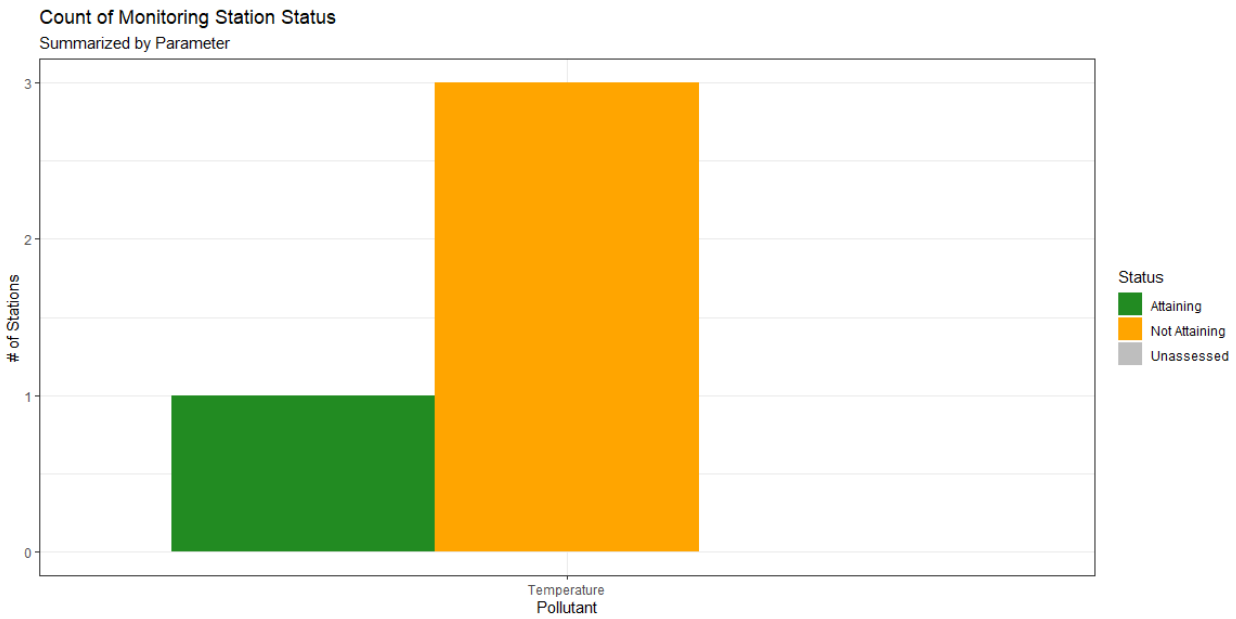

Figure 201: The number of stations in each status category by parameter for the 2016–2019 status period within the Silver Subbasin.

4.13.5.10.3 Trend

A summary of the trends within parameters is shown in Table 299. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 299: Subbasin Summary of trend results at stations across the Silver.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Temperature	0	0	0	0	4

4.14 Owyhee

A summary of status and trend results for the Owyhee and all subbasins within the Owyhee are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix M**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Owyhee are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 19 stations within the Owyhee. These stations were located across 11 assessment units consisting of 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.14.1 Land Use

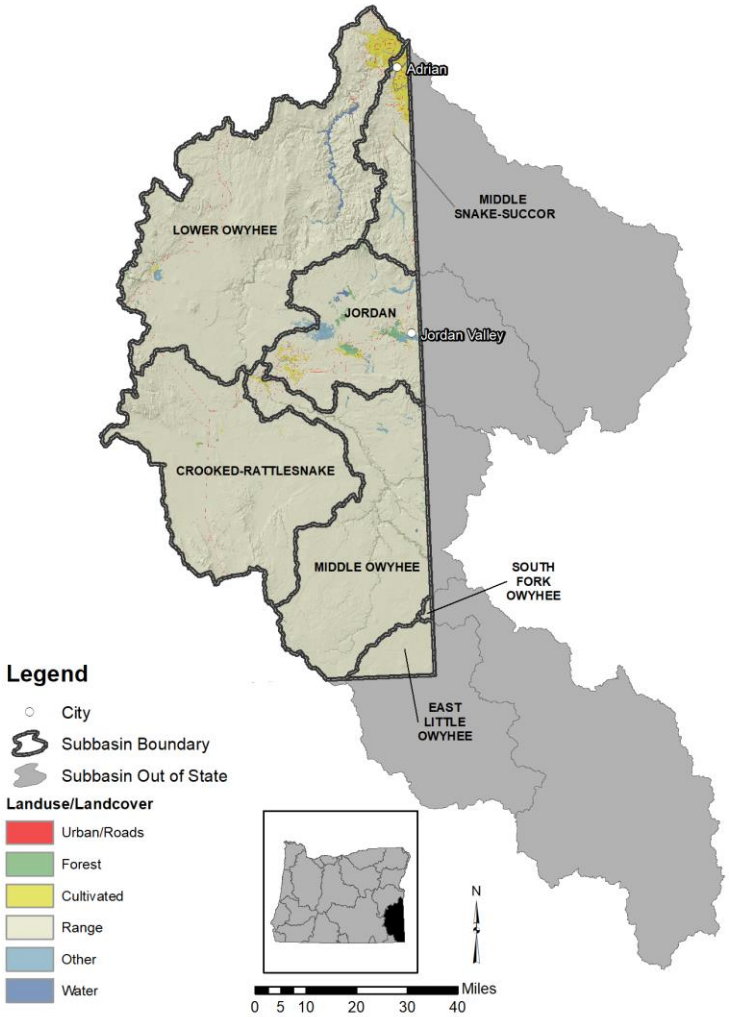

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 300: Land use within the Owyhee Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Snake-Succor	836	1.1	0.4	10.4	86.0	2.0
Middle Owyhee	3111	0.1	0.6	0.2	98.7	0.4
Jordan	1813	0.9	2.6	1.9	90.6	4.1

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Crooked-Rattlesnake	3443	0.2	0.1	0.1	99.6	0.1
Lower Owyhee	5116	0.4	0.2	2.0	96.2	1.2

4.14.2 Parameter Maps

The maps in Figure 202 through Figure 207 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

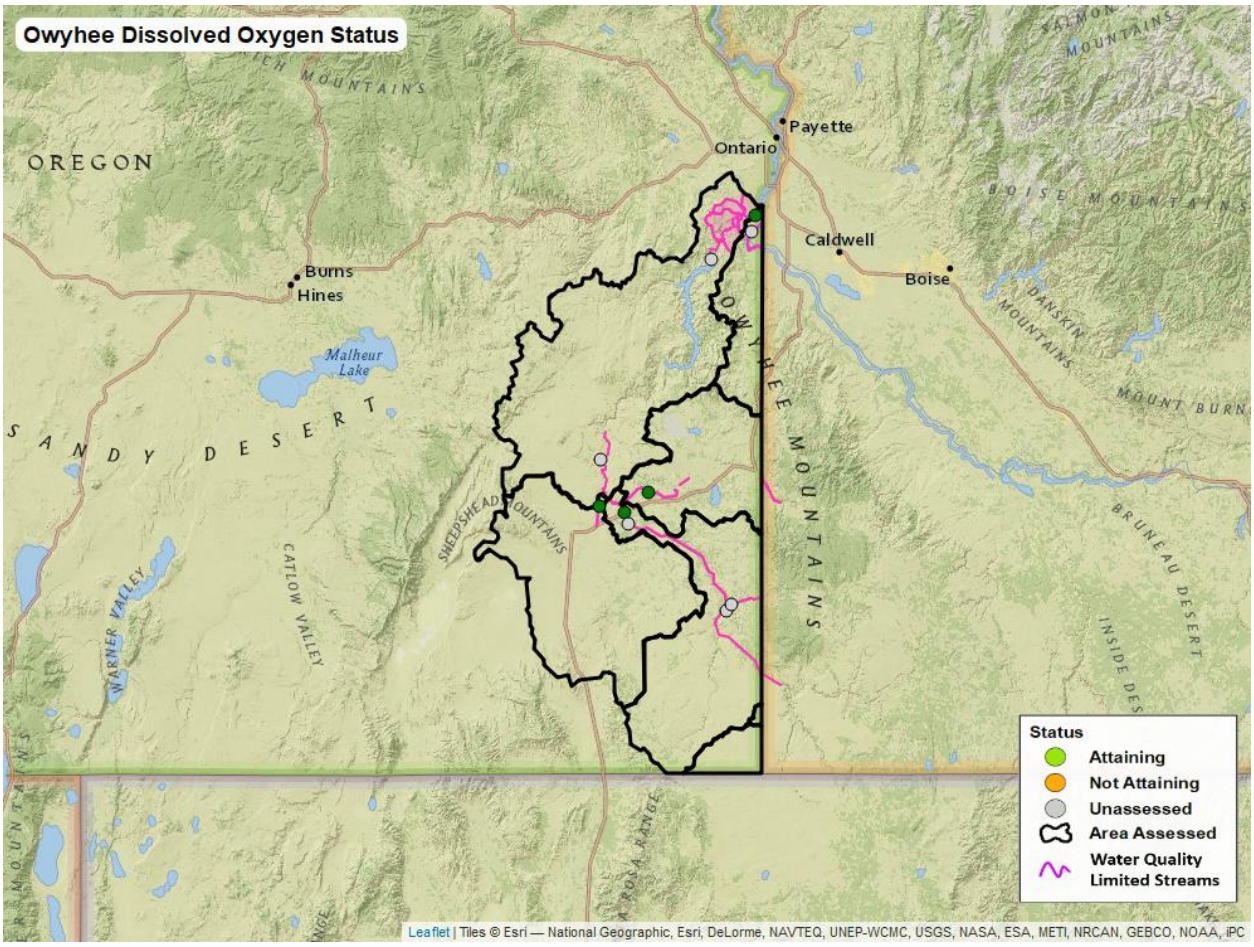

Figure 202: Summary map of the status of dissolved oxygen across the Owyhee.

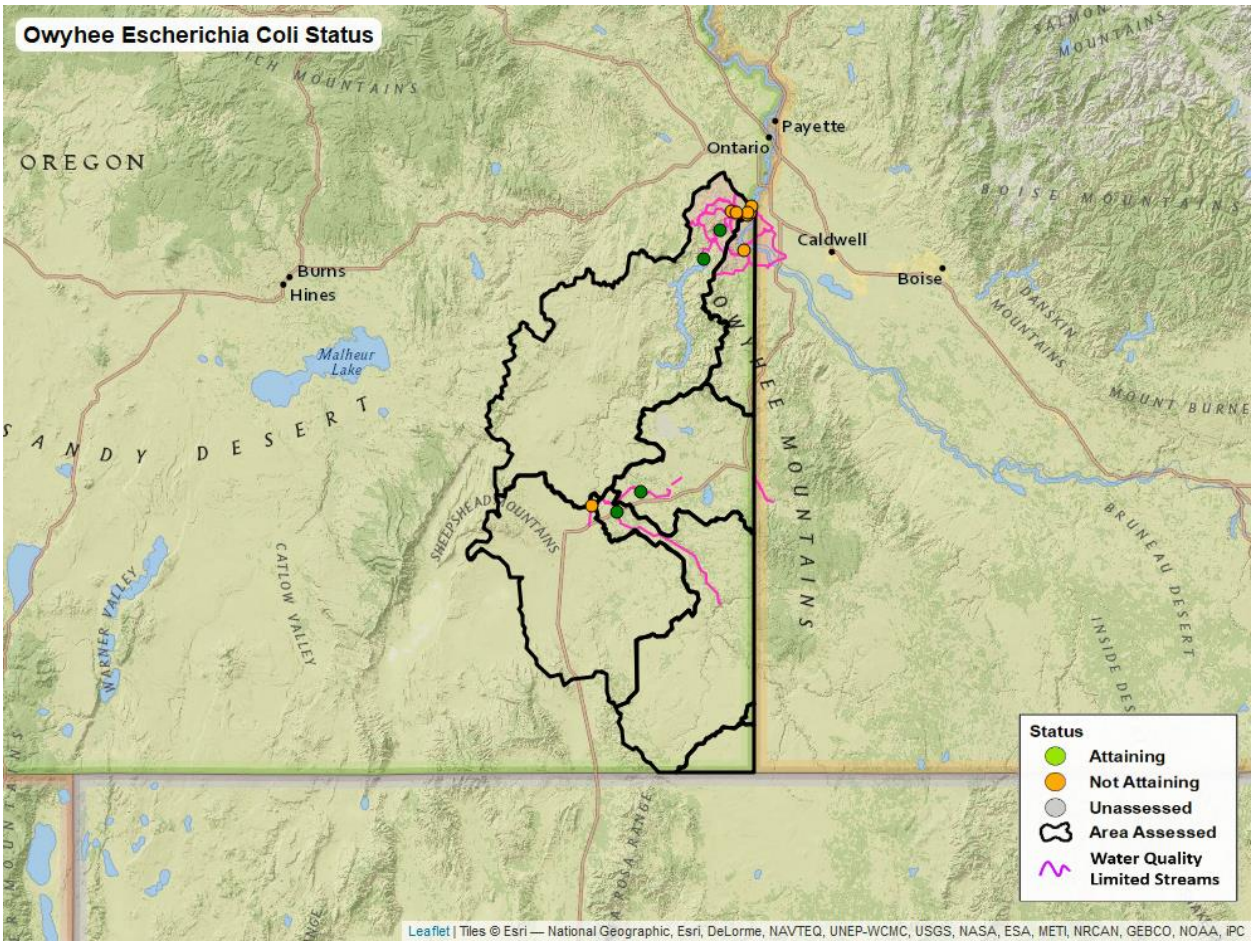

Figure 203: Summary map of the status of *Escherichia coli* across the Owyhee.

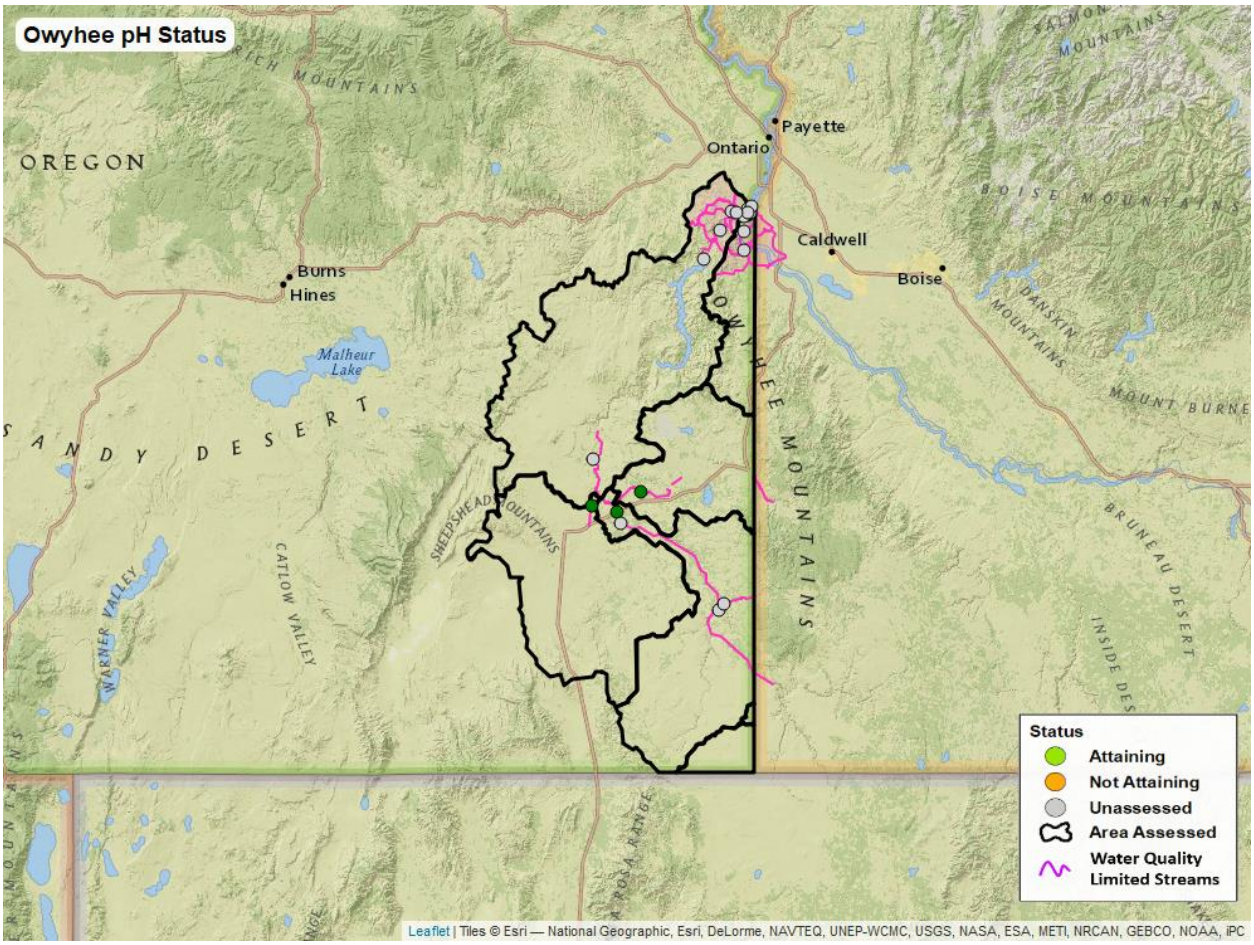

Figure 204: Summary map of the status of pH across the Owyhee.

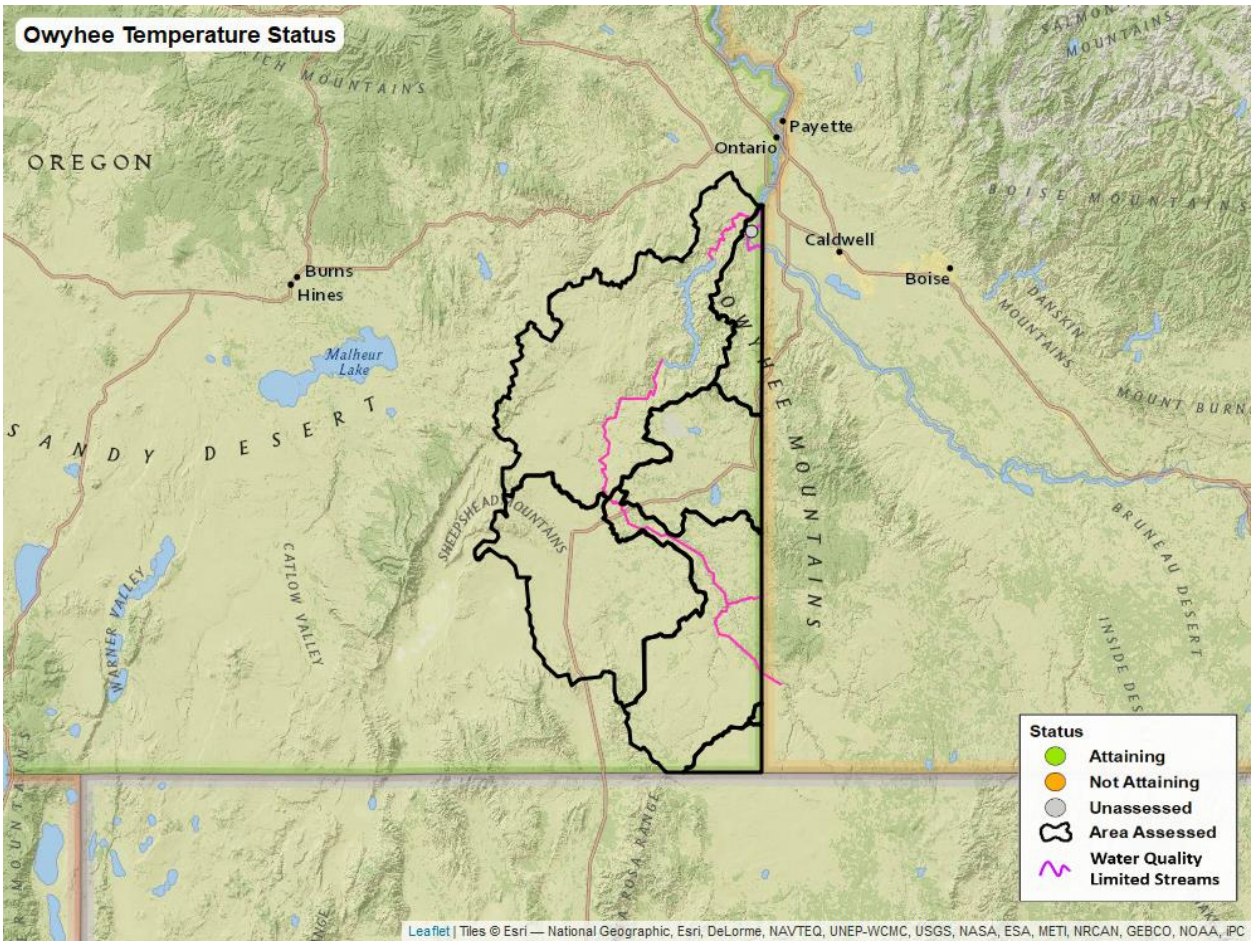

Figure 205: Summary map of the status of temperature across the Owyhee.

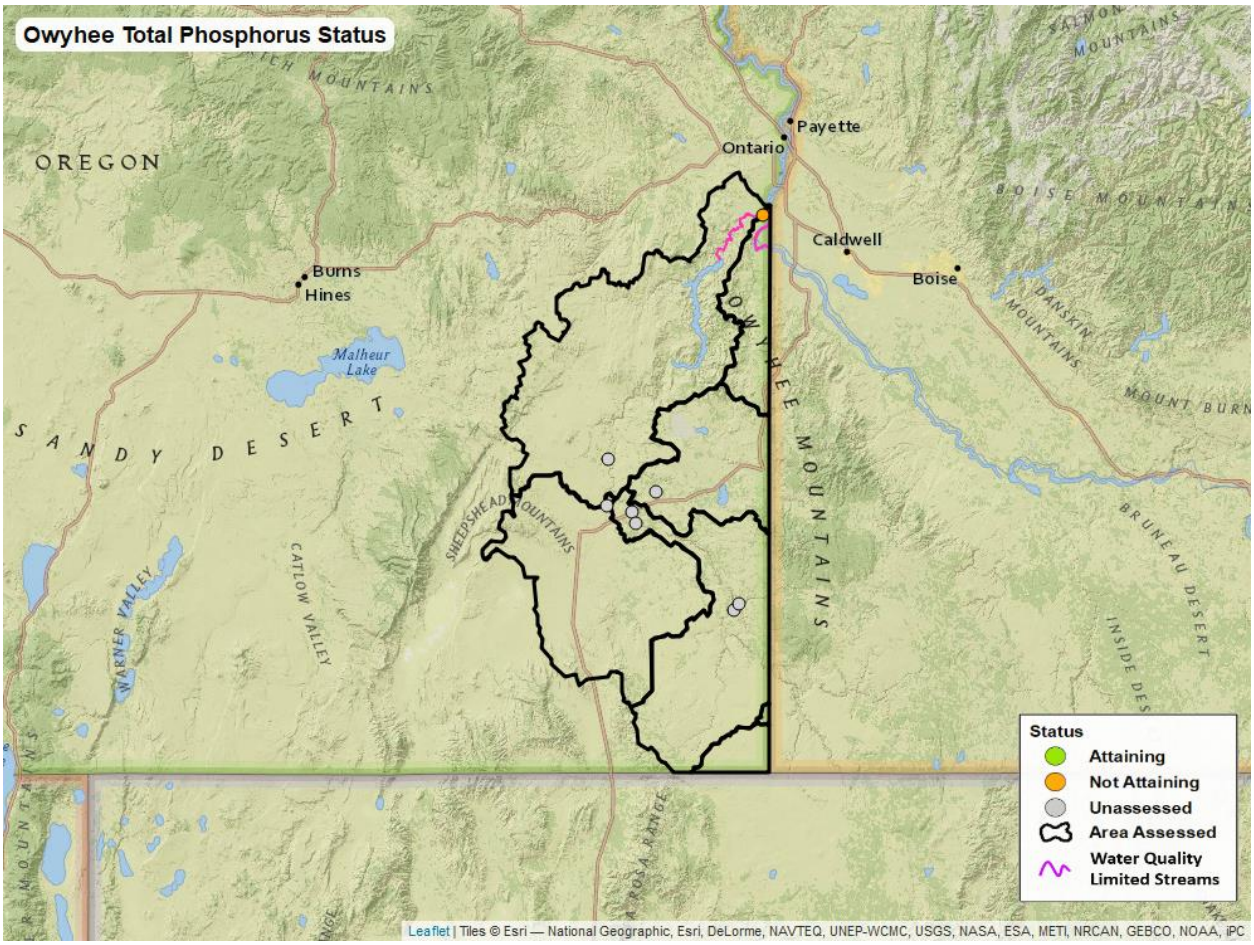

Figure 206: Summary map of the status of total phosphorus across the Owyhee.

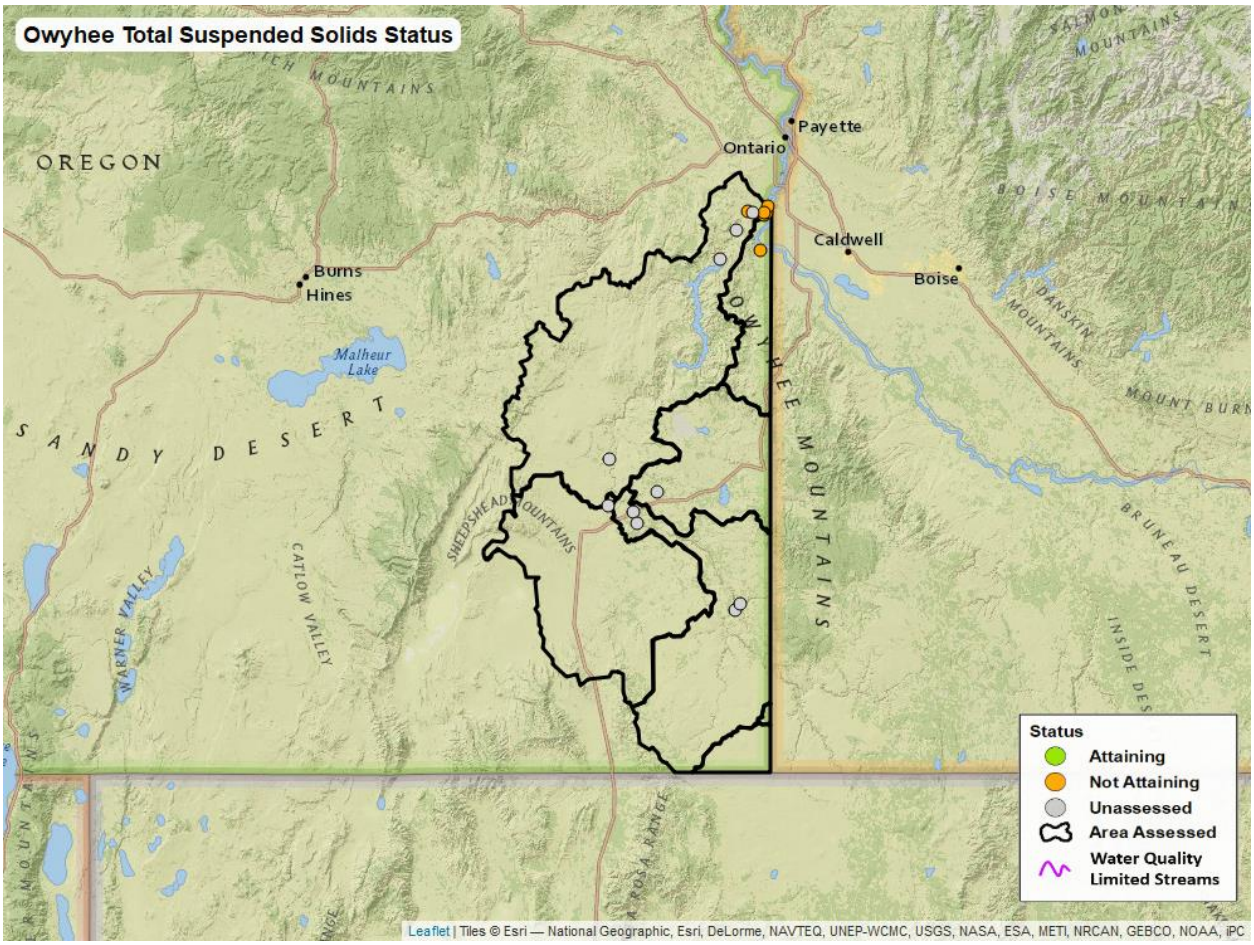

Figure 207: Summary map of the status of total suspended solids across the Owyhee.

4.14.3 Status

There are 11 assessment units within the Owyhee containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 301 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 301: Summary of the 2016–2019 assessment unit status within the Owyhee.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	4
Escherichia coli	2	5	0
PH	4	0	7
Temperature	0	0	1
Total Phosphorus	0	1	6
Total Suspended Solids	0	3	7

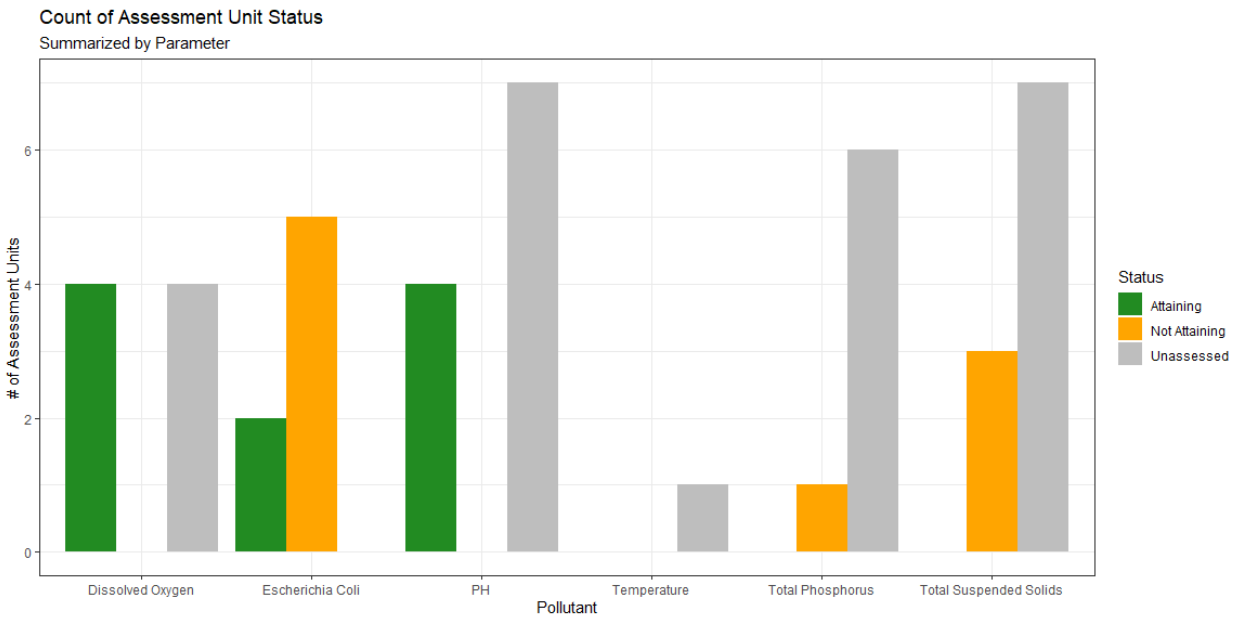

Figure 208: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Owyhee.

Table 302 and Figure 208 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Owyhee for the 2016–2019 status period.

Table 302: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Owyhee.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	4	0	4
Stream	*Escherichia coli*	2	2	0
Stream	PH	4	0	4
Stream	Temperature	0	0	1
Stream	Total Phosphorus	0	1	6
Stream	Total Suspended Solids	0	1	6
Watershed Unit	*Escherichia coli*	0	3	0
Watershed Unit	PH	0	0	3
Watershed Unit	Total Suspended Solids	0	2	1

Table 303 and Figure 209 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix M.

Table 303: Summary of the 2016–2019 status at monitoring stations within the Owyhee.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	6
Escherichia coli	4	8	0

Pollutant	Attaining	Not Attaining	Unassessed
PH	4	0	15
Temperature	0	0	1
Total Phosphorus	0	1	7
Total Suspended Solids	0	6	10

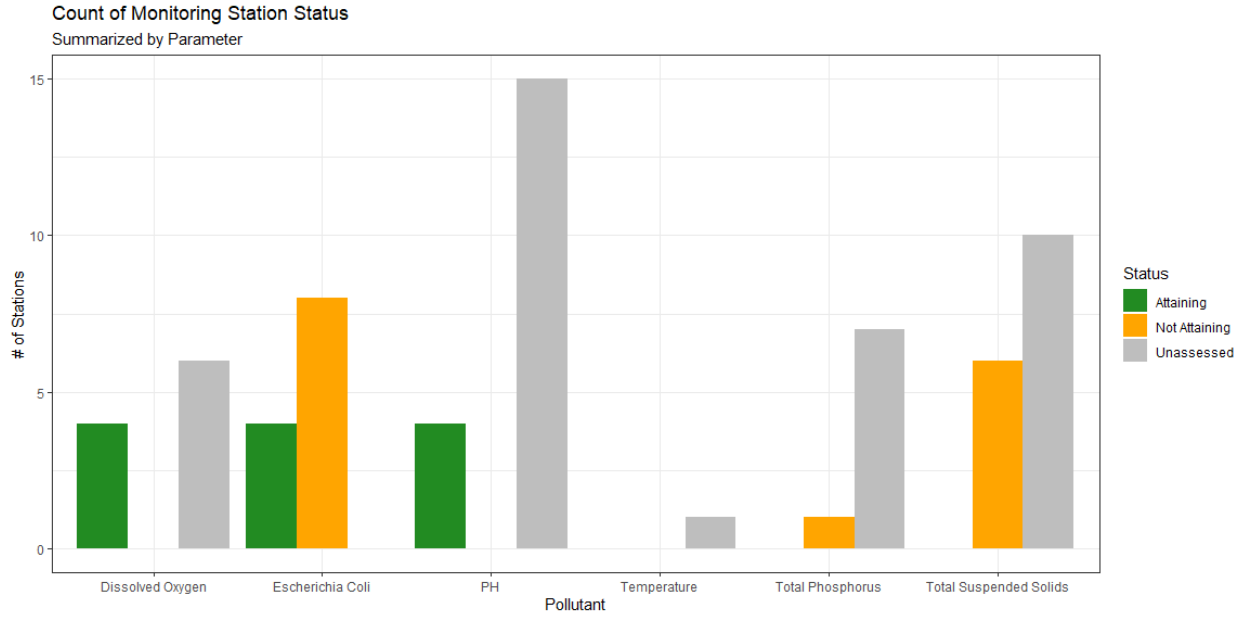

Figure 209: Summary plot of the 2016–2019 station status within the Owyhee by parameter.

4.14.4 Trend

A summary of the trends across parameters is shown in Table 304. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 304: Owyhee summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	1	0	2	5
Escherichia coli	2	0	0	2	8
PH	0	2	1	4	12
Temperature	0	0	0	0	1
Total Phosphorus	1	0	1	2	4
Total Suspended Solids	4	0	0	3	9

4.14.5 Subbasin Summary

4.14.5.1 Lower Owyhee Subbasin

4.14.5.1.1 Water Quality Limited Assessment Units

Table 305: Number of water quality limited assessment units in the Lower Owyhee Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1
pH	1
Total Phosphorus, mixed forms	1

4.14.5.1.2 Status

There are 4 assessment units within the Lower Owyhee Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 306 and Figure 210 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 306: Summary of the 2016–2019 assessment unit status within the Lower Owyhee Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	1
Escherichia coli	0	3	0
PH	1	0	3
Total Phosphorus	0	1	1
Total Suspended Solids	0	2	2

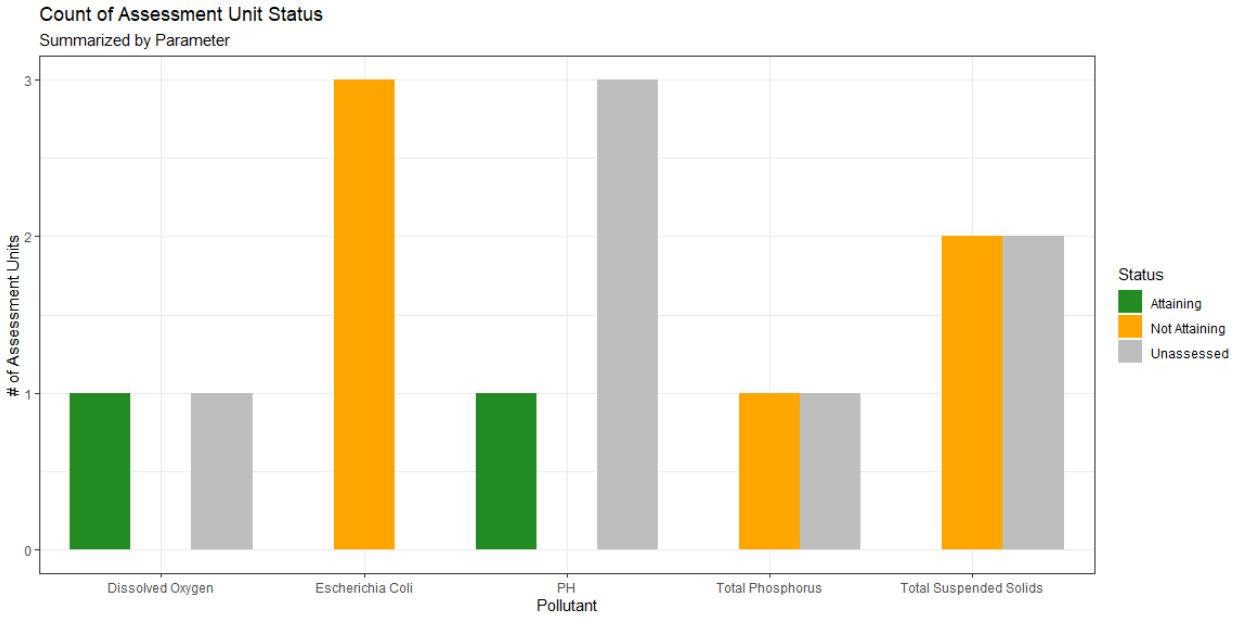

Figure 210: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Owyhee Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 307 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Owyhee Subbasin for the 2016 – 2019 status period.

Table 307: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Owyhee Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	0	1	0
Stream	PH	1	0	1
Stream	Total Phosphorus	0	1	1
Stream	Total Suspended Solids	0	1	1
Watershed Unit	*Escherichia coli*	0	2	0
Watershed Unit	PH	0	0	2
Watershed Unit	Total Suspended Solids	0	1	1

There are 10 stations within the Lower Owyhee Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix M**. Table 308 and Figure 211 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 308: Summary of the 2016–2019 status at monitoring stations within the Lower Owyhee Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	2	5	0
PH	1	0	9
Total Phosphorus	0	1	1
Total Suspended Solids	0	4	4

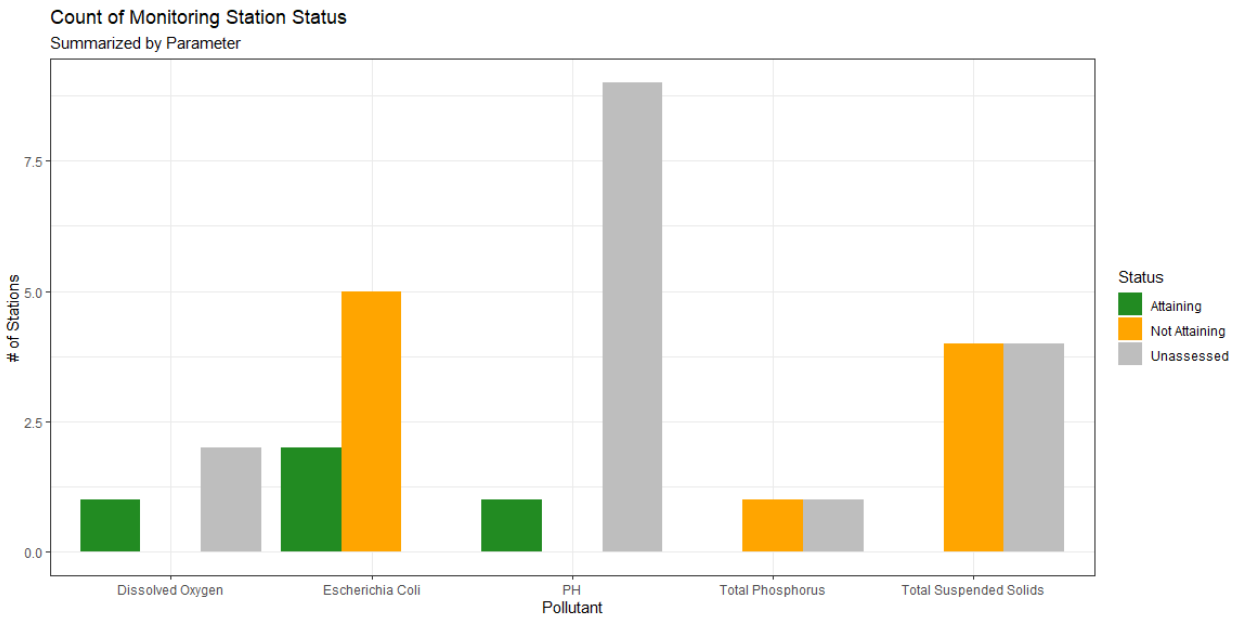

Figure 211: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Owyhee Subbasin.

4.14.5.1.3 Trend

A summary of the trends within parameters is shown in Table 309. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 309: Subbasin Summary of trend results at stations across the Lower Owyhee.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	1
Escherichia coli	1	0	0	1	5
PH	0	0	1	1	8
Total Phosphorus	1	0	0	0	1
Total Suspended Solids	1	0	0	1	6

4.14.5.2 Middle Owyhee Subbasin

4.14.5.2.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.14.5.2.2 Status

There are 3 assessment units within the Middle Owyhee Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 310 and Figure 212 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 310: Summary of the 2016–2019 assessment unit status within the Middle Owyhee Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	2
Escherichia coli	1	0	0
PH	1	0	2
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	3

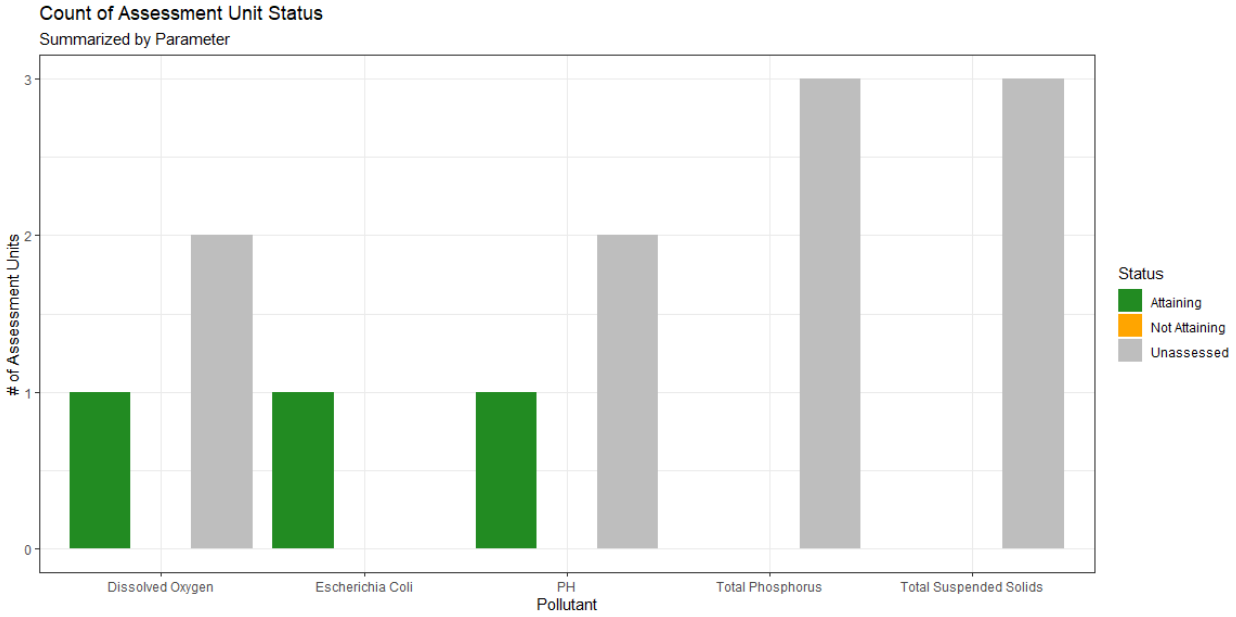

Figure 212: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Owyhee Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 311 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Owyhee Subbasin for the 2016 – 2019 status period.

Table 311: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Owyhee Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	2
Stream	*Escherichia coli*	1	0	0
Stream	PH	1	0	2
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	3

There are 4 stations within the Middle Owyhee Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix M**. Table 312 and Figure 213

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 312: Summary of the 2016–2019 status at monitoring stations within the Middle Owyhee Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	3
Escherichia coli	1	0	0
PH	1	0	3
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

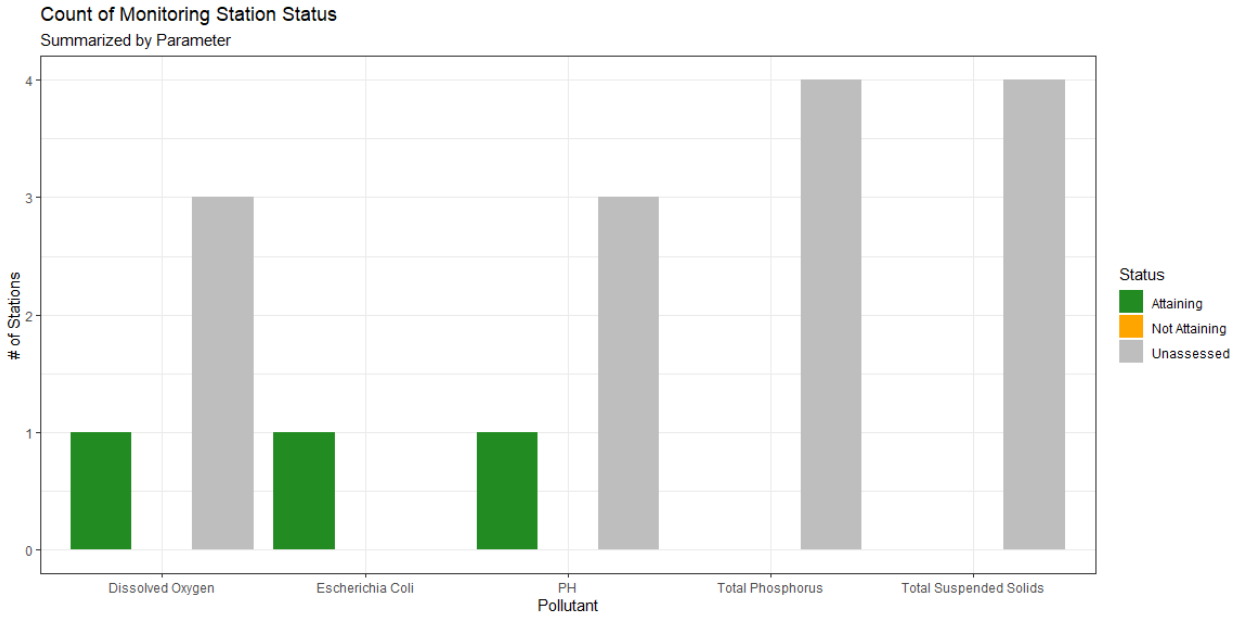

Figure 213: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Owyhee Subbasin.

4.14.5.2.3 Trend

A summary of the trends within parameters is shown in Table 313. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 313: Subbasin Summary of trend results at stations across the Middle Owyhee.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	3
Escherichia coli	0	0	0	0	1
PH	0	0	0	1	3
Total Phosphorus	0	0	0	1	3
Total Suspended Solids	0	0	0	1	3

4.14.5.3 Jordan Subbasin

4.14.5.3.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.14.5.3.2 Status

There are 1 assessment units within the Jordan Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 314 and Figure 214 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 314: Summary of the 2016–2019 assessment unit status within the Jordan Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
Escherichia coli	1	0	0
PH	1	0	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

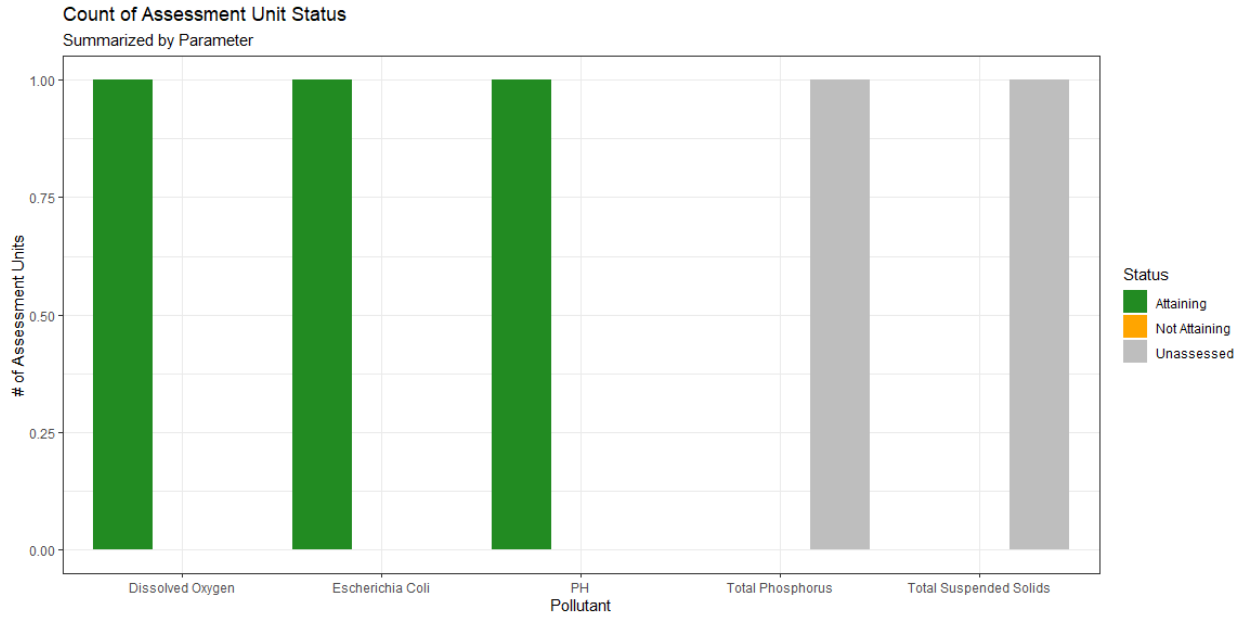

Figure 214: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Jordan Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 315 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Jordan Subbasin for the 2016 – 2019 status period.

Table 315: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Jordan Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	0
Stream	*Escherichia coli*	1	0	0
Stream	PH	1	0	0
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1

There are 1 stations within the Jordan Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix M**. Table 316 and Figure 215 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 316: Summary of the 2016–2019 status at monitoring stations within the Jordan Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
Escherichia coli	1	0	0
PH	1	0	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

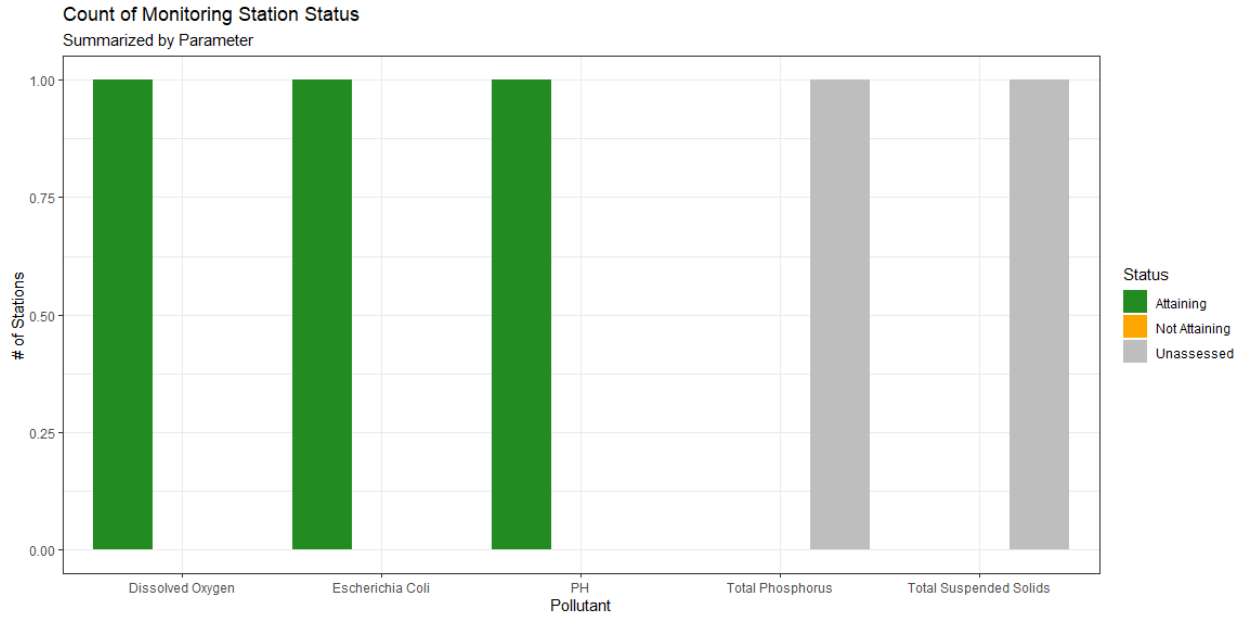

Figure 215: The number of stations in each status category by parameter for the 2016–2019 status period within the Jordan Subbasin.

4.14.5.3.3 Trend

A summary of the trends within parameters is shown in Table 317. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 317: Subbasin Summary of trend results at stations across the Jordan.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	0	0
Escherichia coli	0	0	0	0	1
PH	0	0	0	1	0
Total Phosphorus	0	0	0	1	0
Total Suspended Solids	0	0	0	1	0

4.14.5.4 Middle Snake-Succor Subbasin

4.14.5.4.1 Water Quality Limited Assessment Units

Table 318: Number of water quality limited assessment units in the Middle Snake-Succor Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	1

4.14.5.4.2 Status

There are 3 assessment units within the Middle Snake-Succor Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 319 and Figure 216 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 319: Summary of the 2016–2019 assessment unit status within the Middle Snake-Succor Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	1
Escherichia coli	0	2	0
PH	1	0	2
Temperature	0	0	1
Total Phosphorus	0	1	0
Total Suspended Solids	0	2	0

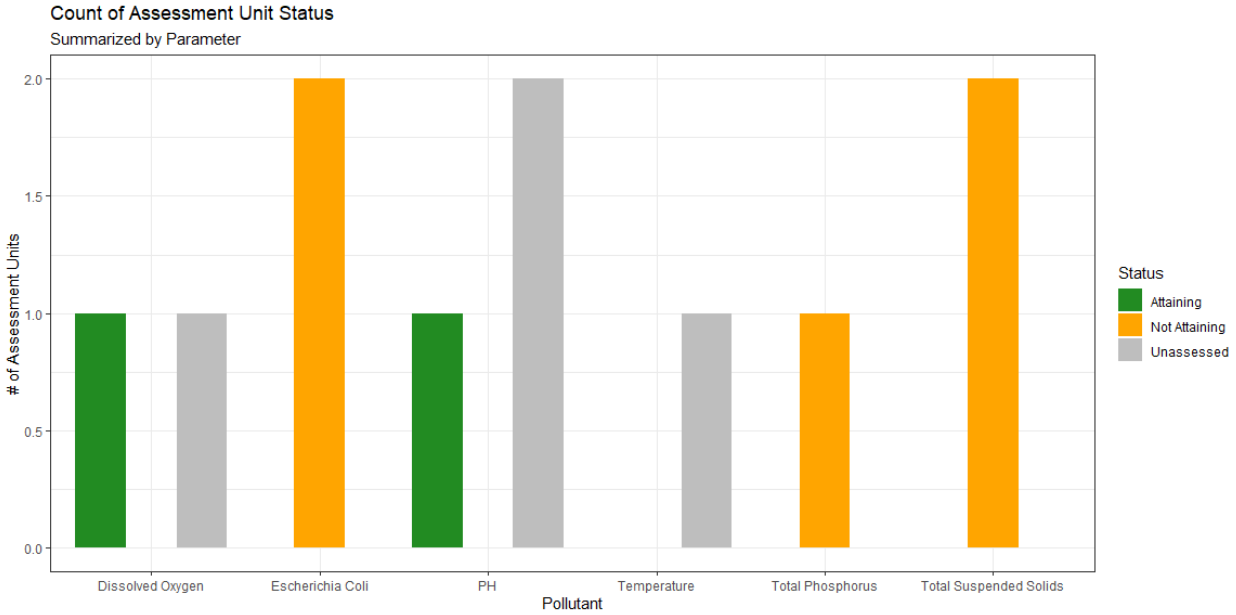

Figure 216: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Succor Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 320 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Snake-Succor Subbasin for the 2016 – 2019 status period.

Table 320: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Succor Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	1
Stream	*Escherichia coli*	0	1	0
Stream	PH	1	0	1
Stream	Temperature	0	0	1
Stream	Total Phosphorus	0	1	0
Stream	Total Suspended Solids	0	1	0
Watershed Unit	*Escherichia coli*	0	1	0
Watershed Unit	PH	0	0	1
Watershed Unit	Total Suspended Solids	0	1	0

There are 3 stations within the Middle Snake-Succor Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix M**. Table 321 and Figure 217 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 321: Summary of the 2016–2019 status at monitoring stations within the Middle Snake-Succor Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	1
Escherichia coli	0	2	0
PH	0	0	3
Temperature	0	0	1
Total Suspended Solids	0	2	0

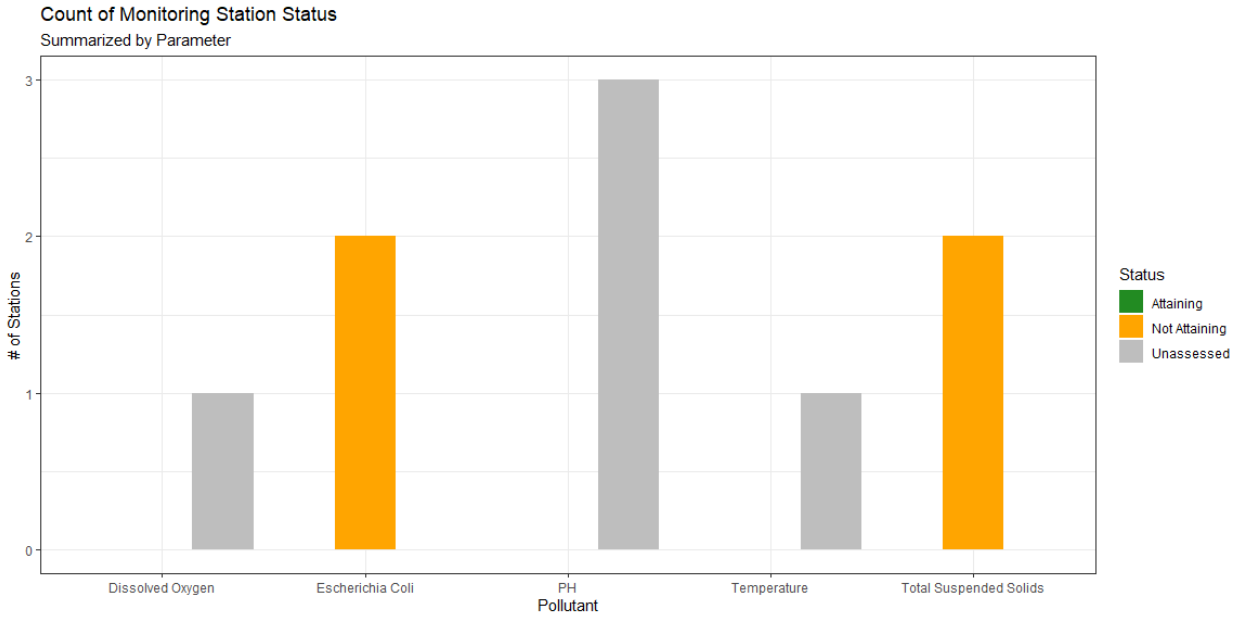

Figure 217: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Snake-Succor Subbasin.

4.14.5.4.3 Trend

A summary of the trends within parameters is shown in Table 322. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 322: Subbasin Summary of trend results at stations across the Middle Snake-Succor.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	1
Escherichia coli	1	0	0	1	0
PH	0	1	0	1	1
Temperature	0	0	0	0	1
Total Suspended Solids	2	0	0	0	0

4.14.5.5 Crooked-Rattlesnake Subbasin

4.14.5.5.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.14.5.5.2 Status

There are 1 assessment units within the Crooked-Rattlesnake Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 323 and Figure 218 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 323: Summary of the 2016–2019 assessment unit status within the Crooked-Rattlesnake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
Escherichia coli	0	1	0
PH	1	0	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

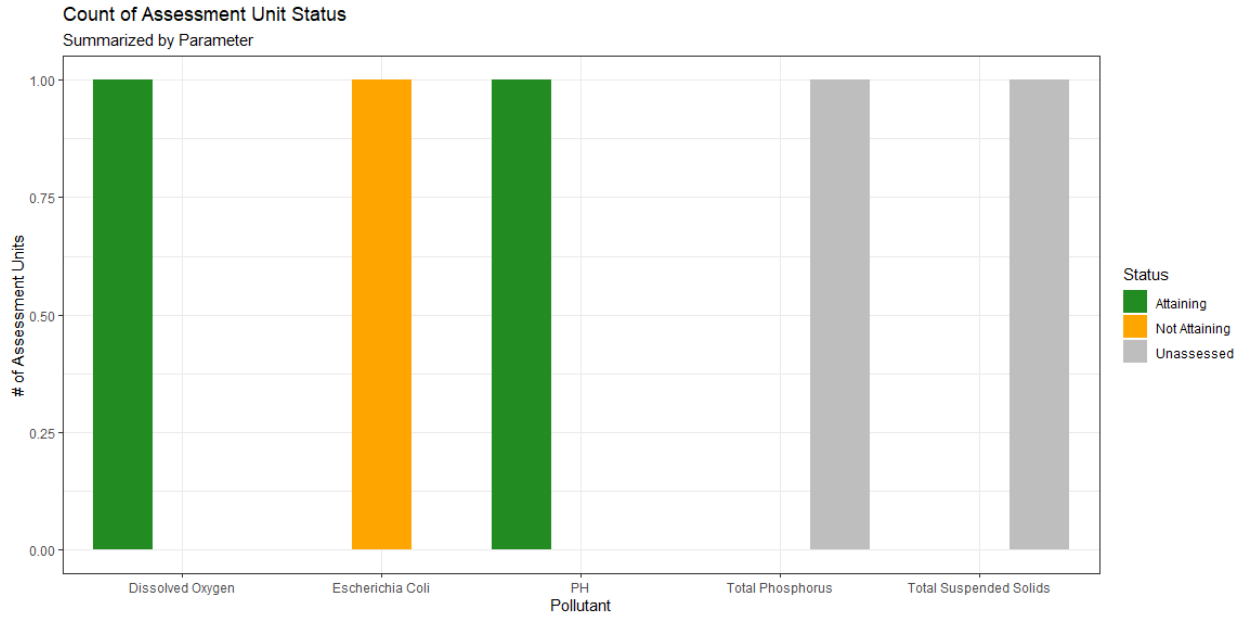

Figure 218: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Crooked-Rattlesnake Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 324 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Crooked-Rattlesnake Subbasin for the 2016 – 2019 status period.

Table 324: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Crooked-Rattlesnake Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	0
Stream	*Escherichia coli*	0	1	0
Stream	PH	1	0	0
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1

There are 1 stations within the Crooked-Rattlesnake Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix M**. Table 325 and Figure 219 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 325: Summary of the 2016–2019 status at monitoring stations within the Crooked-Rattlesnake Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	0
Escherichia coli	0	1	0
PH	1	0	0
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

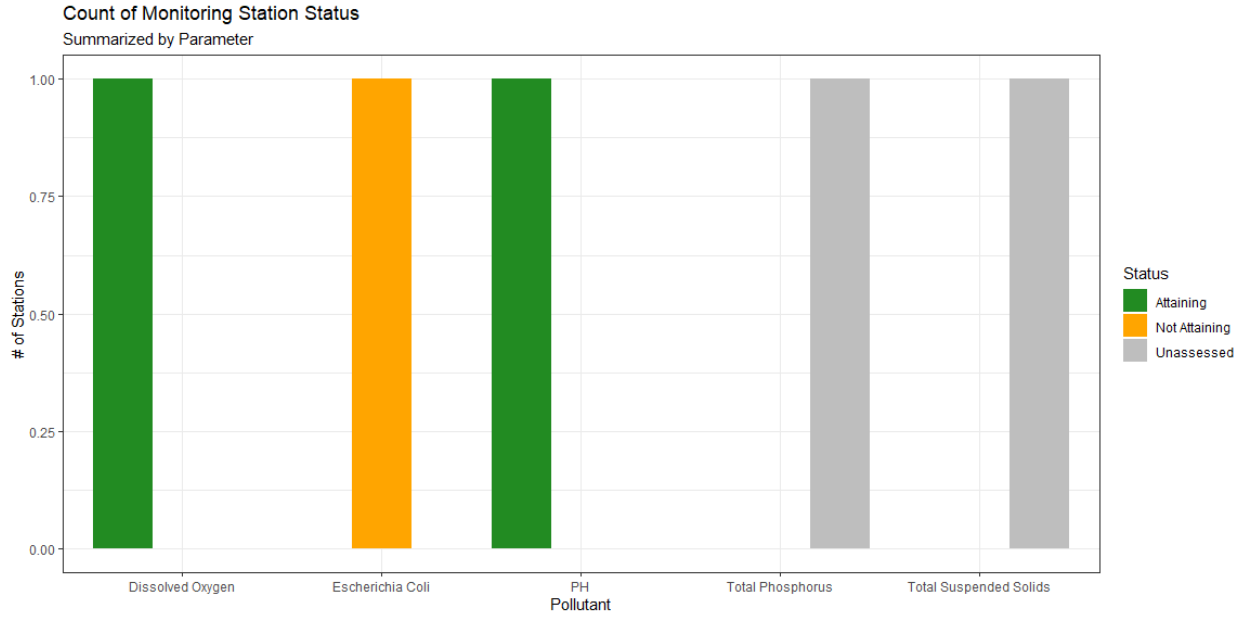

Figure 219: The number of stations in each status category by parameter for the 2016–2019 status period within the Crooked-Rattlesnake Subbasin.

4.14.5.5.3 Trend

A summary of the trends within parameters is shown in Table 326. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 326: Subbasin Summary of trend results at stations across the Crooked-Rattlesnake.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	0
Escherichia coli	0	0	0	0	1
PH	0	1	0	0	0
Total Phosphorus	0	0	1	0	0
Total Suspended Solids	1	0	0	0	0

4.15 Powder-Burnt

A summary of status and trend results for the Powder-Burnt and all subbasins within the Powder-Burnt are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix N**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Powder-Burnt are water quality limited for 4 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 340 stations within the Powder-Burnt. These stations were located across 85 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.15.1 Land Use

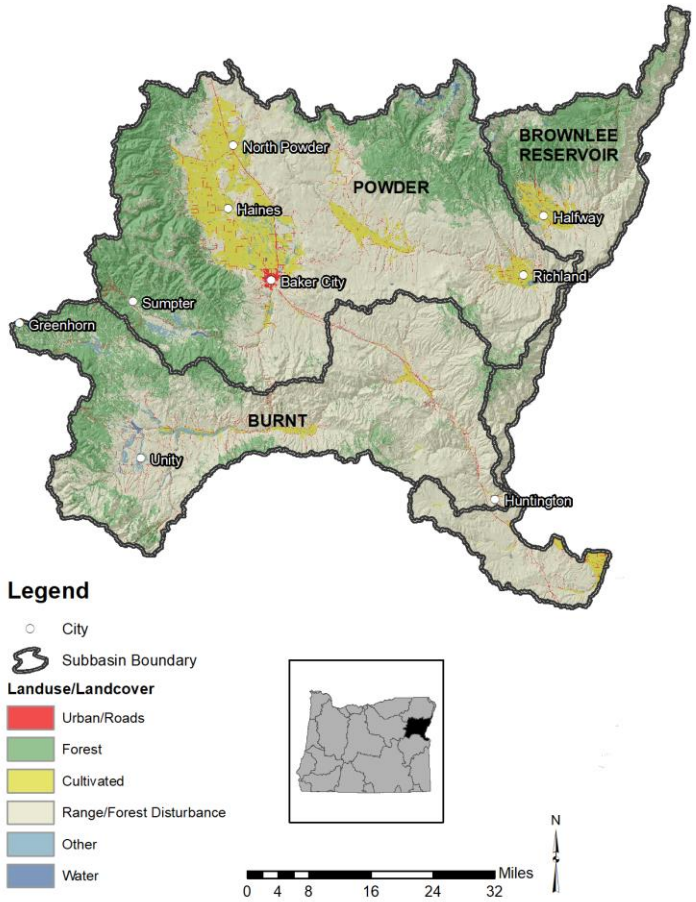

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 327: Land use within the Powder-Burnt Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Brownlee Reservoir	1630	1.2	24.2	5.4	68.6	0.6
Burnt	2848	1.3	21.7	1.3	74.3	1.4
Powder	4423	1.7	32.0	10.1	54.6	1.7

4.15.2 Parameter Maps

The maps in Figure 220 through Figure 225 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

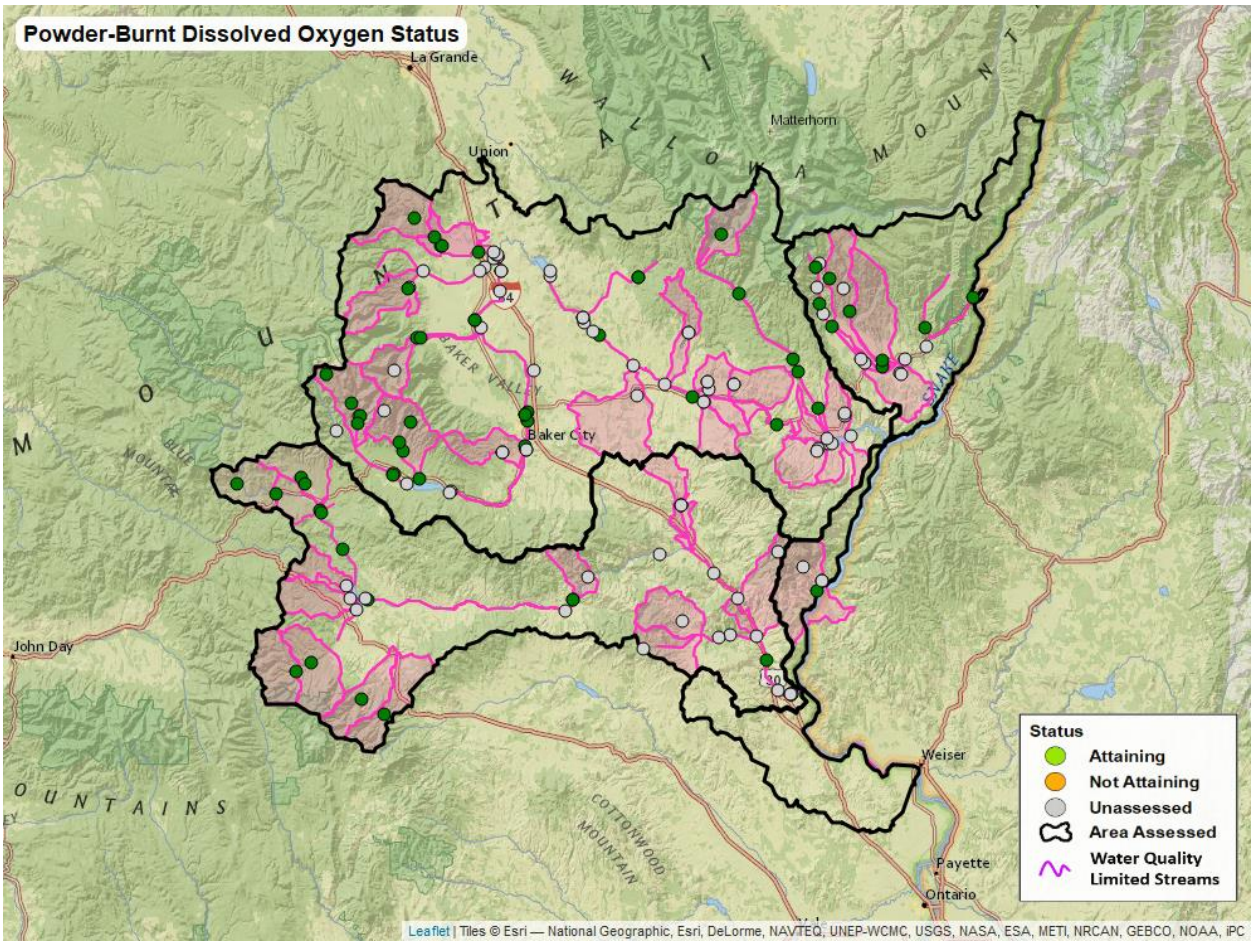

Figure 220: Summary map of the status of dissolved oxygen across the Powder-Burnt.

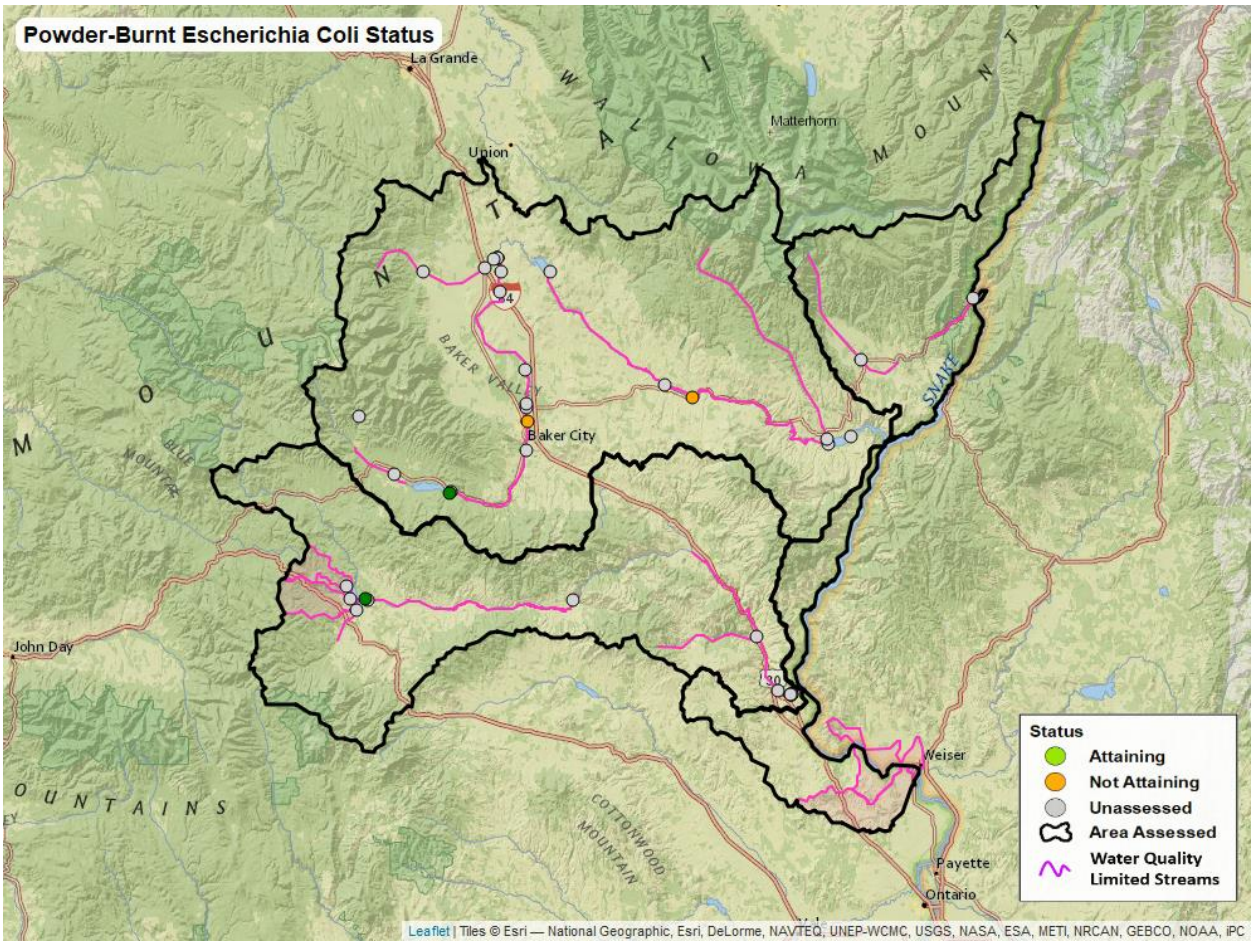

Figure 221: Summary map of the status of *Escherichia coli* across the Powder-Burnt.

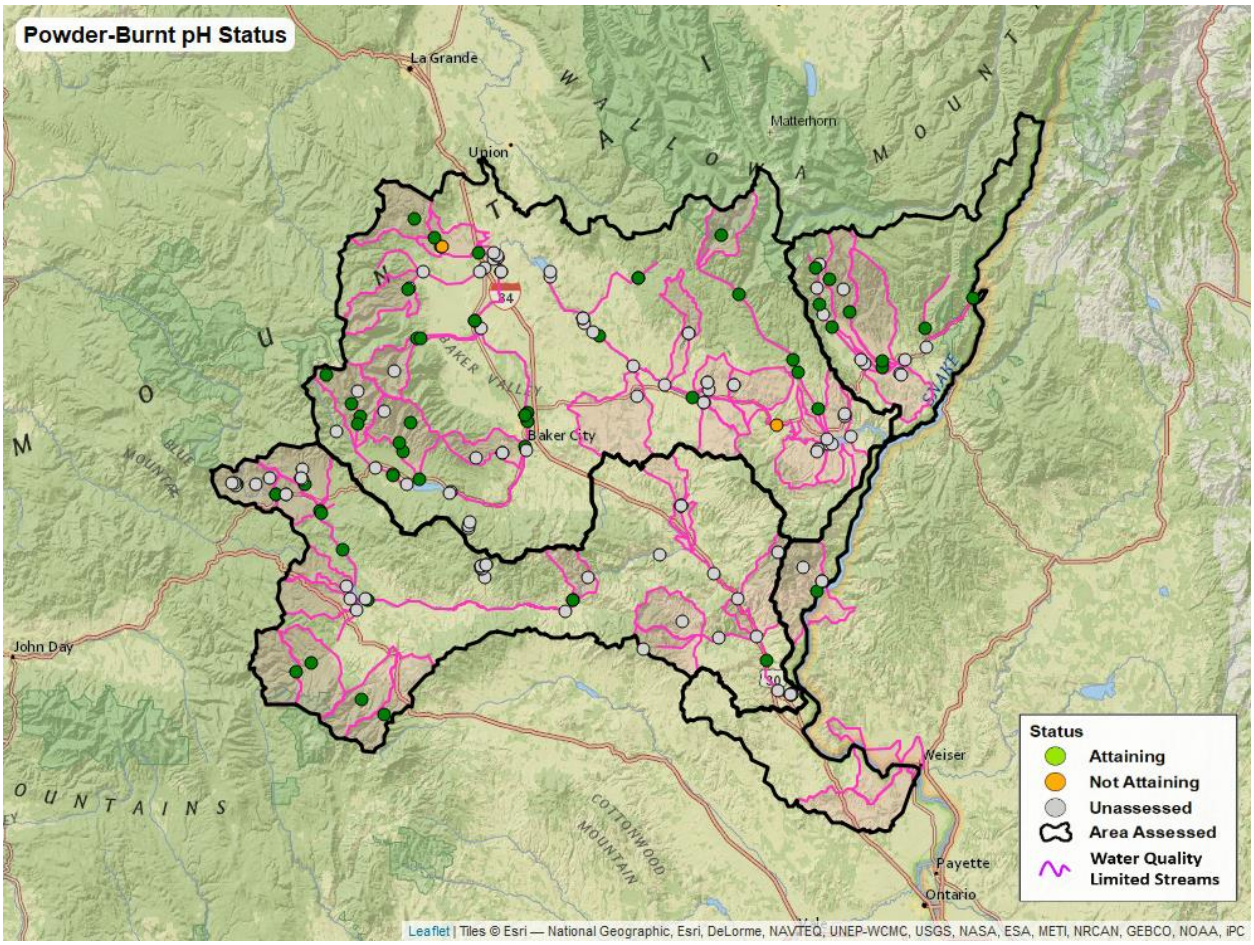

Figure 222: Summary map of the status of pH across the Powder-Burnt.

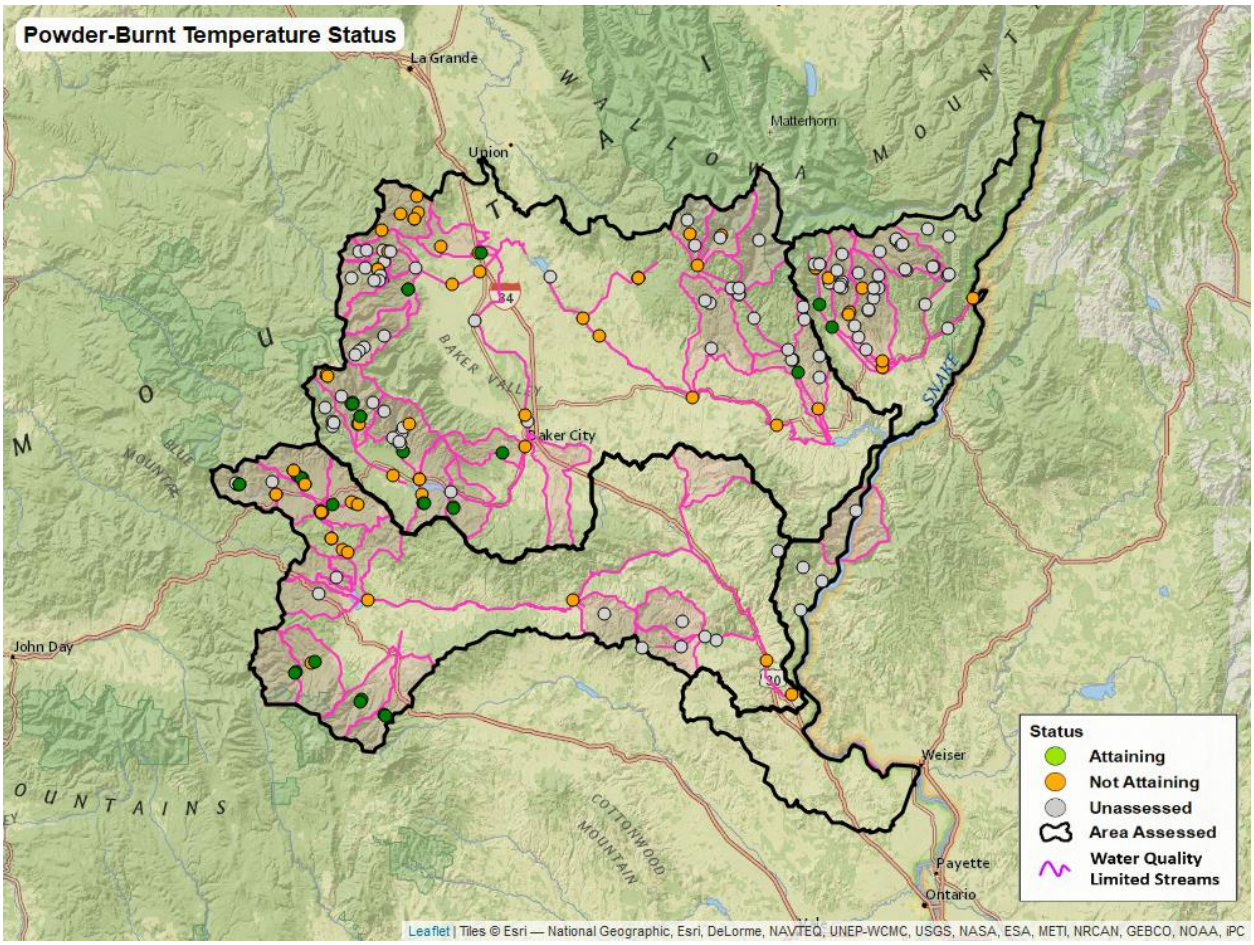

Figure 223: Summary map of the status of temperature across the Powder-Burnt.

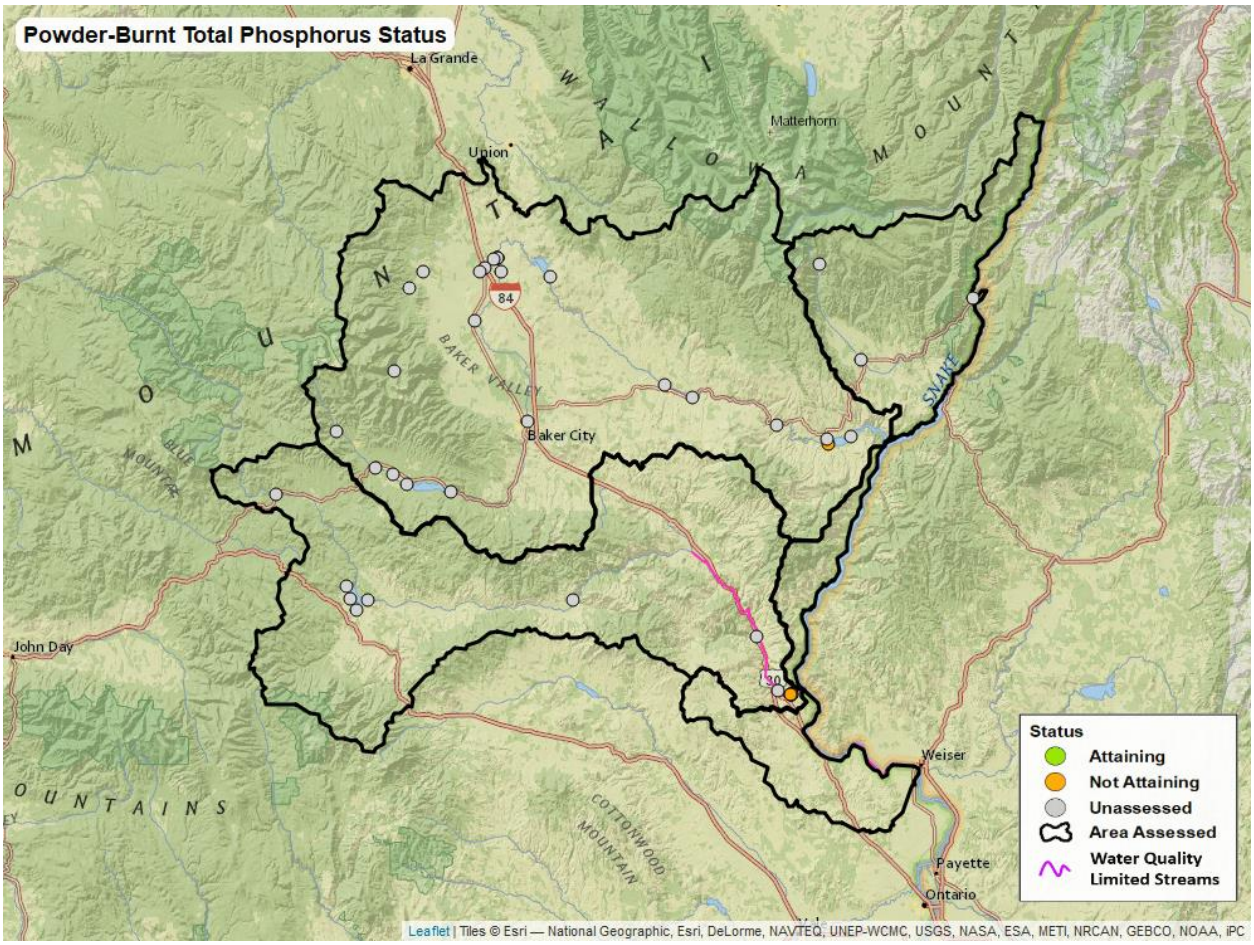

Figure 224: Summary map of the status of total phosphorus across the Powder-Burnt.

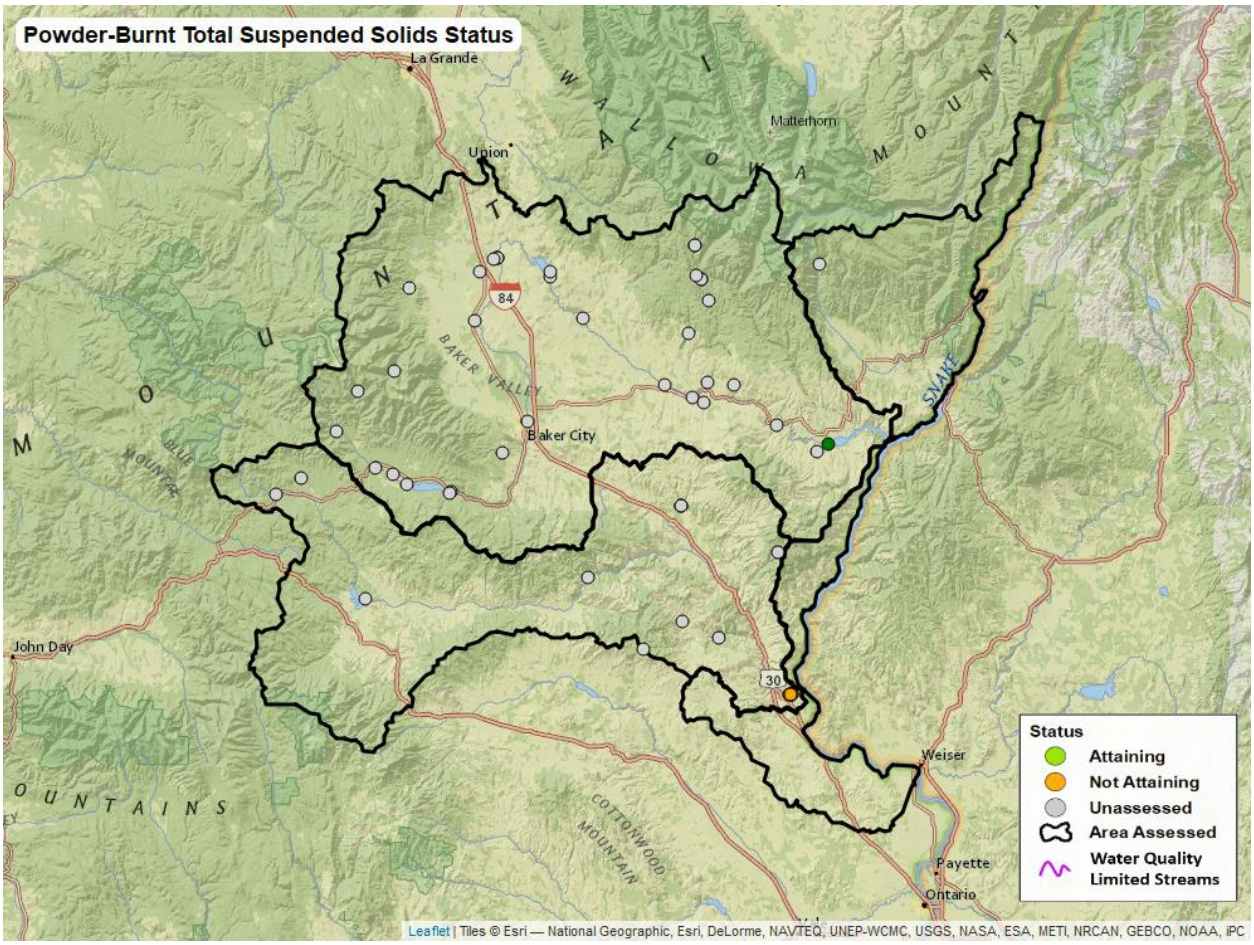

Figure 225: Summary map of the status of total suspended solids across the Powder-Burnt.

4.15.3 Status

There are 85 assessment units within the Powder-Burnt containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 328 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 328: Summary of the 2016–2019 assessment unit status within the Powder-Burnt.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	35	0	29
Escherichia coli	2	3	15
PH	33	2	31
Temperature	7	32	24
Total Phosphorus	0	2	23
Total Suspended Solids	1	1	33

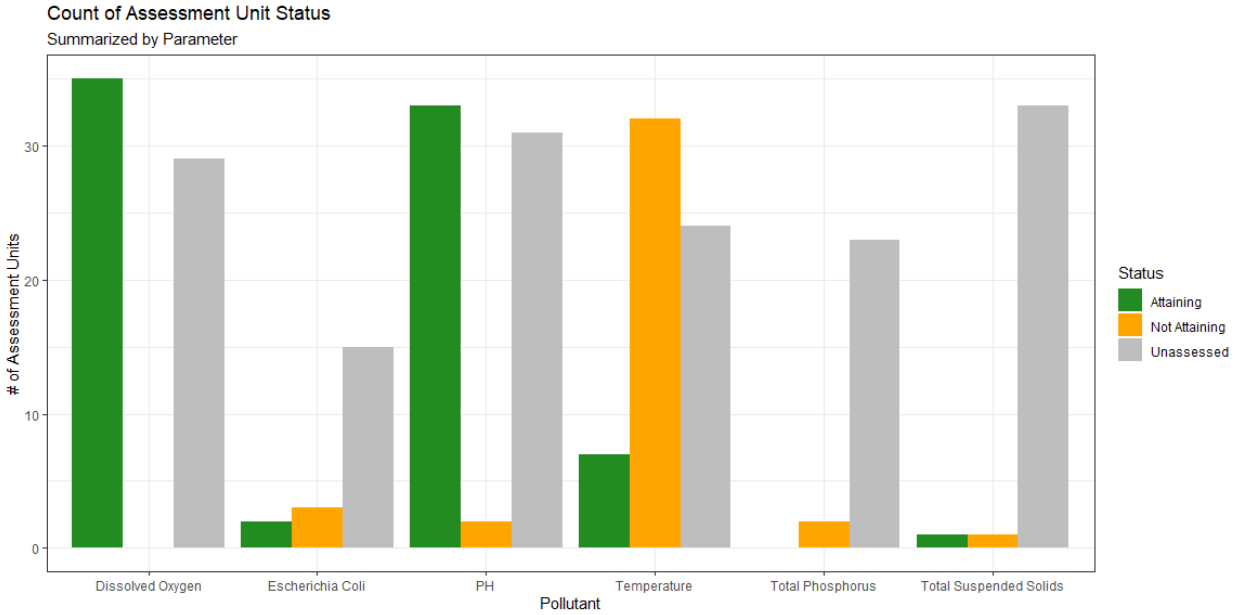

Figure 226: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Powder-Burnt.

Table 329 and Figure 226 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Powder-Burnt for the 2016–2019 status period.

Table 329: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Powder-Burnt.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	17	0	9
Stream	*Escherichia coli*	2	3	12
Stream	PH	16	1	9
Stream	Temperature	0	17	7
Stream	Total Phosphorus	0	2	14
Stream	Total Suspended Solids	1	1	11
Watershed Unit	Dissolved Oxygen	18	0	18
Watershed Unit	*Escherichia coli*	0	0	2
Watershed Unit	PH	17	1	20
Watershed Unit	Temperature	7	15	17
Watershed Unit	Total Phosphorus	0	0	7
Watershed Unit	Total Suspended Solids	0	0	21

Table 330 and Figure 227 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix N.

Table 330: Summary of the 2016–2019 status at monitoring stations within the Powder-Burnt.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	58	0	93
Escherichia coli	2	3	34
PH	56	2	111
Temperature	33	71	101
Total Phosphorus	0	3	38
Total Suspended Solids	1	2	51

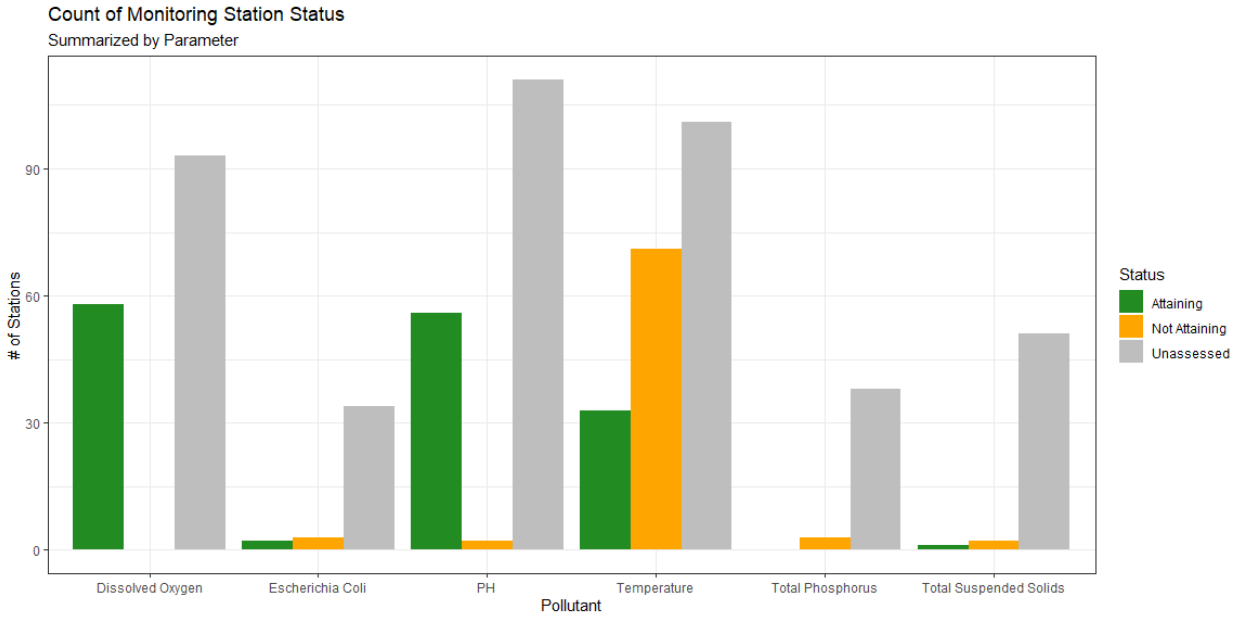

Figure 227: Summary plot of the 2016–2019 station status within the Powder-Burnt by parameter.

4.15.4 Trend

A summary of the trends across parameters is shown in Table 331. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 331: Powder-Burnt summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	2	148
Escherichia coli	0	2	0	1	36
PH	0	2	0	1	166
Temperature	0	0	0	0	205

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	2	38
Total Suspended Solids	0	0	0	3	51

4.15.5 Subbasin Summary

4.15.5.1 Powder Subbasin

4.15.5.1.1 Water Quality Limited Assessment Units

Table 332: Number of water quality limited assessment units in the Powder Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1

4.15.5.1.2 Status

There are 44 assessment units within the Powder Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 333 and Figure 228 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 333: Summary of the 2016–2019 assessment unit status within the Powder Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	17	0	15
Escherichia coli	1	2	8
PH	15	2	15
Temperature	3	19	9
Total Phosphorus	0	1	13
Total Suspended Solids	1	0	22

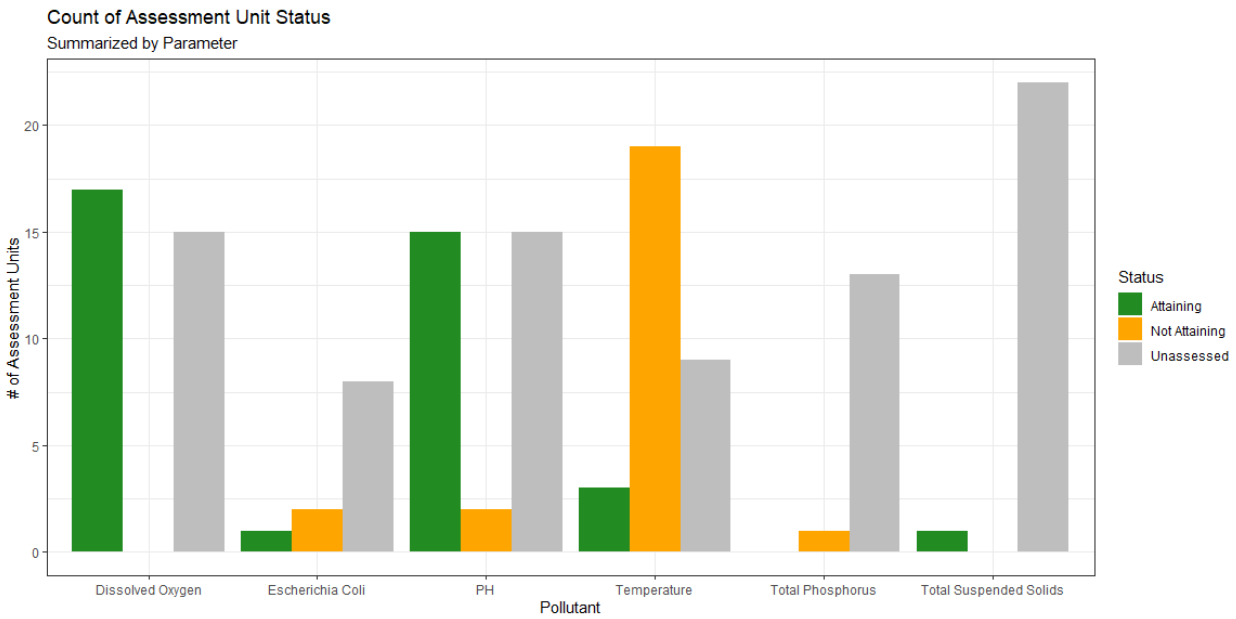

Figure 228: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Powder Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 334 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Powder Subbasin for the 2016 – 2019 status period.

Table 334: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Powder Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	9	0	4
Stream	*Escherichia coli*	1	2	7
Stream	PH	8	1	4
Stream	Temperature	0	10	3
Stream	Total Phosphorus	0	1	8
Stream	Total Suspended Solids	1	0	8
Watershed Unit	Dissolved Oxygen	8	0	9
Watershed Unit	PH	7	1	9
Watershed Unit	Temperature	3	9	6
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	13

There are 179 stations within the Powder Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix N**. Table 335 and Figure 229 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 335: Summary of the 2016–2019 status at monitoring stations within the Powder Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	33	0	56
Escherichia coli	1	2	21
PH	31	2	57
Temperature	17	37	50
Total Phosphorus	0	1	24
Total Suspended Solids	1	0	34

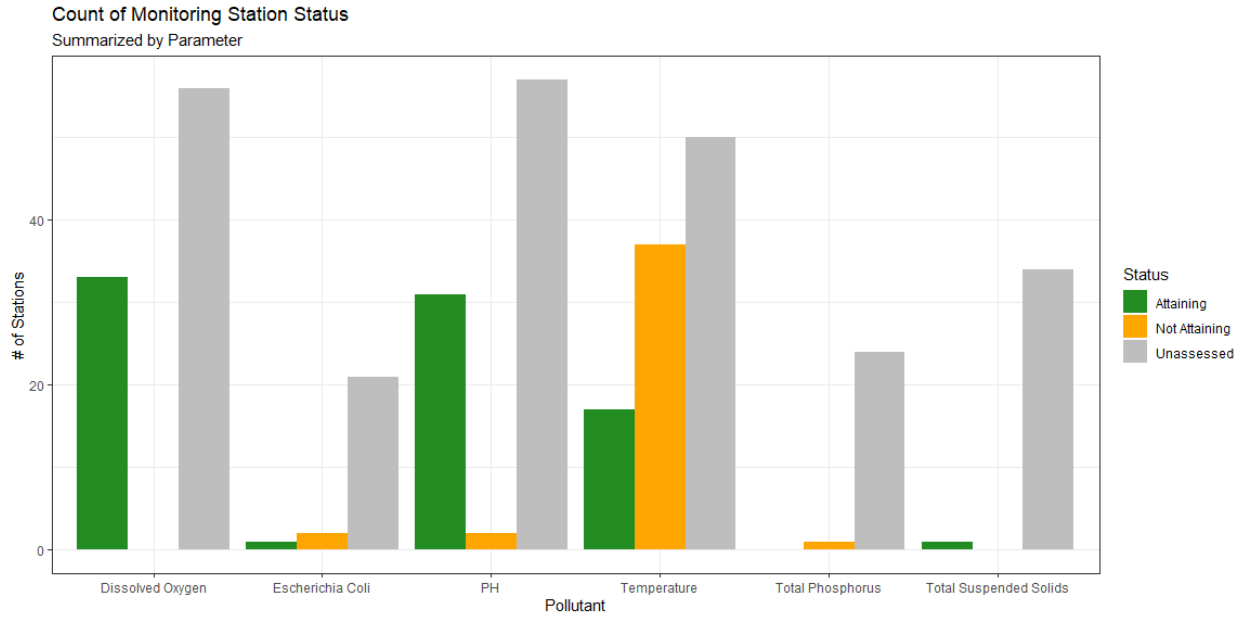

Figure 229: The number of stations in each status category by parameter for the 2016–2019 status period within the Powder Subbasin.

4.15.5.1.3 Trend

A summary of the trends within parameters is shown in Table 336. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 336: Subbasin Summary of trend results at stations across the Powder.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	87
Escherichia coli	0	1	0	1	22
PH	0	1	0	1	88
Temperature	0	0	0	0	104

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	1	23
Total Suspended Solids	0	0	0	2	33

4.15.5.2 Burnt Subbasin

4.15.5.2.1 Water Quality Limited Assessment Units

Table 337: Number of water quality limited assessment units in the Burnt Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	1
Total Phosphorus, mixed forms	1

4.15.5.2.2 Status

There are 27 assessment units within the Burnt Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 338 and Figure 230 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 338: Summary of the 2016–2019 assessment unit status within the Burnt Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	12	0	11
Escherichia coli	1	1	5
PH	12	0	13
Temperature	4	9	7
Total Phosphorus	0	1	7
Total Suspended Solids	0	1	10

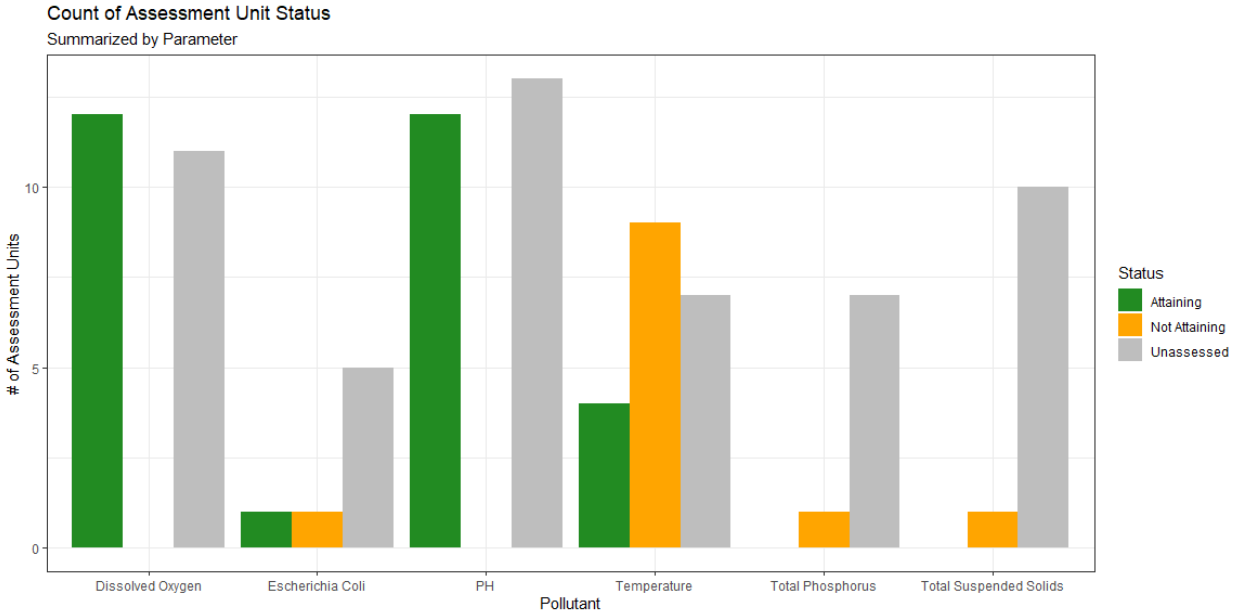

Figure 230: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Burnt Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 339 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Burnt Subbasin for the 2016 – 2019 status period.

Table 339: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Burnt Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	5	0	4
Stream	*Escherichia coli*	1	1	3
Stream	PH	5	0	4
Stream	Temperature	0	5	1
Stream	Total Phosphorus	0	1	4
Stream	Total Suspended Solids	0	1	3
Watershed Unit	Dissolved Oxygen	7	0	7
Watershed Unit	*Escherichia coli*	0	0	2
Watershed Unit	PH	7	0	9
Watershed Unit	Temperature	4	4	6
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	7

There are 93 stations within the Burnt Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix N**. Table 340 and Figure 231 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 340: Summary of the 2016–2019 status at monitoring stations within the Burnt Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	15	0	24
Escherichia coli	1	1	11
PH	15	0	41
Temperature	14	23	12
Total Phosphorus	0	2	11
Total Suspended Solids	0	2	16

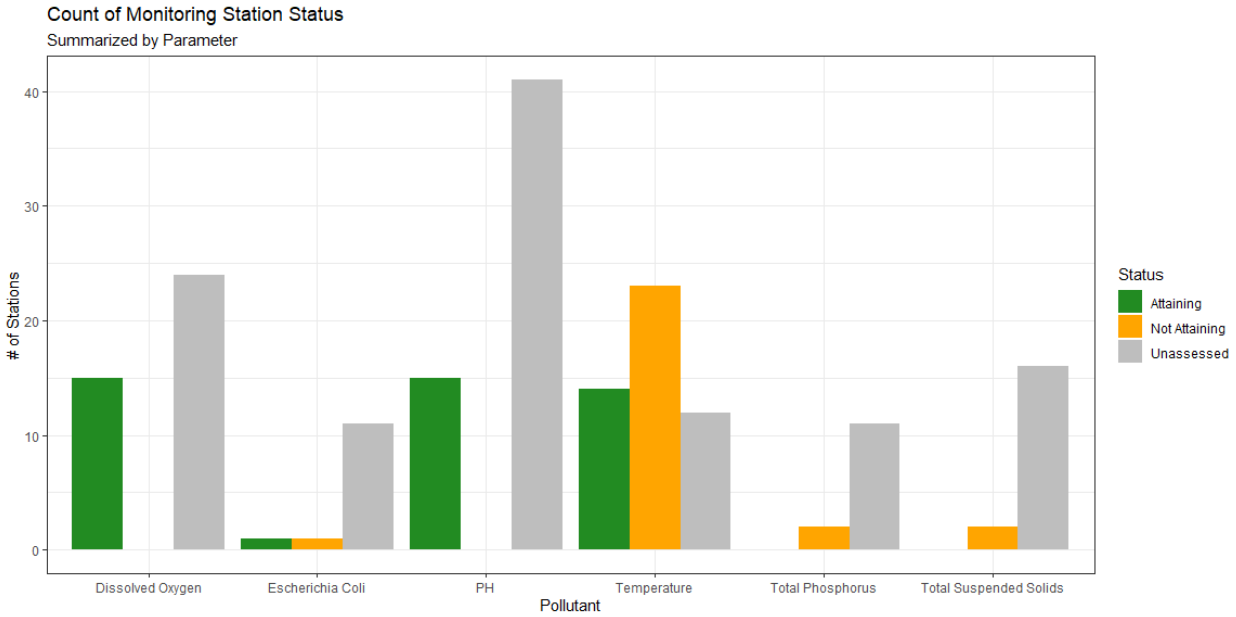

Figure 231: The number of stations in each status category by parameter for the 2016–2019 status period within the Burnt Subbasin.

4.15.5.2.3 Trend

A summary of the trends within parameters is shown in Table 341. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 341: Subbasin Summary of trend results at stations across the Burnt.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	0	38
Escherichia coli	0	1	0	0	12
PH	0	1	0	0	55
Temperature	0	0	0	0	49
Total Phosphorus	0	0	0	1	12
Total Suspended Solids	0	0	0	1	17

4.15.5.3 Brownlee Reservoir Subbasin

4.15.5.3.1 Water Quality Limited Assessment Units

Table 342: Number of water quality limited assessment units in the Brownlee Reservoir Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	4

4.15.5.3.2 Status

There are 14 assessment units within the Brownlee Reservoir Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 343 and Figure 232 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 343: Summary of the 2016–2019 assessment unit status within the Brownlee Reservoir Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	0	3
Escherichia coli	0	0	2
PH	6	0	3
Temperature	0	4	8
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	1

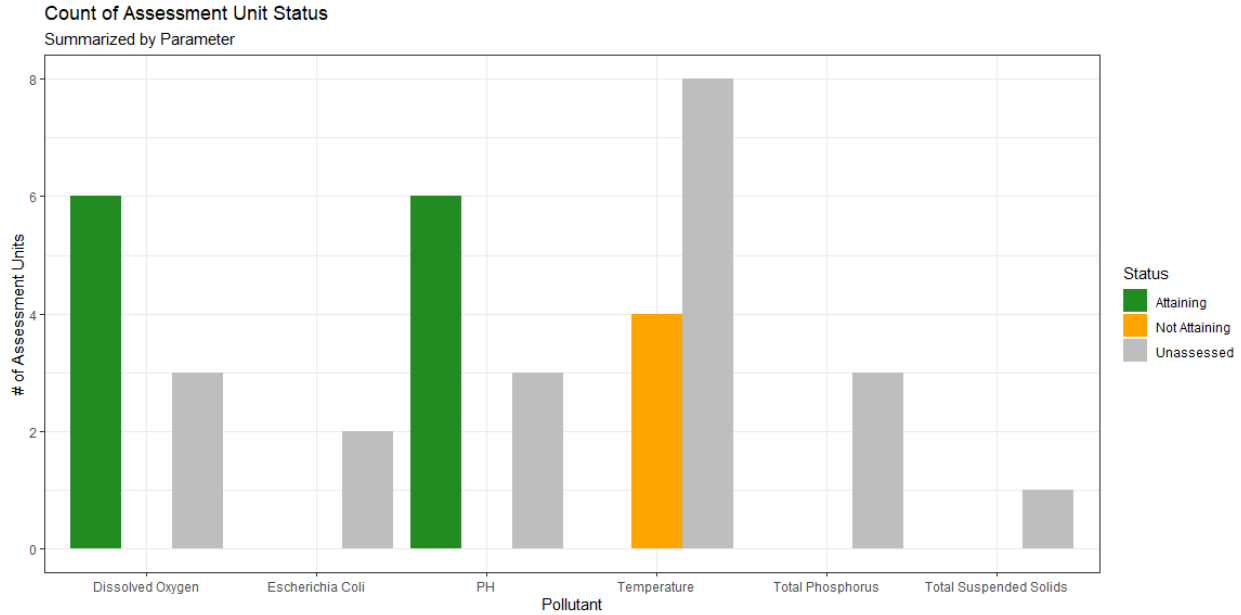

Figure 232: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Brownlee Reservoir Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 344 summarizes of the number of attaining, not attaining, and unassessed

assessment units by parameter and assessment unit type within the Brownlee Reservoir Subbasin for the 2016 – 2019 status period.

Table 344: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Brownlee Reservoir Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	3	0	1
Stream	*Escherichia coli*	0	0	2
Stream	PH	3	0	1
Stream	Temperature	0	2	3
Stream	Total Phosphorus	0	0	2
Watershed Unit	Dissolved Oxygen	3	0	2
Watershed Unit	PH	3	0	2
Watershed Unit	Temperature	0	2	5
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	1

There are 68 stations within the Brownlee Reservoir Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix N**. Table 345 and Figure 233 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 345: Summary of the 2016–2019 status at monitoring stations within the Brownlee Reservoir Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	10	0	13
Escherichia coli	0	0	2
PH	10	0	13
Temperature	2	11	39
Total Phosphorus	0	0	3
Total Suspended Solids	0	0	1

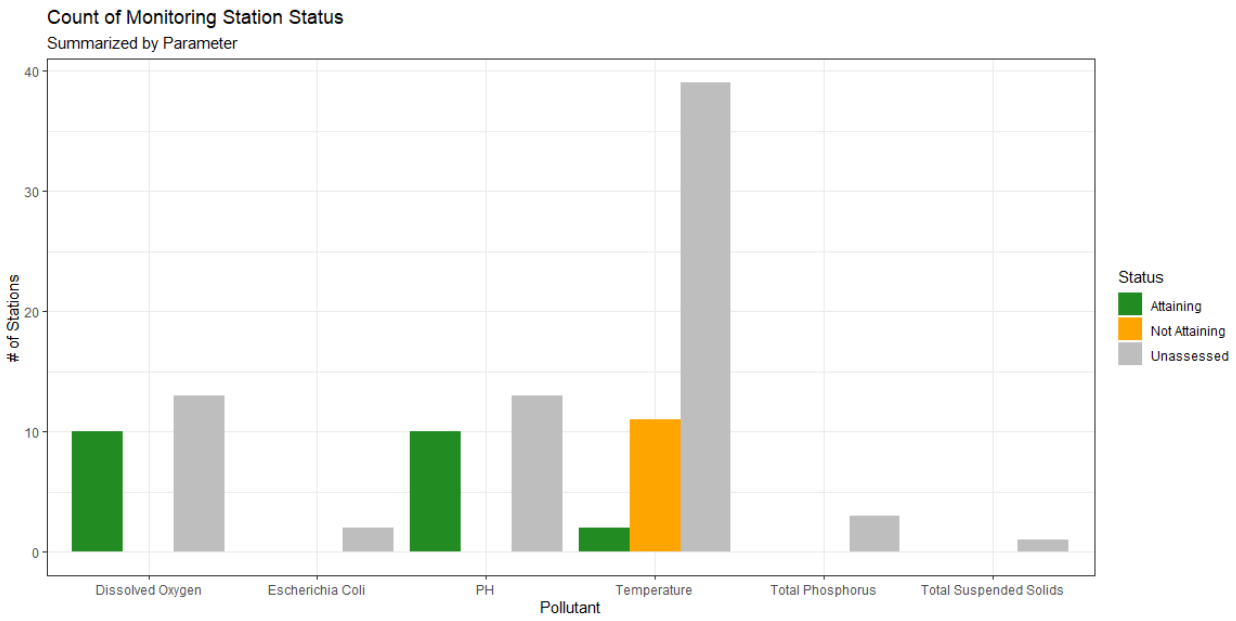

Figure 233: The number of stations in each status category by parameter for the 2016–2019 status period within the Brownlee Reservoir Subbasin.

4.15.5.3.3 Trend

A summary of the trends within parameters is shown in Table 346. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 346: Subbasin Summary of trend results at stations across the Brownlee Reservoir.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	23
Escherichia coli	0	0	0	0	2
PH	0	0	0	0	23
Temperature	0	0	0	0	52
Total Phosphorus	0	0	0	0	3
Total Suspended Solids	0	0	0	0	1

4.16 Rogue Basin

A summary of status and trend results for the Rogue Basin and all subbasins within the Rogue Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix O**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Rogue Basin are water quality limited for 4 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 423 stations within the Rogue Basin. These stations were located across 158 assessment units consisting of 'Lakes', 'Streams', 'Watershed Units' and 'Estuary or Bays'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.16.1 Land Use

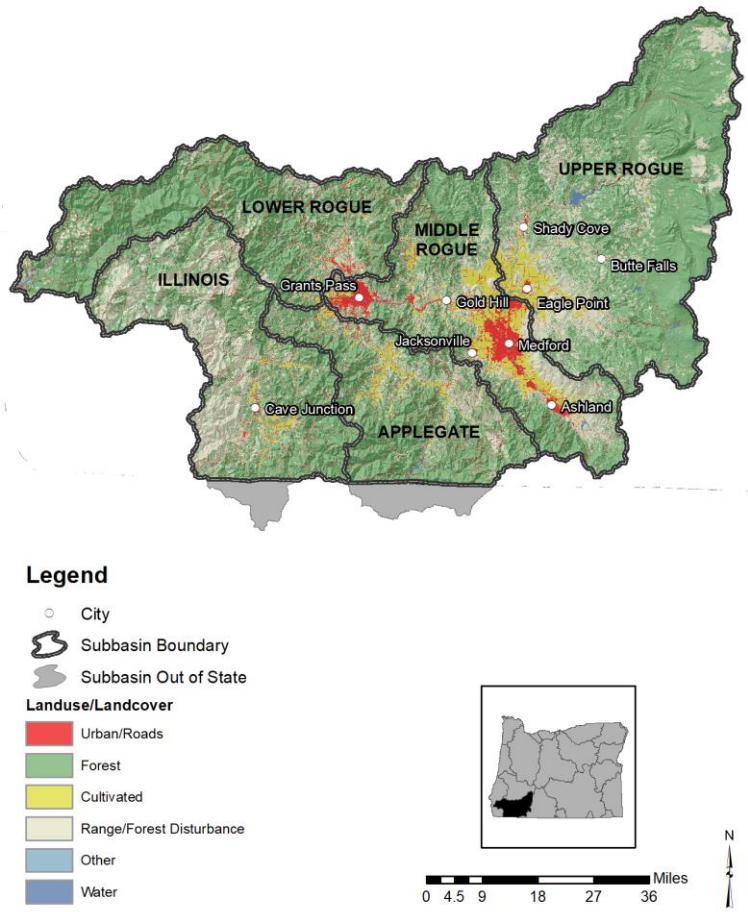

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 347: Land use within the Rogue Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Upper Rogue	4183	1.3	68.6	3.5	25.6	1.1
Middle Rogue	2285	11.5	49.0	12.3	26.4	0.7
Applegate	1760	5.3	68.1	4.2	21.5	0.8

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Rogue	2349	5.3	78.0	0.8	14.9	1.1
Illinois	2412	3.5	50.4	1.8	43.6	0.7

4.16.2 Parameter Maps

The maps in Figure 234 through Figure 239 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

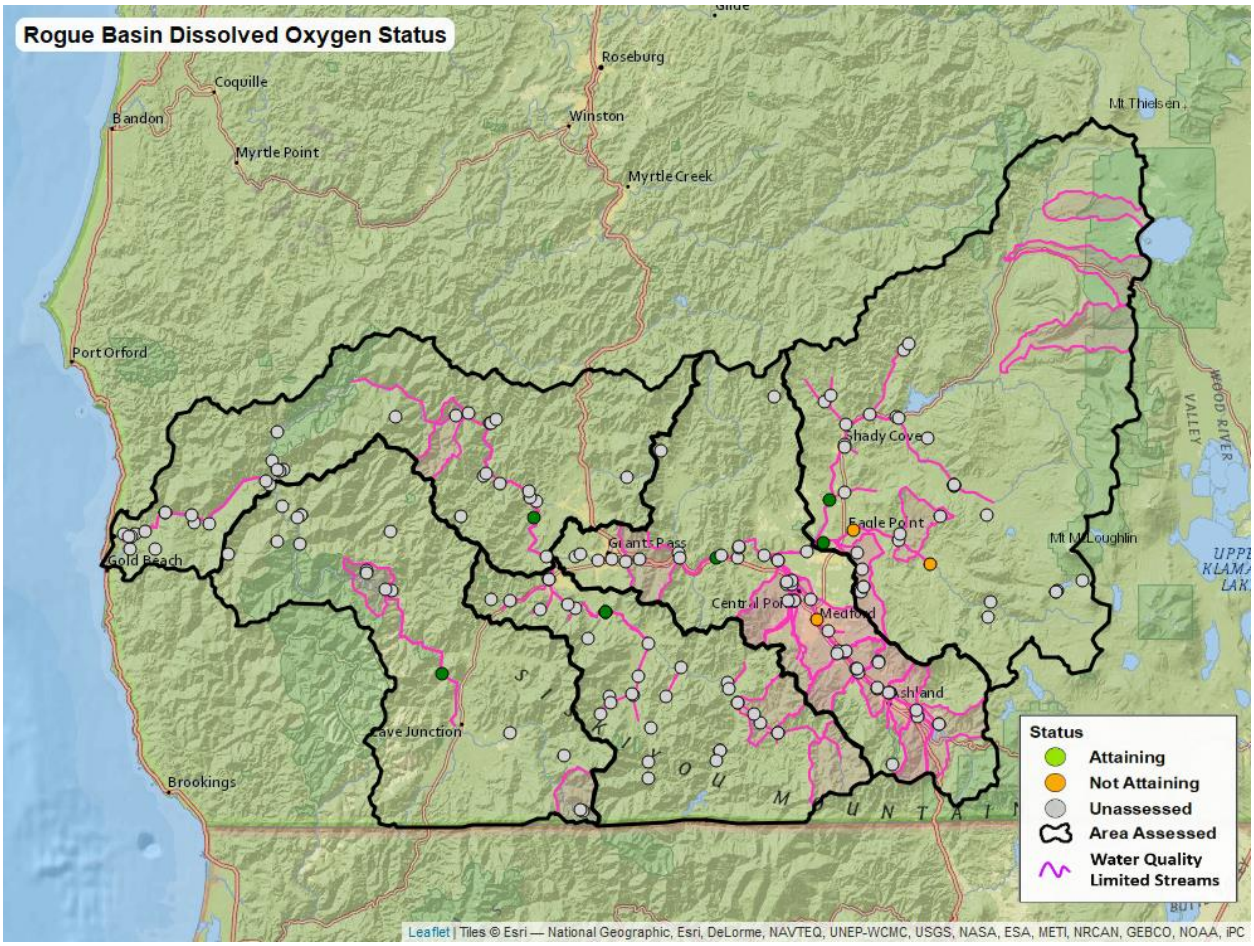

Figure 234: Summary map of the status of dissolved oxygen across the Rogue Basin.

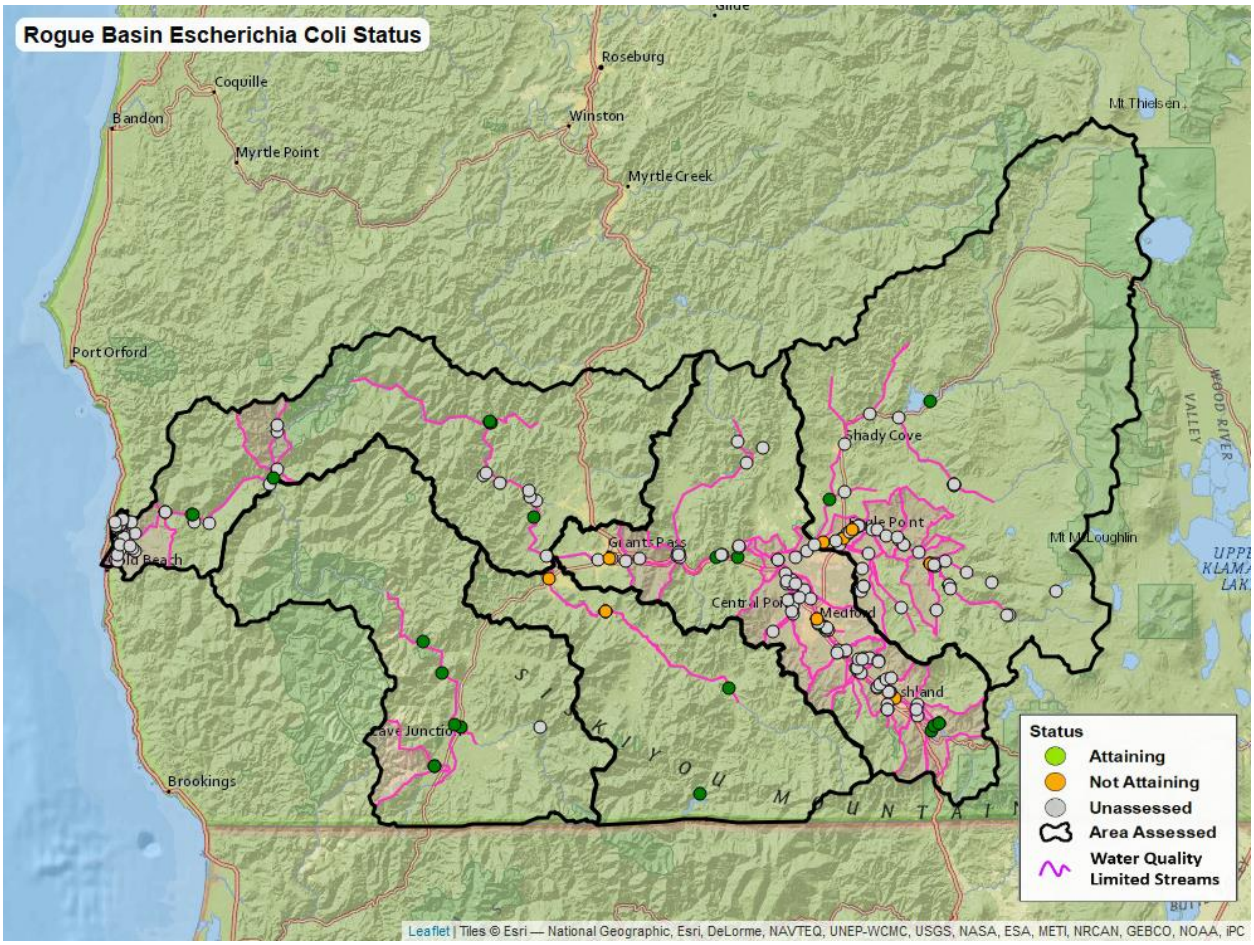

Figure 235: Summary map of the status of *Escherichia coli* across the Rogue Basin.

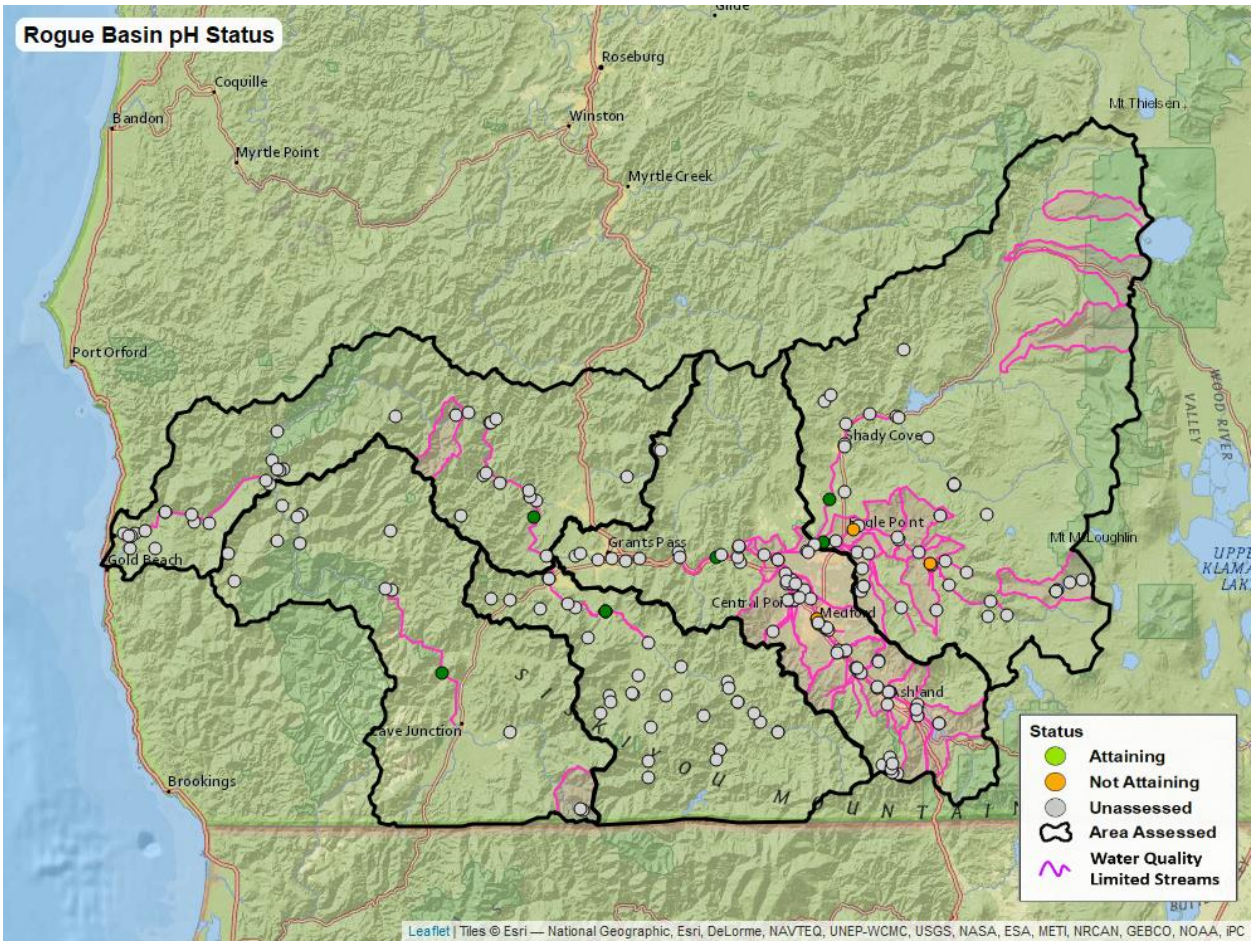

Figure 236: Summary map of the status of pH across the Rogue Basin.

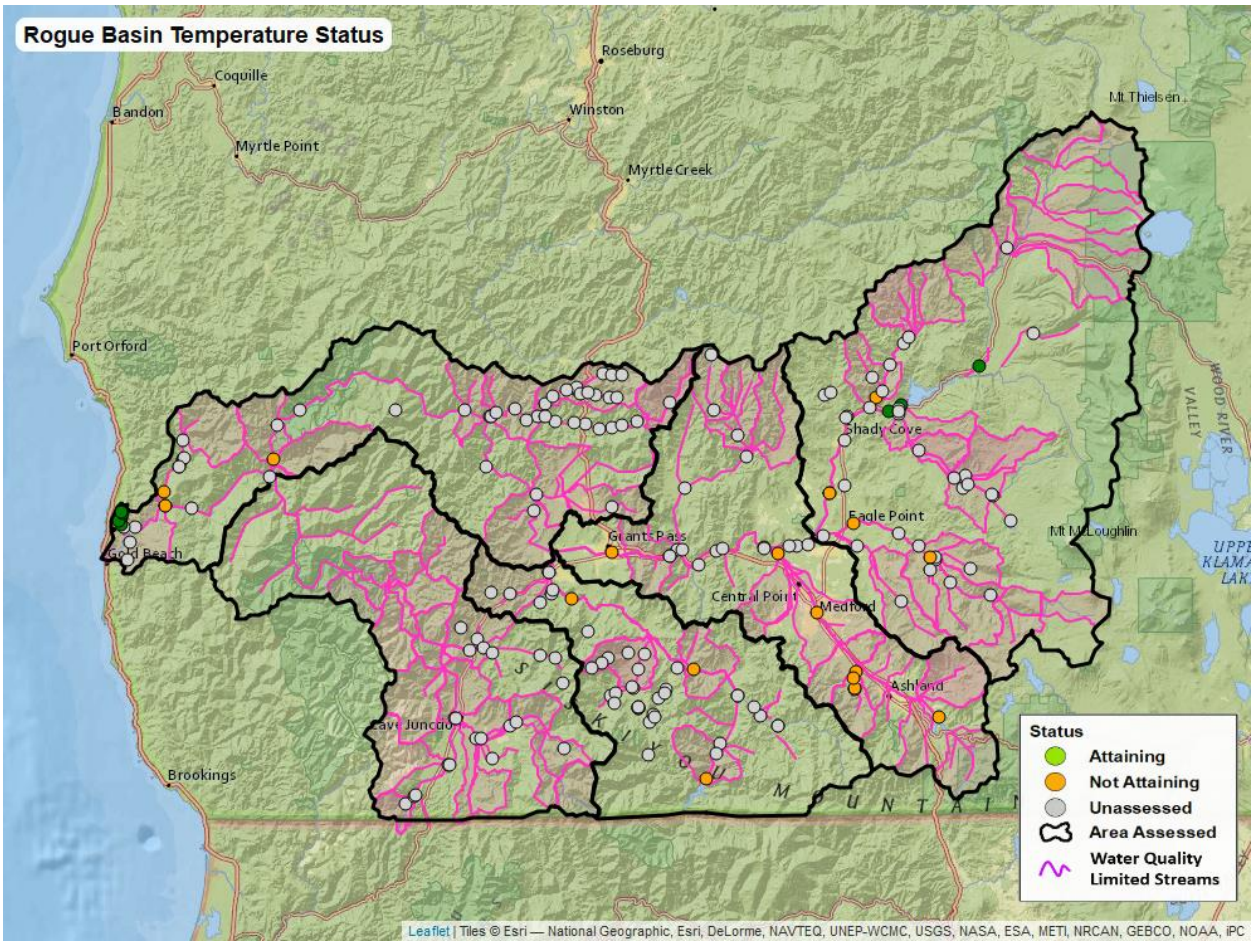

Figure 237: Summary map of the status of temperature across the Rogue Basin.

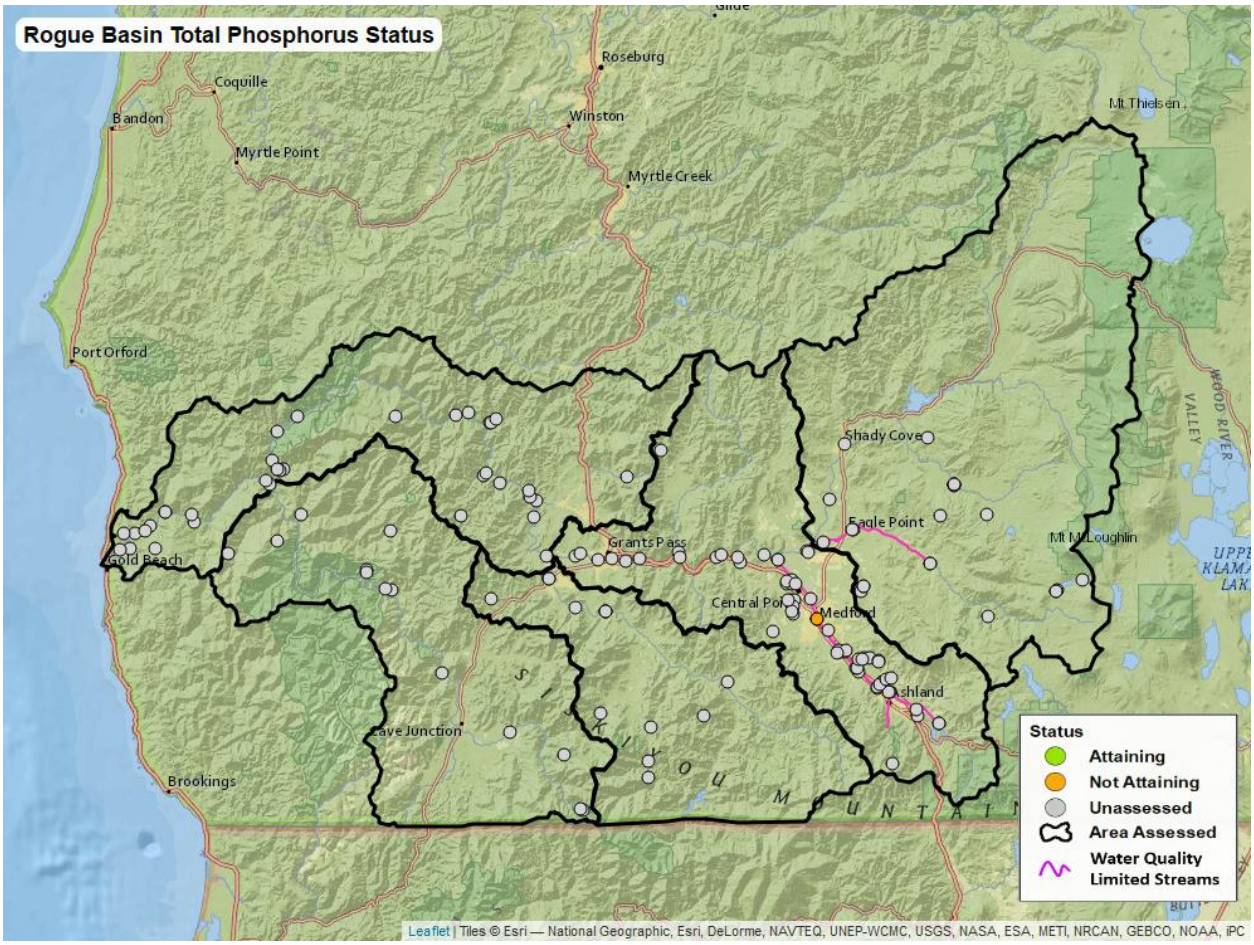

Figure 238: Summary map of the status of total phosphorus across the Rogue Basin.

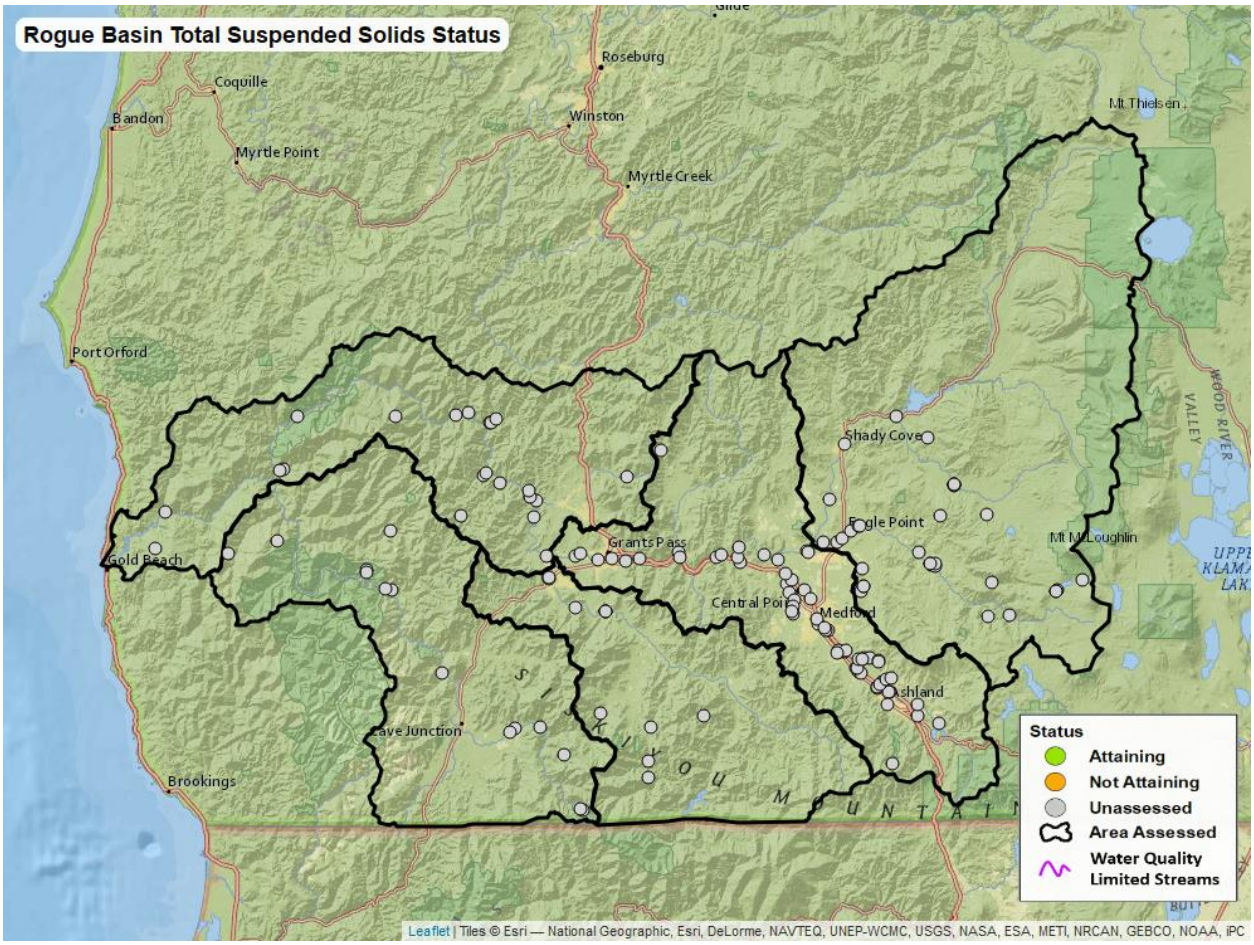

Figure 239: Summary map of the status of total suspended solids across the Rogue Basin.

4.16.3 Status

There are 158 assessment units within the Rogue Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 348 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 348: Summary of the 2016–2019 assessment unit status within the Rogue Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	6	3	91
Escherichia coli	19	6	44
PH	6	3	98
Temperature	4	14	78
Total Phosphorus	0	1	74
Total Suspended Solids	0	0	72

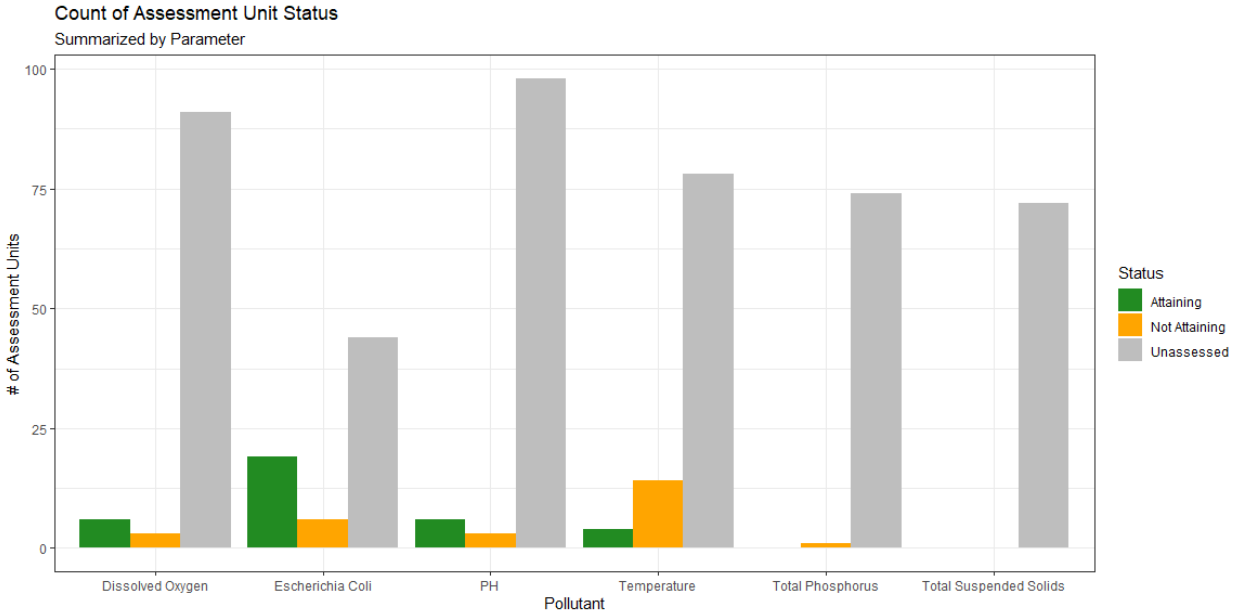

Figure 240: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Rogue Basin.

Table 349 and Figure 240 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Rogue Basin for the 2016–2019 status period.

Table 349: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Rogue Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	*Escherichia coli*	0	0	1
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	3	0	1
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	6	3	53
Stream	*Escherichia coli*	12	6	24
Stream	PH	6	3	56
Stream	Temperature	3	14	60
Stream	Total Phosphorus	0	1	37
Stream	Total Suspended Solids	0	0	37
Watershed Unit	Dissolved Oxygen	0	0	36
Watershed Unit	*Escherichia coli*	4	0	18
Watershed Unit	PH	0	0	40
Watershed Unit	Temperature	1	0	18
Watershed Unit	Total Phosphorus	0	0	36

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	33

Table 350 and Figure 241 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix O.

Table 350: Summary of the 2016–2019 status at monitoring stations within the Rogue Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	5	157
Escherichia coli	25	15	163
PH	8	5	189
Temperature	9	19	163
Total Phosphorus	0	2	142
Total Suspended Solids	0	0	140

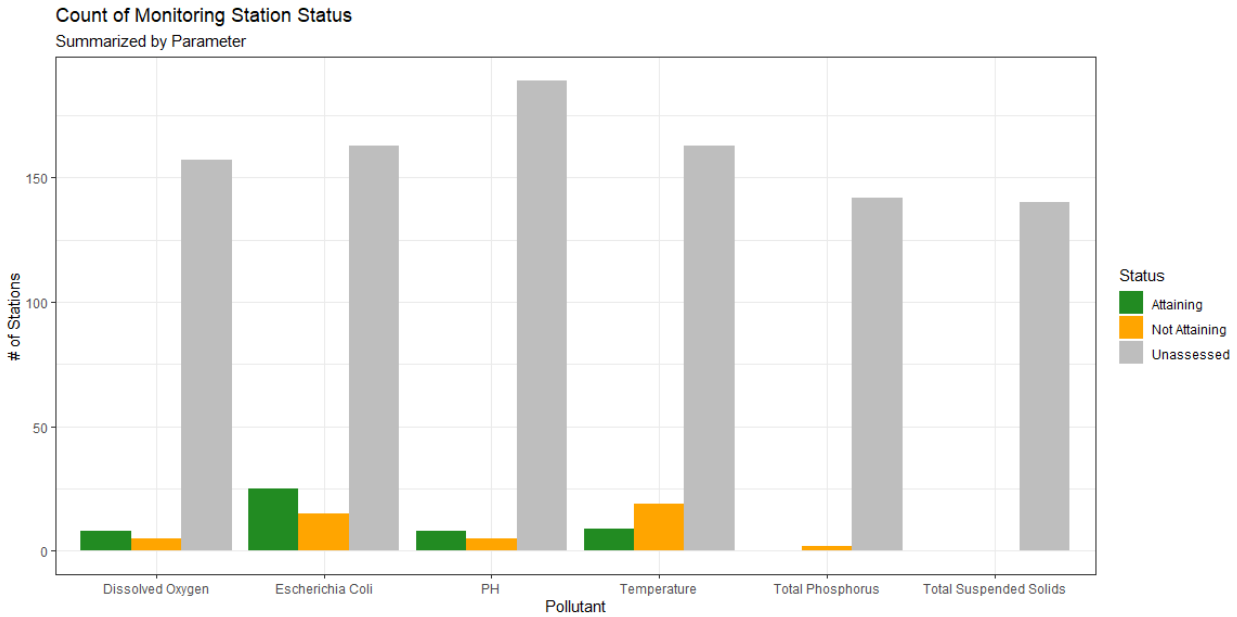

Figure 241: Summary plot of the 2016–2019 station status within the Rogue Basin by parameter.

4.16.4 Trend

A summary of the trends across parameters is shown in Table 351. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 351: Rogue Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	1	0	8	160

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	0	2	0	9	192
PH	0	3	3	4	192
Temperature	2	4	1	3	181
Total Phosphorus	3	0	5	1	135
Total Suspended Solids	0	2	1	7	130

4.16.5 Subbasin Summary

4.16.5.1 Middle Rogue Subbasin

4.16.5.1.1 Water Quality Limited Assessment Units

Table 352: Number of water quality limited assessment units in the Middle Rogue Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	15
pH	2
Total Phosphorus, mixed forms	3

4.16.5.1.2 Status

There are 32 assessment units within the Middle Rogue Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 353 and Figure 242 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 353: Summary of the 2016–2019 assessment unit status within the Middle Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	3	17
Escherichia coli	5	5	14
PH	1	3	20
Temperature	0	7	5
Total Phosphorus	0	1	21
Total Suspended Solids	0	0	21

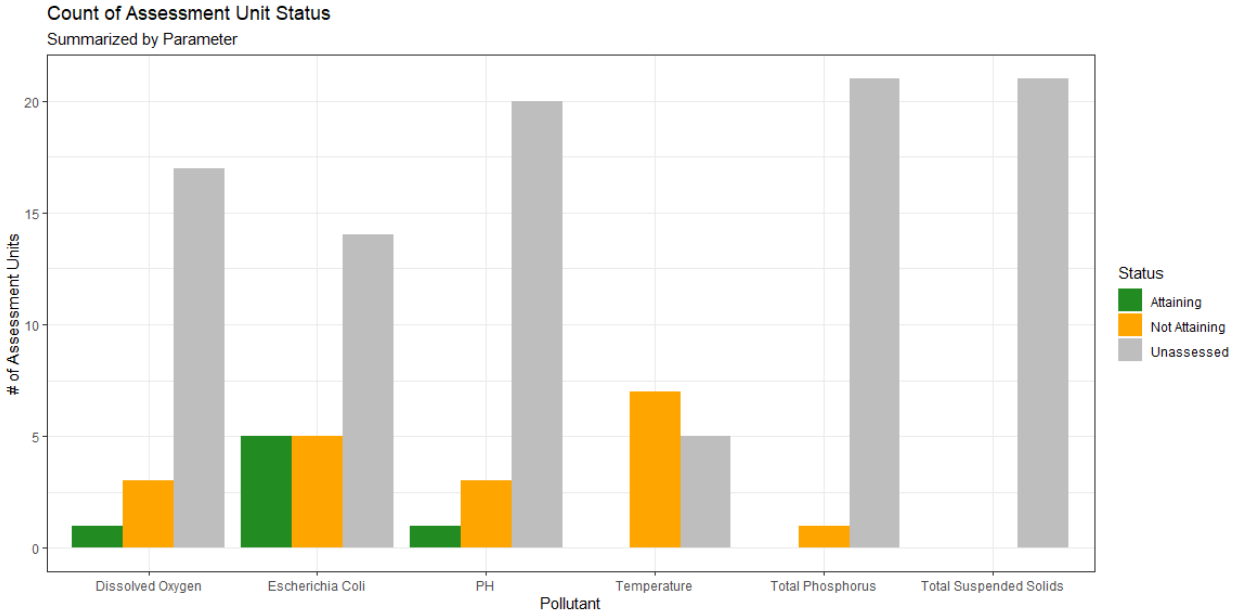

Figure 242: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Rogue Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 354 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Rogue Subbasin for the 2016 – 2019 status period.

Table 354: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Rogue Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	*Escherichia coli*	1	0	0
Stream	Dissolved Oxygen	1	3	8
Stream	*Escherichia coli*	2	5	7
Stream	PH	1	3	9
Stream	Temperature	0	7	4
Stream	Total Phosphorus	0	1	11
Stream	Total Suspended Solids	0	0	12
Watershed Unit	Dissolved Oxygen	0	0	9
Watershed Unit	*Escherichia coli*	2	0	7
Watershed Unit	PH	0	0	11
Watershed Unit	Temperature	0	0	1
Watershed Unit	Total Phosphorus	0	0	10
Watershed Unit	Total Suspended Solids	0	0	9

There are 118 stations within the Middle Rogue Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix O**. Table 355 and Figure 243

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 355: Summary of the 2016–2019 status at monitoring stations within the Middle Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	3	45
Escherichia coli	8	7	71
PH	1	3	67
Temperature	0	8	17
Total Phosphorus	0	2	59
Total Suspended Solids	0	0	61

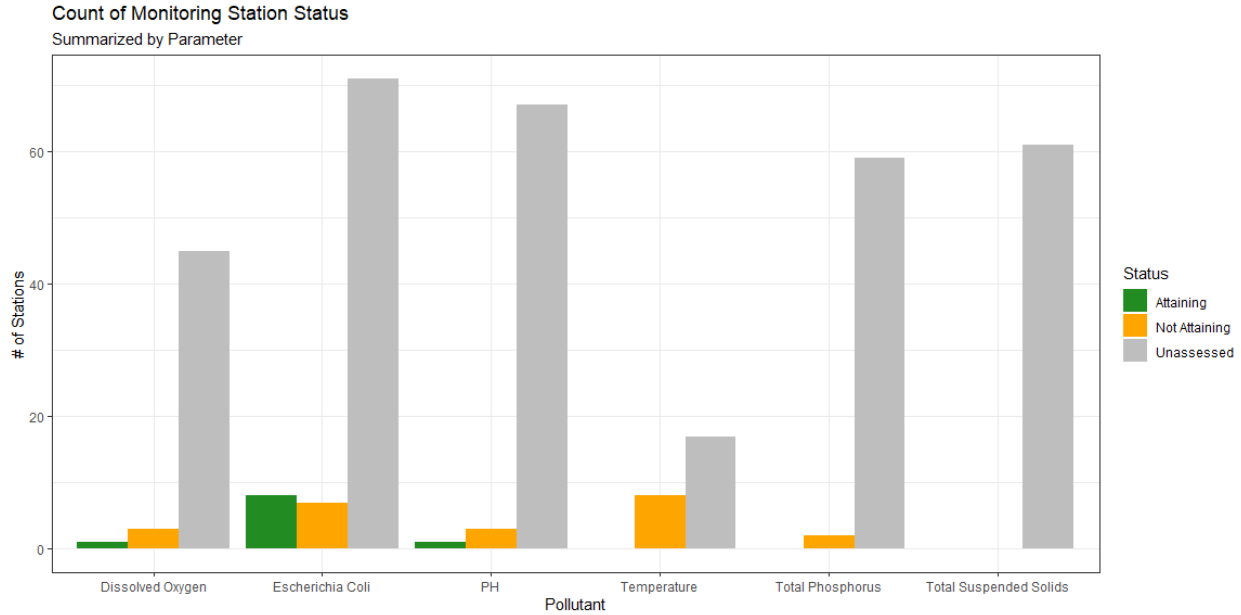

Figure 243: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Rogue Subbasin.

4.16.5.1.3 Trend

A summary of the trends within parameters is shown in Table 356. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 356: Subbasin Summary of trend results at stations across the Middle Rogue.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	2	46
Escherichia coli	0	0	0	4	82
PH	0	1	0	2	68
Temperature	0	2	0	0	23
Total Phosphorus	2	0	0	0	59

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	2	0	1	58

4.16.5.2 Lower Rogue Subbasin

4.16.5.2.1 Water Quality Limited Assessment Units

Table 357: Number of water quality limited assessment units in the Lower Rogue Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1

4.16.5.2.2 Status

There are 37 assessment units within the Lower Rogue Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 358 and Figure 244 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 358: Summary of the 2016–2019 assessment unit status within the Lower Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	22
Escherichia coli	5	0	13
PH	2	0	22
Temperature	1	2	21
Total Phosphorus	0	0	25
Total Suspended Solids	0	0	16

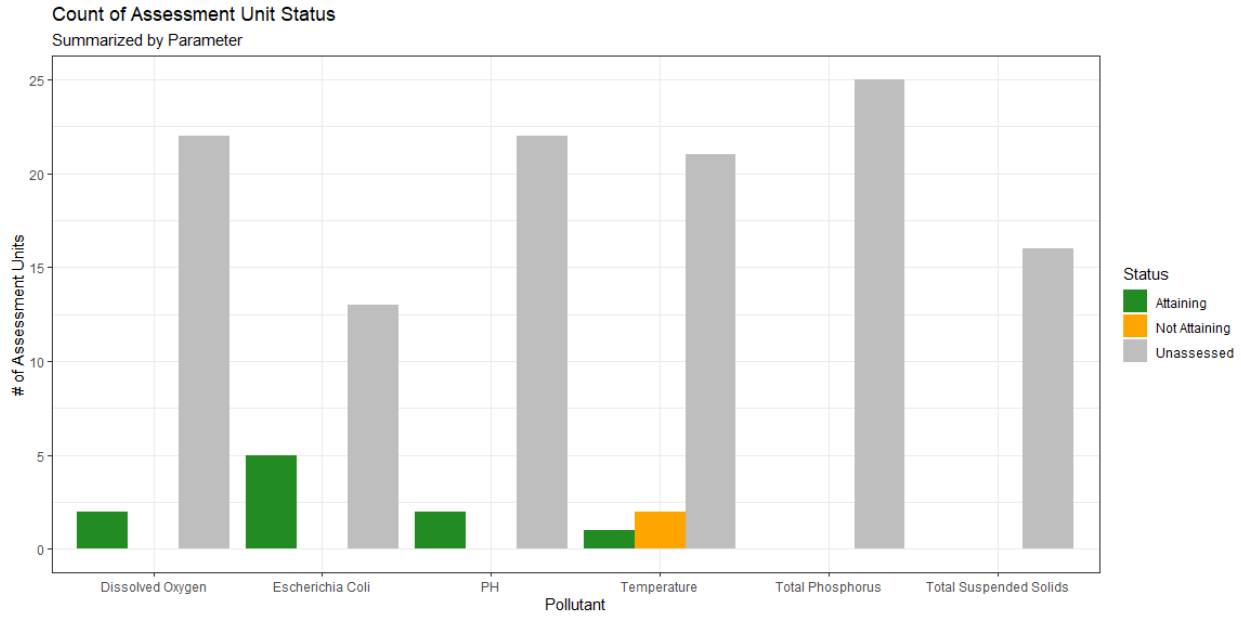

Figure 244: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Rogue Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 359 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Rogue Subbasin for the 2016 – 2019 status period.

Table 359: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Rogue Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	*Escherichia coli*	0	0	1
Stream	Dissolved Oxygen	2	0	14
Stream	*Escherichia coli*	5	0	7
Stream	PH	2	0	14
Stream	Temperature	0	2	17
Stream	Total Phosphorus	0	0	16
Stream	Total Suspended Solids	0	0	11
Watershed Unit	Dissolved Oxygen	0	0	8
Watershed Unit	*Escherichia coli*	0	0	5
Watershed Unit	PH	0	0	8
Watershed Unit	Temperature	1	0	4
Watershed Unit	Total Phosphorus	0	0	9
Watershed Unit	Total Suspended Solids	0	0	5

There are 103 stations within the Lower Rogue Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix O**. Table 360 and Figure 245 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 360: Summary of the 2016–2019 status at monitoring stations within the Lower Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	33
Escherichia coli	6	0	41
PH	2	0	33
Temperature	6	4	48
Total Phosphorus	0	0	35
Total Suspended Solids	0	0	21

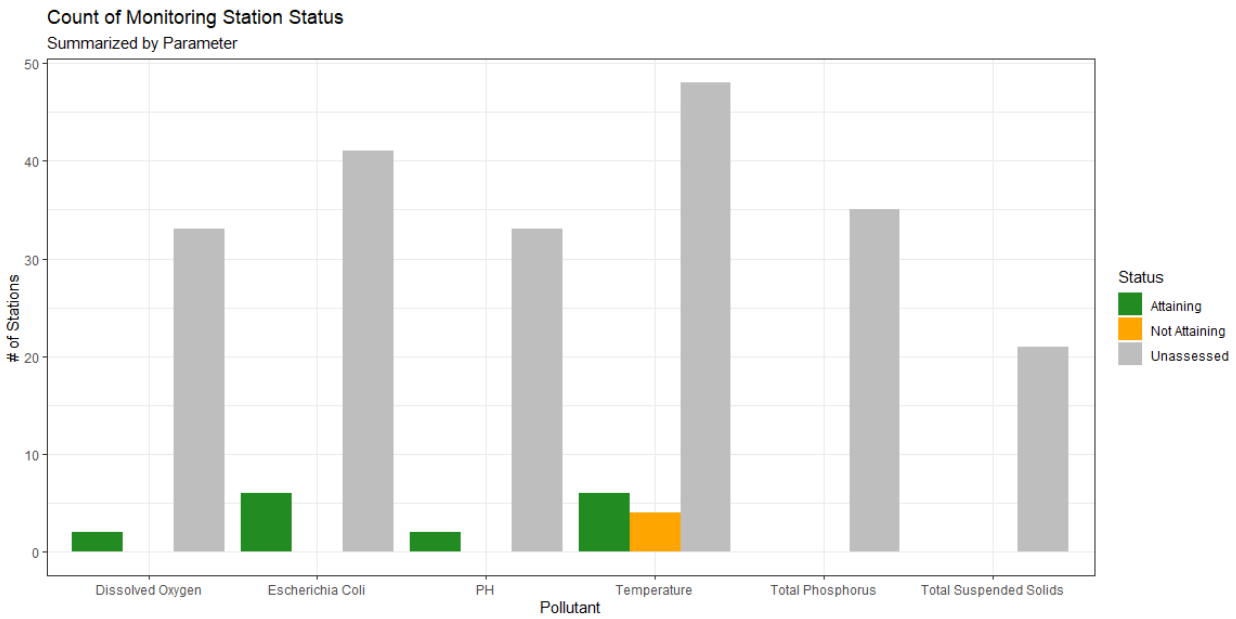

Figure 245: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Rogue Subbasin.

4.16.5.2.3 Trend

A summary of the trends within parameters is shown in Table 361. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 361: Subbasin Summary of trend results at stations across the Lower Rogue.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	33
Escherichia coli	0	0	0	3	44
PH	0	0	1	1	33
Temperature	0	0	0	1	57
Total Phosphorus	0	0	2	0	33
Total Suspended Solids	0	0	0	2	19

4.16.5.3 Upper Rogue Subbasin

4.16.5.3.1 Water Quality Limited Assessment Units

Table 362: Number of water quality limited assessment units in the Upper Rogue Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	2
Total Phosphorus, mixed forms	1

4.16.5.3.2 Status

There are 36 assessment units within the Upper Rogue Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 363 and Figure 246 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 363: Summary of the 2016–2019 assessment unit status within the Upper Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	1	18
Escherichia coli	3	1	16
PH	1	1	22
Temperature	3	3	18
Total Phosphorus	0	0	10
Total Suspended Solids	0	0	20

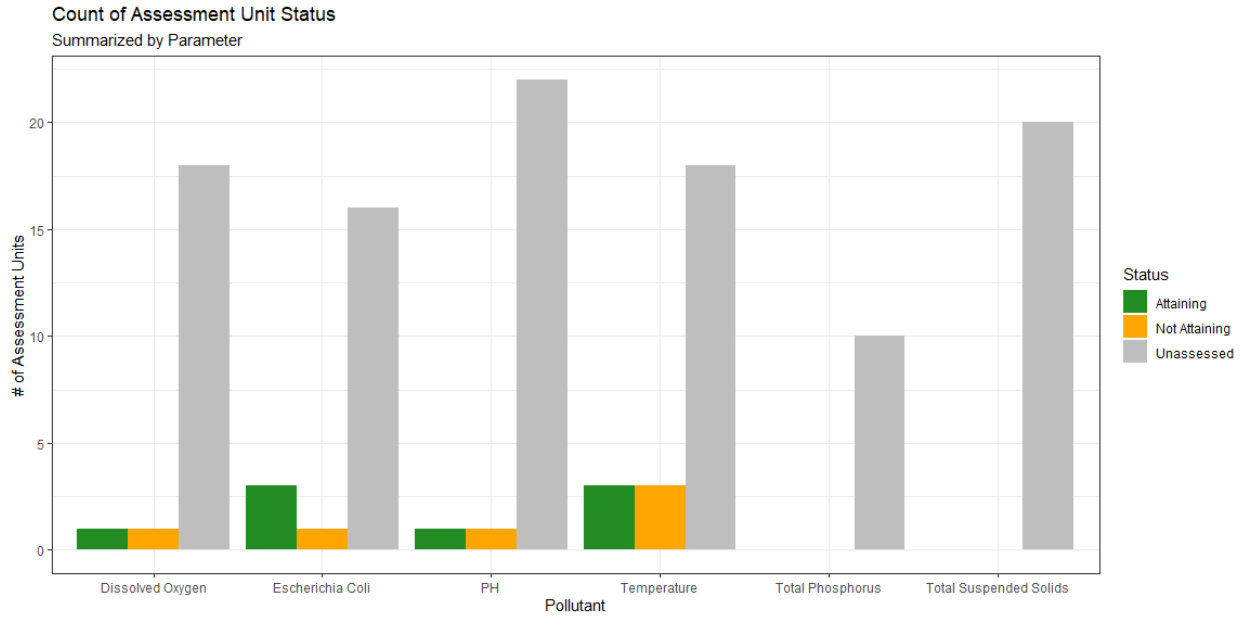

Figure 246: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Rogue Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 364 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Rogue Subbasin for the 2016 – 2019 status period.

Table 364: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Rogue Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	1	0	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	PH	0	0	2
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	1	1	10
Stream	*Escherichia coli*	1	1	10
Stream	PH	1	1	12
Stream	Temperature	3	3	17
Stream	Total Phosphorus	0	0	3
Stream	Total Suspended Solids	0	0	10
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	*Escherichia coli*	1	0	5
Watershed Unit	PH	0	0	8
Watershed Unit	Temperature	0	0	1
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	8

There are 100 stations within the Upper Rogue Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix O**. Table 365 and Figure 247 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 365: Summary of the 2016–2019 status at monitoring stations within the Upper Rogue Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	2	31
Escherichia coli	3	6	48
PH	2	2	42
Temperature	3	4	38
Total Phosphorus	0	0	22
Total Suspended Solids	0	0	33

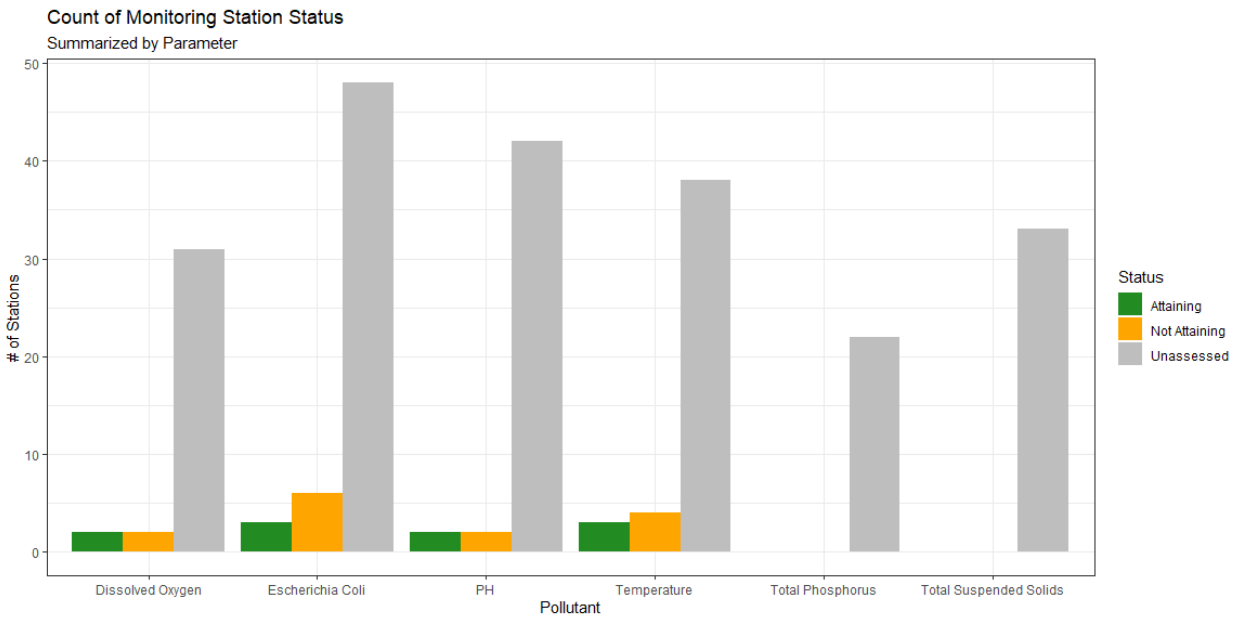

Figure 247: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Rogue Subbasin.

4.16.5.3.3 Trend

A summary of the trends within parameters is shown in Table 366. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 366: Subbasin Summary of trend results at stations across the Upper Rogue.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	33
Escherichia coli	0	0	0	2	55
PH	0	1	1	0	44
Temperature	0	1	1	2	41
Total Phosphorus	1	0	1	0	20
Total Suspended Solids	0	0	0	2	31

4.16.5.4 Applegate Subbasin

4.16.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.16.5.4.2 Status

There are 27 assessment units within the Applegate Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 367 and Figure 248 summarizes

the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 367: Summary of the 2016–2019 assessment unit status within the Applegate Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	22
Escherichia coli	2	1	0
PH	1	0	23
Temperature	0	3	20
Total Phosphorus	0	0	9
Total Suspended Solids	0	0	6

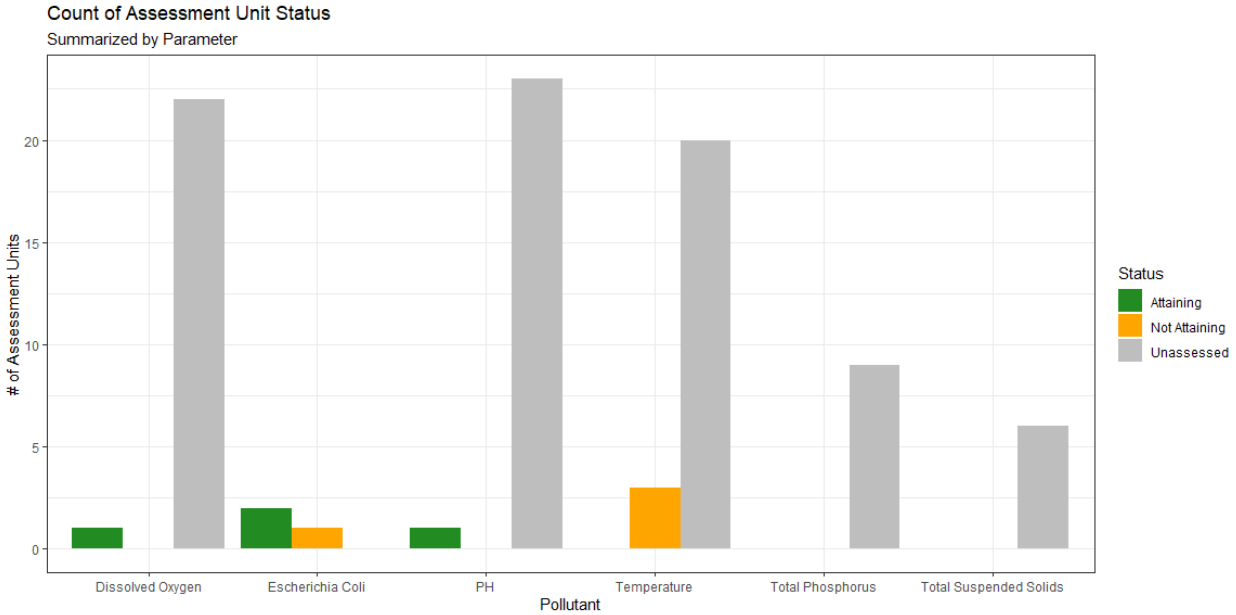

Figure 248: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Applegate Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 368 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Applegate Subbasin for the 2016 – 2019 status period.

Table 368: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Applegate Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	*Escherichia coli*	1	0	0
Stream	Dissolved Oxygen	1	0	15
Stream	*Escherichia coli*	1	1	0
Stream	PH	1	0	15
Stream	Temperature	0	3	12
Stream	Total Phosphorus	0	0	3

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Dissolved Oxygen	0	0	7
Watershed Unit	PH	0	0	8
Watershed Unit	Temperature	0	0	8
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	5

There are 59 stations within the Applegate Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix O**. Table 369 and Figure 249 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 369: Summary of the 2016–2019 status at monitoring stations within the Applegate Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	32
Escherichia coli	2	2	2
PH	2	0	33
Temperature	0	3	39
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	11

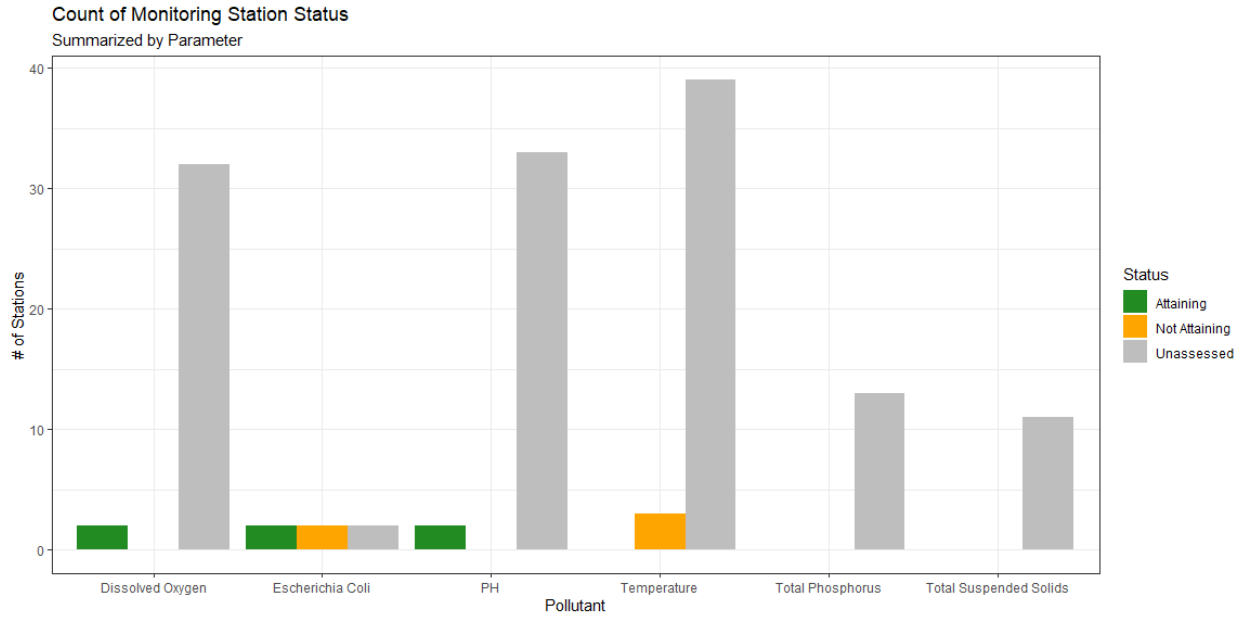

Figure 249: The number of stations in each status category by parameter for the 2016–2019 status period within the Applegate Subbasin.

4.16.5.4.3 Trend

A summary of the trends within parameters is shown in Table 370. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 370: Subbasin Summary of trend results at stations across the Applegate.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	32
Escherichia coli	0	1	0	0	5
PH	0	0	1	1	33
Temperature	2	1	0	0	39
Total Phosphorus	0	0	1	1	11
Total Suspended Solids	0	0	0	2	9

4.16.5.5 Illinois Subbasin

4.16.5.5.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.16.5.5.2 Status

There are 27 assessment units within the Illinois Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 371 and Figure 250 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 371: Summary of the 2016–2019 assessment unit status within the Illinois Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	12
Escherichia coli	4	0	1
PH	1	0	11
Temperature	0	0	14
Total Phosphorus	0	0	10
Total Suspended Solids	0	0	10

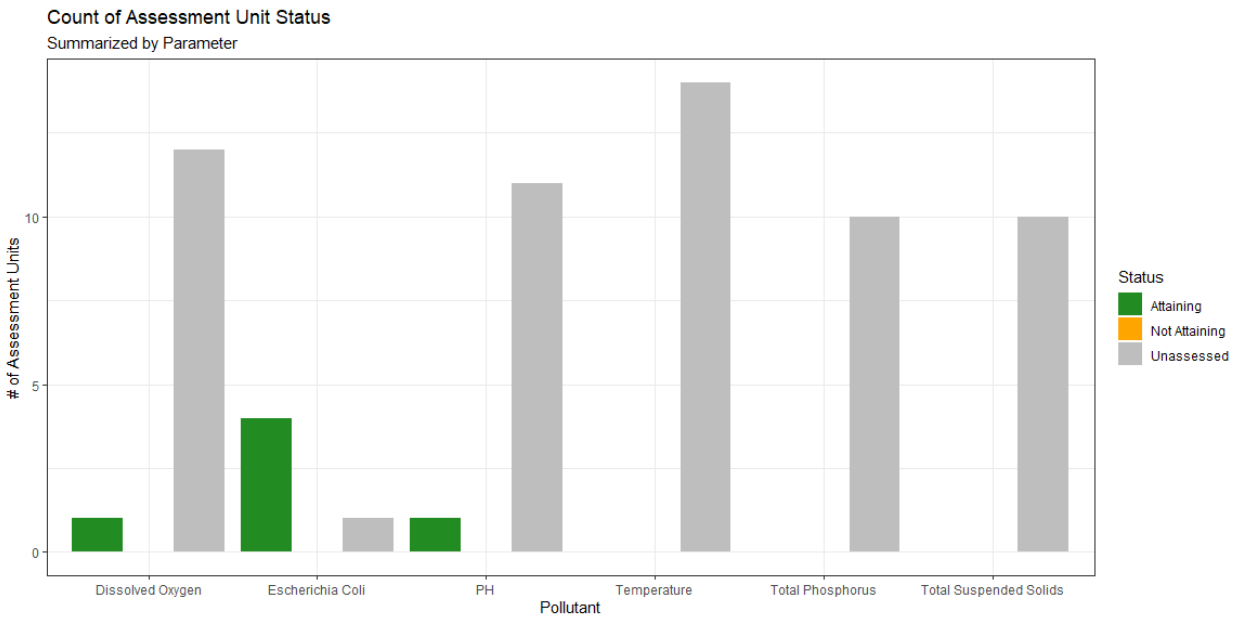

Figure 250: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Illinois Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 372 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Illinois Subbasin for the 2016 – 2019 status period.

Table 372: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Illinois Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	6
Stream	*Escherichia coli*	3	0	0
Stream	PH	1	0	6
Stream	Temperature	0	0	10
Stream	Total Phosphorus	0	0	5
Stream	Total Suspended Solids	0	0	4
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	*Escherichia coli*	1	0	1
Watershed Unit	PH	0	0	5
Watershed Unit	Temperature	0	0	4
Watershed Unit	Total Phosphorus	0	0	5
Watershed Unit	Total Suspended Solids	0	0	6

There are 43 stations within the Illinois Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix O**. Table 373 and Figure 251 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 373: Summary of the 2016–2019 status at monitoring stations within the Illinois Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	16
Escherichia coli	6	0	1
PH	1	0	14
Temperature	0	0	21
Total Phosphorus	0	0	13
Total Suspended Solids	0	0	14

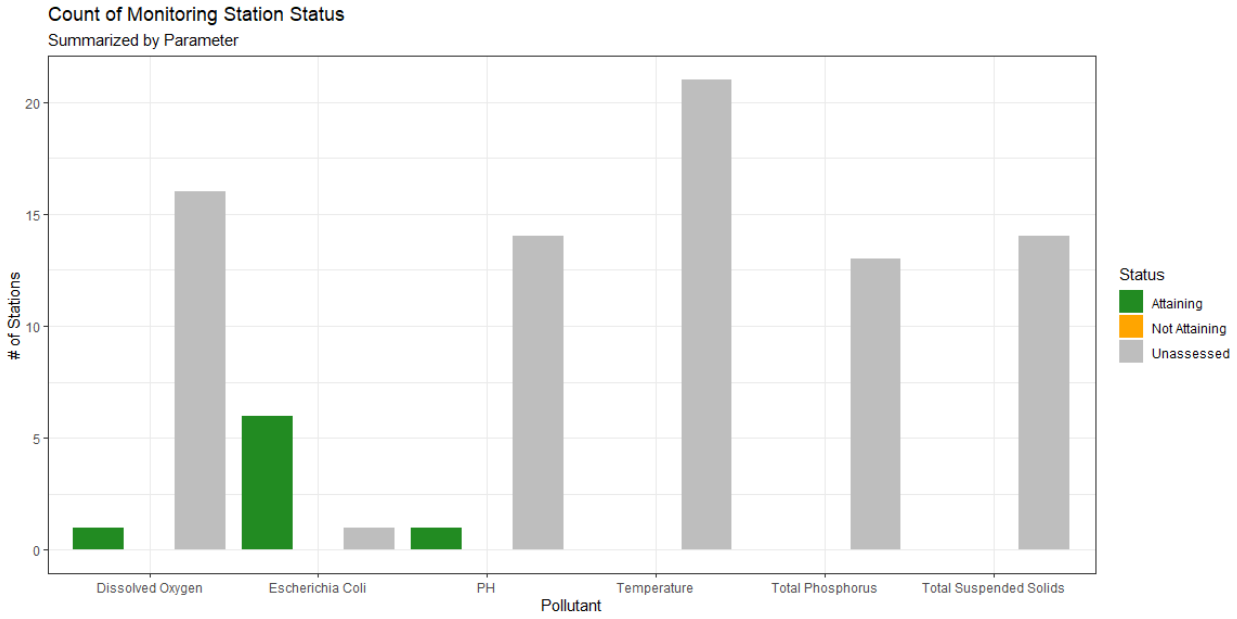

Figure 251: The number of stations in each status category by parameter for the 2016–2019 status period within the Illinois Subbasin.

4.16.5.5.3 Trend

A summary of the trends within parameters is shown in Table 374. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 374: Subbasin Summary of trend results at stations across the Illinois.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	16
Escherichia coli	0	1	0	0	6
PH	0	1	0	0	14
Temperature	0	0	0	0	21
Total Phosphorus	0	0	1	0	12
Total Suspended Solids	0	0	1	0	13

4.17 Sandy

A summary of status and trend results for the Sandy and all subbasins within the Sandy are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix P**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Sandy are water quality limited for 2 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 90 stations within the Sandy. These stations were located across 38 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.17.1 Land Use

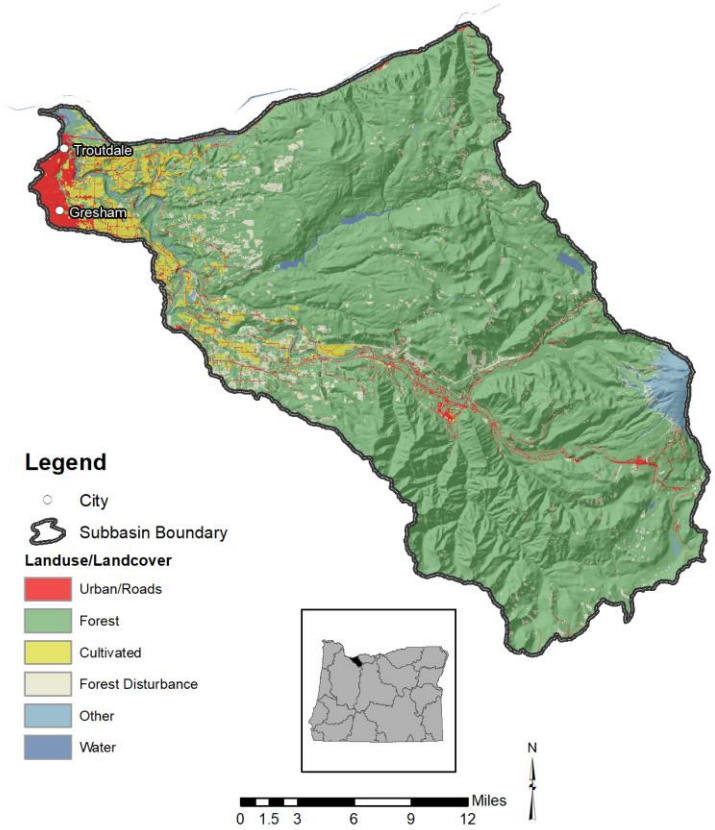

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 375: Land use within the Sandy Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Lower Columbia-Sandy	1474	3.4	83.7	3.7	6.6	2.6

4.17.2 Parameter Maps

The maps in Figure 252 through Figure 257 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

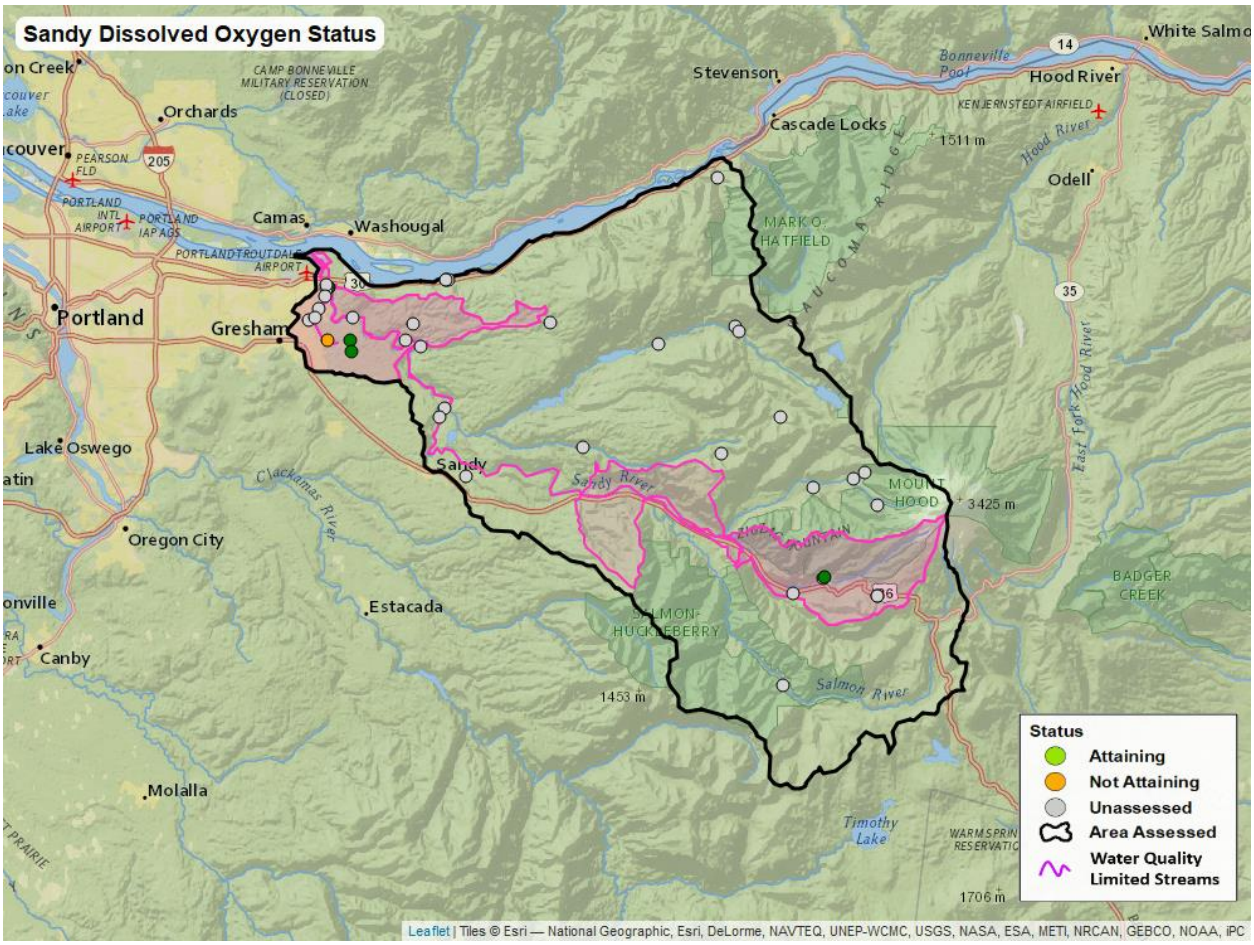

Figure 252: Summary map of the status of dissolved oxygen across the Sandy.

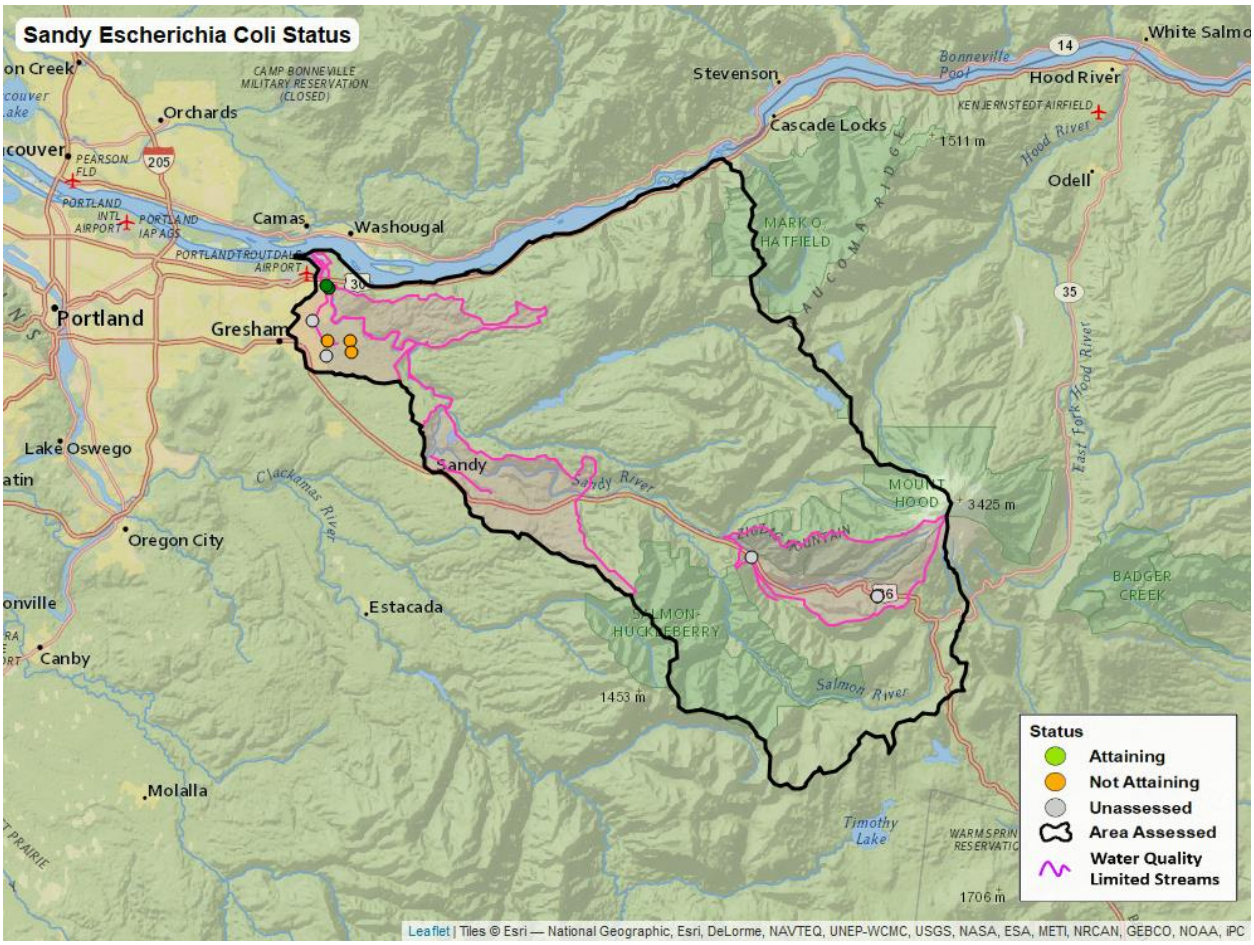

Figure 253: Summary map of the status of *Escherichia coli* across the Sandy.

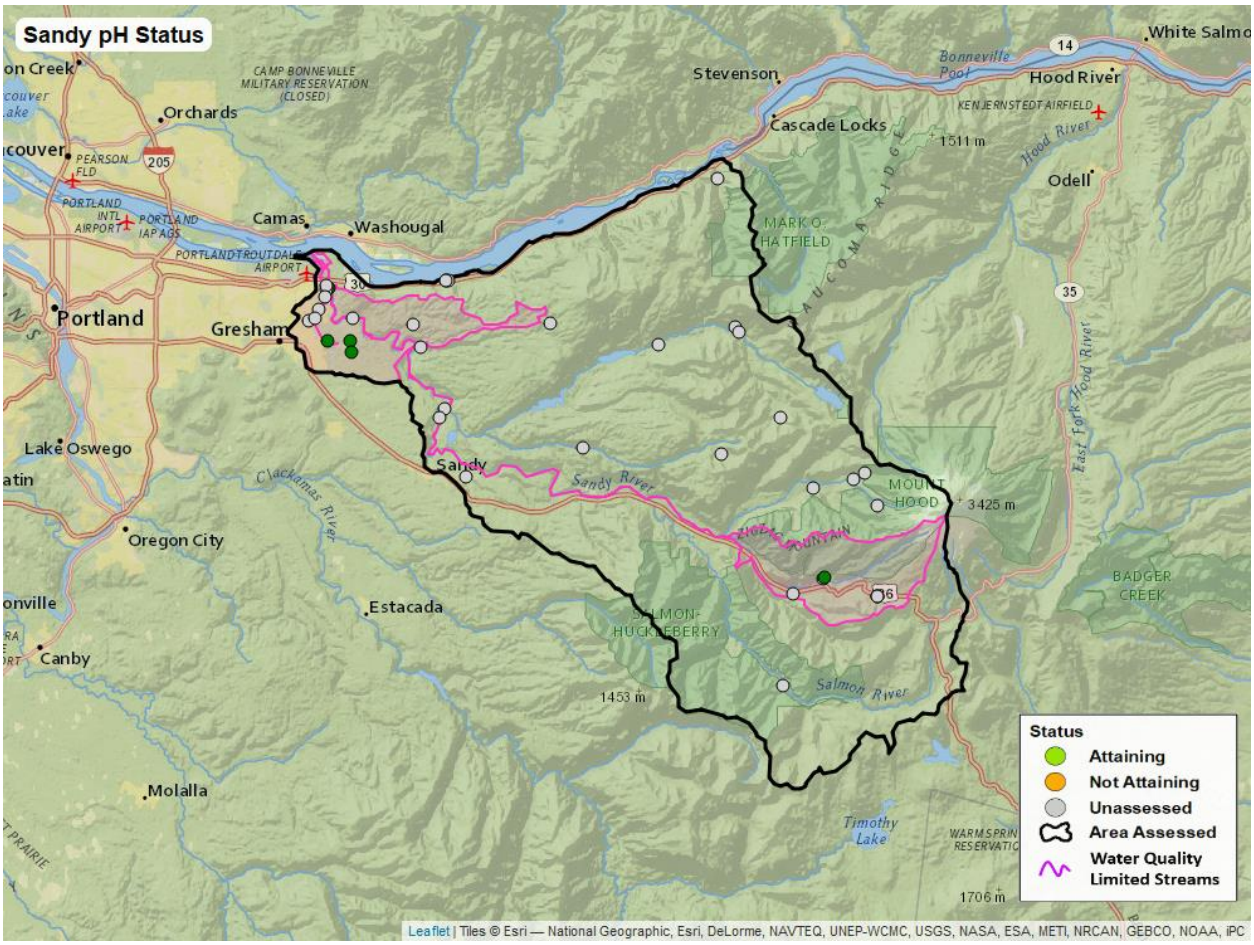

Figure 254: Summary map of the status of pH across the Sandy.

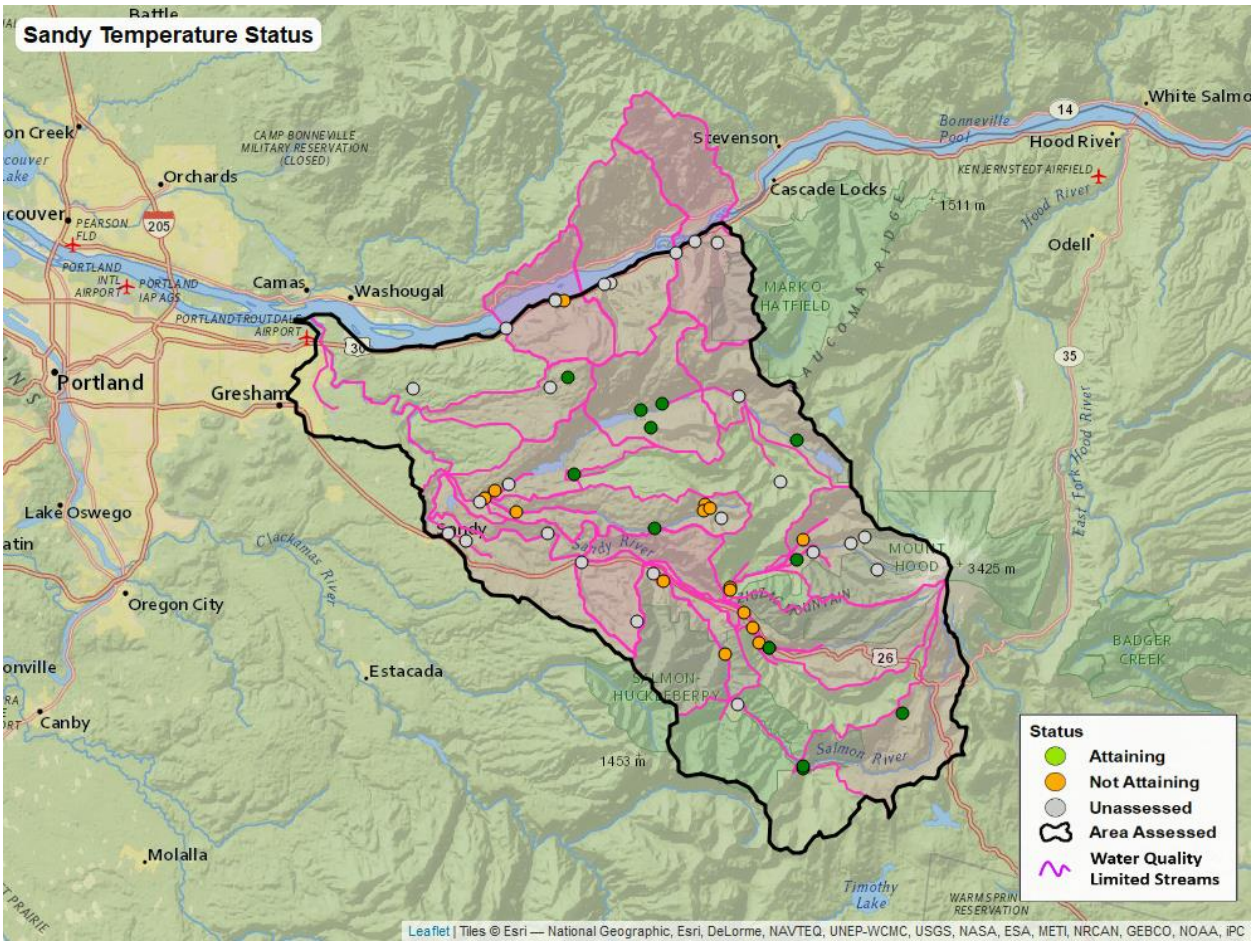

Figure 255: Summary map of the status of temperature across the Sandy.

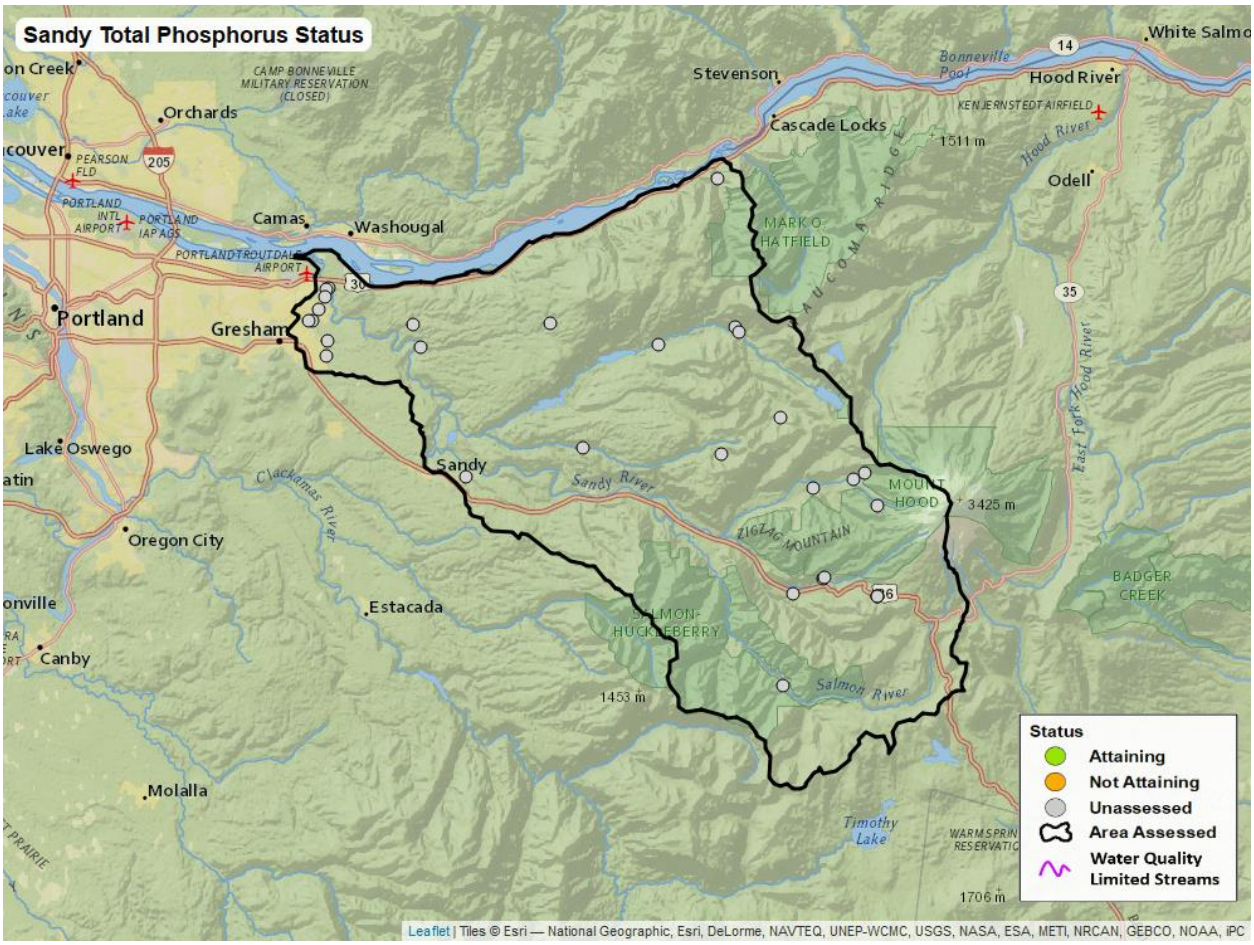

Figure 256: Summary map of the status of total phosphorus across the Sandy.

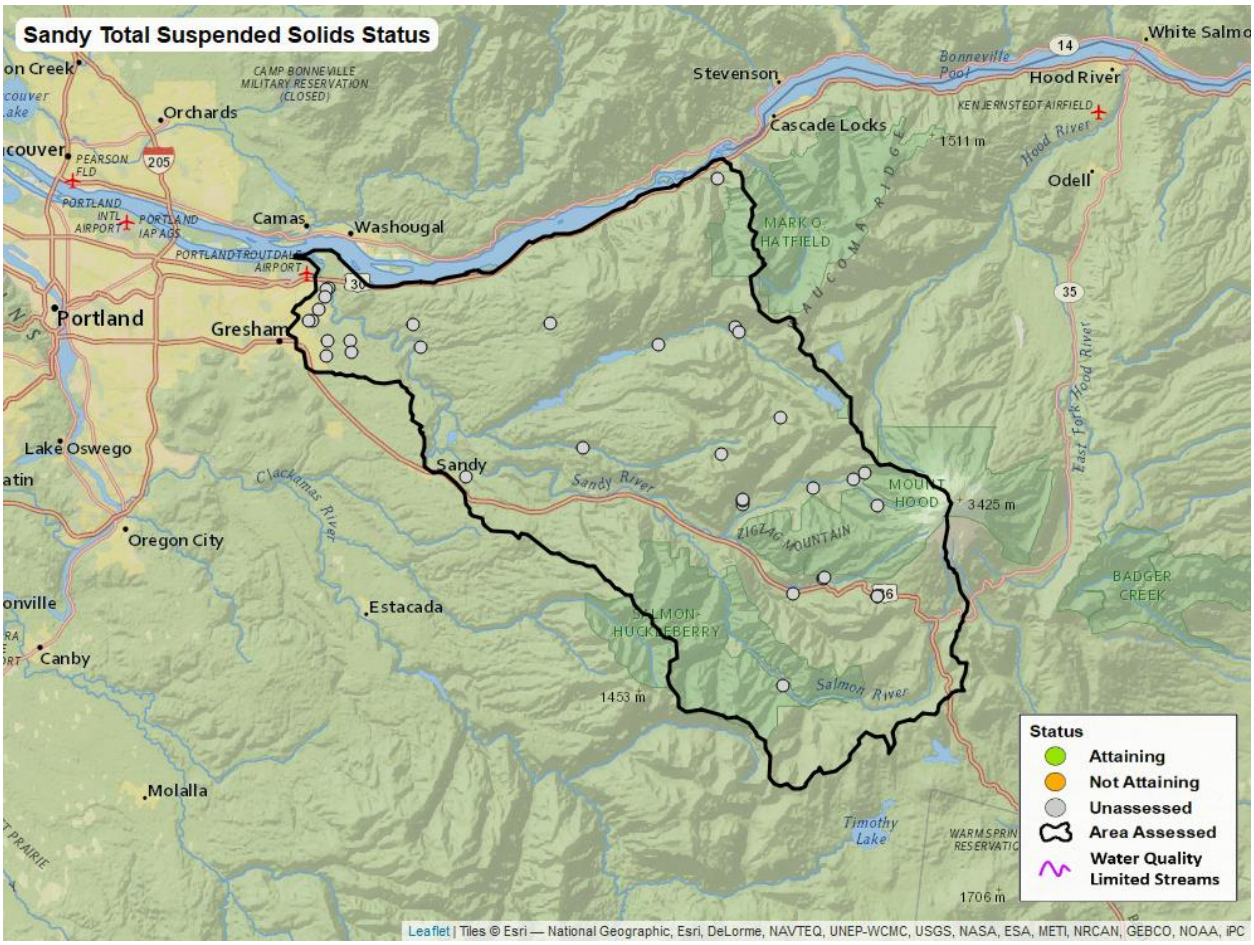

Figure 257: Summary map of the status of total suspended solids across the Sandy.

4.17.3 Status

There are 38 assessment units within the Sandy containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 376 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 376: Summary of the 2016–2019 assessment unit status within the Sandy.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	1	14
Escherichia coli	1	2	2
PH	4	0	14
Temperature	10	10	12
Total Phosphorus	0	0	16
Total Suspended Solids	0	0	18

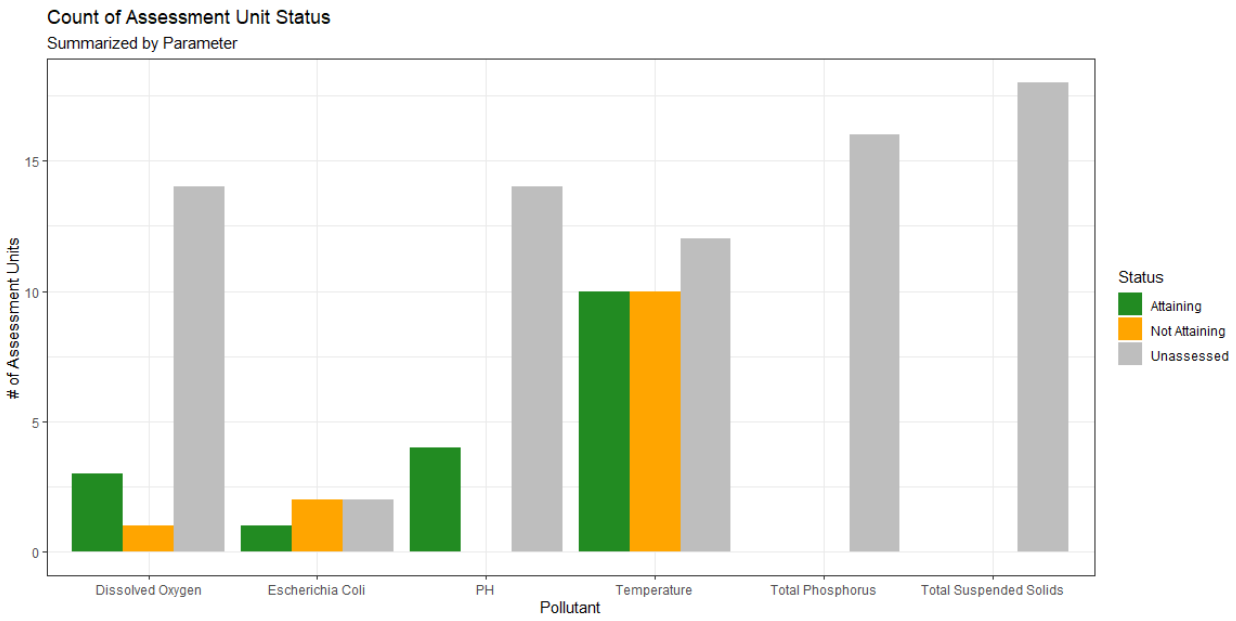

Figure 258: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Sandy.

Table 377 and Figure 258 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Sandy for the 2016–2019 status period.

Table 377: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Sandy.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Temperature	1	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	1	1	7
Stream	*Escherichia coli*	1	1	1
Stream	PH	2	0	7
Stream	Temperature	5	8	2
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	8
Watershed Unit	Dissolved Oxygen	2	0	6
Watershed Unit	*Escherichia coli*	0	1	1
Watershed Unit	PH	2	0	6
Watershed Unit	Temperature	4	2	9
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	9

Table 378 and Figure 259 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix P.

Table 378: Summary of the 2016–2019 status at monitoring stations within the Sandy.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	1	33
Escherichia coli	2	3	6
PH	5	0	33
Temperature	12	15	28
Total Phosphorus	0	0	30
Total Suspended Solids	0	0	35

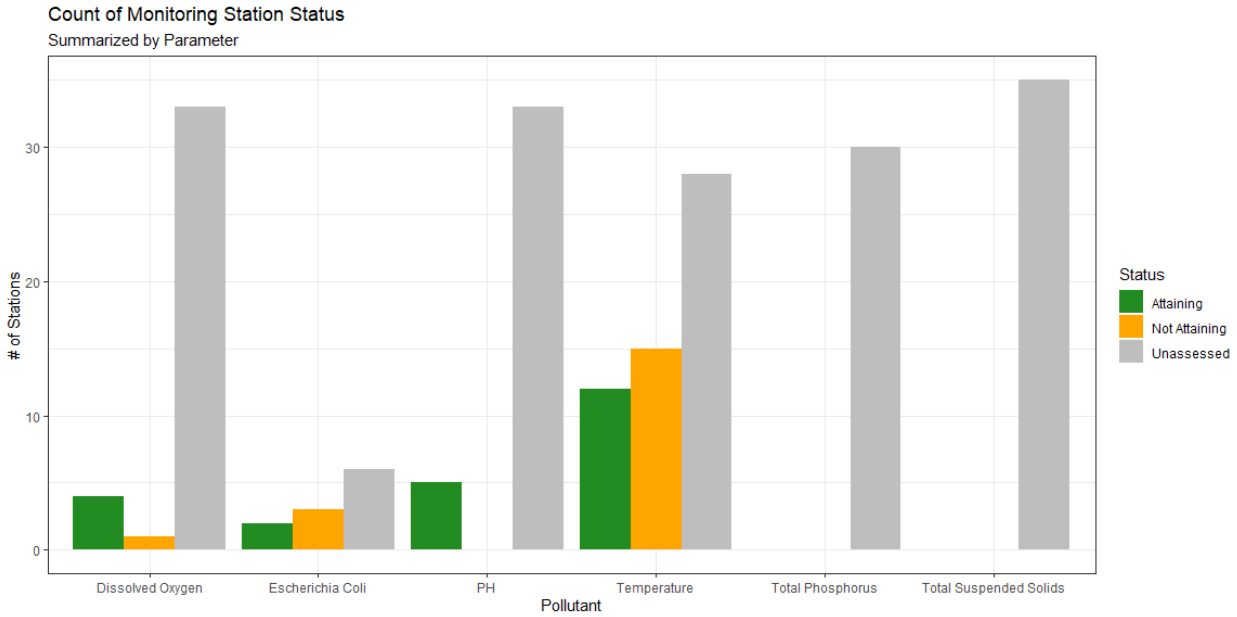

Figure 259: Summary plot of the 2016–2019 station status within the Sandy by parameter.

4.17.4 Trend

A summary of the trends across parameters is shown in Table 379. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 379: Sandy summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	37
Escherichia coli	1	0	0	0	10
PH	0	1	0	0	37
Temperature	0	15	1	0	39

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	0	29
Total Suspended Solids	0	0	0	1	34

4.17.5 Subbasin Summary

4.17.5.1 Lower Columbia-Sandy Subbasin

4.17.5.1.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.17.5.1.2 Status

There are 38 assessment units within the Lower Columbia-Sandy Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 45 and Figure 31 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 45: Summary of the 2016–2019 assessment unit status within the Lower Columbia-Sandy Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	1	14
Escherichia coli	1	2	2
PH	4	0	14
Temperature	10	10	12
Total Phosphorus	0	0	16
Total Suspended Solids	0	0	18

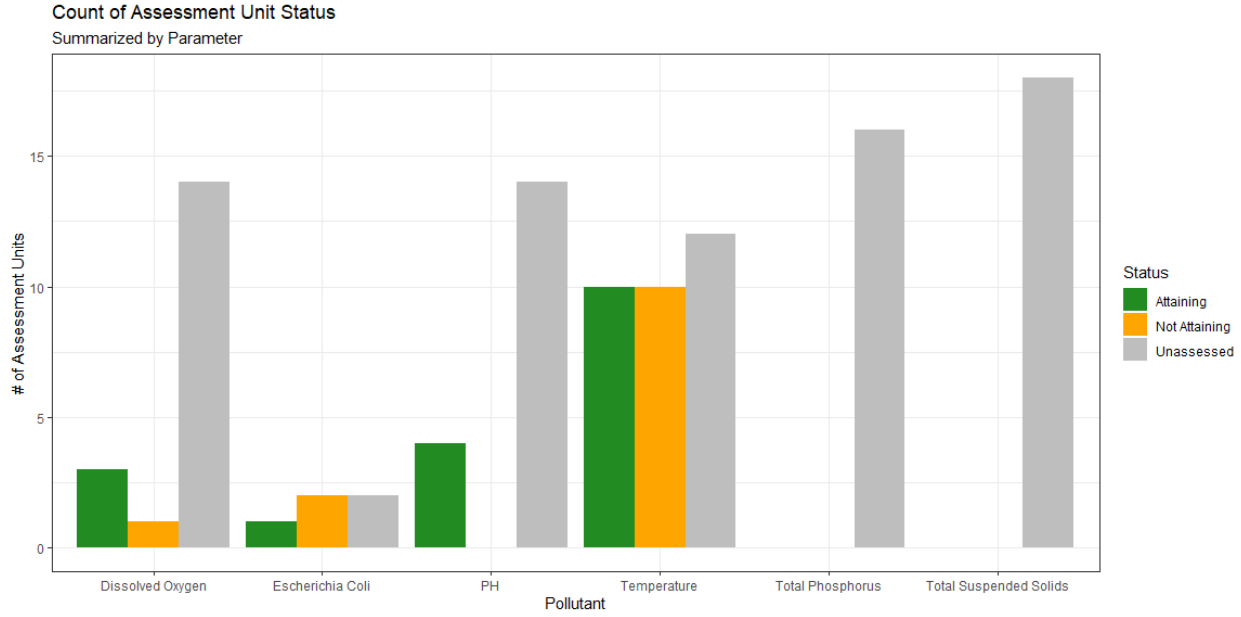

Figure 31: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 46 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Columbia-Sandy Subbasin for the 2016 – 2019 status period.

Table 46: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Lake	Temperature	1	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	1	1	7
Stream	*Escherichia coli*	1	1	1
Stream	PH	2	0	7
Stream	Temperature	5	8	2
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	8
Watershed Unit	Dissolved Oxygen	2	0	6
Watershed Unit	*Escherichia coli*	0	1	1
Watershed Unit	PH	2	0	6
Watershed Unit	Temperature	4	2	9
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	9

There are 90 stations within the Lower Columbia-Sandy Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix P**. Table 47 and Figure 32 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 47: Summary of the 2016–2019 status at monitoring stations within the Lower Columbia-Sandy Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	1	33
Escherichia coli	2	3	6
PH	5	0	33
Temperature	12	15	28
Total Phosphorus	0	0	30
Total Suspended Solids	0	0	35

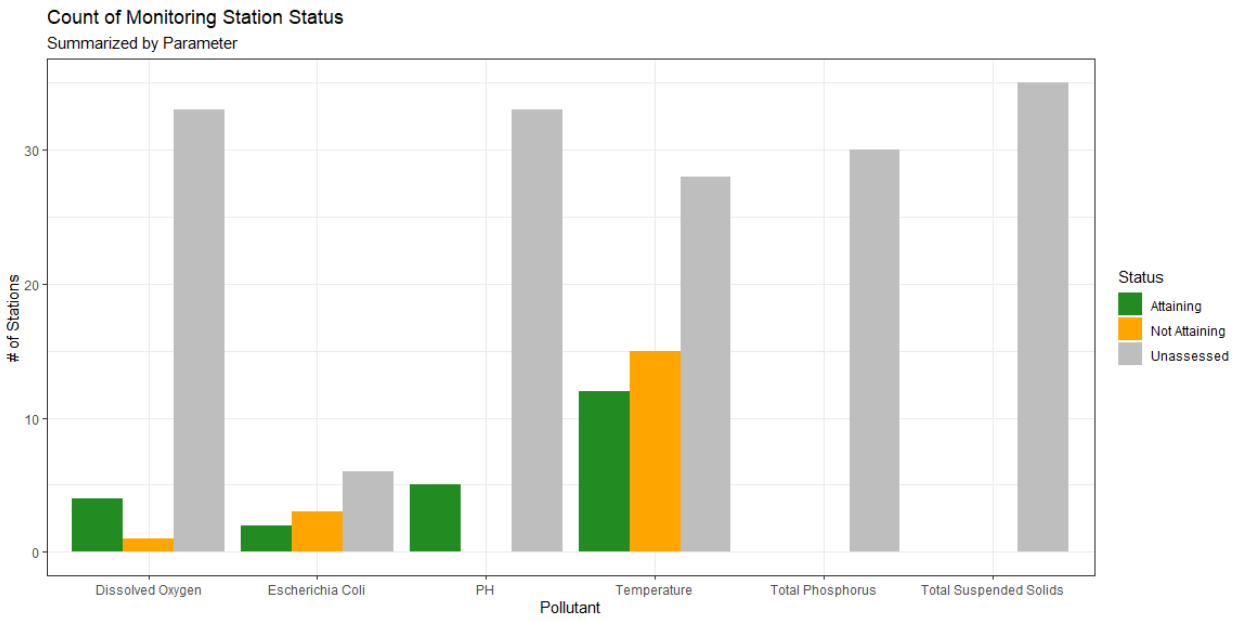

Figure 32: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Columbia-Sandy Subbasin.

4.17.5.1.3 Trend

A summary of the trends within parameters is shown in Table 48. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 48: Subbasin Summary of trend results at stations across the Lower Columbia-Sandy.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	1	37
Escherichia coli	1	0	0	0	10
PH	0	1	0	0	37
Temperature	0	15	1	0	39
Total Phosphorus	0	0	1	0	29
Total Suspended Solids	0	0	0	1	34

4.18 Snake River

A summary of status and trend results for the Snake River and all subbasins within the Snake River are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix Q**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Snake River are water quality limited for 0 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 4 stations within the Snake River. These stations were located across 1 assessment units consisting of 'Streams' and 'Streams'. Data for dissolved oxygen, *Escherichia coli*, pH, total phosphorus and total suspended solids were available for analysis and included in this report.

4.18.1 Land Use

Table 380: Land use within the Snake River Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Snake-Payette	14	0.9	2.0	36.6	1.6	58.4
Brownlee Reservoir	38	0.4	0.6	1.7	5.4	93.2
Hells Canyon	505	0.1	20.3	0.0	78.7	0.9

4.18.2 Parameter Maps

The maps in Figure 260 through Figure 264 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

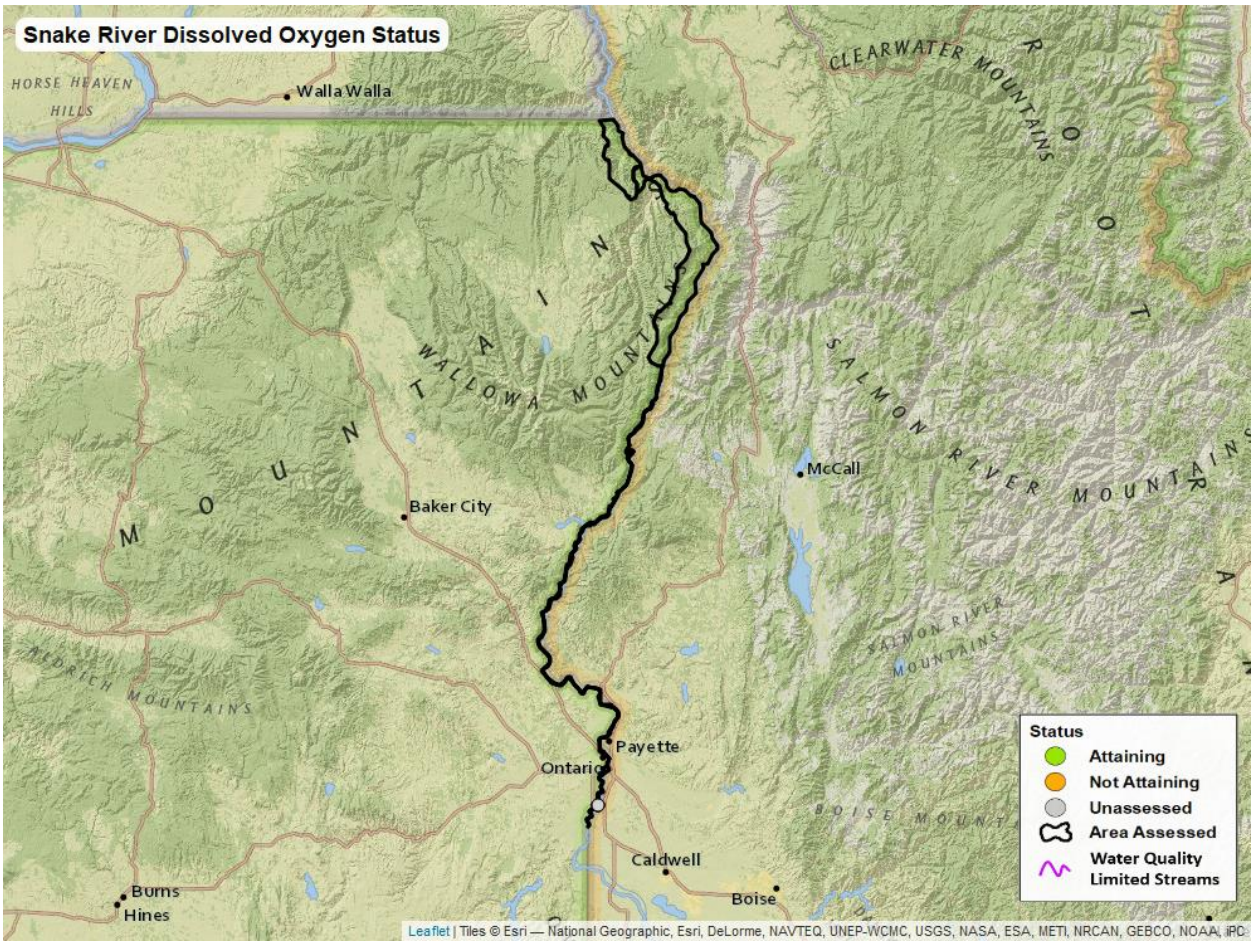

Figure 260: Summary map of the status of dissolved oxygen across the Snake River.

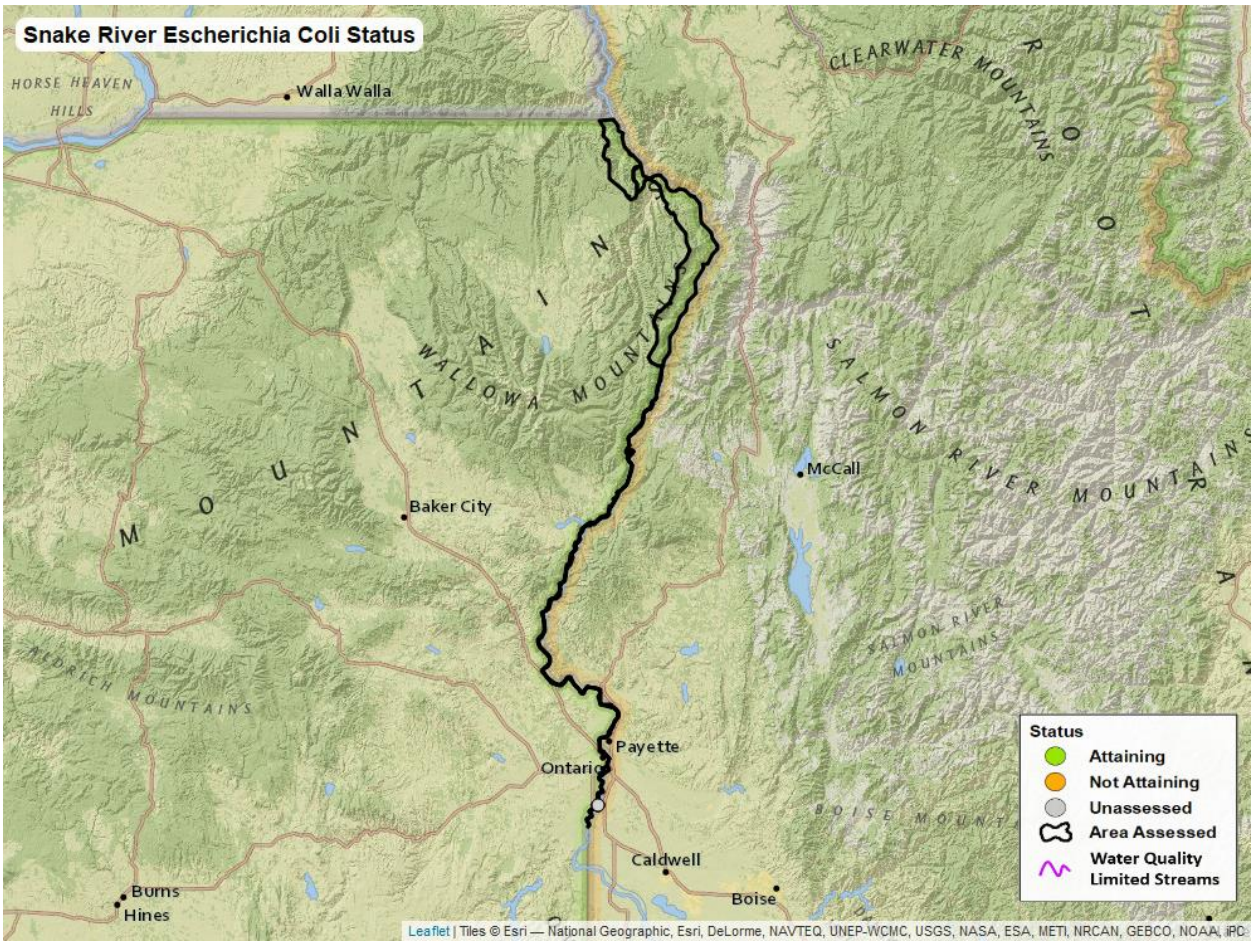

Figure 261: Summary map of the status of *Escherichia coli* across the Snake River.

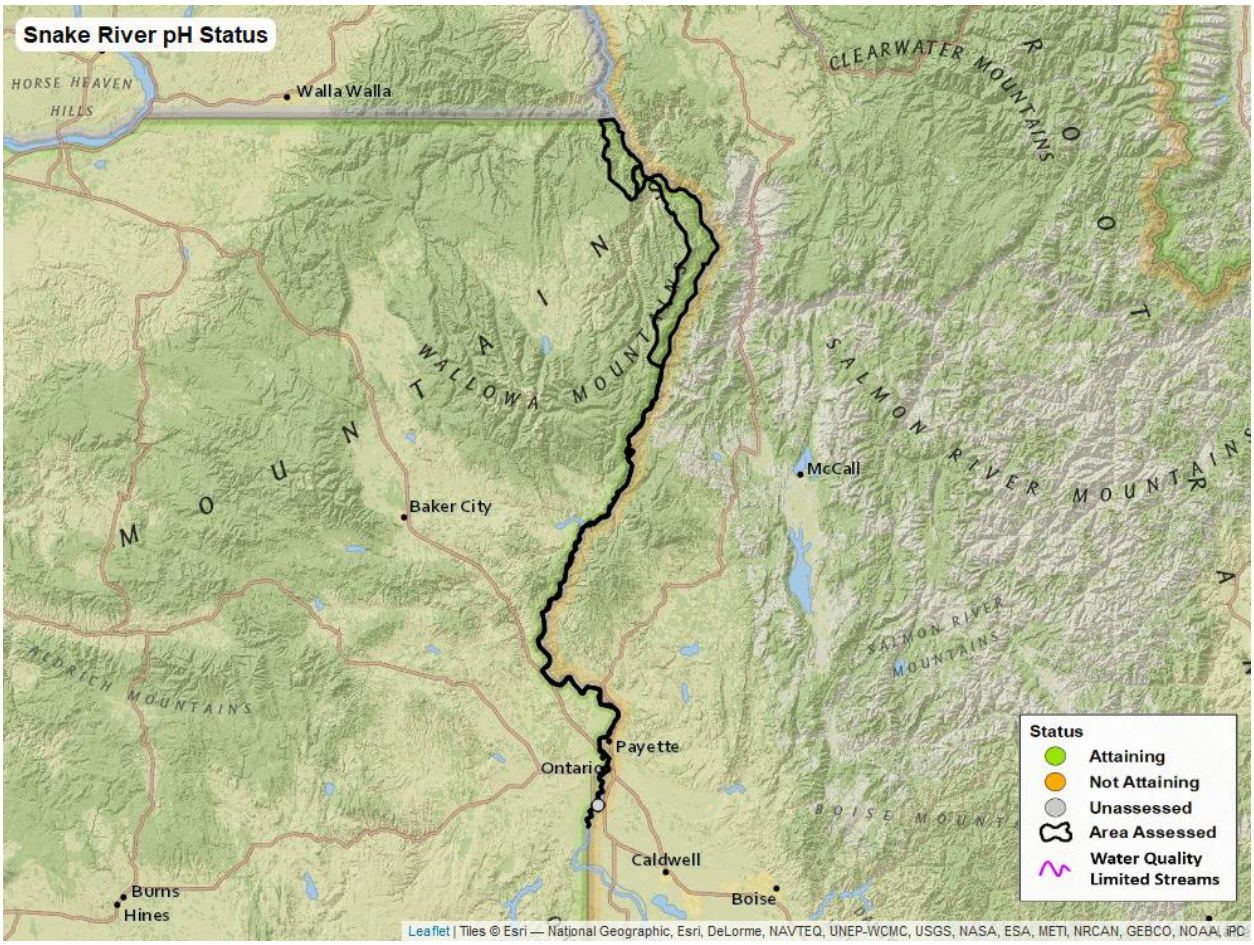

Figure 262: Summary map of the status of pH across the Snake River.

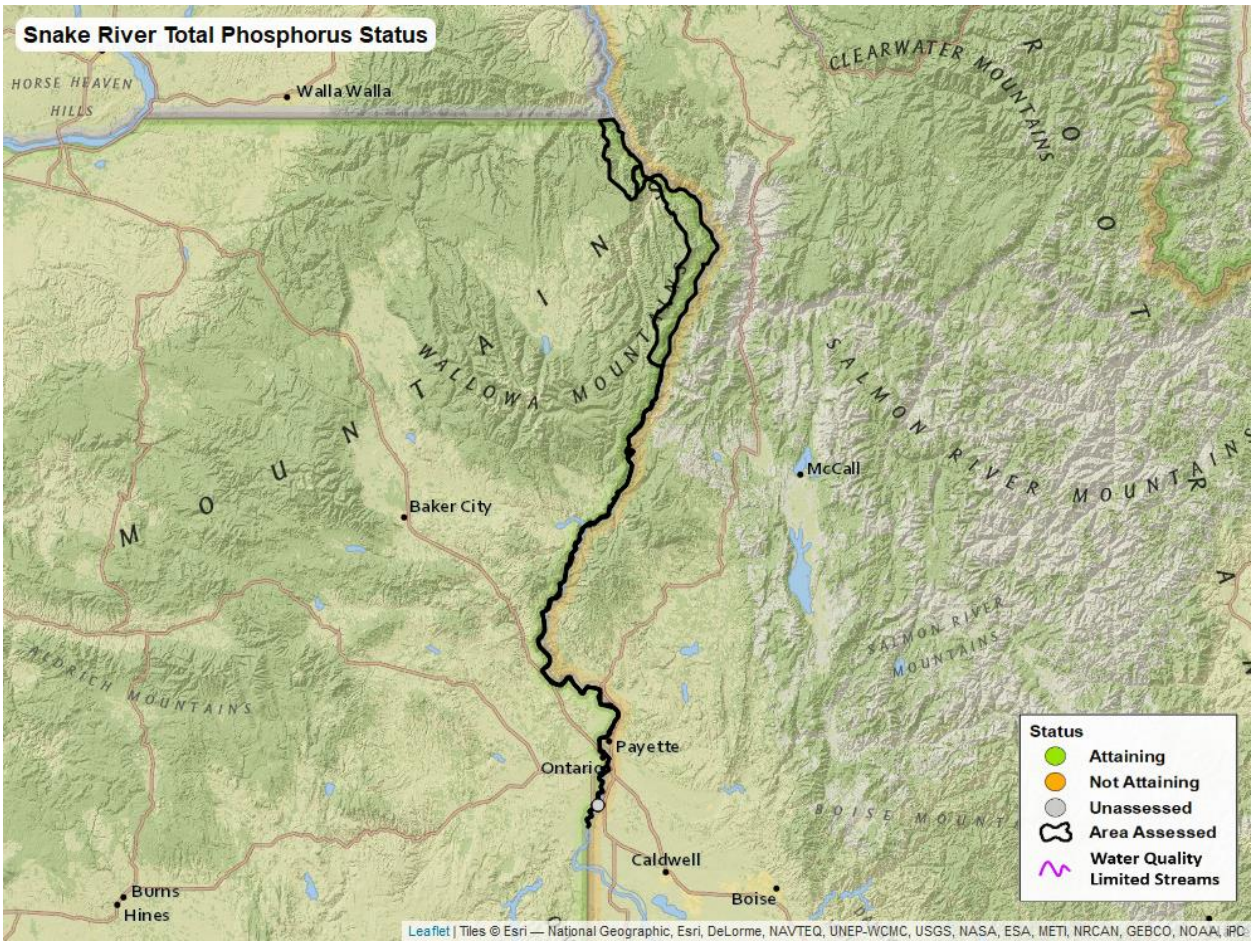

Figure 263: Summary map of the status of total phosphorus across the Snake River.

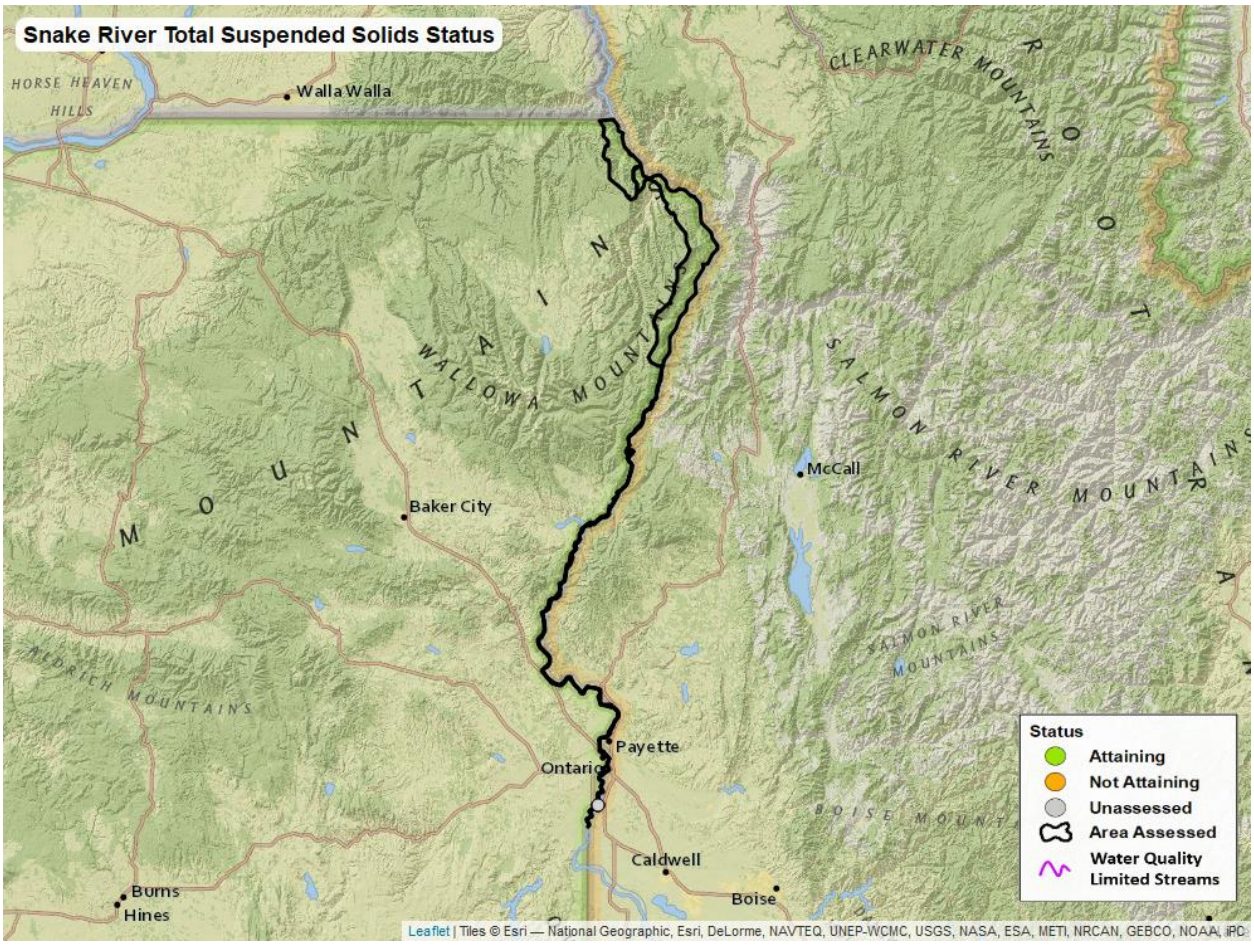

Figure 264: Summary map of the status of total suspended solids across the Snake River.

4.18.3 Status

There are 1 assessment units within the Snake River containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 381 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 381: Summary of the 2016–2019 assessment unit status within the Snake River.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	1
Escherichia coli	0	0	1
PH	0	0	1
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

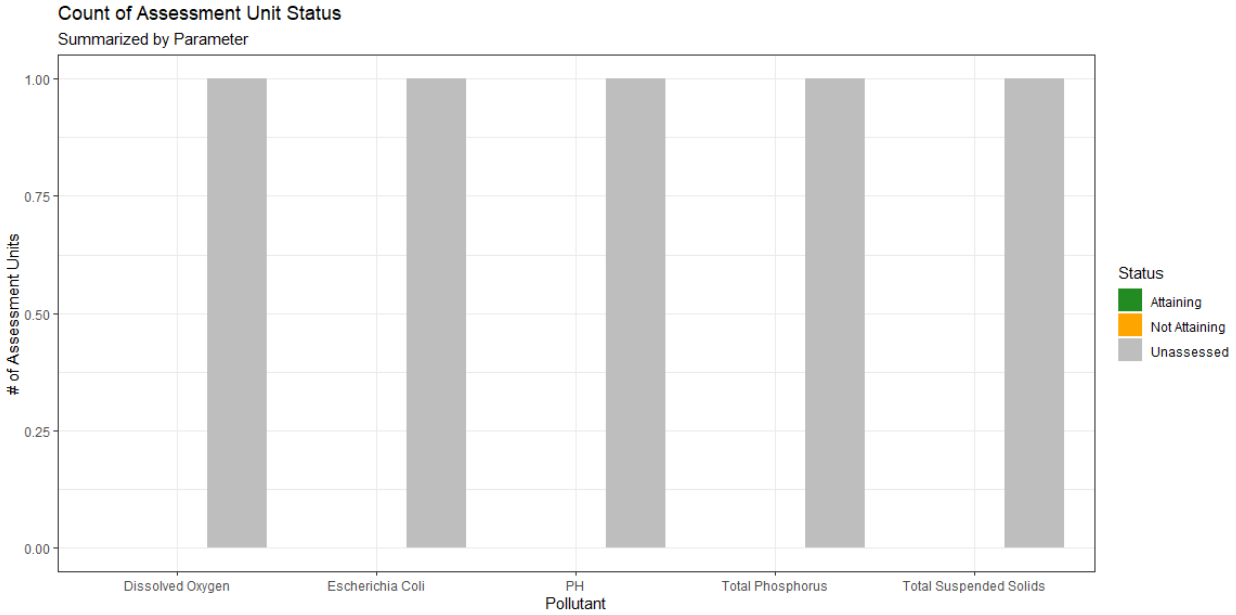

Figure 265: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Snake River.

Table 382 and Figure 265 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Snake River for the 2016–2019 status period.

Table 382: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Snake River.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	1
Stream	*Escherichia coli*	0	0	1
Stream	PH	0	0	1
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1

Table 383 and Figure 266 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix Q.

Table 383: Summary of the 2016–2019 status at monitoring stations within the Snake River.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	4
Escherichia coli	0	0	4
PH	0	0	4
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

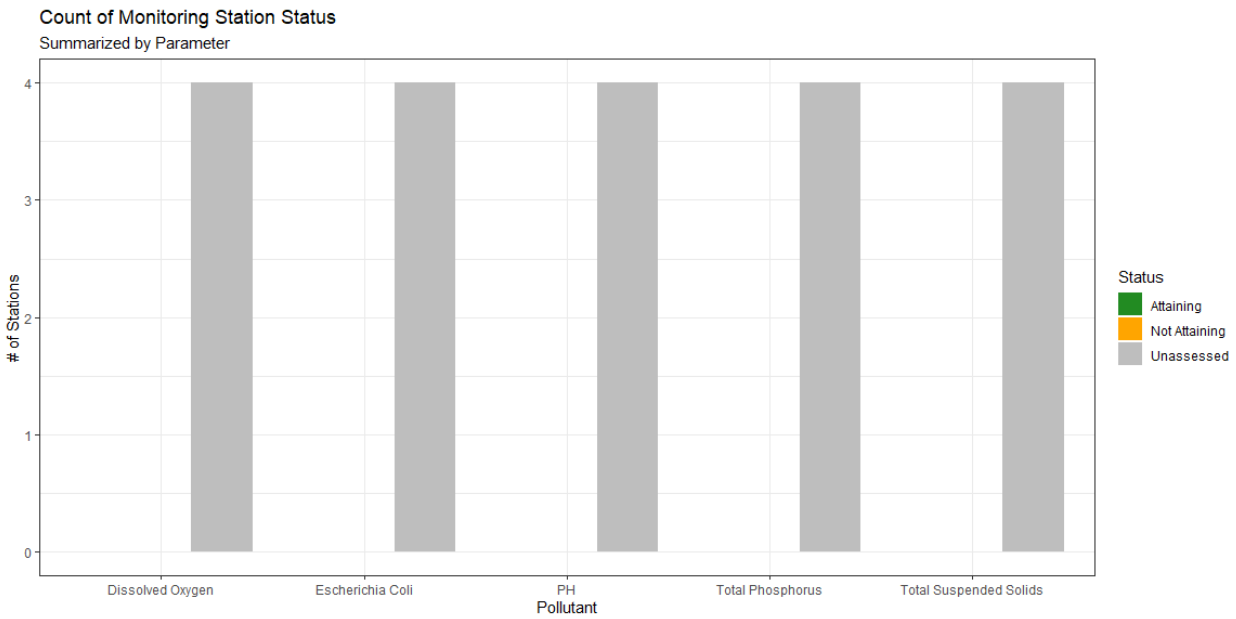

Figure 266: Summary plot of the 2016–2019 station status within the Snake River by parameter.

4.18.4 Trend

A summary of the trends across parameters is shown in Table 384. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 384: Snake River summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	4
Escherichia coli	0	0	0	0	4
PH	0	0	0	0	4
Total Phosphorus	0	0	0	0	4
Total Suspended Solids	0	0	0	0	4

4.18.5 Subbasin Summary

4.18.5.1 Middle Snake-Payette Subbasin

4.18.5.1.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.18.5.1.2 Status

There are 1 assessment units within the Middle Snake-Payette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 203 and Figure 134

summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 203: Summary of the 2016–2019 assessment unit status within the Middle Snake-Payette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	1
Escherichia coli	0	0	1
PH	0	0	1
Total Phosphorus	0	0	1
Total Suspended Solids	0	0	1

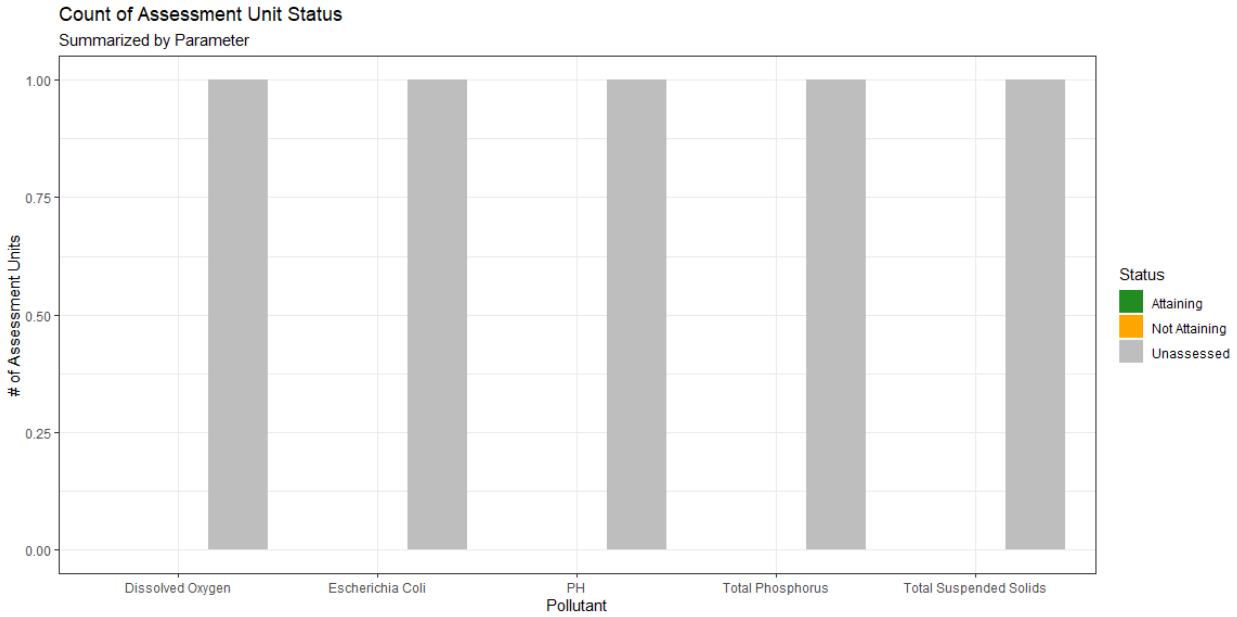

Figure 134: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 204 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Snake-Payette Subbasin for the 2016 – 2019 status period.

Table 204: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	1
Stream	*Escherichia coli*	0	0	1
Stream	PH	0	0	1
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1

There are 4 stations within the Middle Snake-Payette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix Q**. Table 205 and Figure 135 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 205: Summary of the 2016–2019 status at monitoring stations within the Middle Snake-Payette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	4
Escherichia coli	0	0	4
PH	0	0	4
Total Phosphorus	0	0	4
Total Suspended Solids	0	0	4

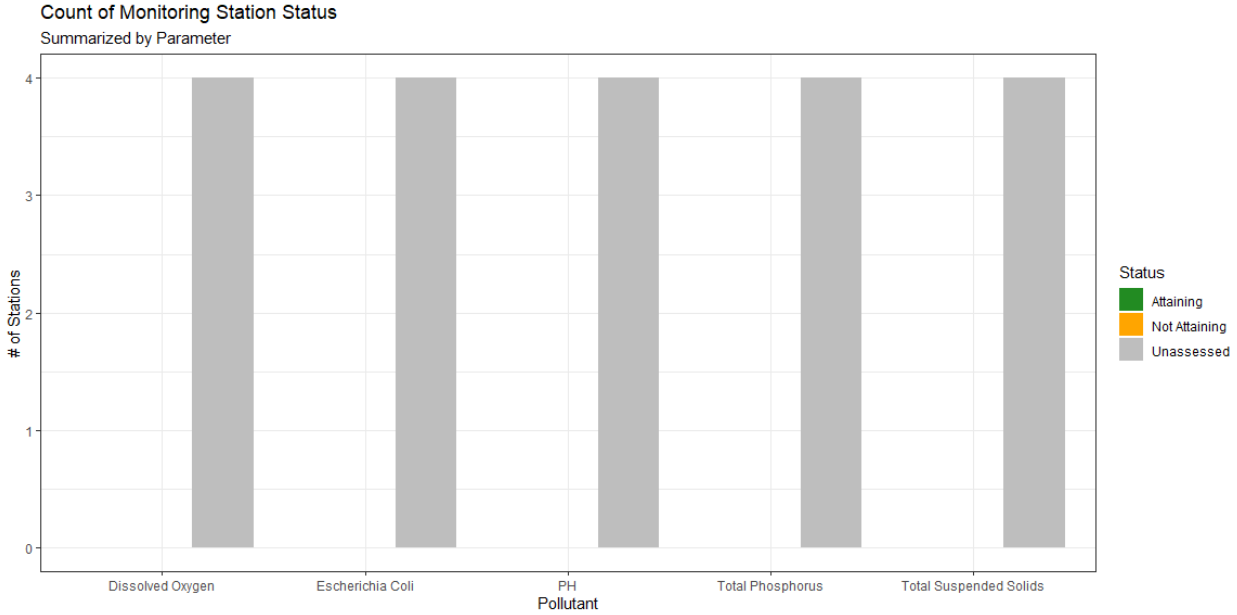

Figure 135: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Snake-Payette Subbasin.

4.18.5.1.3 Trend

A summary of the trends within parameters is shown in Table 206. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 206: Subbasin Summary of trend results at stations across the Middle Snake-Payette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	4
Escherichia coli	0	0	0	0	4
PH	0	0	0	0	4
Total Phosphorus	0	0	0	0	4

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	0	0	4

4.19 South Coast

A summary of status and trend results for the South Coast and all subbasins within the South Coast are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix R**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the South Coast are water quality limited for 5 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 622 stations within the South Coast. These stations were located across 177 assessment units consisting of 'Estuary or Bays', 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, fecal coliform, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.19.1 Land Use

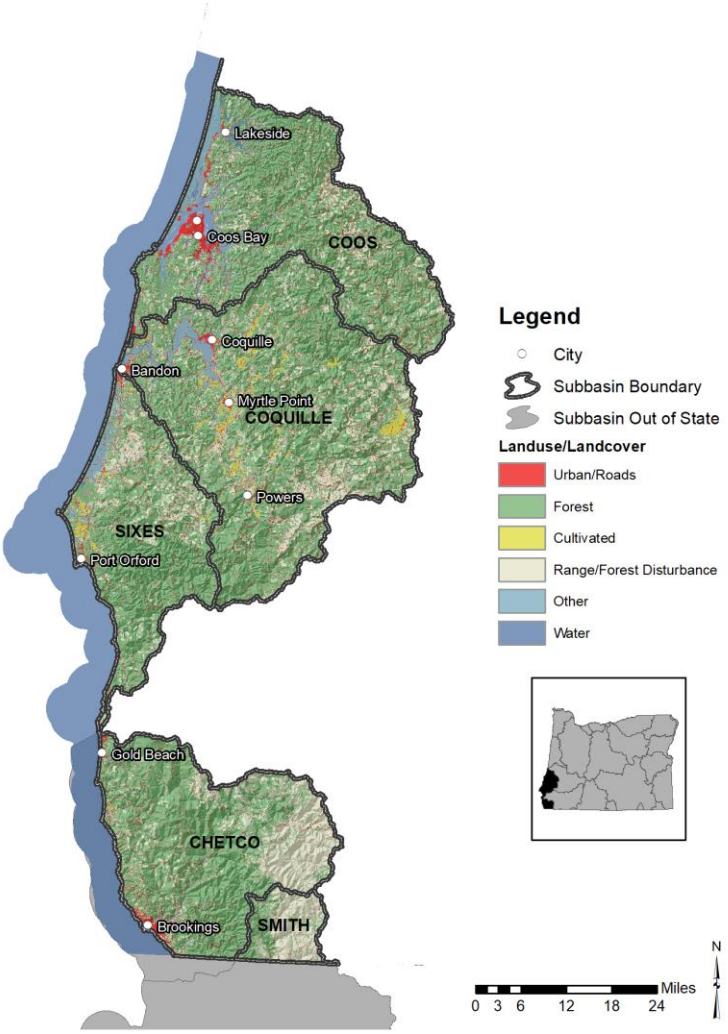

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 385: Land use within the South Coast Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Coos	2321	5.6	55.7	0.1	13.1	25.5
Coquille	2737	5.1	68.0	2.7	21.0	3.2
Sixes	1937	2.9	43.7	1.0	11.7	40.7
Chetco	1909	3.5	55.9	0.1	23.1	17.3
Smith	235	1.2	31.9	0.0	67.0	0.1

4.19.2 Parameter Maps

The maps in Figure 267 through Figure 273 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

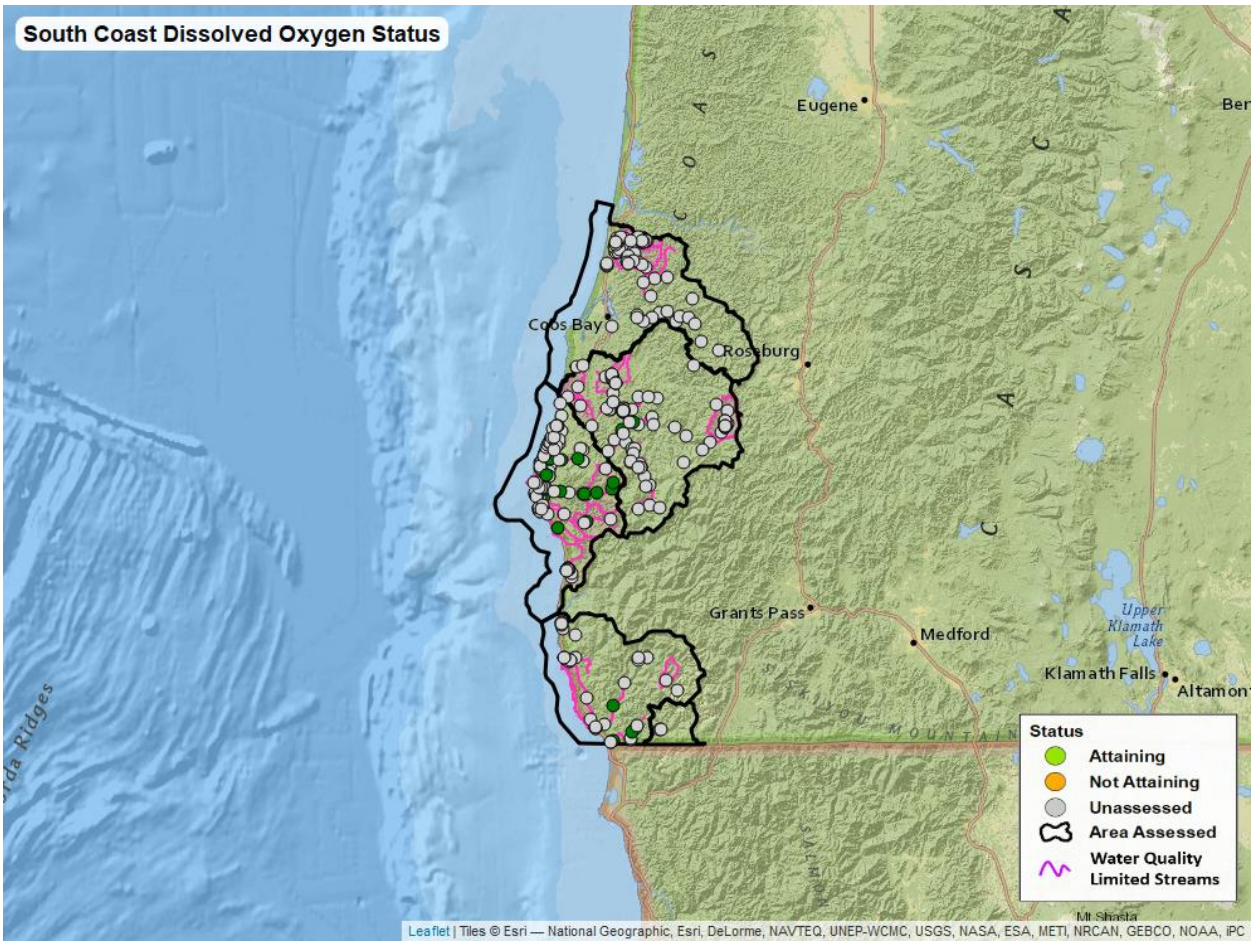

Figure 267: Summary map of the status of dissolved oxygen across the South Coast.

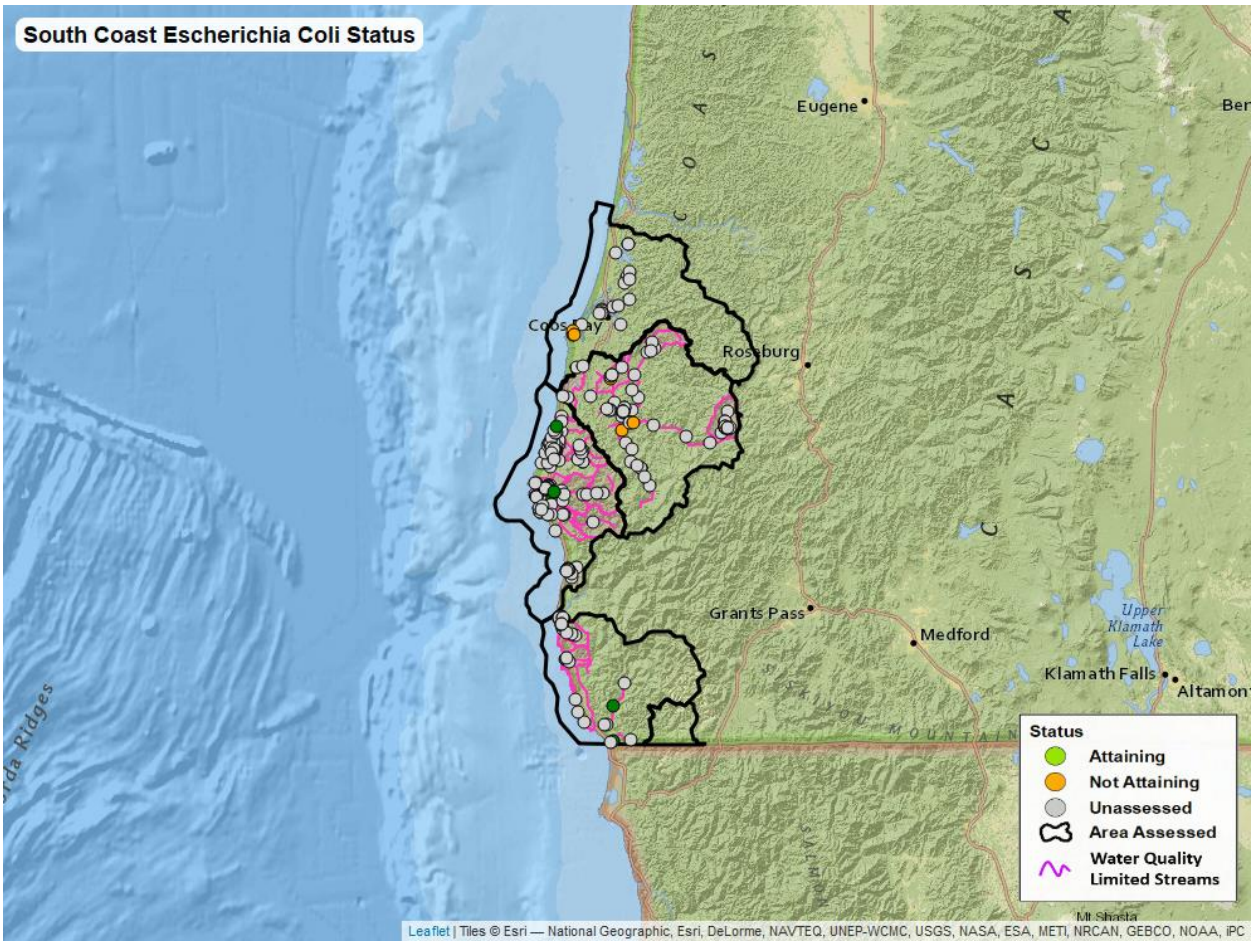

Figure 268: Summary map of the status of *Escherichia coli* across the South Coast.

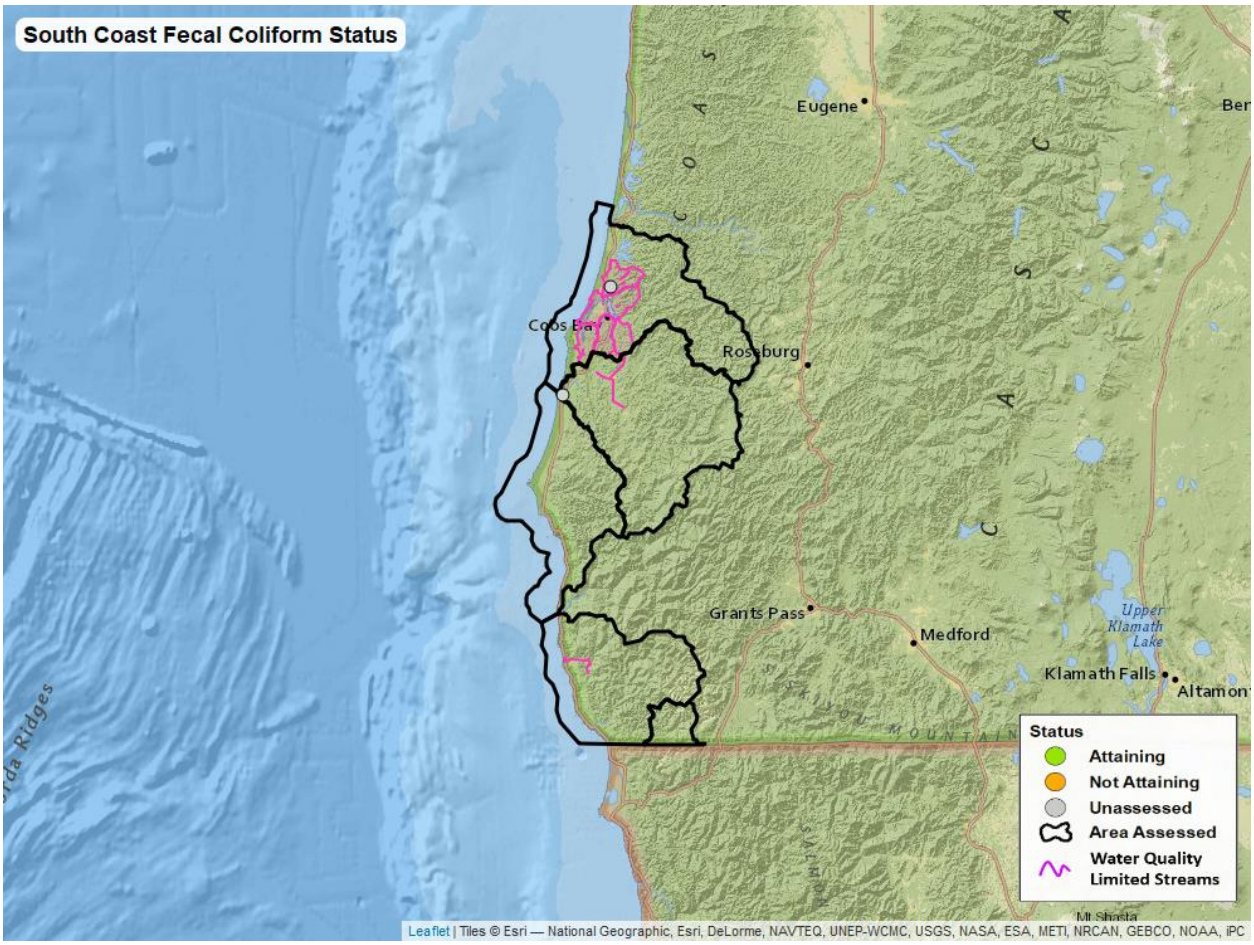

Figure 269: Summary map of the status of fecal coliform across the South Coast.

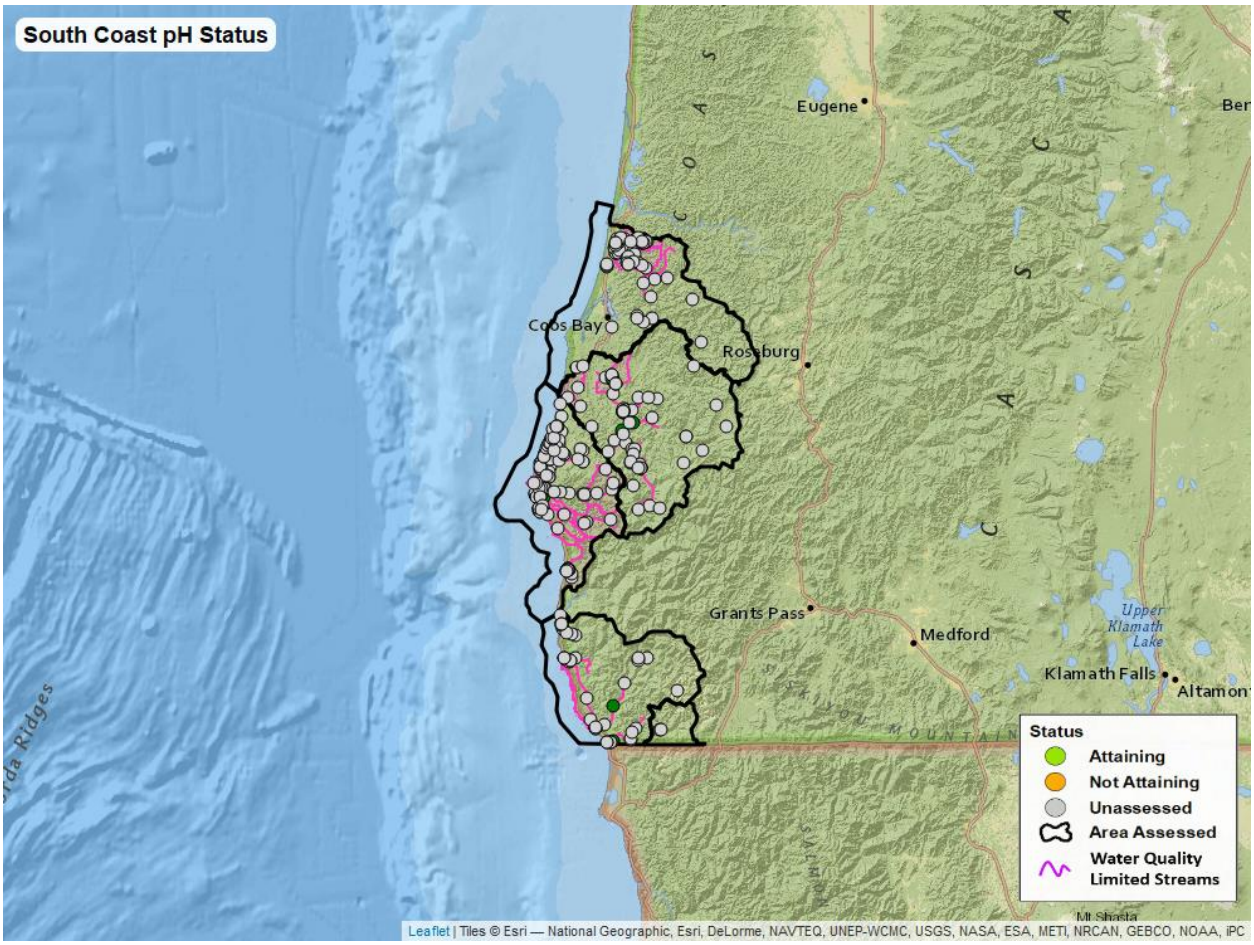

Figure 270: Summary map of the status of pH across the South Coast.

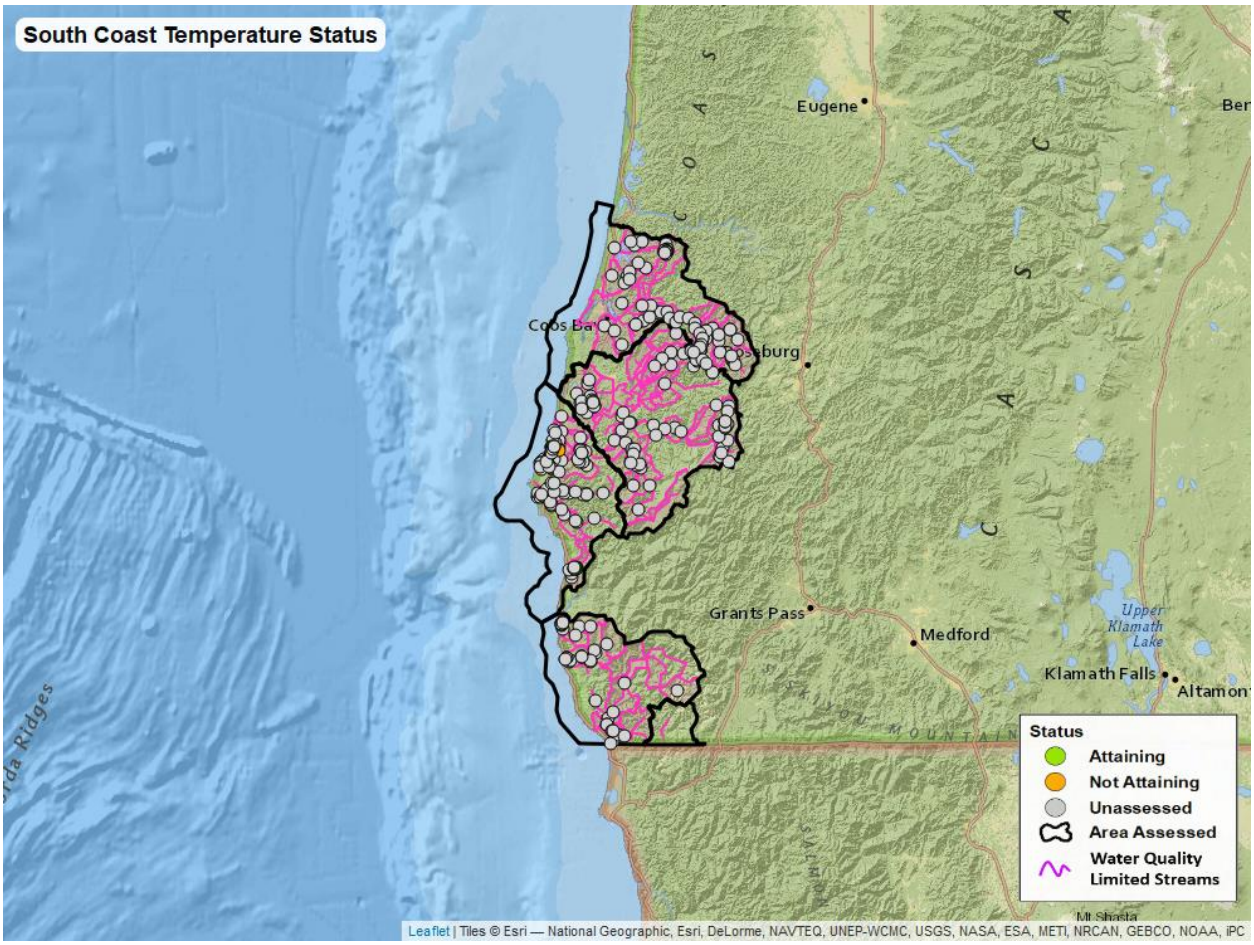

Figure 271: Summary map of the status of temperature across the South Coast.

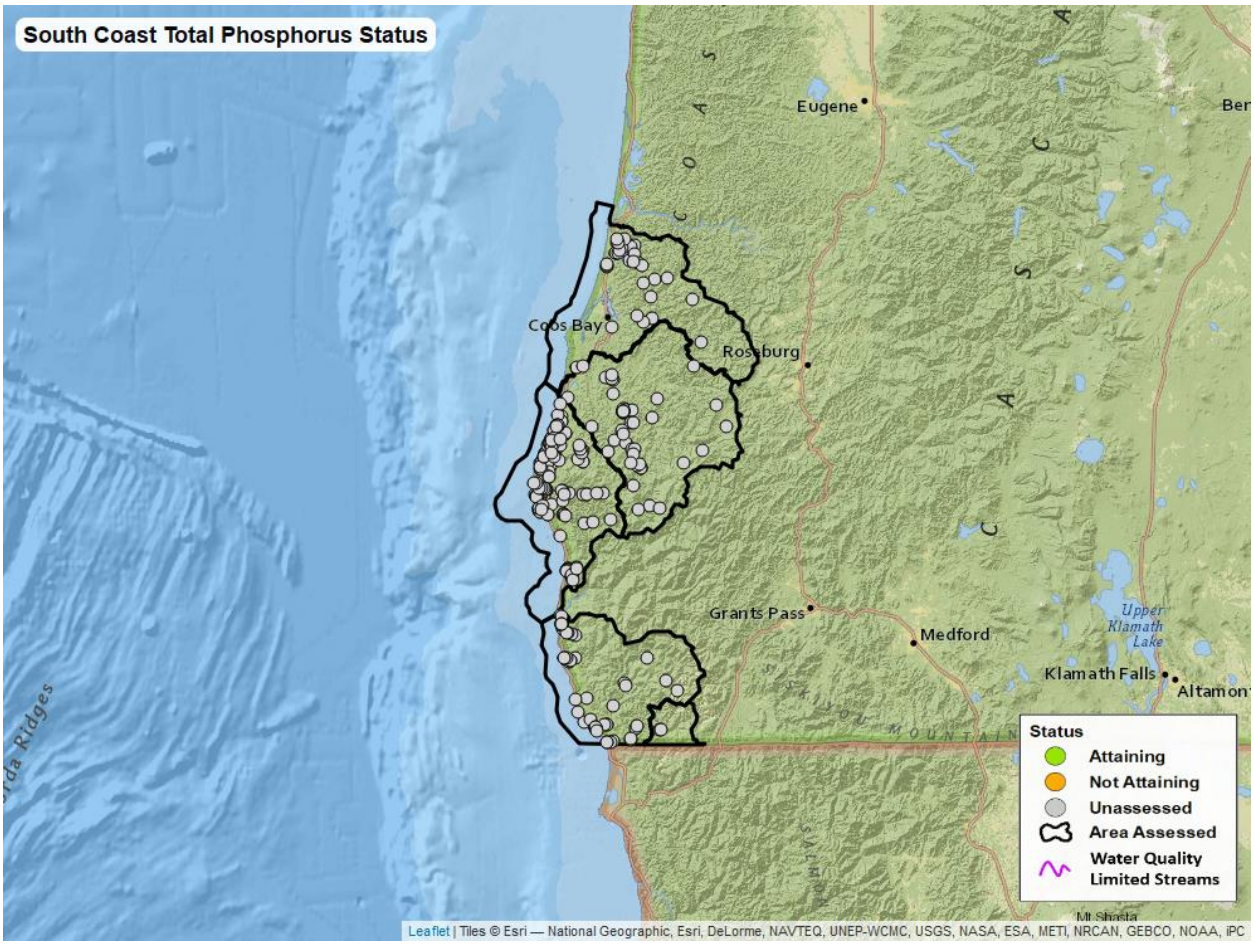

Figure 272: Summary map of the status of total phosphorus across the South Coast.

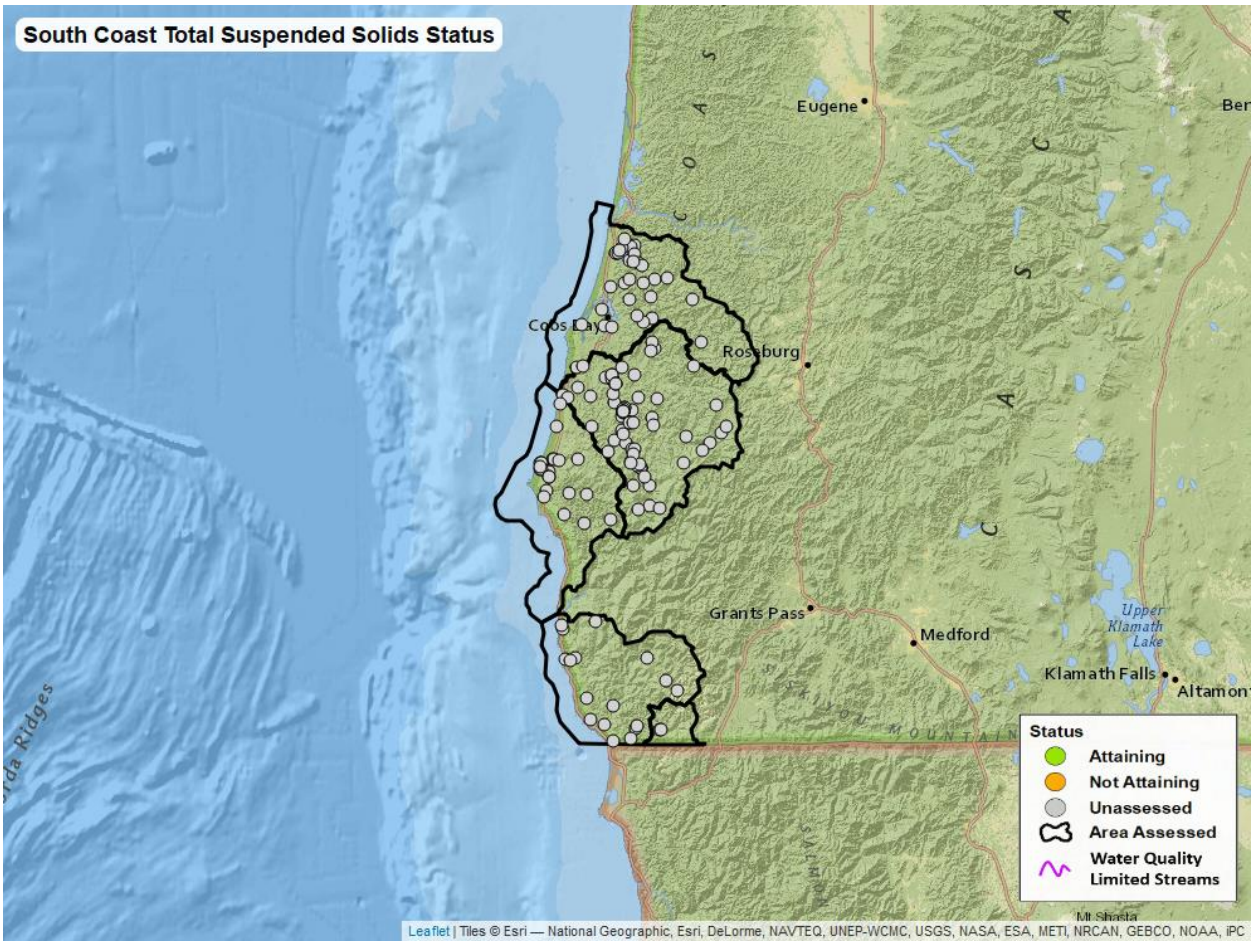

Figure 273: Summary map of the status of total suspended solids across the South Coast.

4.19.3 Status

There are 177 assessment units within the South Coast containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 386 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 386: Summary of the 2016–2019 assessment unit status within the South Coast.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	15	0	93
Escherichia coli	8	5	62
Fecal Coliform	0	0	2
PH	10	0	92
Temperature	1	3	97
Total Phosphorus	0	0	103
Total Suspended Solids	0	0	73

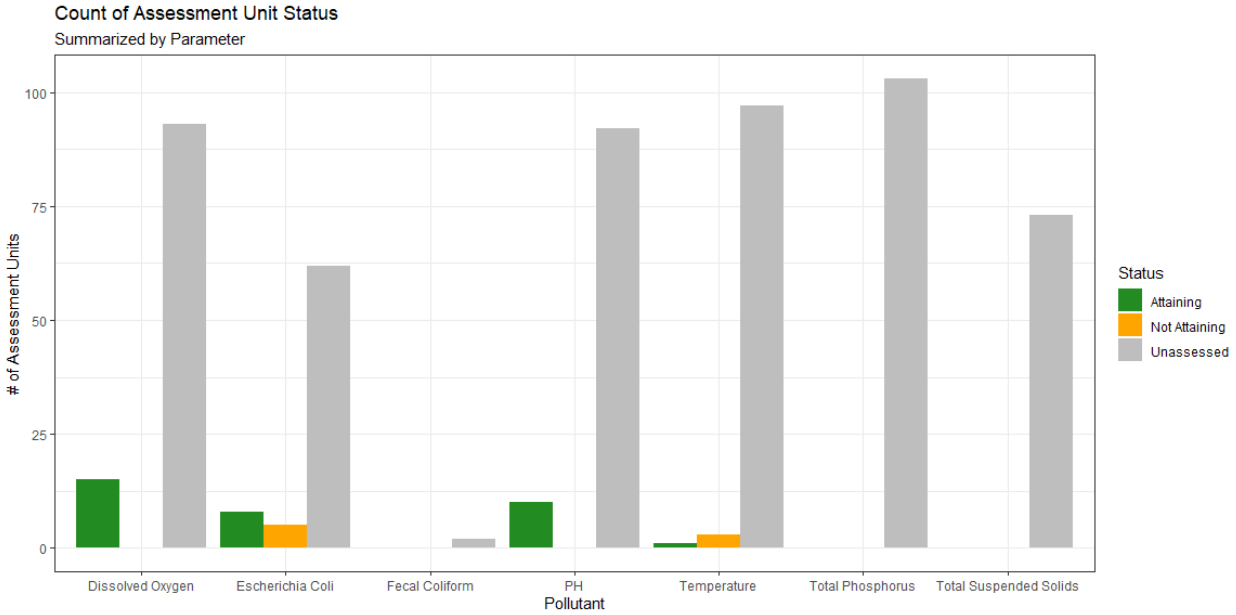

Figure 274: The number of assessment units in each status category by parameter for the 2016–2019 status period within the South Coast.

Table 387 and Figure 274 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the South Coast for the 2016–2019 status period.

Table 387: The number of assessment units in each status category by parameter for the 2016–2019 status period within the South Coast.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	8
Estuary or Bay	*Escherichia coli*	0	0	6
Estuary or Bay	Fecal Coliform	0	0	2
Estuary or Bay	PH	0	0	8
Estuary or Bay	Temperature	0	0	4
Estuary or Bay	Total Phosphorus	0	0	6
Estuary or Bay	Total Suspended Solids	0	0	6
Lake	Dissolved Oxygen	0	0	9
Lake	*Escherichia coli*	2	0	1
Lake	PH	0	0	9
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	8
Lake	Total Suspended Solids	0	0	4
Stream	Dissolved Oxygen	12	0	48
Stream	*Escherichia coli*	6	4	32
Stream	PH	10	0	44
Stream	Temperature	0	2	62

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Total Phosphorus	0	0	51
Stream	Total Suspended Solids	0	0	37
Watershed Unit	Dissolved Oxygen	3	0	28
Watershed Unit	*Escherichia coli*	0	1	23
Watershed Unit	PH	0	0	31
Watershed Unit	Temperature	1	1	30
Watershed Unit	Total Phosphorus	0	0	38
Watershed Unit	Total Suspended Solids	0	0	26

Table 388 and Figure 275 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix R.

Table 388: Summary of the 2016–2019 status at monitoring stations within the South Coast.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	22	0	269
Escherichia coli	9	7	204
Fecal Coliform	0	0	2
PH	10	0	263
Temperature	3	9	264
Total Phosphorus	0	0	270
Total Suspended Solids	0	0	150

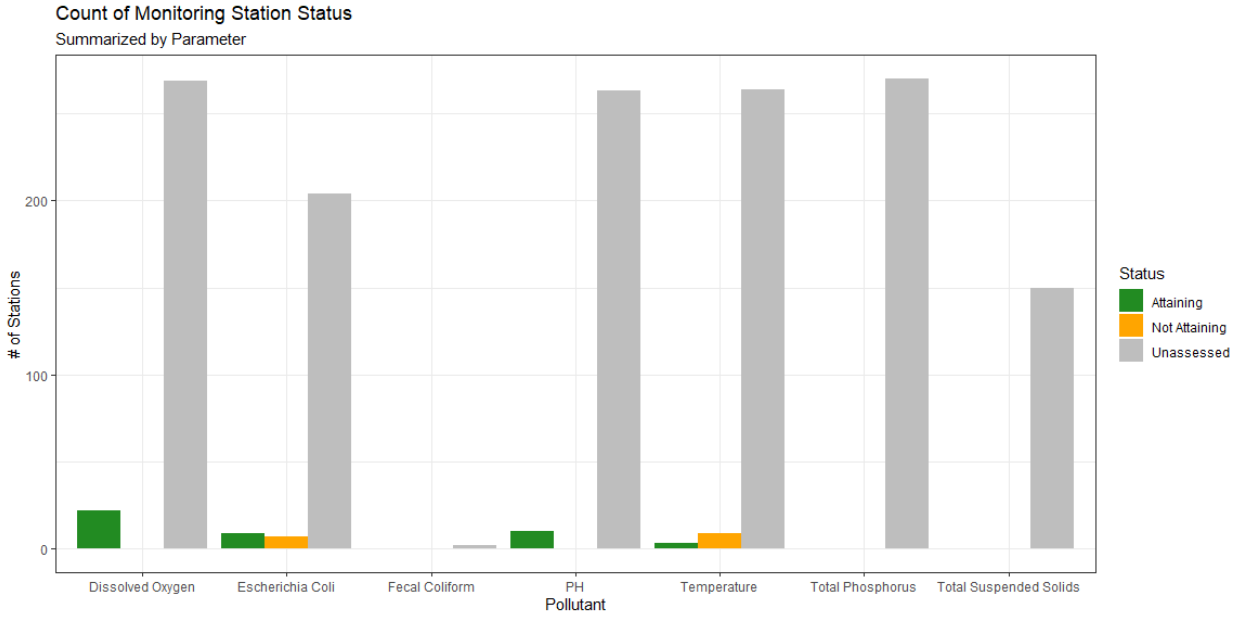

Figure 275: Summary plot of the 2016–2019 station status within the South Coast by parameter.

4.19.4 Trend

A summary of the trends across parameters is shown in Table 389. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 389: South Coast summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	7	3	0	7	274
Escherichia coli	1	6	0	3	210
Fecal Coliform	0	0	0	0	2
PH	0	5	5	7	256
Temperature	0	0	0	0	276
Total Phosphorus	0	6	5	8	251
Total Suspended Solids	1	2	1	8	138

4.19.5 Subbasin Summary

4.19.5.1 Coquille Subbasin

4.19.5.1.1 Water Quality Limited Assessment Units

Table 390: Number of water quality limited assessment units in the Coquille Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	1
Fecal Coliform	4
pH	1

4.19.5.1.2 Status

There are 56 assessment units within the Coquille Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 391 and Figure 276 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 391: Summary of the 2016–2019 assessment unit status within the Coquille Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	33
Escherichia coli	0	4	17
Fecal Coliform	0	0	1
PH	4	0	29
Temperature	0	0	33

Pollutant	Attaining	Not Attaining	Unassessed
Total Phosphorus	0	0	25
Total Suspended Solids	0	0	34

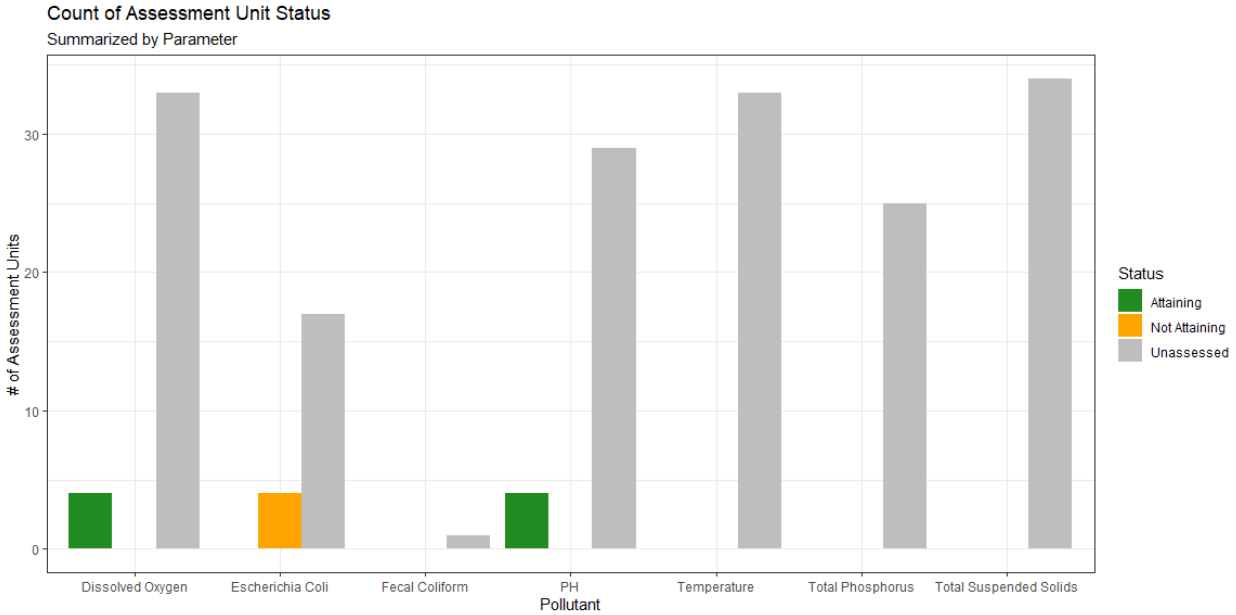

Figure 276: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Coquille Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 392 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Coquille Subbasin for the 2016 – 2019 status period.

Table 392: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Coquille Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	1
Estuary or Bay	*Escherichia coli*	0	0	1
Estuary or Bay	Fecal Coliform	0	0	1
Estuary or Bay	PH	0	0	1
Estuary or Bay	Temperature	0	0	1
Estuary or Bay	Total Suspended Solids	0	0	2
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	1
Stream	Dissolved Oxygen	4	0	20
Stream	*Escherichia coli*	0	4	12
Stream	PH	4	0	16
Stream	Temperature	0	0	22
Stream	Total Phosphorus	0	0	14

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Total Suspended Solids	0	0	20
Watershed Unit	Dissolved Oxygen	0	0	11
Watershed Unit	*Escherichia coli*	0	0	4
Watershed Unit	PH	0	0	11
Watershed Unit	Temperature	0	0	10
Watershed Unit	Total Phosphorus	0	0	11
Watershed Unit	Total Suspended Solids	0	0	12

There are 144 stations within the Coquille Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix R**. Table 393 and Figure 277 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 393: Summary of the 2016–2019 status at monitoring stations within the Coquille Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	85
Escherichia coli	0	4	57
Fecal Coliform	0	0	1
PH	4	0	61
Temperature	0	0	63
Total Phosphorus	0	0	48
Total Suspended Solids	0	0	74

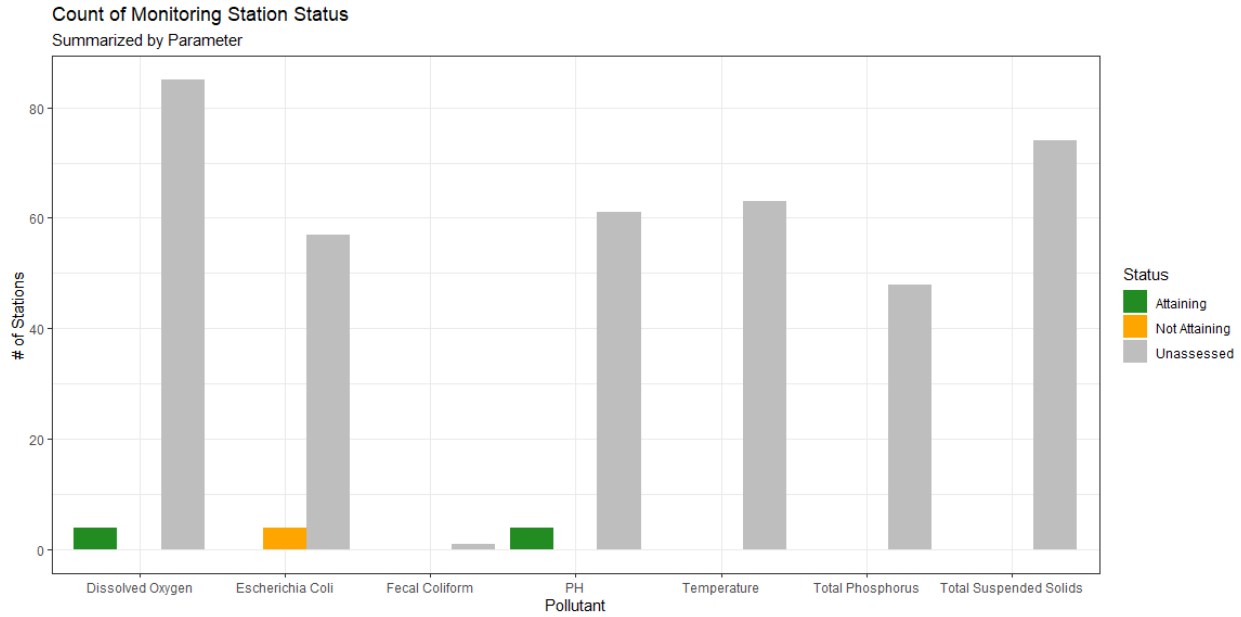

Figure 277: The number of stations in each status category by parameter for the 2016–2019 status period within the Coquille Subbasin.

4.19.5.1.3 Trend

A summary of the trends within parameters is shown in Table 394. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 394: Subbasin Summary of trend results at stations across the Coquille.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	4	0	0	1	84
Escherichia coli	1	0	0	3	57
Fecal Coliform	0	0	0	0	1
PH	0	1	2	2	60
Temperature	0	0	0	0	63
Total Phosphorus	0	0	3	2	43
Total Suspended Solids	1	1	0	3	69

4.19.5.2 Sixes Subbasin

4.19.5.2.1 Water Quality Limited Assessment Units

Table 395: Number of water quality limited assessment units in the Sixes Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	1
Total Phosphorus, mixed forms	1

4.19.5.2.2 Status

There are 48 assessment units within the Sixes Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 396 and Figure 278 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 396: Summary of the 2016–2019 assessment unit status within the Sixes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	7	0	28
Escherichia coli	4	0	30
PH	3	0	32
Temperature	1	3	19
Total Phosphorus	0	0	42
Total Suspended Solids	0	0	9

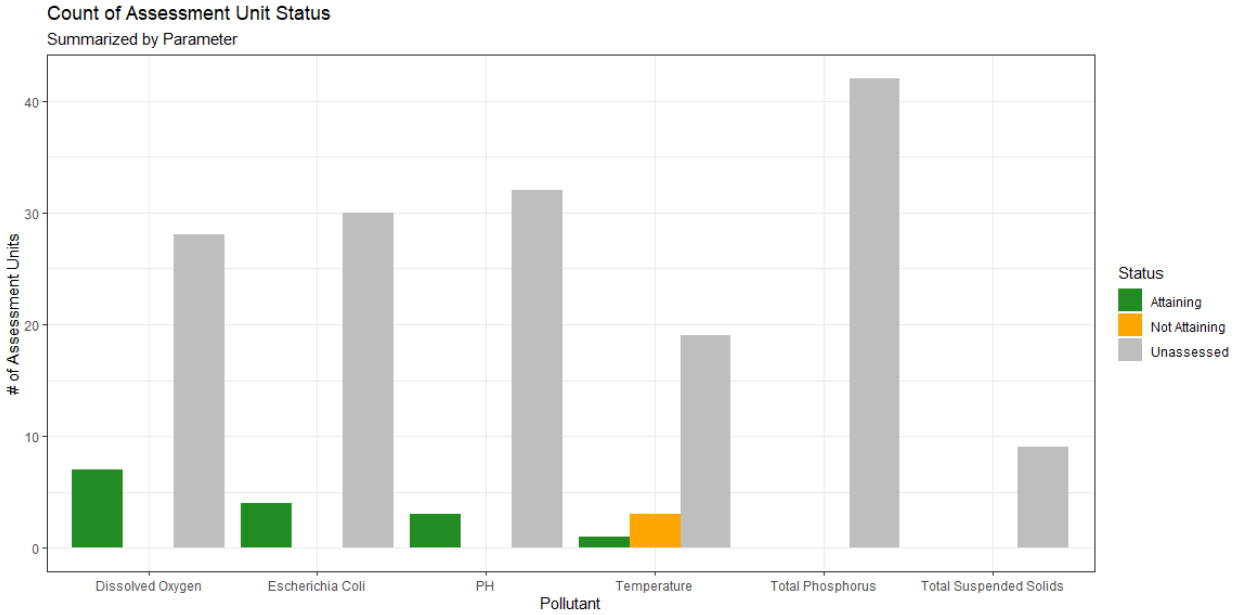

Figure 278: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Sixes Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 397 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Sixes Subbasin for the 2016 – 2019 status period.

Table 397: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Sixes Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	3
Estuary or Bay	*Escherichia coli*	0	0	2
Estuary or Bay	PH	0	0	3
Estuary or Bay	Total Phosphorus	0	0	2
Lake	Dissolved Oxygen	0	0	4
Lake	*Escherichia coli*	1	0	1
Lake	PH	0	0	4
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	4
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	4	0	15
Stream	*Escherichia coli*	3	0	16
Stream	PH	3	0	16
Stream	Temperature	0	2	15
Stream	Total Phosphorus	0	0	23
Stream	Total Suspended Solids	0	0	4

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Dissolved Oxygen	3	0	6
Watershed Unit	*Escherichia coli*	0	0	11
Watershed Unit	PH	0	0	9
Watershed Unit	Temperature	1	1	3
Watershed Unit	Total Phosphorus	0	0	13
Watershed Unit	Total Suspended Solids	0	0	3

There are 242 stations within the Sixes Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix R**. Table 398 and Figure 279 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 398: Summary of the 2016–2019 status at monitoring stations within the Sixes Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	14	0	89
Escherichia coli	5	0	103
PH	3	0	109
Temperature	3	9	84
Total Phosphorus	0	0	143
Total Suspended Solids	0	0	26

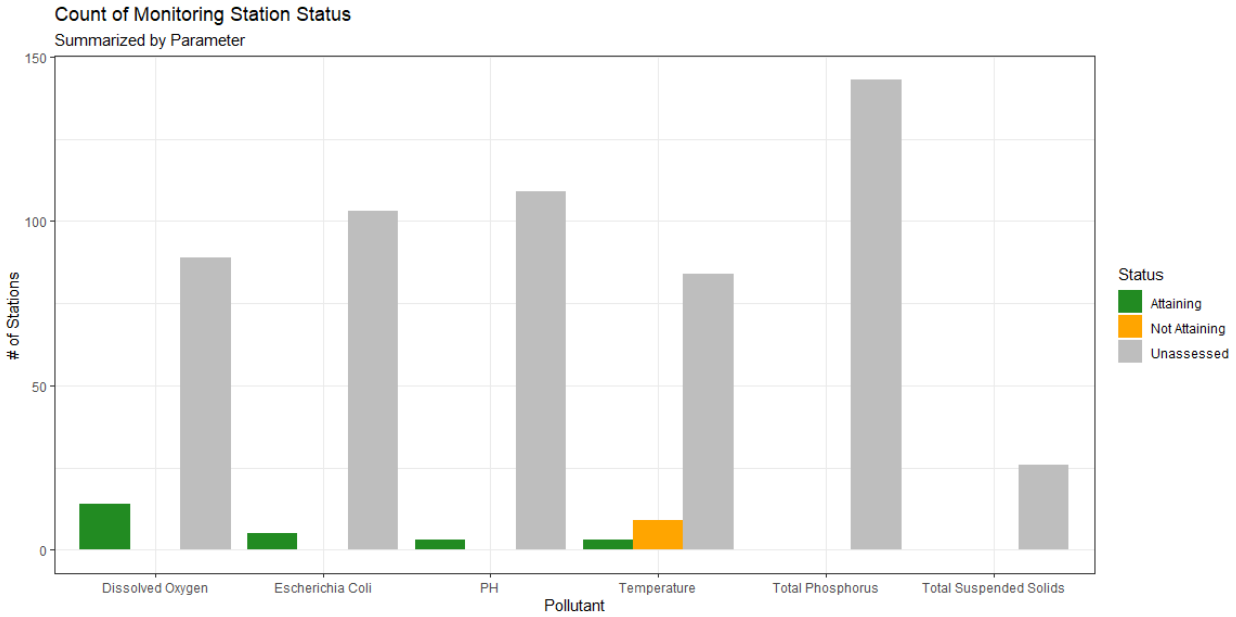

Figure 279: The number of stations in each status category by parameter for the 2016–2019 status period within the Sixes Subbasin.

4.19.5.2.3 Trend

A summary of the trends within parameters is shown in Table 399. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 399: Subbasin Summary of trend results at stations across the Sixes.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	0	100
Escherichia coli	0	3	0	0	105
PH	0	0	3	0	109
Temperature	0	0	0	0	96
Total Phosphorus	0	2	2	1	138
Total Suspended Solids	0	0	1	2	23

4.19.5.3 Chetco Subbasin

4.19.5.3.1 Water Quality Limited Assessment Units

Table 400: Number of water quality limited assessment units in the Chetco Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	1
Enterococcus	2
Fecal Coliform	1
pH	1

4.19.5.3.2 Status

There are 27 assessment units within the Chetco Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 401 and Figure 280 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 401: Summary of the 2016–2019 assessment unit status within the Chetco Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	10
Escherichia coli	3	0	6
PH	3	0	12
Temperature	0	0	15
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	10

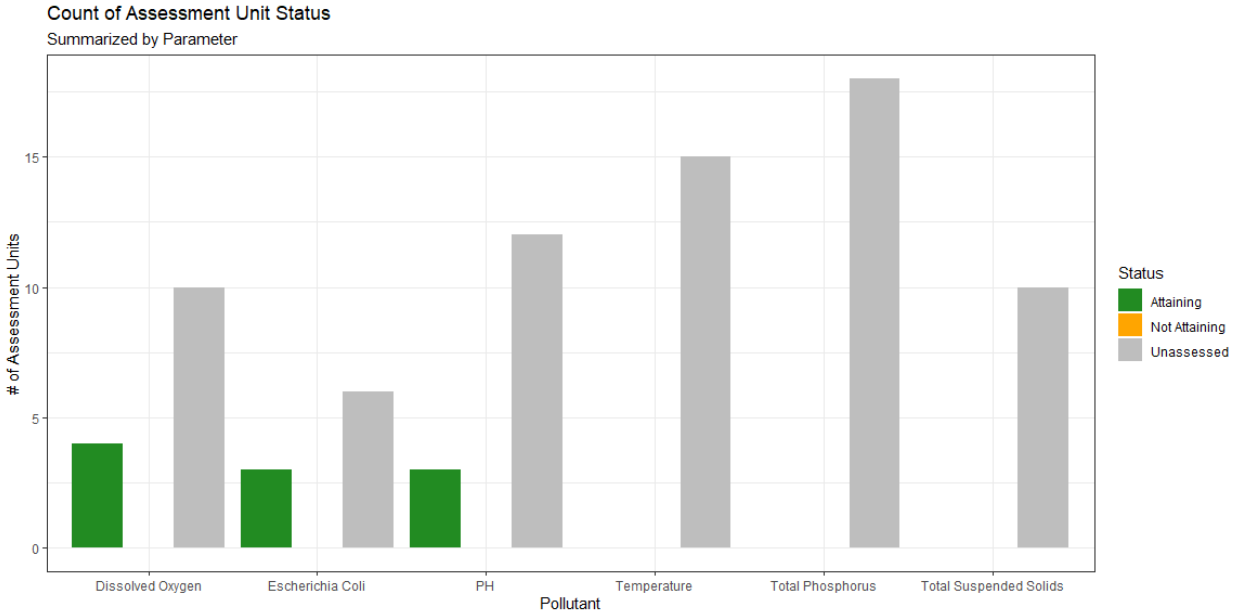

Figure 280: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Chetco Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 402 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Chetco Subbasin for the 2016 – 2019 status period.

Table 402: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Chetco Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	2
Estuary or Bay	PH	0	0	2
Estuary or Bay	Total Phosphorus	0	0	2
Stream	Dissolved Oxygen	4	0	2
Stream	*Escherichia coli*	3	0	1
Stream	PH	3	0	3
Stream	Temperature	0	0	8
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	5
Watershed Unit	Dissolved Oxygen	0	0	6
Watershed Unit	*Escherichia coli*	0	0	5
Watershed Unit	PH	0	0	7
Watershed Unit	Temperature	0	0	7
Watershed Unit	Total Phosphorus	0	0	10
Watershed Unit	Total Suspended Solids	0	0	5

There are 84 stations within the Chetco Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix R**. Table 403 and Figure 281 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 403: Summary of the 2016–2019 status at monitoring stations within the Chetco Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	29
Escherichia coli	3	0	28
PH	3	0	34
Temperature	0	0	37
Total Phosphorus	0	0	47
Total Suspended Solids	0	0	17

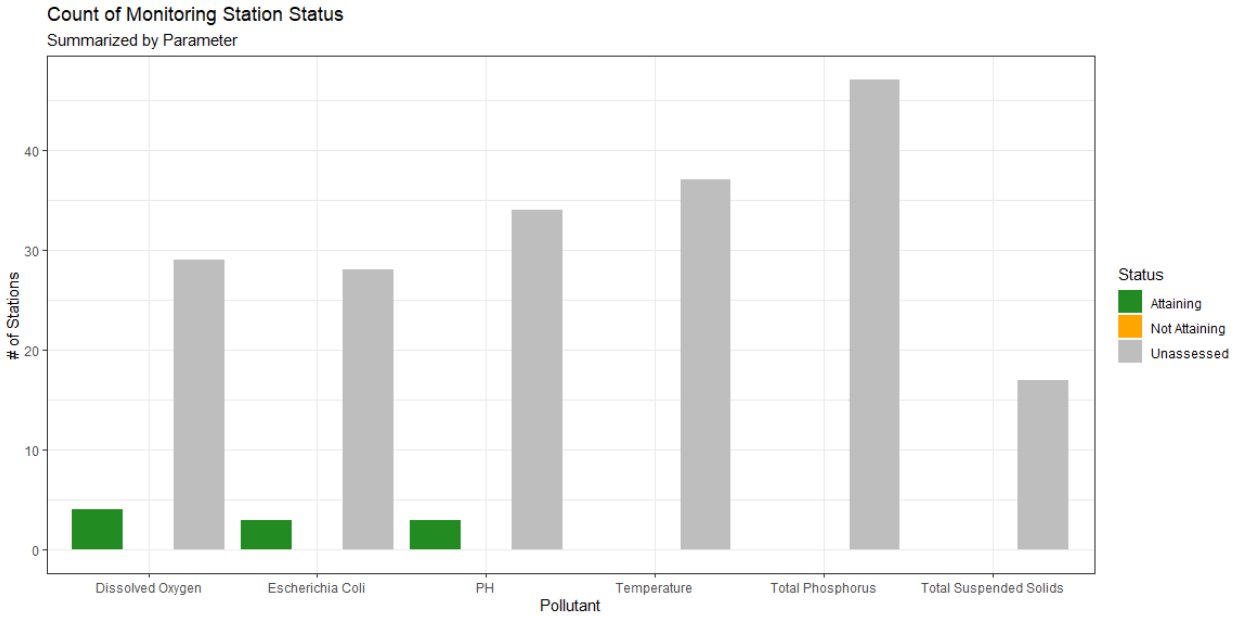

Figure 281: The number of stations in each status category by parameter for the 2016–2019 status period within the Chetco Subbasin.

4.19.5.3.3 Trend

A summary of the trends within parameters is shown in Table 404. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 404: Subbasin Summary of trend results at stations across the Chetco.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	2	0	1	30
Escherichia coli	0	3	0	0	28
PH	0	2	0	1	34
Temperature	0	0	0	0	37

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	1	0	4	42
Total Suspended Solids	0	0	0	3	14

4.19.5.4 Smith Subbasin

4.19.5.4.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.19.5.4.2 Status

There are 2 assessment units within the Smith Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 405 and Figure 282 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 405: Summary of the 2016–2019 assessment unit status within the Smith Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	2
PH	0	0	2
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

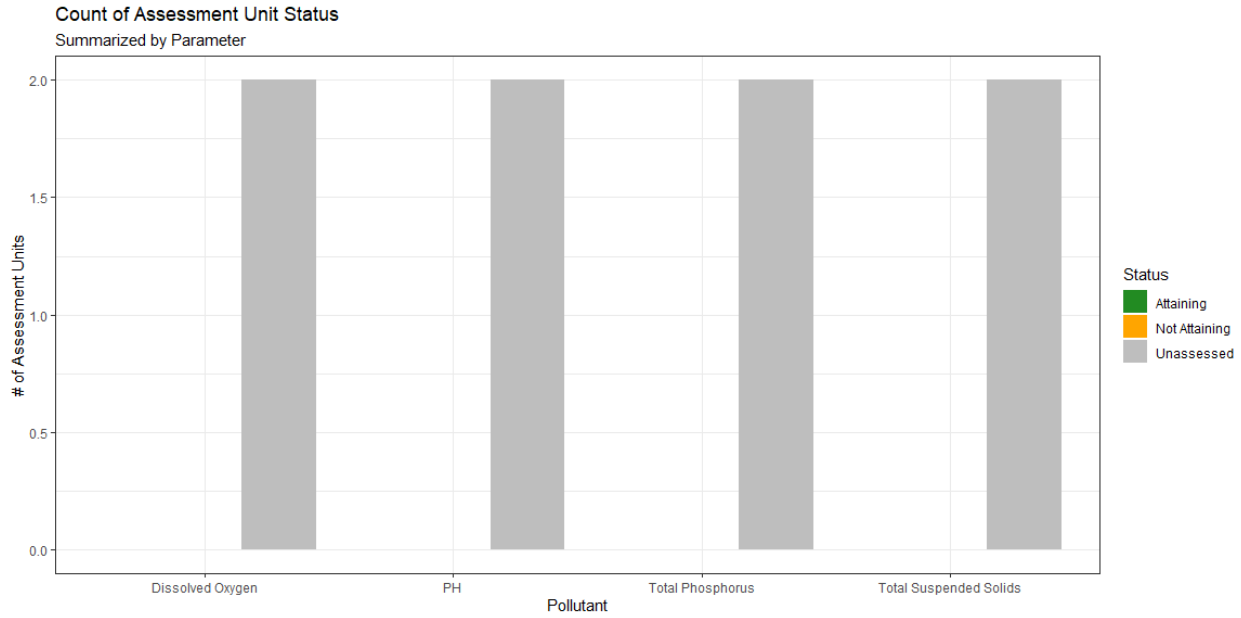

Figure 282: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Smith Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 406 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Smith Subbasin for the 2016 – 2019 status period.

Table 406: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Smith Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	1
Stream	PH	0	0	1
Stream	Total Phosphorus	0	0	1
Stream	Total Suspended Solids	0	0	1
Watershed Unit	Dissolved Oxygen	0	0	1
Watershed Unit	PH	0	0	1
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	1

There are 2 stations within the Smith Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix R**. Table 407 and Figure 283 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 407: Summary of the 2016–2019 status at monitoring stations within the Smith Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	2
PH	0	0	2
Total Phosphorus	0	0	2
Total Suspended Solids	0	0	2

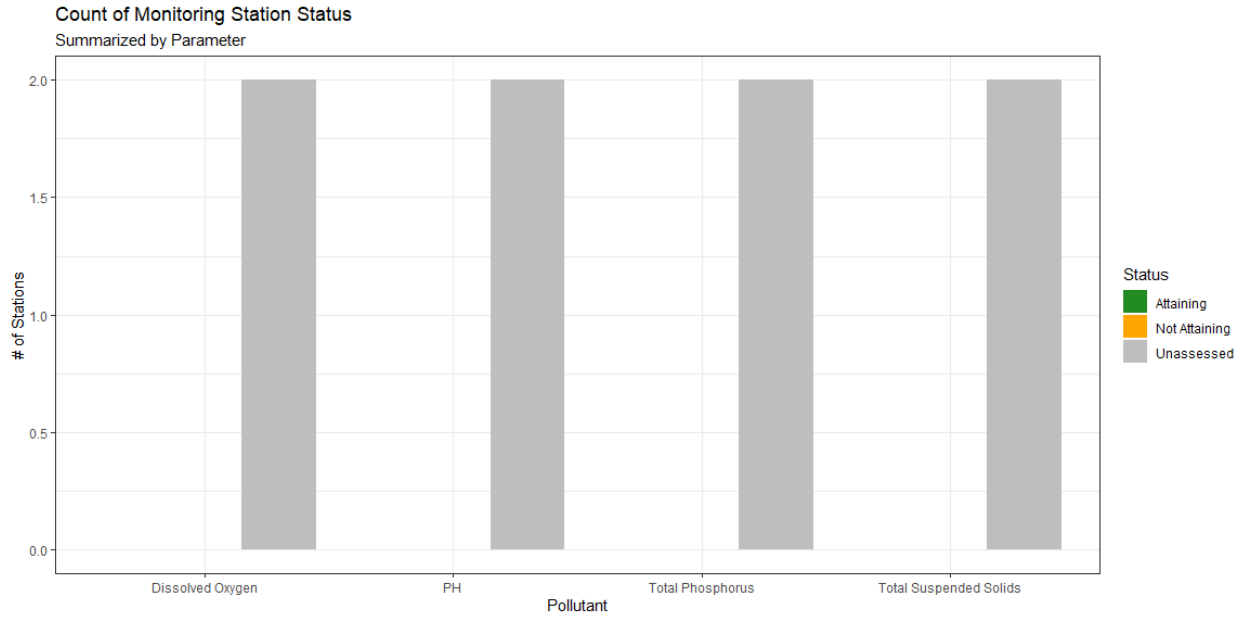

Figure 283: The number of stations in each status category by parameter for the 2016–2019 status period within the Smith Subbasin.

4.19.5.4.3 Trend

A summary of the trends within parameters is shown in Table 408. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 408: Subbasin Summary of trend results at stations across the Smith.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	0	2
PH	0	0	0	0	2
Total Phosphorus	0	0	0	0	2
Total Suspended Solids	0	0	0	0	2

4.19.5.5 Coos Subbasin

4.19.5.5.1 Water Quality Limited Assessment Units

Table 409: Number of water quality limited assessment units in the Coos Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Dissolved oxygen (DO)	2
Enterococcus	1
Fecal Coliform	24
pH	3

4.19.5.5.2 Status

There are 44 assessment units within the Coos Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 410 and Figure 284 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 410: Summary of the 2016–2019 assessment unit status within the Coos Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	20
Escherichia coli	1	1	9
Fecal Coliform	0	0	1
PH	0	0	17
Temperature	0	0	30
Total Phosphorus	0	0	16
Total Suspended Solids	0	0	18

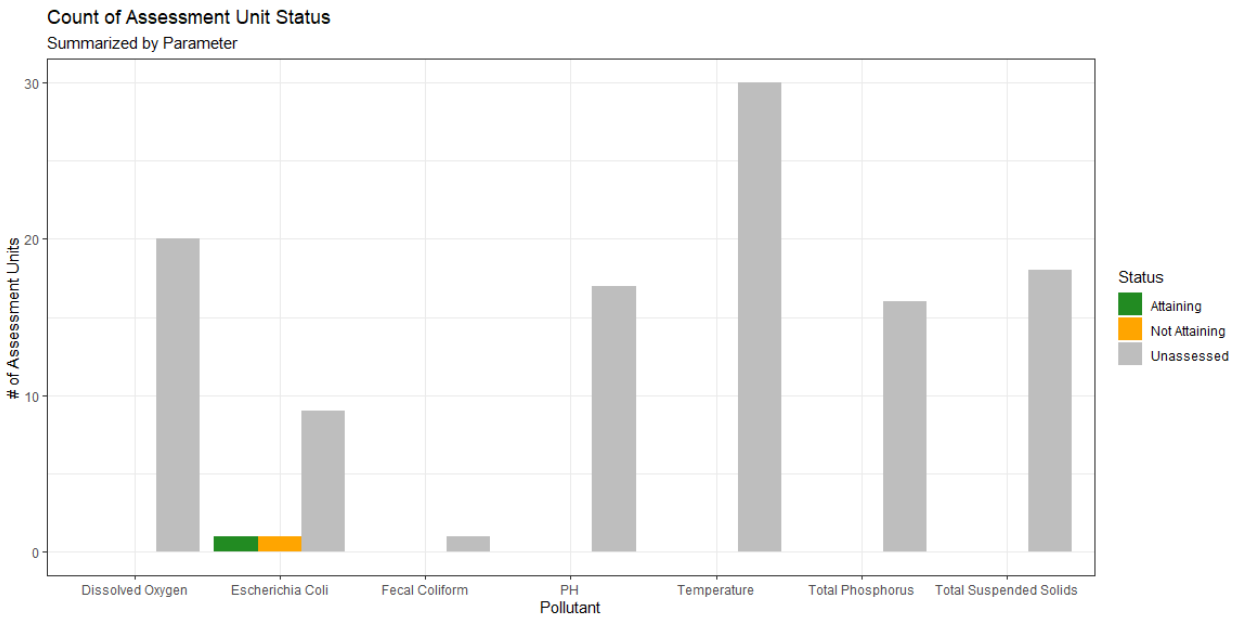

Figure 284: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Coos Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 411 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Coos Subbasin for the 2016 – 2019 status period.

Table 411: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Coos Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	2
Estuary or Bay	*Escherichia coli*	0	0	3
Estuary or Bay	Fecal Coliform	0	0	1
Estuary or Bay	PH	0	0	2
Estuary or Bay	Temperature	0	0	3
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	4
Lake	Dissolved Oxygen	0	0	4
Lake	*Escherichia coli*	1	0	0
Lake	PH	0	0	4
Lake	Total Phosphorus	0	0	4
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	0	0	10
Stream	*Escherichia coli*	0	0	3
Stream	PH	0	0	8
Stream	Temperature	0	0	17

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Total Phosphorus	0	0	7
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	0	0	4
Watershed Unit	*Escherichia coli*	0	1	3
Watershed Unit	PH	0	0	3
Watershed Unit	Temperature	0	0	10
Watershed Unit	Total Phosphorus	0	0	3
Watershed Unit	Total Suspended Solids	0	0	5

There are 150 stations within the Coos Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix R**. Table 412 and Figure 285 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 412: Summary of the 2016–2019 status at monitoring stations within the Coos Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	0	0	64
Escherichia coli	1	3	16
Fecal Coliform	0	0	1
PH	0	0	57
Temperature	0	0	80
Total Phosphorus	0	0	30
Total Suspended Solids	0	0	31

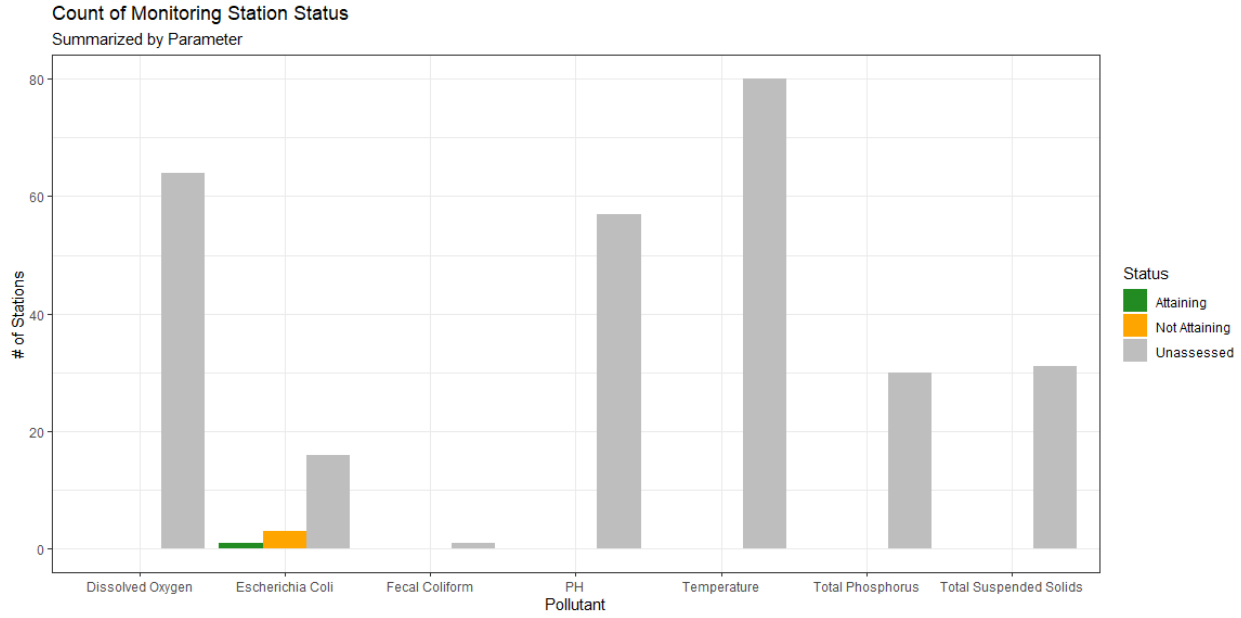

Figure 285: The number of stations in each status category by parameter for the 2016–2019 status period within the Coos Subbasin.

4.19.5.5.3 Trend

A summary of the trends within parameters is shown in Table 413. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 413: Subbasin Summary of trend results at stations across the Coos.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	1	0	5	58
Escherichia coli	0	0	0	0	20
Fecal Coliform	0	0	0	0	1
PH	0	2	0	4	51
Temperature	0	0	0	0	80
Total Phosphorus	0	3	0	1	26
Total Suspended Solids	0	1	0	0	30

4.20 Umatilla-Walla Walla-Willow

A summary of status and trend results for the Umatilla-Walla Walla-Willow and all subbasins within the Umatilla-Walla Walla-Willow are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix S**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Umatilla-Walla Walla-Willow are water quality limited for 3 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 119 stations within the Umatilla-Walla Walla-Willow. These stations were located across 39 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.20.1 Land Use

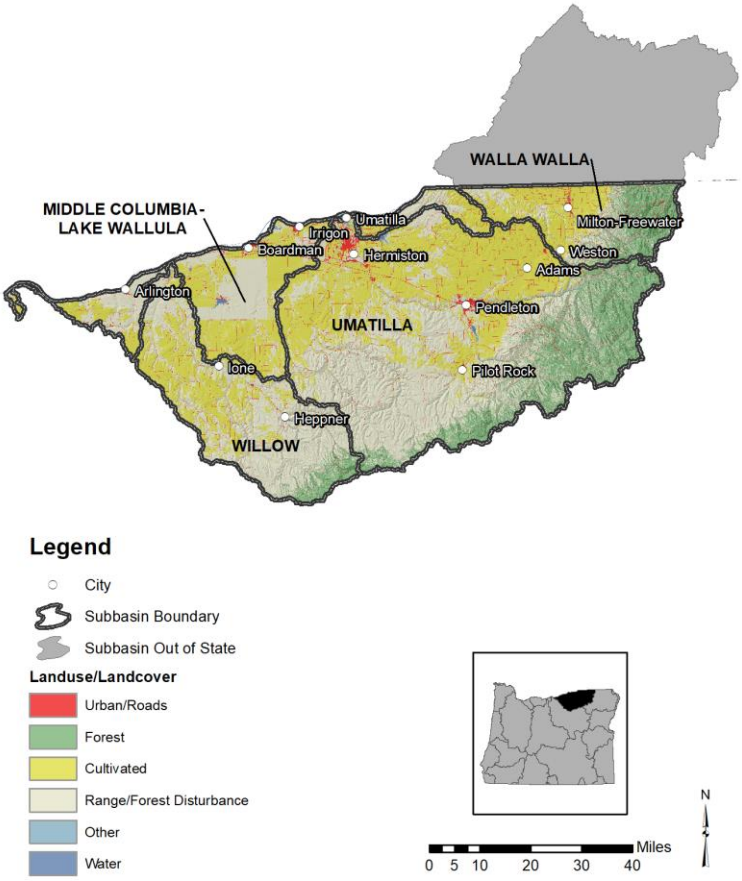

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 414: Land use within the Umatilla-Walla Walla-Willow Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Columbia-Lake Wallula	2032	4.1	0.1	49.7	45.3	0.8
Walla Walla	1243	3.6	30.6	37.7	27.7	0.4
Umatilla	6542	3.1	16.3	32.3	47.7	0.5

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Willow	2247	2.0	6.2	30.0	61.4	0.5

4.20.2 Parameter Maps

The maps in Figure 286 through Figure 291 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

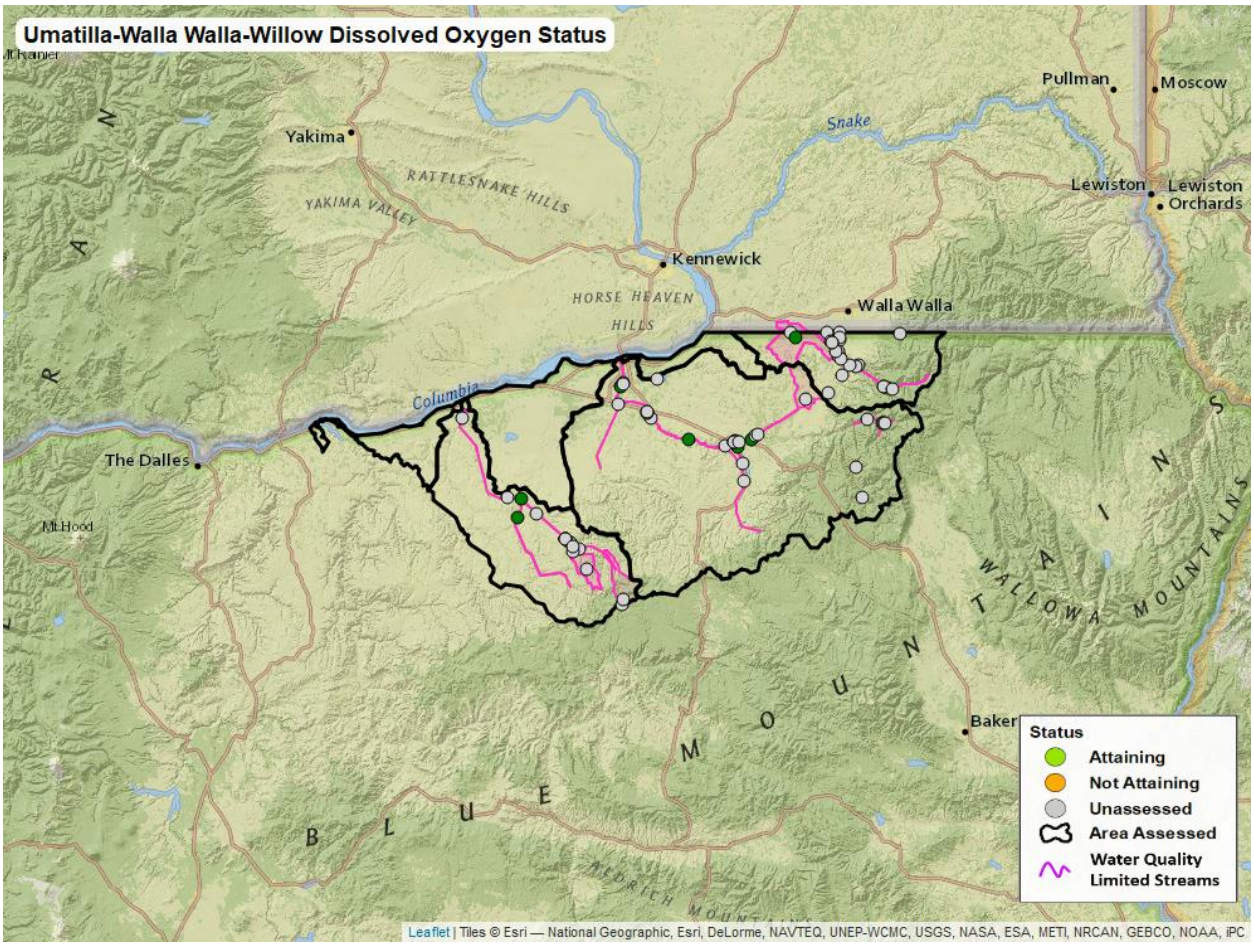

Figure 286: Summary map of the status of dissolved oxygen across the Umatilla-Walla Walla-Willow.

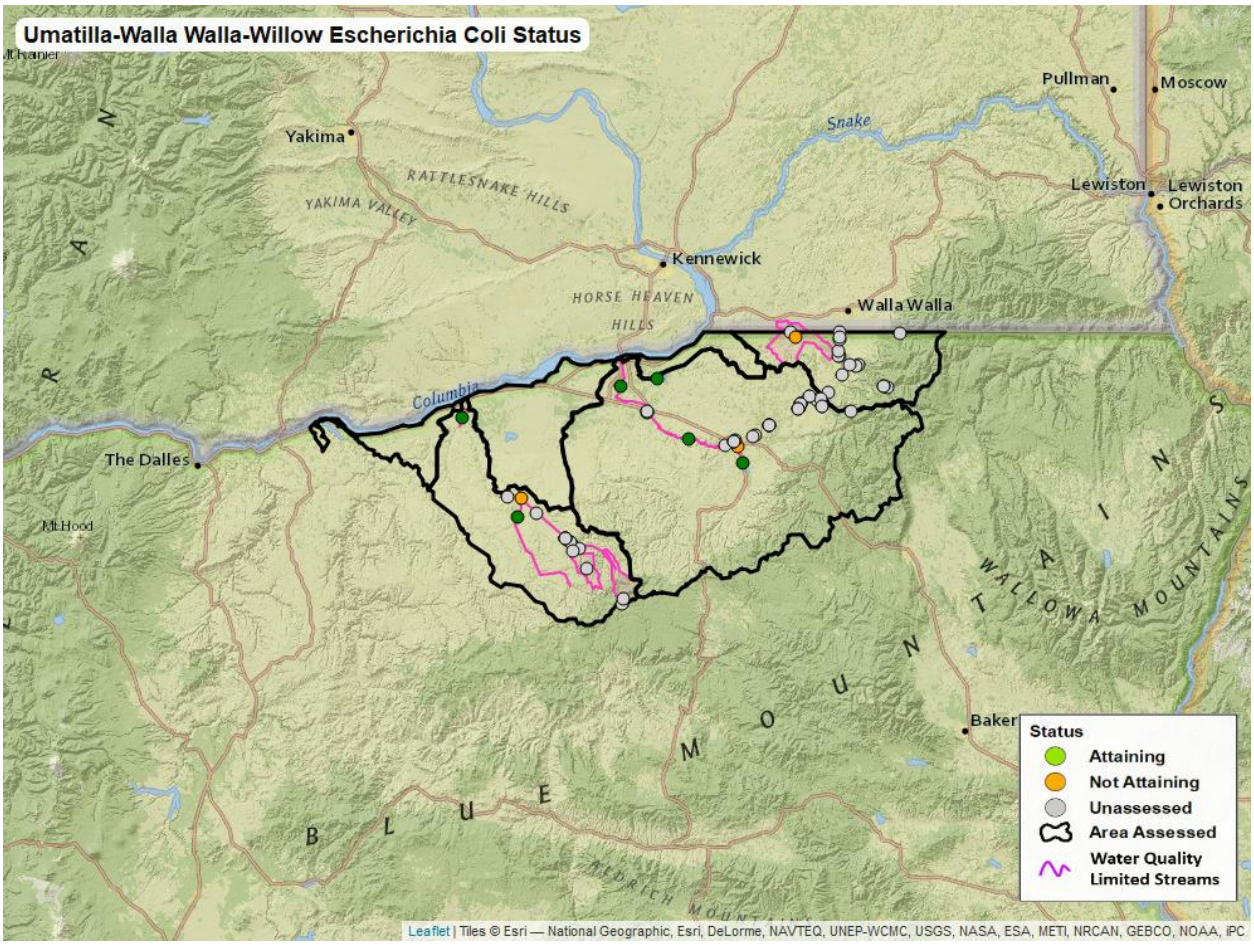

Figure 287: Summary map of the status of *Escherichia coli* across the Umatilla-Walla Walla-Willow.

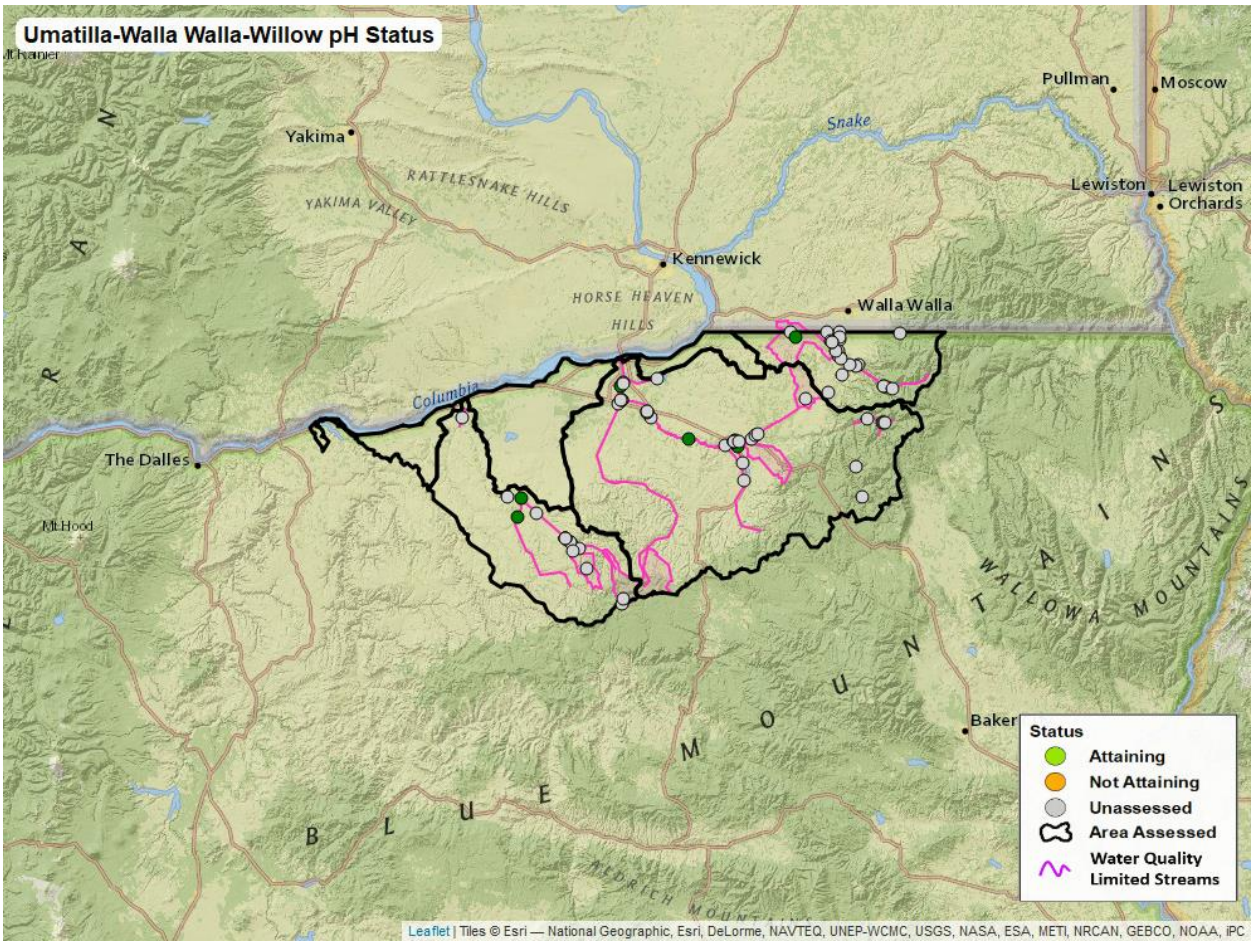

Figure 288: Summary map of the status of pH across the Umatilla-Walla Walla-Willow.

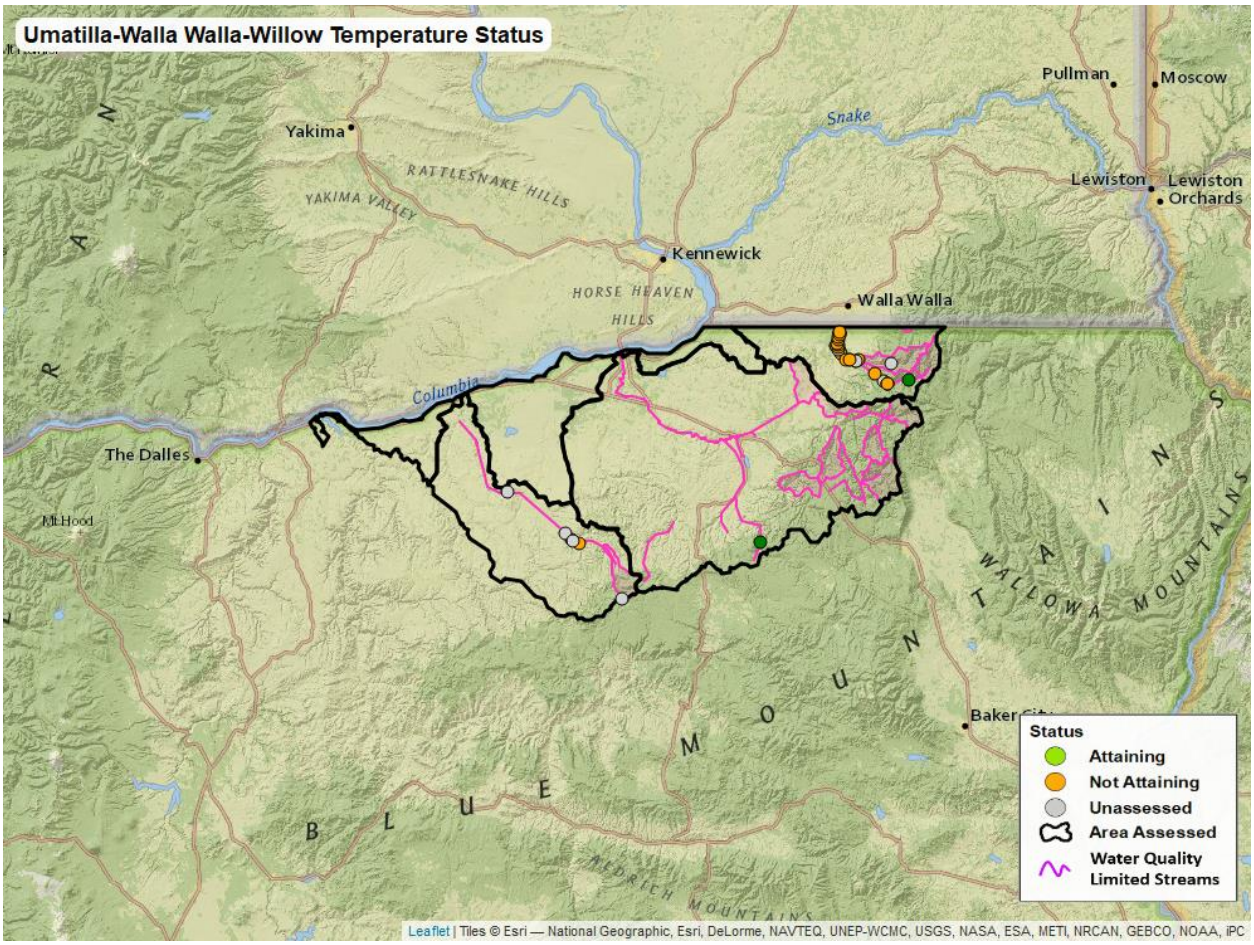

Figure 289: Summary map of the status of temperature across the Umatilla-Walla Walla-Willow.

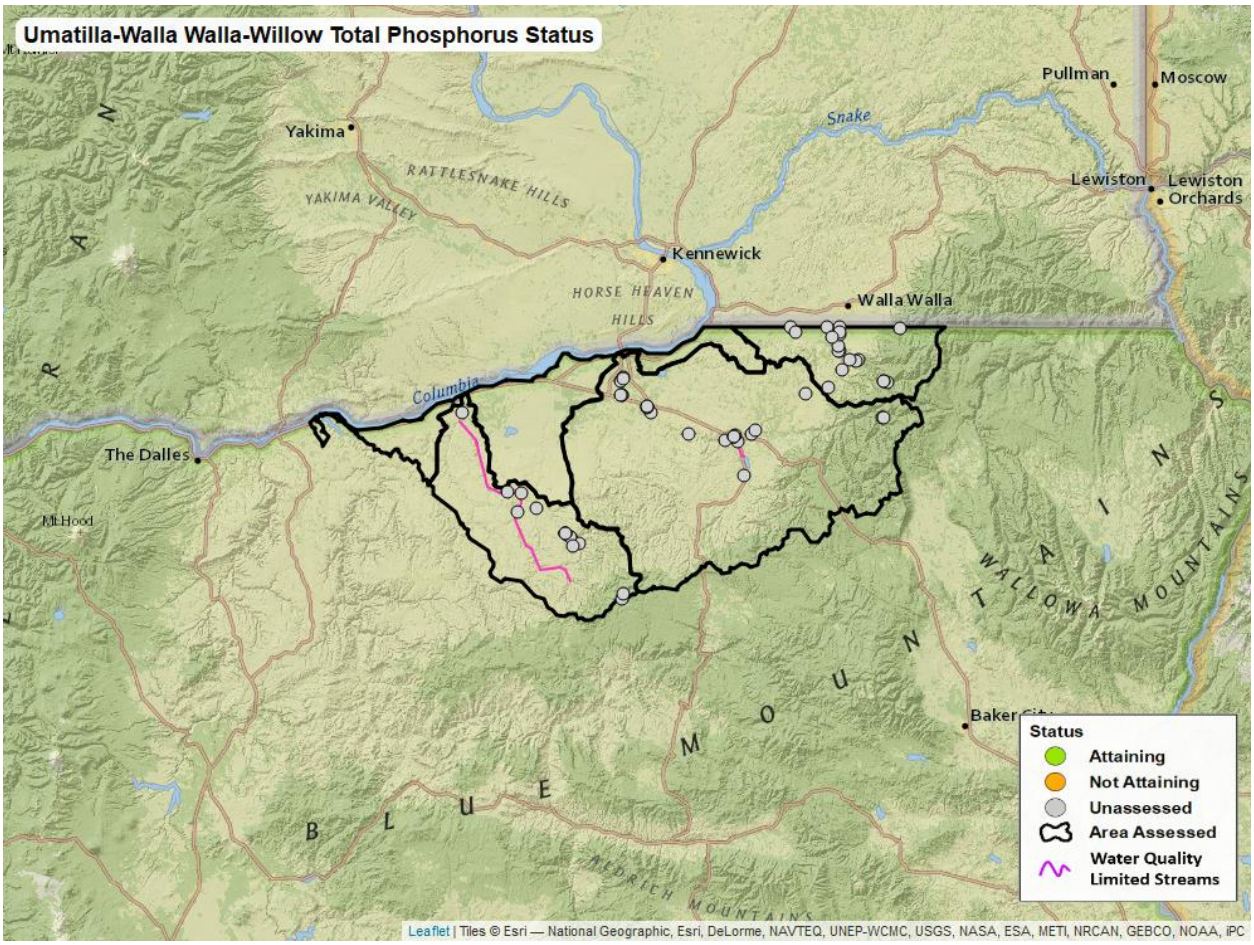

Figure 290: Summary map of the status of total phosphorus across the Umatilla-Walla Walla-Willow.

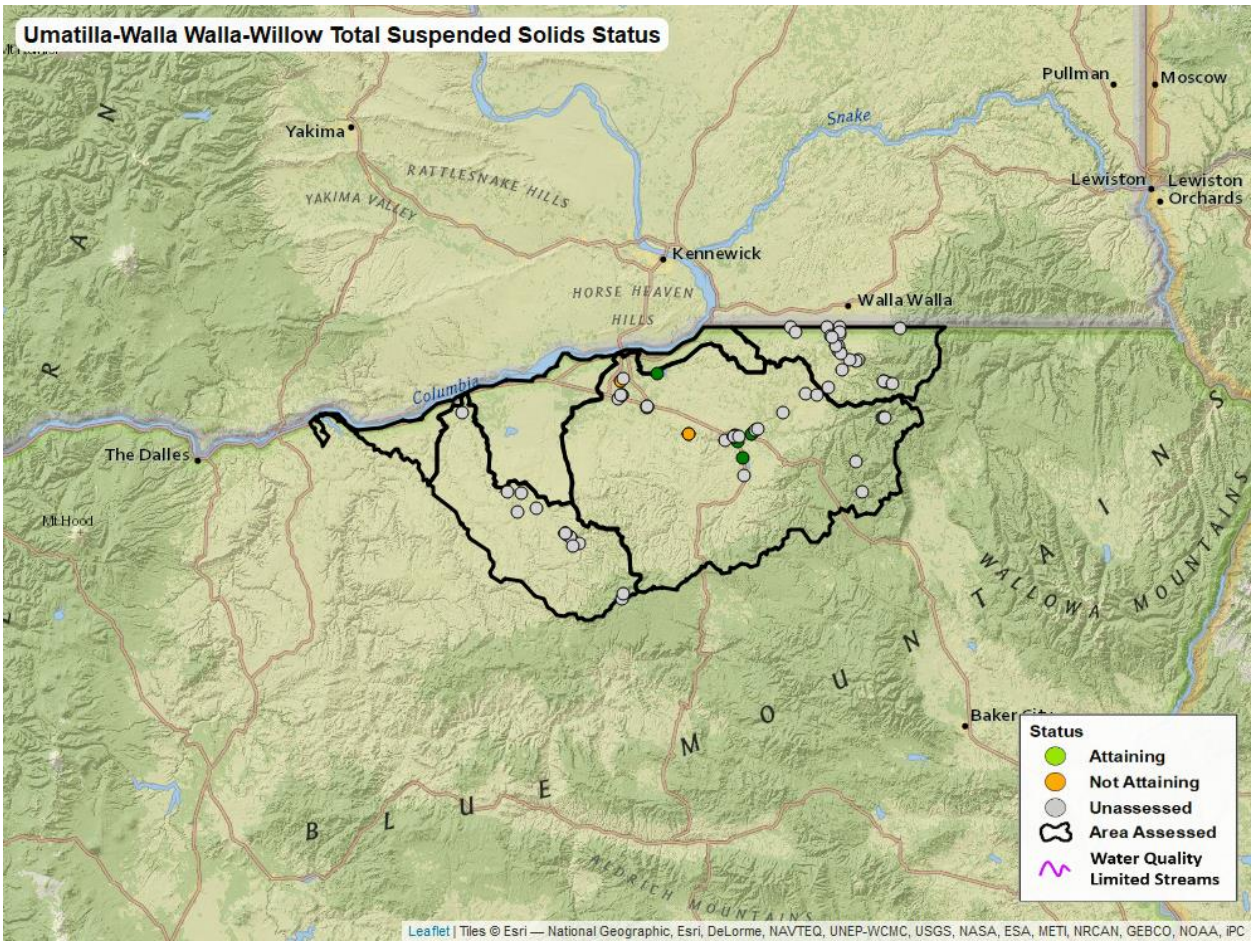

Figure 291: Summary map of the status of total suspended solids across the Umatilla-Walla Walla-Willow.

4.20.3 Status

There are 39 assessment units within the Umatilla-Walla Walla-Willow containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 415 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 415: Summary of the 2016–2019 assessment unit status within the Umatilla-Walla Walla-Willow.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	7	0	27
Escherichia coli	6	3	21
PH	6	0	28
Temperature	1	6	5
Total Phosphorus	0	0	29
Total Suspended Solids	4	3	29

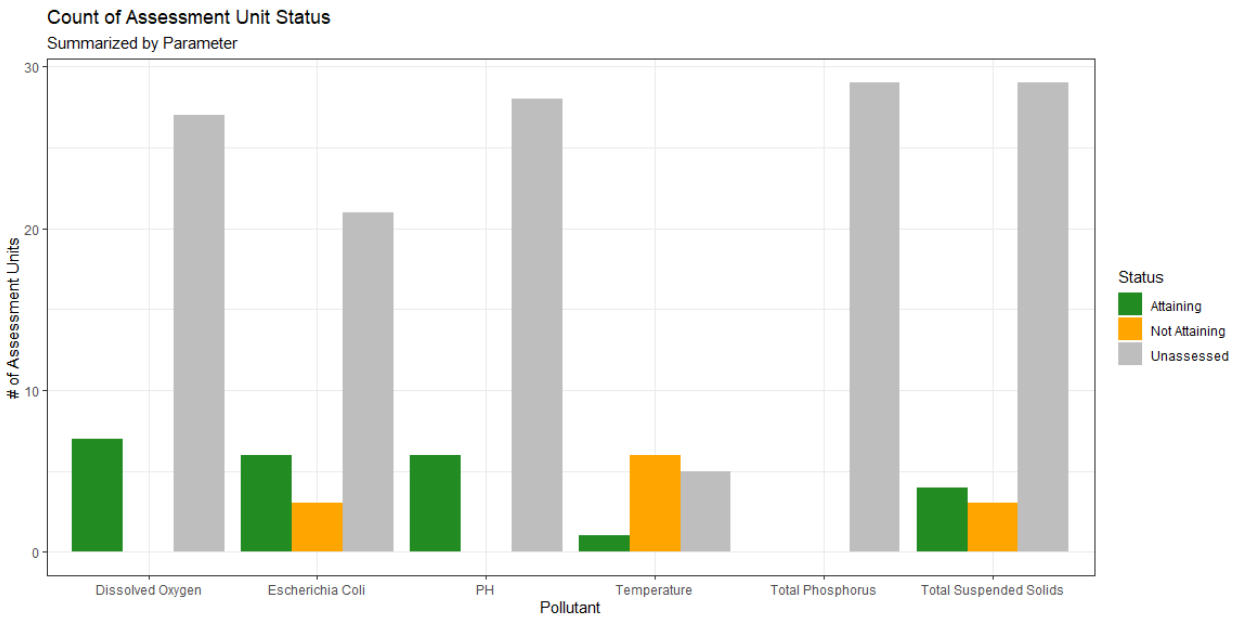

Figure 292: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umatilla-Walla Walla-Willow.

Table 416 and Figure 292 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Umatilla-Walla Walla-Willow for the 2016–2019 status period.

Table 416: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umatilla-Walla Walla-Willow.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	3
Lake	*Escherichia coli*	2	0	1
Lake	PH	0	0	3
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	2	0	1
Stream	Dissolved Oxygen	6	0	17
Stream	*Escherichia coli*	4	2	10
Stream	PH	5	0	18
Stream	Temperature	1	5	3
Stream	Total Phosphorus	0	0	21
Stream	Total Suspended Solids	2	3	18
Watershed Unit	Dissolved Oxygen	1	0	7
Watershed Unit	*Escherichia coli*	0	1	10
Watershed Unit	PH	1	0	7
Watershed Unit	Temperature	0	1	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	7
Watershed Unit	Total Suspended Solids	0	0	10

Table 417 and Figure 293 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix S.

Table 417: Summary of the 2016–2019 status at monitoring stations within the Umatilla-Walla Walla-Willow.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	7	0	64
Escherichia coli	6	3	58
PH	6	0	68
Temperature	2	20	12
Total Phosphorus	0	0	58
Total Suspended Solids	4	4	65

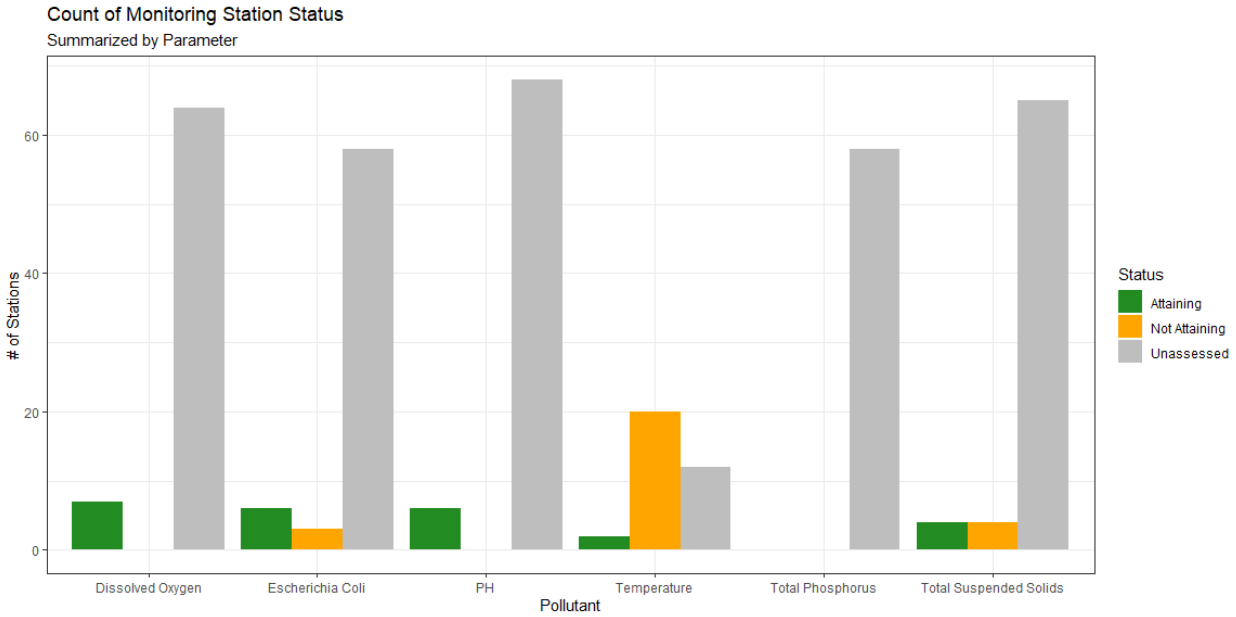

Figure 293: Summary plot of the 2016–2019 station status within the Umatilla-Walla Walla-Willow by parameter.

4.20.4 Trend

A summary of the trends across parameters is shown in Table 418. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 418: Umatilla-Walla Walla-Willow summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	2	0	3	63
Escherichia coli	0	1	0	2	64
PH	0	5	0	3	66
Temperature	4	7	0	0	23
Total Phosphorus	1	0	1	5	51
Total Suspended Solids	3	3	1	1	65

4.20.5 Subbasin Summary

4.20.5.1 Umatilla Subbasin

4.20.5.1.1 Water Quality Limited Assessment Units

Table 419: Number of water quality limited assessment units in the Umatilla Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	3
pH	9
Total Phosphorus, mixed forms	1

4.20.5.1.2 Status

There are 19 assessment units within the Umatilla Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 420 and Figure 294 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 420: Summary of the 2016–2019 assessment unit status within the Umatilla Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	10
Escherichia coli	4	1	7
PH	3	0	11
Temperature	1	0	0
Total Phosphorus	0	0	10
Total Suspended Solids	4	3	9

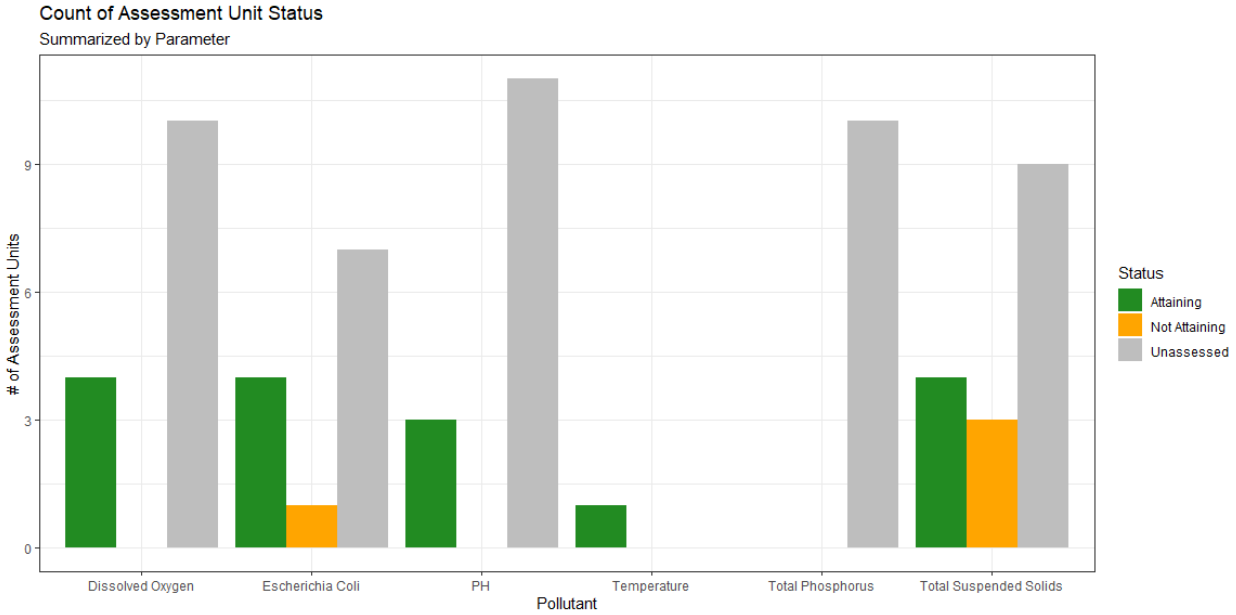

Figure 294: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Umatilla Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 421 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Umatilla Subbasin for the 2016 – 2019 status period.

Table 421: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umatilla Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	*Escherichia coli*	2	0	0
Lake	PH	0	0	2
Lake	Total Suspended Solids	2	0	0
Stream	Dissolved Oxygen	4	0	6
Stream	*Escherichia coli*	2	1	2
Stream	PH	3	0	7
Stream	Temperature	1	0	0
Stream	Total Phosphorus	0	0	9
Stream	Total Suspended Solids	2	3	5
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	*Escherichia coli*	0	0	5
Watershed Unit	PH	0	0	2
Watershed Unit	Total Phosphorus	0	0	1
Watershed Unit	Total Suspended Solids	0	0	4

There are 56 stations within the Umatilla Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix S**. Table 422 and Figure 295 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 422: Summary of the 2016–2019 status at monitoring stations within the Umatilla Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	0	25
Escherichia coli	4	1	28
PH	3	0	30
Temperature	1	0	0
Total Phosphorus	0	0	23
Total Suspended Solids	4	4	26

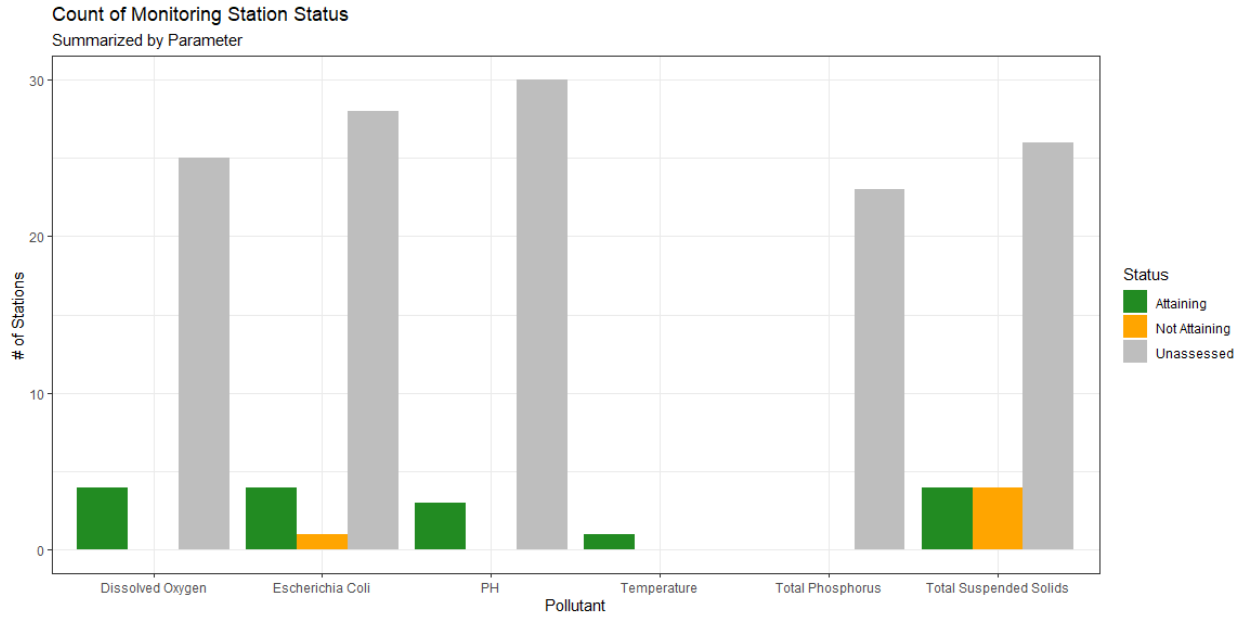

Figure 295: The number of stations in each status category by parameter for the 2016–2019 status period within the Umatilla Subbasin.

4.20.5.1.3 Trend

A summary of the trends within parameters is shown in Table 423. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 423: Subbasin Summary of trend results at stations across the Umatilla.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	2	0	0	25
Escherichia coli	0	1	0	2	30
PH	0	3	0	1	29
Temperature	0	1	0	0	0

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Phosphorus	0	0	1	3	19
Total Suspended Solids	1	3	1	0	29

4.20.5.2 Willow Subbasin

4.20.5.2.1 Water Quality Limited Assessment Units

Table 187: Number of water quality limited assessment units in the Willow Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2
pH	2
Total Phosphorus, mixed forms	2

4.20.5.2.2 Status

There are 9 assessment units within the Willow Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 188 and Figure 128 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 188: Summary of the 2016–2019 assessment unit status within the Willow Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	7
Escherichia coli	2	1	6
PH	2	0	7
Temperature	0	2	4
Total Phosphorus	0	0	9
Total Suspended Solids	0	0	9

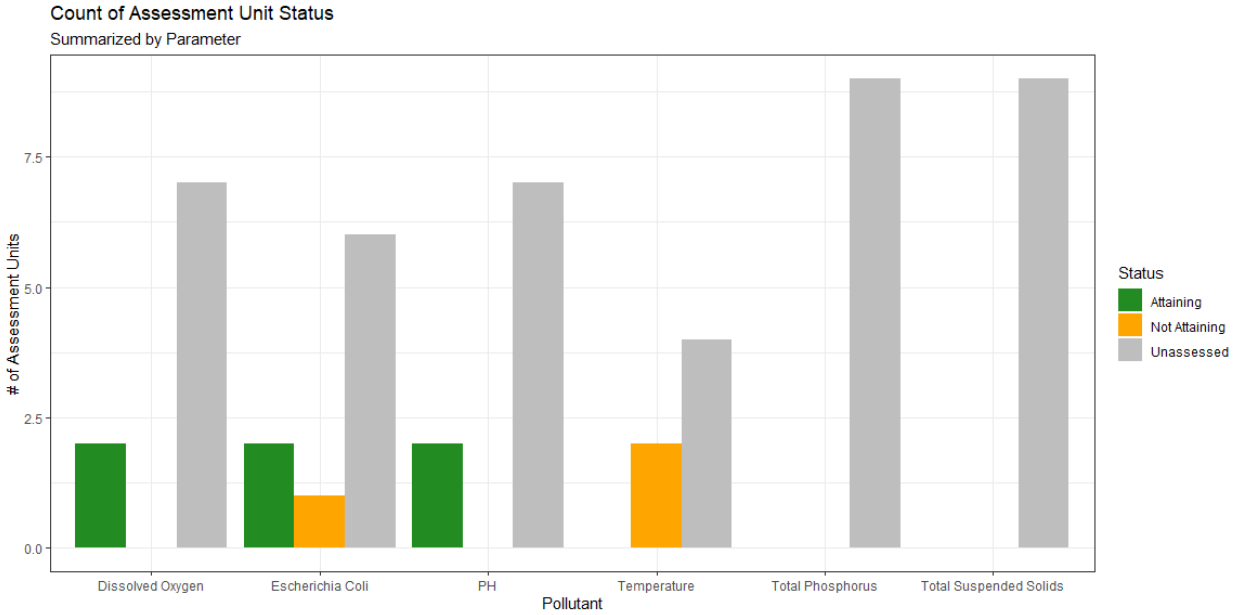

Figure 128: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 189 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Willow Subbasin for the 2016 – 2019 status period.

Table 189: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	1
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	2	0	4
Stream	*Escherichia coli*	2	1	3
Stream	PH	2	0	4
Stream	Temperature	0	2	2
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	6
Watershed Unit	Dissolved Oxygen	0	0	2
Watershed Unit	*Escherichia coli*	0	0	2
Watershed Unit	PH	0	0	2
Watershed Unit	Temperature	0	0	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Phosphorus	0	0	2
Watershed Unit	Total Suspended Solids	0	0	2

There are 20 stations within the Willow Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix S**. Table 190 and Figure 129 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 190: Summary of the 2016–2019 status at monitoring stations within the Willow Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	0	16
Escherichia coli	2	1	14
PH	2	0	15
Temperature	0	2	4
Total Phosphorus	0	0	16
Total Suspended Solids	0	0	16

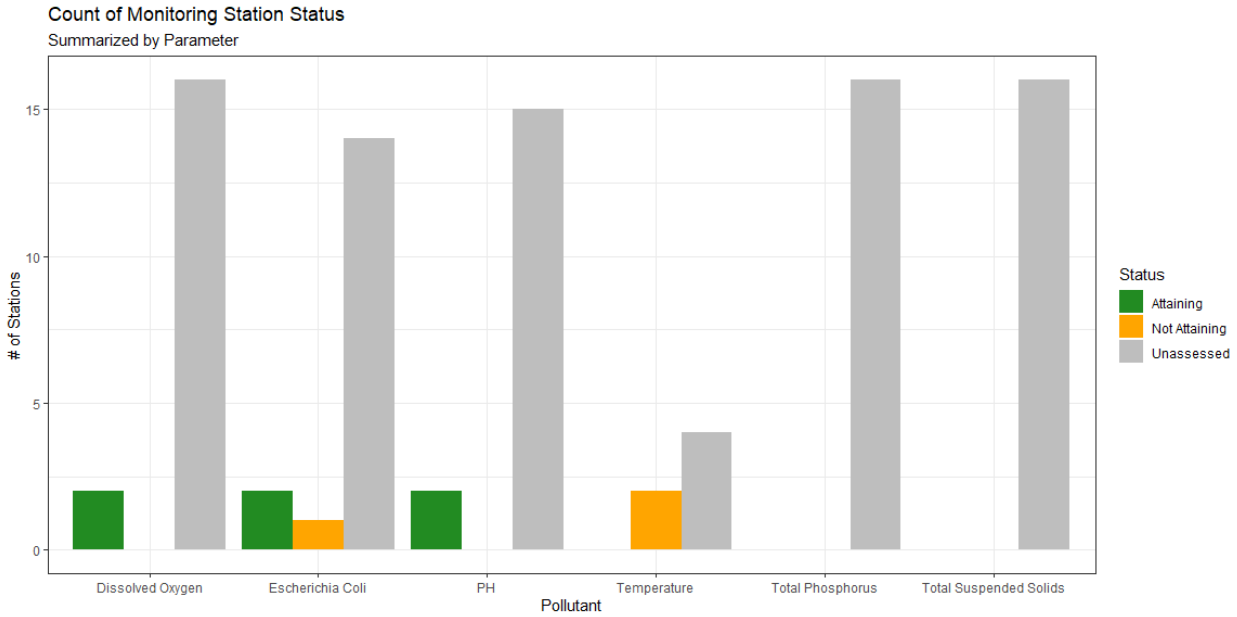

Figure 129: The number of stations in each status category by parameter for the 2016–2019 status period within the Willow Subbasin.

4.20.5.2.3 Trend

A summary of the trends within parameters is shown in Table 191. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 191: Subbasin Summary of trend results at stations across the Willow.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	0	0	0	2	16
Escherichia coli	0	0	0	0	17
PH	0	1	0	1	15
Temperature	0	2	0	0	4
Total Phosphorus	1	0	0	1	14
Total Suspended Solids	2	0	0	0	14

4.20.5.3 Walla Walla Subbasin

4.20.5.3.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.20.5.3.2 Status

There are 11 assessment units within the Walla Walla Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 424 and Figure 296 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 424: Summary of the 2016–2019 assessment unit status within the Walla Walla Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	10
Escherichia coli	0	1	8
PH	1	0	10
Temperature	0	4	1
Total Phosphorus	0	0	10
Total Suspended Solids	0	0	11

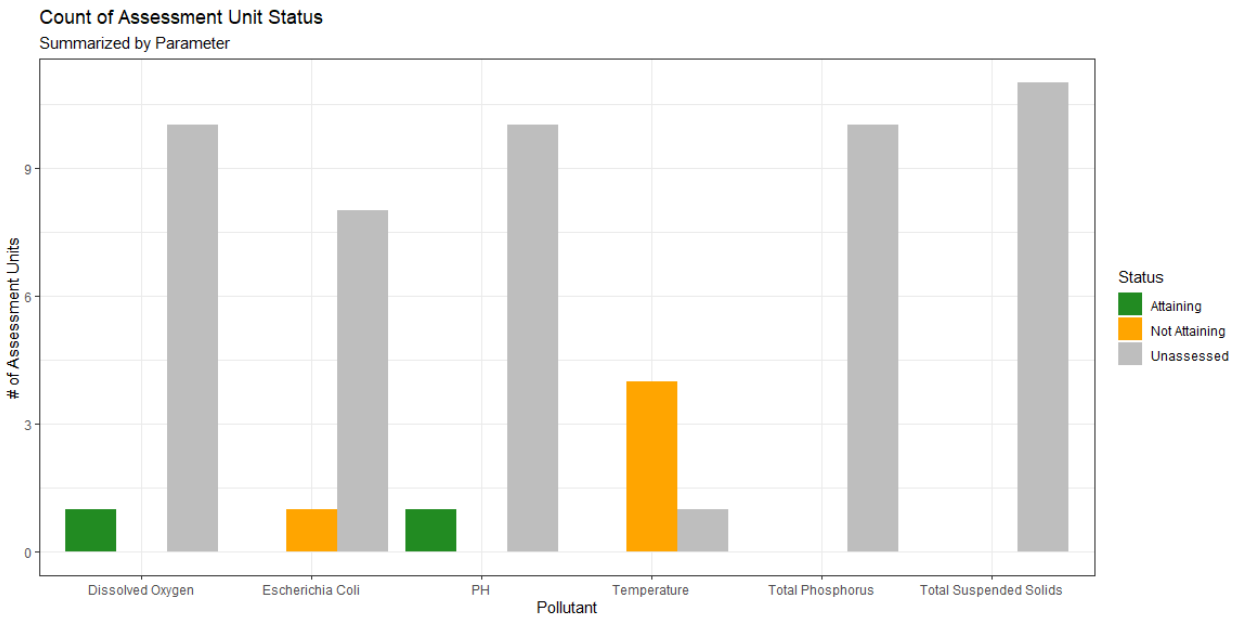

Figure 296: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Walla Walla Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 425 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Walla Walla Subbasin for the 2016 – 2019 status period.

Table 425: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Walla Walla Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	0	0	7
Stream	*Escherichia coli*	0	0	5
Stream	PH	0	0	7
Stream	Temperature	0	3	1
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	1	0	3
Watershed Unit	*Escherichia coli*	0	1	3
Watershed Unit	PH	1	0	3
Watershed Unit	Temperature	0	1	0
Watershed Unit	Total Phosphorus	0	0	4
Watershed Unit	Total Suspended Solids	0	0	4

There are 43 stations within the Walla Walla Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix S**. Table 426 and Figure 297 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 426: Summary of the 2016–2019 status at monitoring stations within the Walla Walla Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	23
Escherichia coli	0	1	16
PH	1	0	23
Temperature	1	18	8
Total Phosphorus	0	0	19
Total Suspended Solids	0	0	23

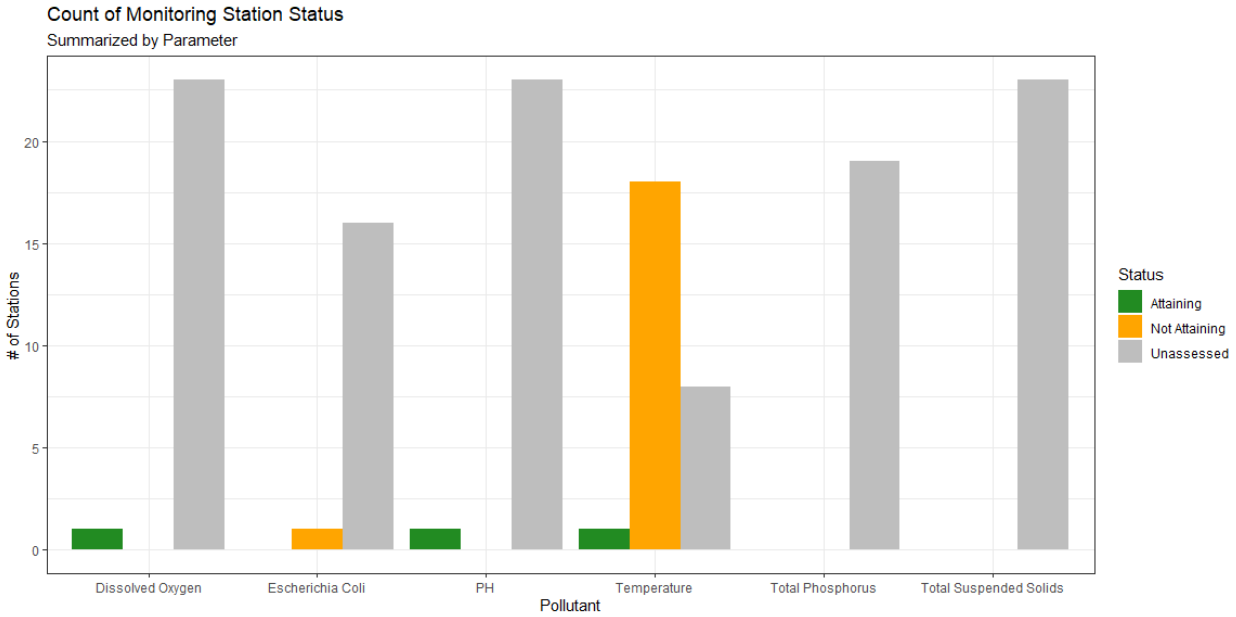

Figure 297: The number of stations in each status category by parameter for the 2016–2019 status period within the Walla Walla Subbasin.

4.20.5.3.3 Trend

A summary of the trends within parameters is shown in Table 427. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 427: Subbasin Summary of trend results at stations across the Walla Walla.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	22
Escherichia coli	0	0	0	0	17
PH	0	1	0	1	22
Temperature	4	4	0	0	19
Total Phosphorus	0	0	0	1	18
Total Suspended Solids	0	0	0	1	22

4.21 Umpqua Basin

A summary of status and trend results for the Umpqua Basin and all subbasins within the Umpqua Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix T**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Umpqua Basin are water quality limited for 4 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 643 stations within the Umpqua Basin. These stations were located across 242 assessment units consisting of 'Estuary or Bays', 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.21.1 Land Use

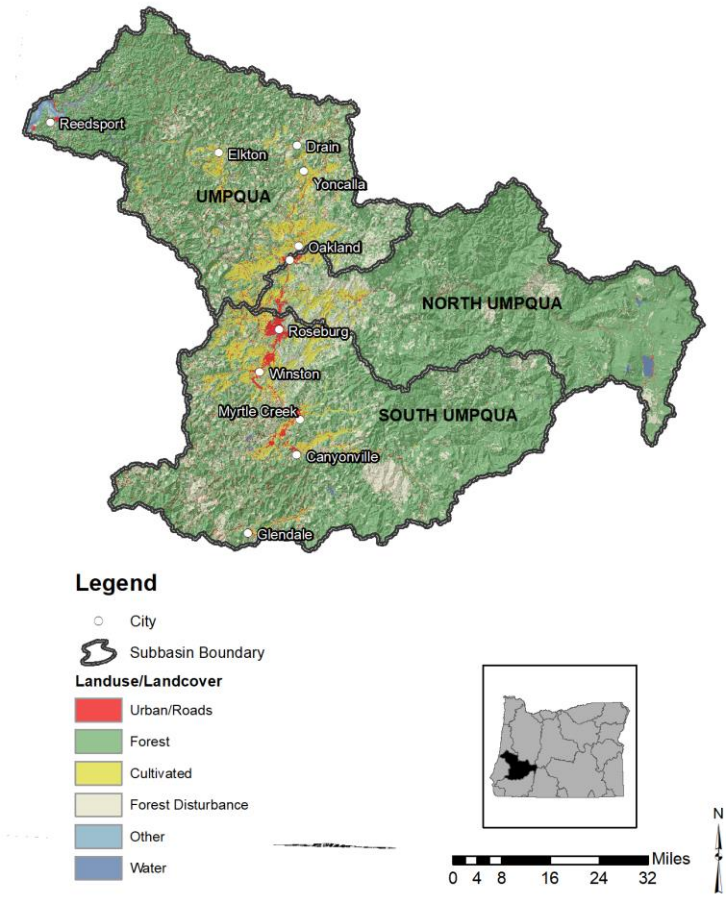

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 428: Land use within the Umpqua Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
North Umpqua	3558	1.2	78.5	3.4	16.0	0.9
South Umpqua	4666	3.8	65.0	6.5	24.2	0.6
Umpqua	3921	4.1	66.9	7.5	19.0	2.5

4.21.2 Parameter Maps

The maps in Figure 298 through Figure 303 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

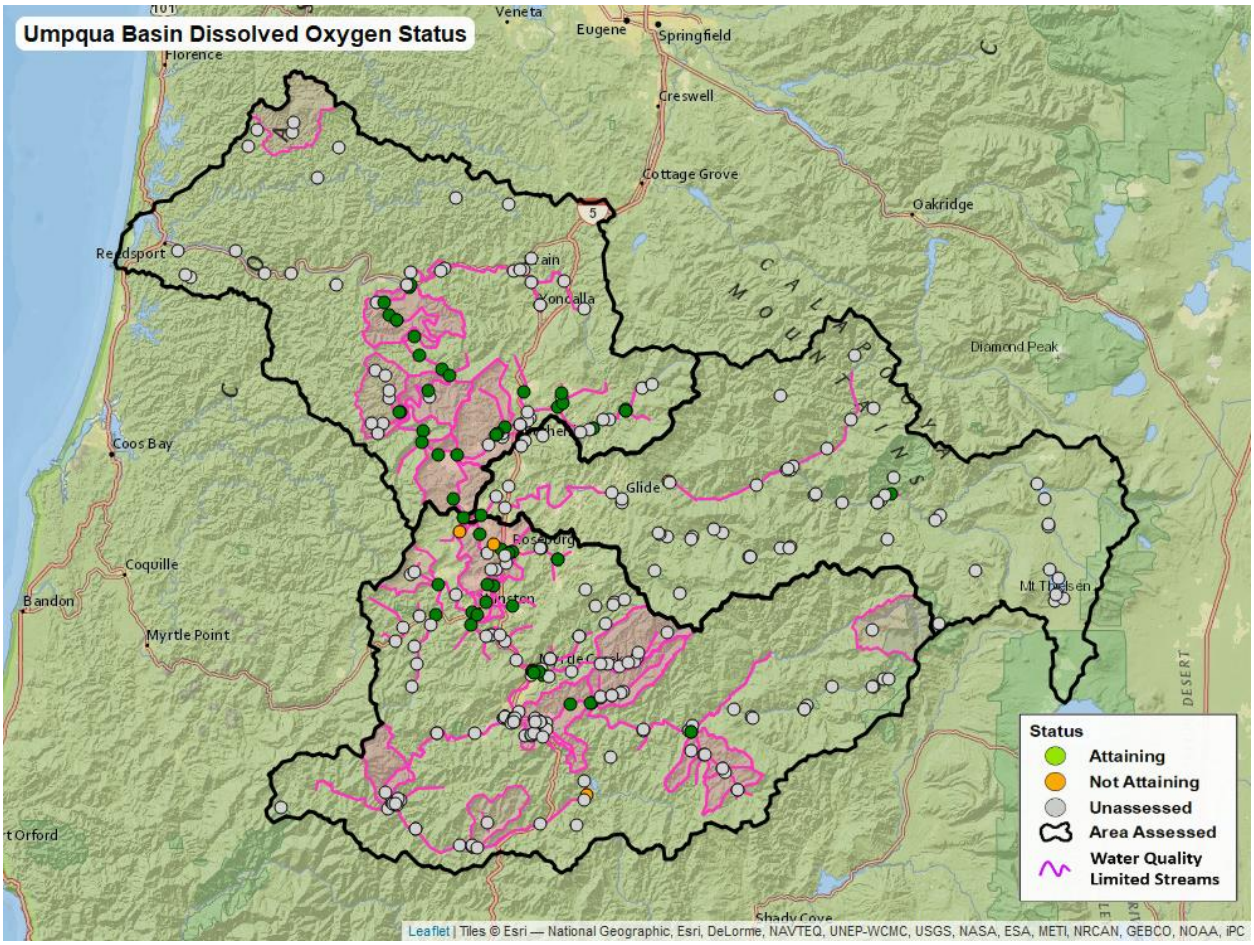

Figure 298: Summary map of the status of dissolved oxygen across the Umpqua Basin.

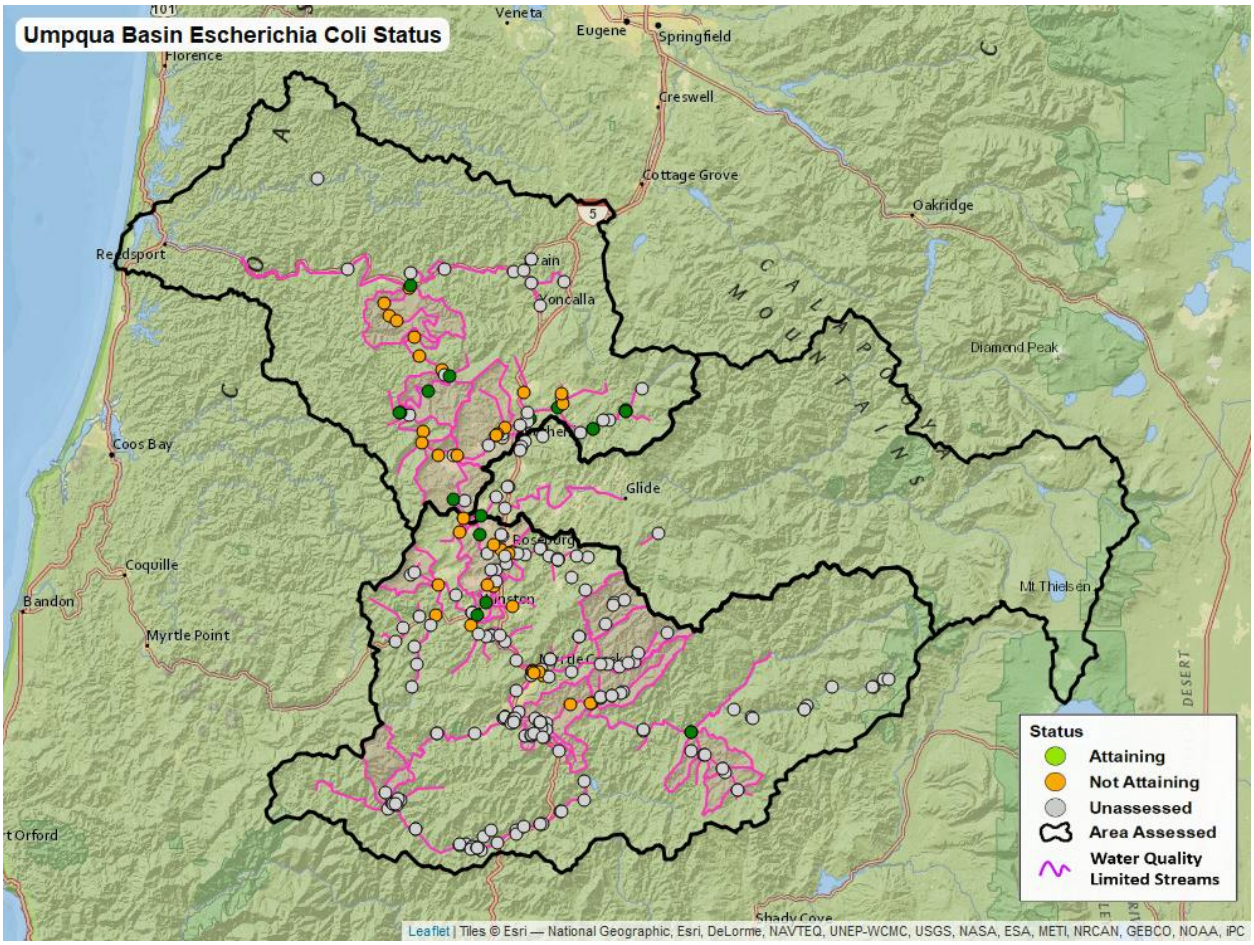

Figure 299: Summary map of the status of *Escherichia coli* across the Umpqua Basin.

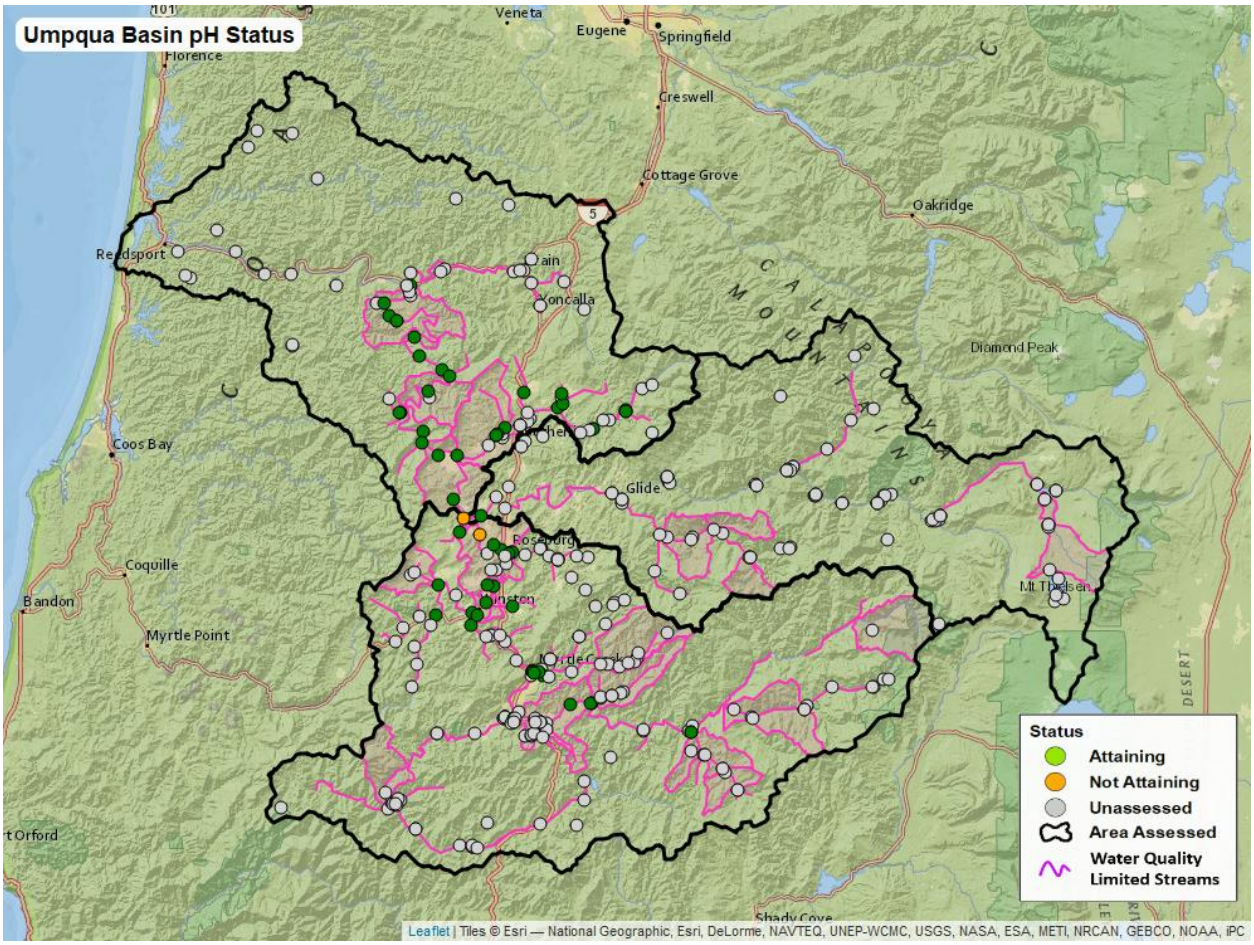

Figure 300: Summary map of the status of pH across the Umpqua Basin.

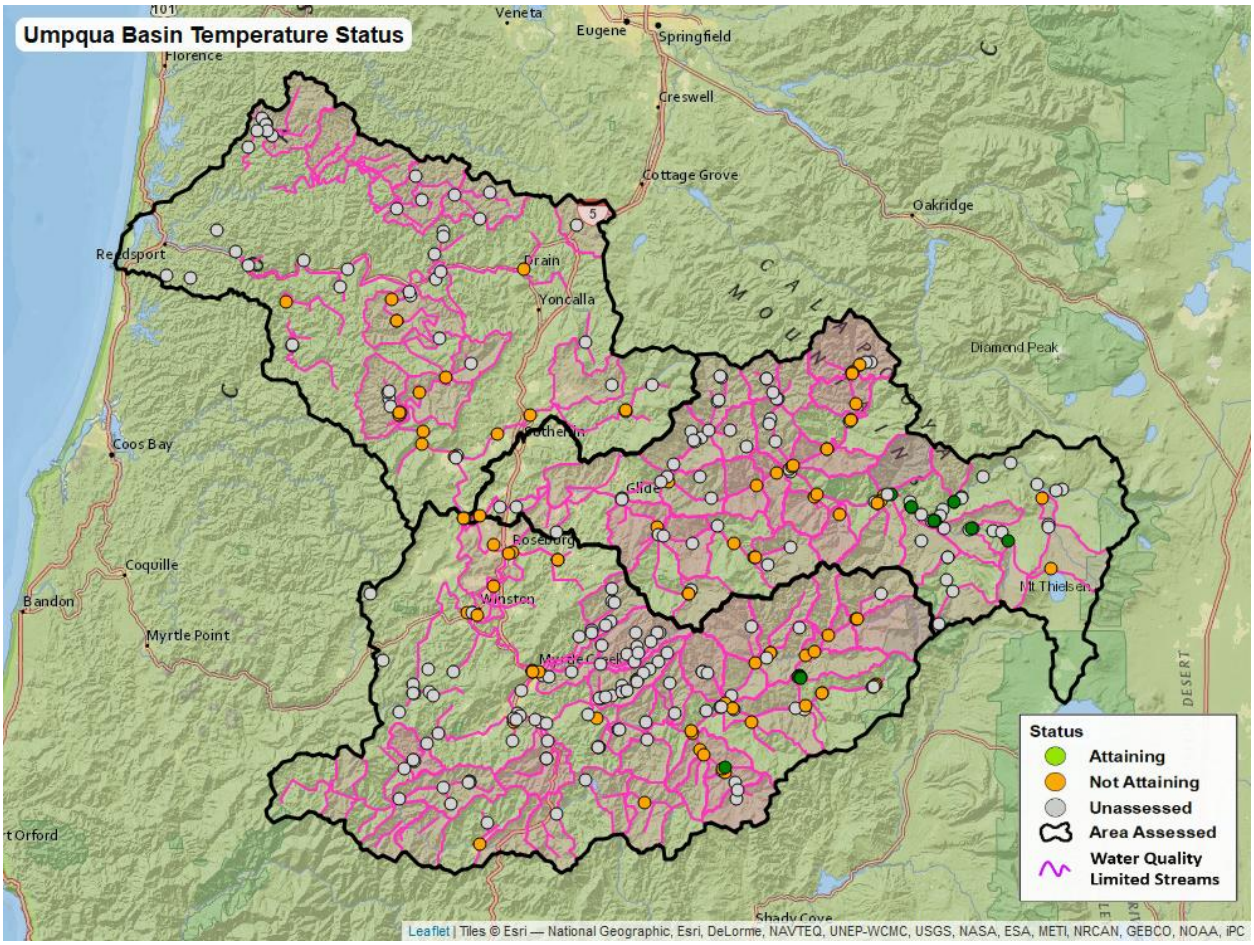

Figure 301: Summary map of the status of temperature across the Umpqua Basin.

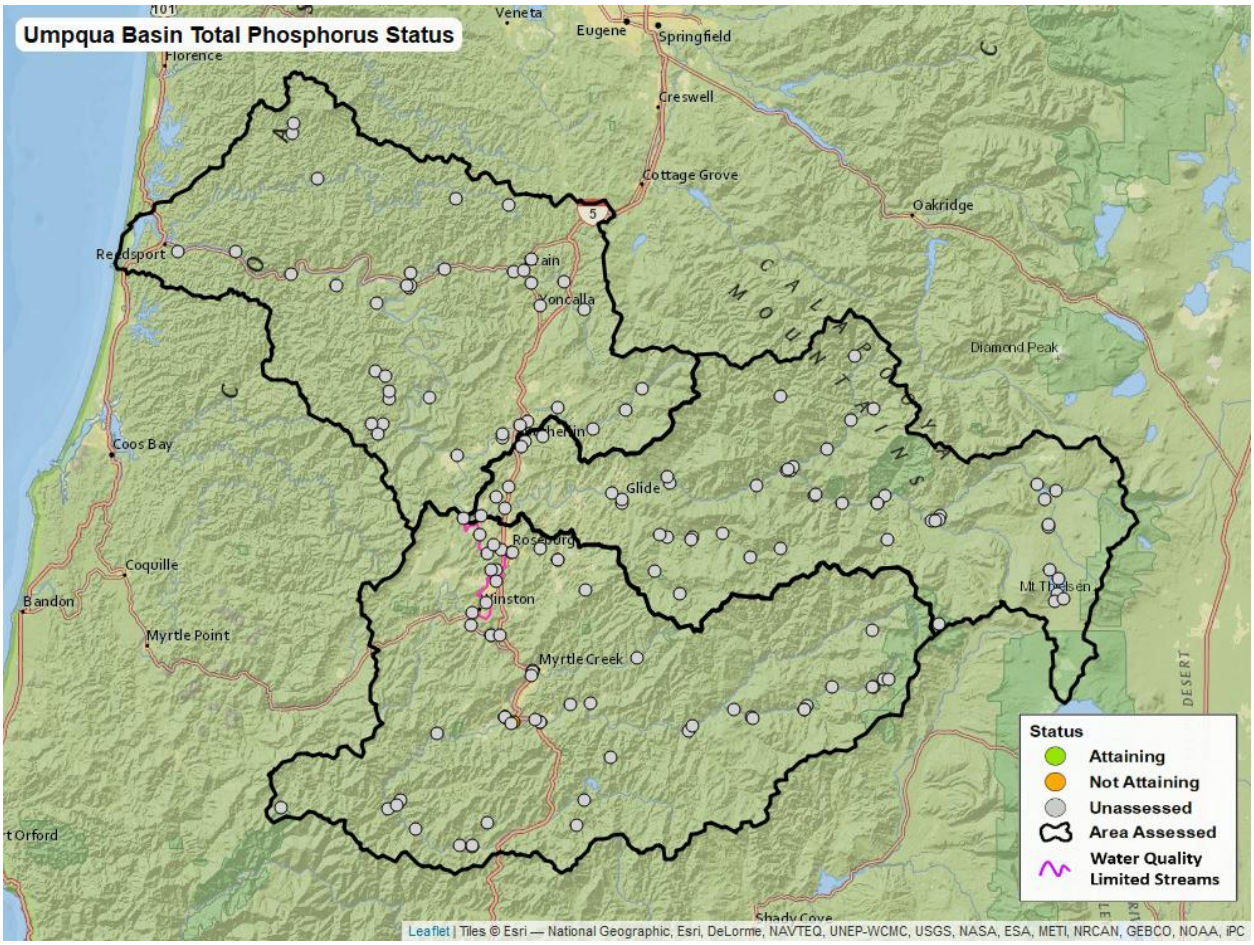

Figure 302: Summary map of the status of total phosphorus across the Umpqua Basin.

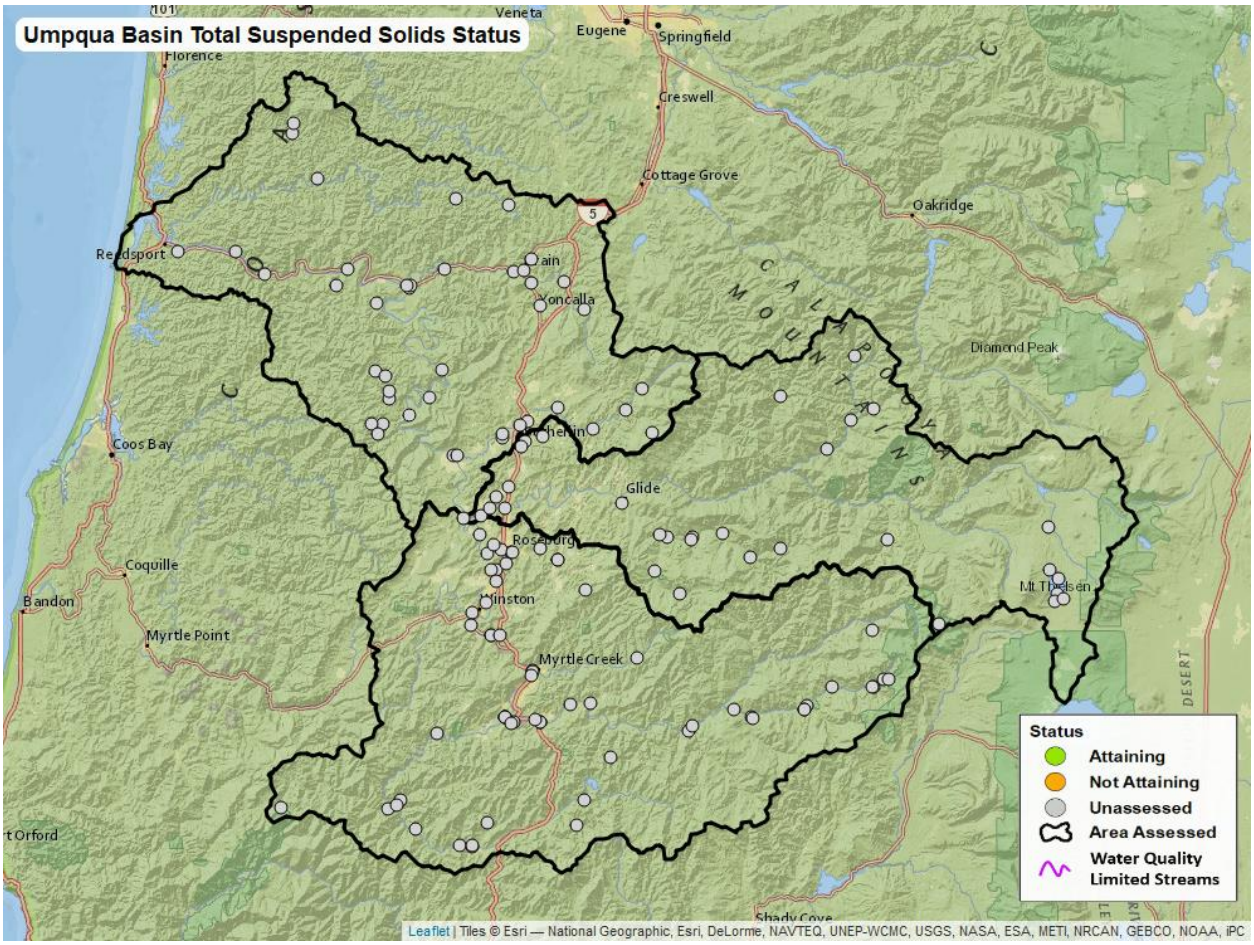

Figure 303: Summary map of the status of total suspended solids across the Umpqua Basin.

4.21.3 Status

There are 242 assessment units within the Umpqua Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 429 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 429: Summary of the 2016–2019 assessment unit status within the Umpqua Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	34	4	91
Escherichia coli	10	25	57
PH	34	1	99
Temperature	6	62	113
Total Phosphorus	0	1	82
Total Suspended Solids	0	0	71

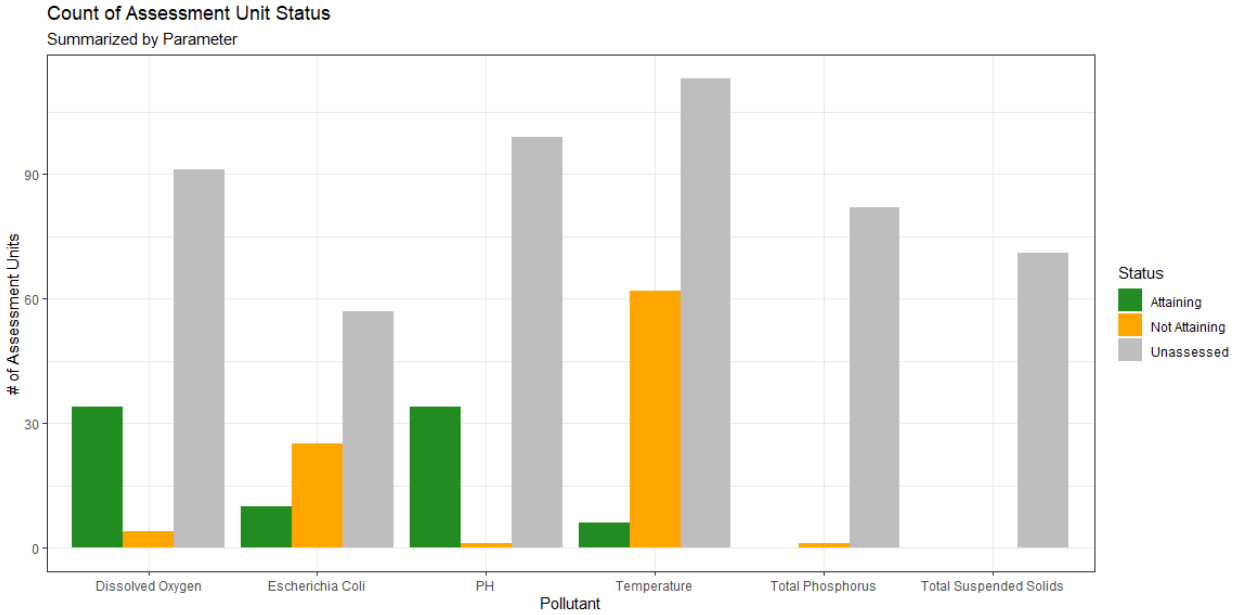

Figure 304: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umpqua Basin.

Table 430 and Figure 304 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Umpqua Basin for the 2016–2019 status period.

Table 430: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umpqua Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	2
Estuary or Bay	PH	0	0	2
Estuary or Bay	Temperature	0	0	1
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	2
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	2
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	30	3	54
Stream	*Escherichia coli*	9	21	42
Stream	PH	29	1	62
Stream	Temperature	1	47	64
Stream	Total Phosphorus	0	1	52
Stream	Total Suspended Solids	0	0	45
Watershed Unit	Dissolved Oxygen	4	1	34

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	*Escherichia coli*	1	4	15
Watershed Unit	PH	5	0	33
Watershed Unit	Temperature	5	15	47
Watershed Unit	Total Phosphorus	0	0	27
Watershed Unit	Total Suspended Solids	0	0	23

Table 431 and Figure 305 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix T.

Table 431: Summary of the 2016–2019 status at monitoring stations within the Umpqua Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	58	4	251
Escherichia coli	17	43	189
PH	57	2	280
Temperature	12	81	232
Total Phosphorus	0	1	154
Total Suspended Solids	0	0	138

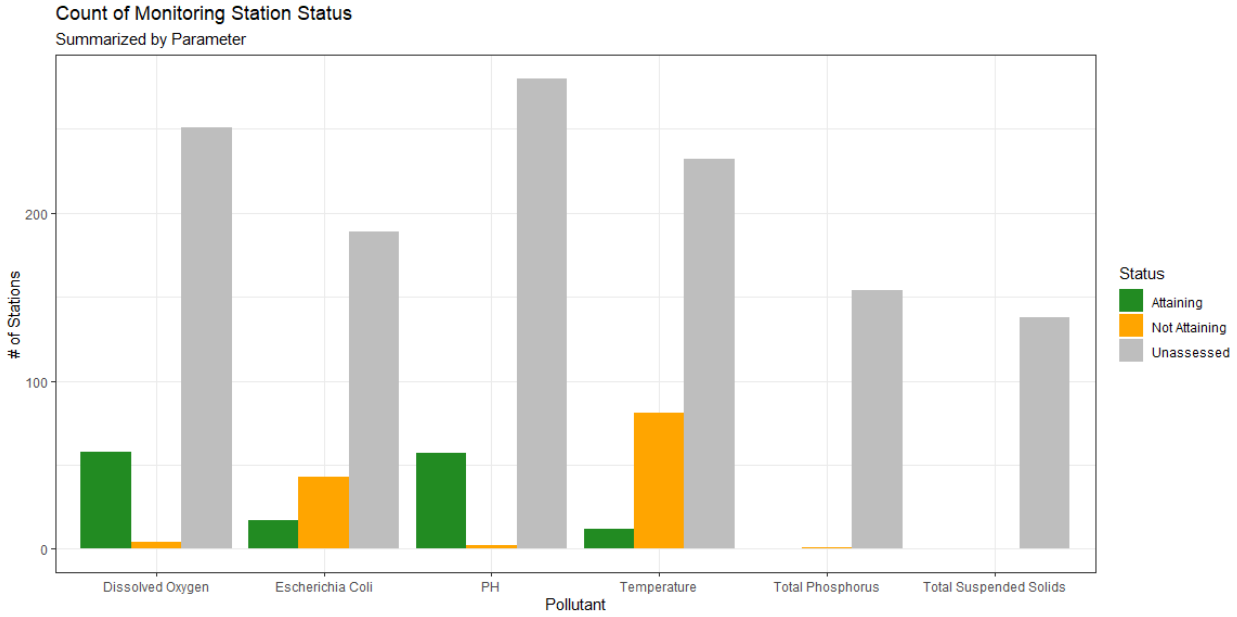

Figure 305: Summary plot of the 2016–2019 station status within the Umpqua Basin by parameter.

4.21.4 Trend

A summary of the trends across parameters is shown in Table 432. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 432: Umpqua Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	7	3	1	3	299
Escherichia coli	5	2	0	6	236
PH	0	6	1	6	326
Temperature	1	49	2	4	269
Total Phosphorus	1	0	6	2	146
Total Suspended Solids	1	0	0	8	129

4.21.5 Subbasin Summary

4.21.5.1 Umpqua Subbasin

4.21.5.1.1 Water Quality Limited Assessment Units

Table 433: Number of water quality limited assessment units in the Umpqua Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	5

4.21.5.1.2 Status

There are 60 assessment units within the Umpqua Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 434 and Figure 306 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 434: Summary of the 2016–2019 assessment unit status within the Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	18	0	19
Escherichia coli	7	11	6
PH	18	0	19
Temperature	0	11	30
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	24

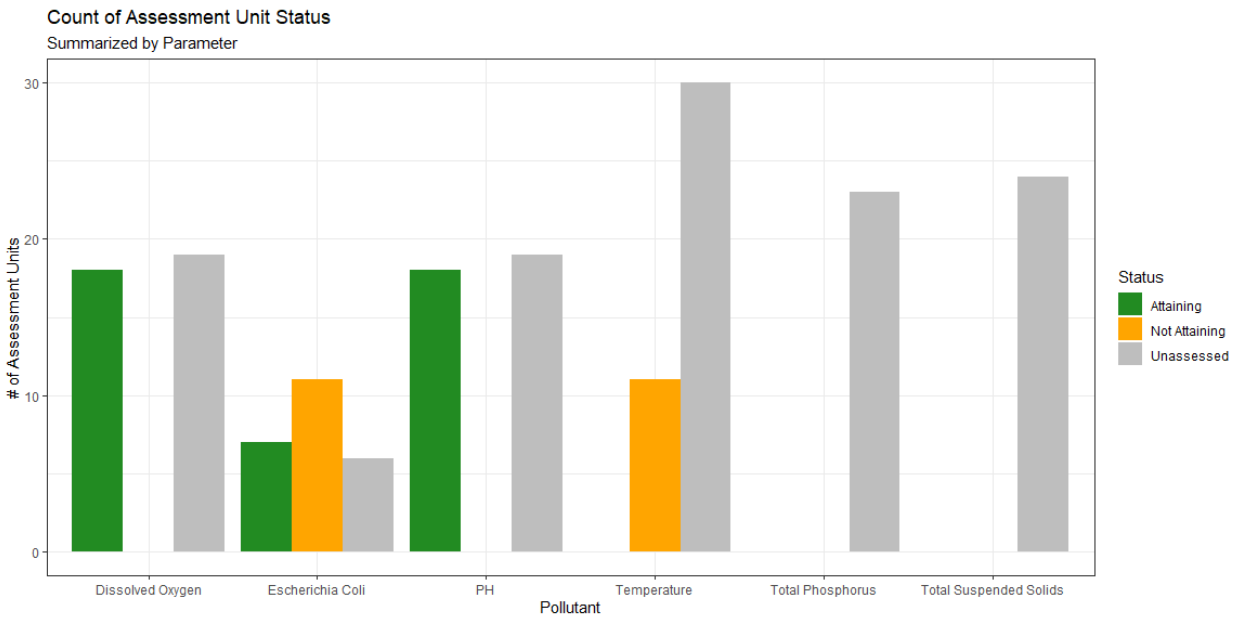

Figure 306: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Umpqua Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 435 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Umpqua Subbasin for the 2016 – 2019 status period.

Table 435: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Umpqua Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Estuary or Bay	Dissolved Oxygen	0	0	2
Estuary or Bay	PH	0	0	2
Estuary or Bay	Temperature	0	0	1
Estuary or Bay	Total Phosphorus	0	0	2
Estuary or Bay	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	14	0	14
Stream	*Escherichia coli*	6	8	5
Stream	PH	14	0	14
Stream	Temperature	0	10	19
Stream	Total Phosphorus	0	0	16
Stream	Total Suspended Solids	0	0	16
Watershed Unit	Dissolved Oxygen	4	0	3
Watershed Unit	*Escherichia coli*	1	3	1
Watershed Unit	PH	4	0	3
Watershed Unit	Temperature	0	1	10
Watershed Unit	Total Phosphorus	0	0	5

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	6

There are 136 stations within the Umpqua Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix T**. Table 436 and Figure 307 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 436: Summary of the 2016–2019 status at monitoring stations within the Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	28	0	55
Escherichia coli	11	18	27
PH	28	0	53
Temperature	0	15	47
Total Phosphorus	0	0	39
Total Suspended Solids	0	0	43

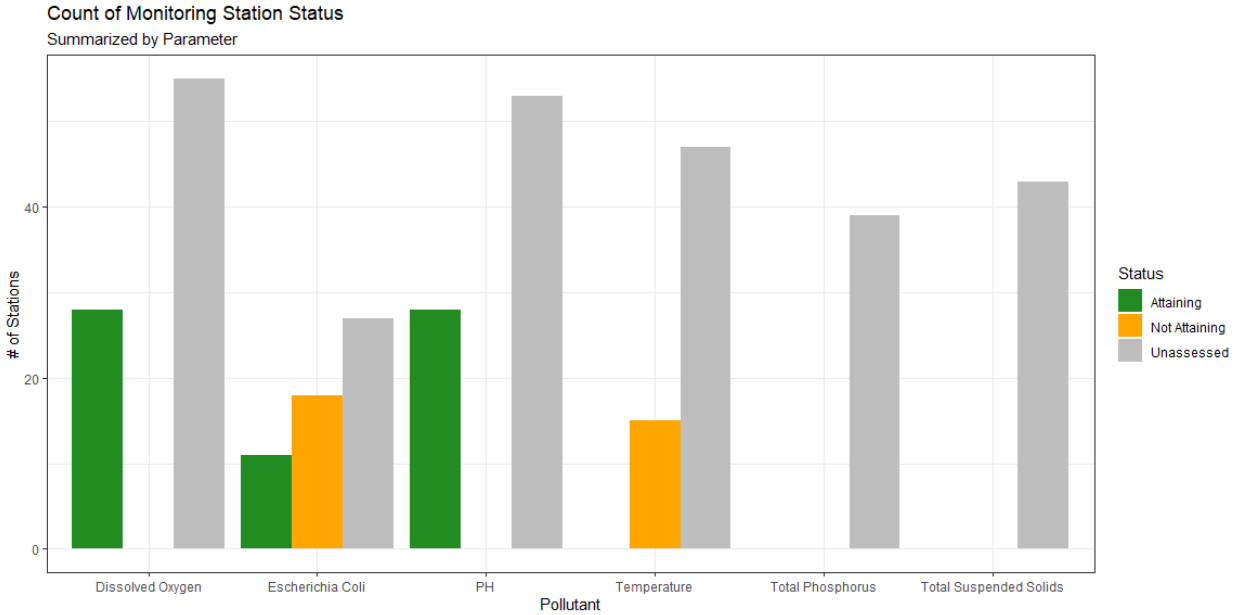

Figure 307: The number of stations in each status category by parameter for the 2016–2019 status period within the Umpqua Subbasin.

4.21.5.1.3 Trend

A summary of the trends within parameters is shown in Table 437. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 437: Subbasin Summary of trend results at stations across the Umpqua.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	0	80

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	1	0	0	2	53
PH	0	1	0	2	78
Temperature	0	4	0	0	58
Total Phosphorus	0	0	3	0	36
Total Suspended Solids	1	0	0	2	40

4.21.5.2 South Umpqua Subbasin

4.21.5.2.1 Water Quality Limited Assessment Units

Table 438: Number of water quality limited assessment units in the South Umpqua Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	2
pH	4
Total Phosphorus, mixed forms	1

4.21.5.2.2 Status

There are 109 assessment units within the South Umpqua Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 439 and Figure 308 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 439: Summary of the 2016–2019 assessment unit status within the South Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	14	3	44
Escherichia coli	2	14	48
PH	15	1	46
Temperature	1	27	49
Total Phosphorus	0	1	29
Total Suspended Solids	0	0	30

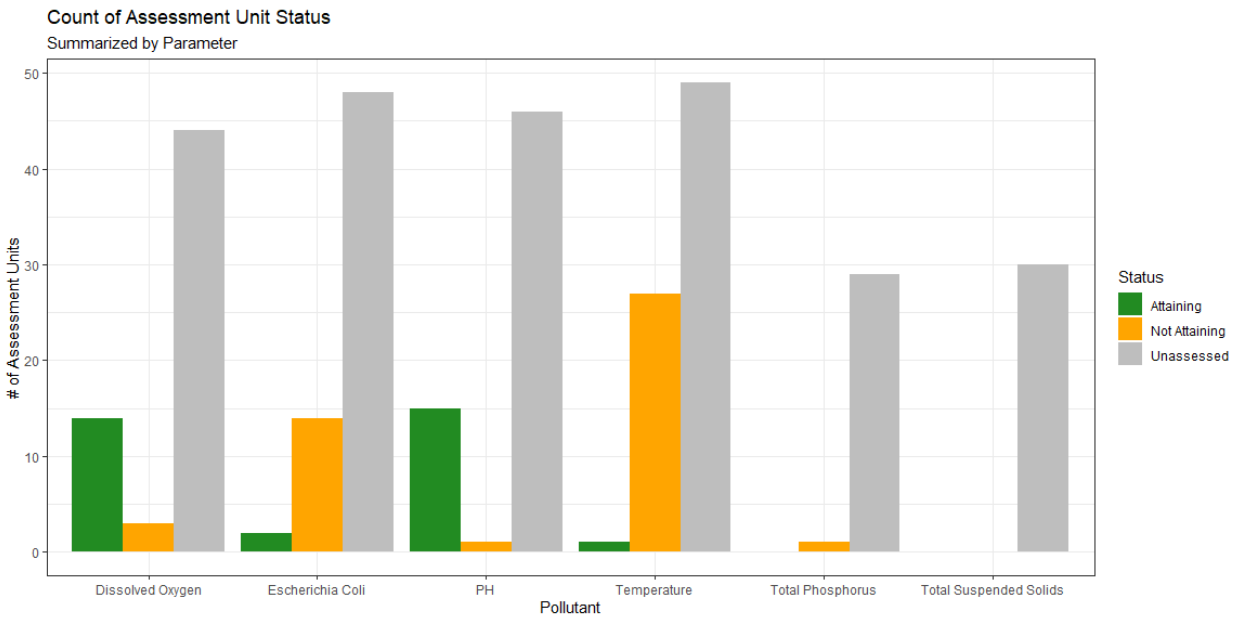

Figure 308: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the South Umpqua Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 440 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the South Umpqua Subbasin for the 2016 – 2019 status period.

Table 440: The number of assessment units in each status category by parameter for the 2016–2019 status period within the South Umpqua Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	14	2	29
Stream	*Escherichia coli*	2	13	35
Stream	PH	14	1	31
Stream	Temperature	0	22	30
Stream	Total Phosphorus	0	1	21
Stream	Total Suspended Solids	0	0	22
Watershed Unit	Dissolved Oxygen	0	1	15
Watershed Unit	*Escherichia coli*	0	1	13
Watershed Unit	PH	1	0	15
Watershed Unit	Temperature	1	5	19
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	8

There are 322 stations within the South Umpqua Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix T**. Table 441 and Figure 309

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 441: Summary of the 2016–2019 status at monitoring stations within the South Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	28	3	138
Escherichia coli	5	25	153
PH	28	2	145
Temperature	5	38	109
Total Phosphorus	0	1	62
Total Suspended Solids	0	0	64

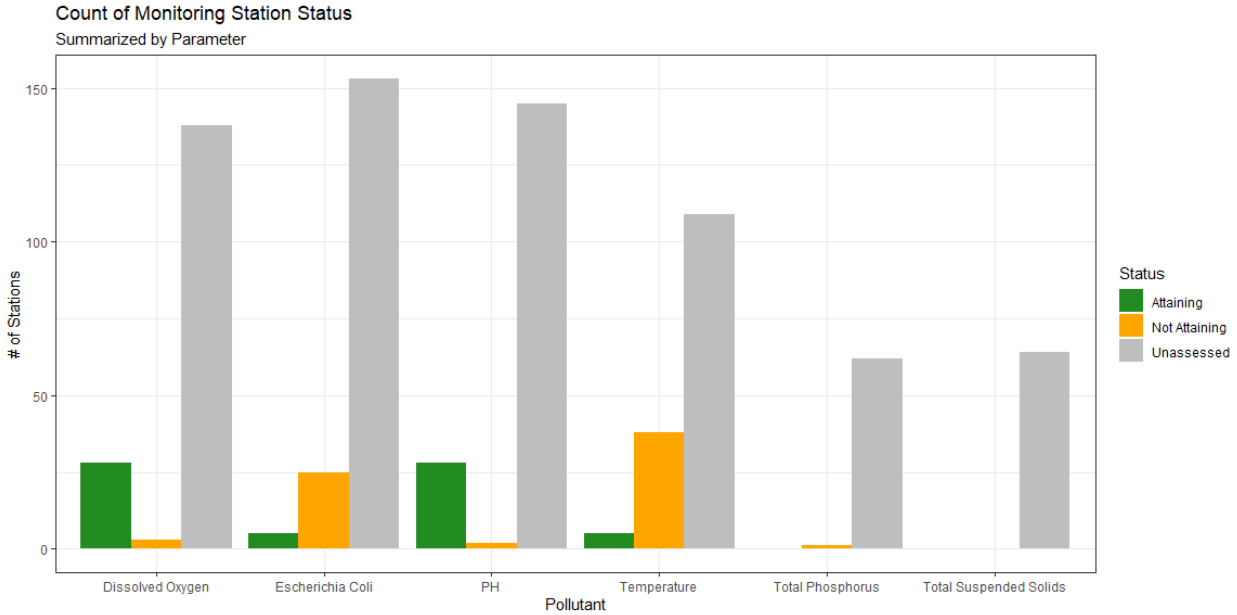

Figure 309: The number of stations in each status category by parameter for the 2016–2019 status period within the South Umpqua Subbasin.

4.21.5.2.3 Trend

A summary of the trends within parameters is shown in Table 442. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 442: Subbasin Summary of trend results at stations across the South Umpqua.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	3	0	2	161
Escherichia coli	3	2	0	4	174
PH	0	4	0	3	168
Temperature	0	21	0	0	131
Total Phosphorus	1	0	2	2	58

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	0	5	59

4.21.5.3 North Umpqua Subbasin

4.21.5.3.1 Water Quality Limited Assessment Units

Table 443: Number of water quality limited assessment units in the North Umpqua Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	11

4.21.5.3.2 Status

There are 73 assessment units within the North Umpqua Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 444 and Figure 310 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 444: Summary of the 2016–2019 assessment unit status within the North Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	1	28
Escherichia coli	1	0	3
PH	1	0	34
Temperature	5	24	34
Total Phosphorus	0	0	30
Total Suspended Solids	0	0	17

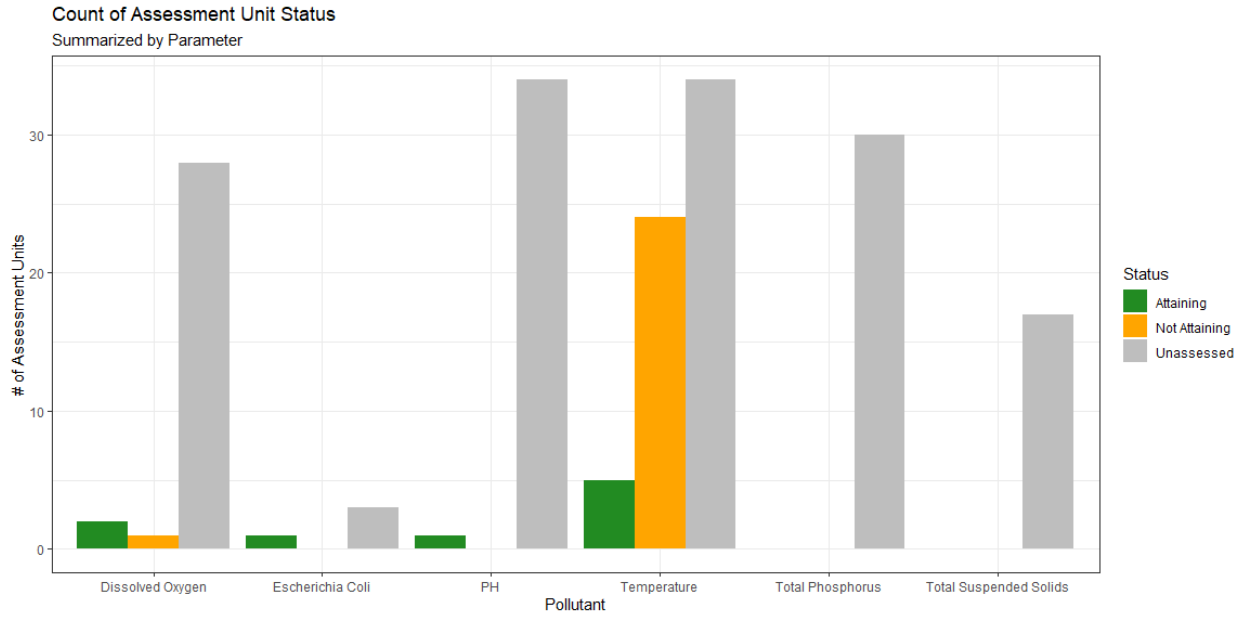

Figure 310: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the North Umpqua Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 445 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the North Umpqua Subbasin for the 2016 – 2019 status period.

Table 445: The number of assessment units in each status category by parameter for the 2016–2019 status period within the North Umpqua Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	PH	0	0	2
Lake	Temperature	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	2	1	11
Stream	*Escherichia coli*	1	0	2
Stream	PH	1	0	17
Stream	Temperature	1	15	15
Stream	Total Phosphorus	0	0	15
Stream	Total Suspended Solids	0	0	7
Watershed Unit	Dissolved Oxygen	0	0	16
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	15
Watershed Unit	Temperature	4	9	18
Watershed Unit	Total Phosphorus	0	0	14
Watershed Unit	Total Suspended Solids	0	0	9

There are 185 stations within the North Umpqua Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix T**. Table 446 and Figure 311 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 446: Summary of the 2016–2019 status at monitoring stations within the North Umpqua Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	1	58
Escherichia coli	1	0	9
PH	1	0	82
Temperature	7	28	76
Total Phosphorus	0	0	53
Total Suspended Solids	0	0	31

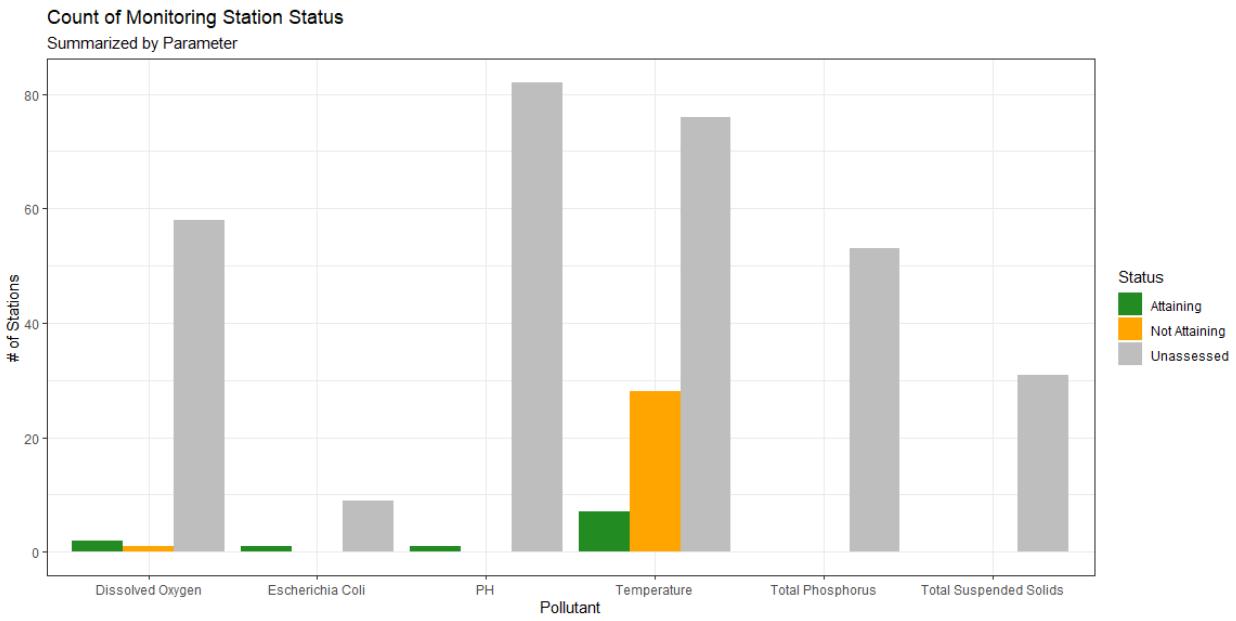

Figure 311: The number of stations in each status category by parameter for the 2016–2019 status period within the North Umpqua Subbasin.

4.21.5.3.3 Trend

A summary of the trends within parameters is shown in Table 447. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 447: Subbasin Summary of trend results at stations across the North Umpqua.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	1	1	58
Escherichia coli	1	0	0	0	9
PH	0	1	1	1	80
Temperature	1	24	2	4	80
Total Phosphorus	0	0	1	0	52
Total Suspended Solids	0	0	0	1	30

4.22 Willamette Basin

A summary of status and trend results for the Willamette Basin and all subbasins within the Willamette Basin are presented in this section. Full tabular results including results for each station, assessment unit, excursion statistics, and the summary of the OWRI watershed restoration or protection treatments implemented are provided in **Appendix U**.

Based the 2018/2020 303(d)/305(b) Integrated Report (DEQ, 2020), assessment units in the Willamette Basin are water quality limited for 5 parameters out of the six parameters assessed in this report. Available data were sufficient to assess status and/or trend at 2213 stations within the Willamette Basin. These stations were located across 500 assessment units consisting of 'Lakes', 'Streams' and 'Watershed Units'. Data for dissolved oxygen, *Escherichia coli*, pH, temperature, total phosphorus and total suspended solids were available for analysis and included in this report.

4.22.1 Land Use

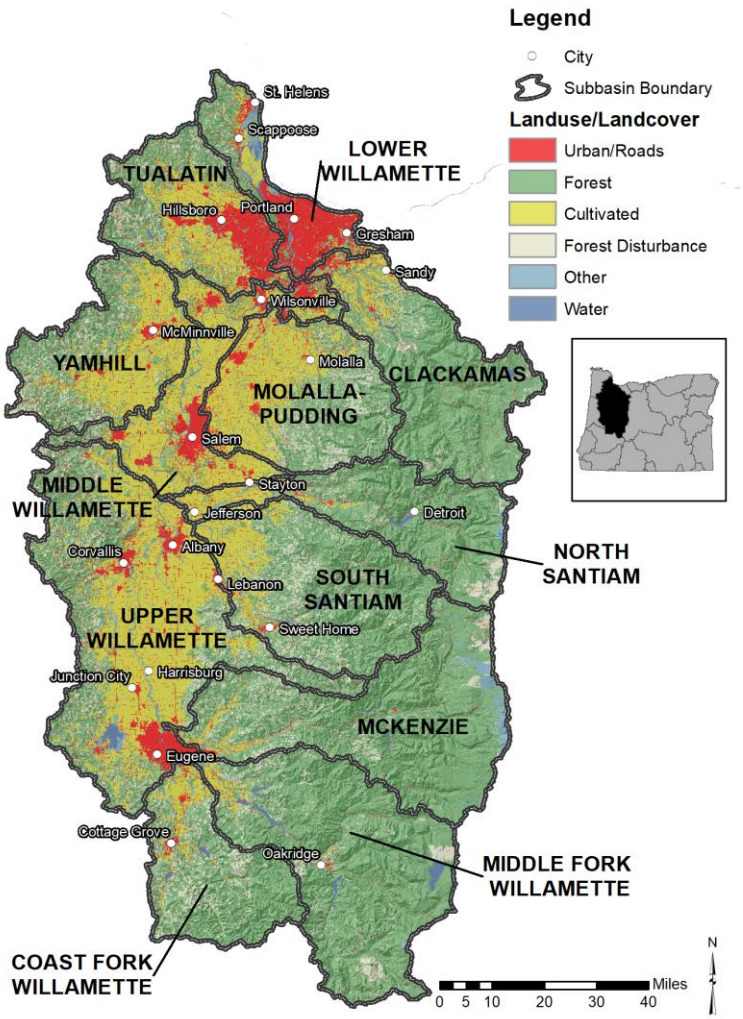

Figure 37: Land use in the Deschutes Basin administrative basin.

Table 448: Land use within the Willamette Basin Basin

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Middle Fork Willamette	3540	1.0	82.9	2.0	11.8	2.3
Coast Fork Willamette	1726	3.1	67.0	8.9	19.9	1.2
Upper Willamette	4850	10.1	34.4	41.5	10.4	3.5

Subbasin	Watershed Area (km2)	% Urban/Roads	% Forest	% Cultivated	% Range/Forest Disturbance	%Other
Mckenzie	3468	1.3	80.2	2.3	12.3	4.0
North Santiam	1979	2.2	72.9	9.9	12.2	2.8
South Santiam	2696	2.0	63.8	14.7	18.2	1.3
Middle Willamette	1841	19.7	17.2	55.9	4.0	3.3
Yamhill	1999	6.9	41.9	37.2	12.8	1.2
Molalla-Pudding	2268	6.8	39.8	38.2	14.2	1.0
Tualatin	1836	22.9	37.3	28.1	10.3	1.5
Clackamas	2442	3.7	78.1	7.4	9.9	0.9
Lower Willamette	1053	45.0	29.0	11.5	4.6	9.8

4.22.2 Parameter Maps

The maps in Figure 312 through Figure 317 show the stations included in the analysis for each parameter. Stations are color coded by the 2016 – 2019 status. The water quality listed streams for each parameter are included in the maps as pink lines.

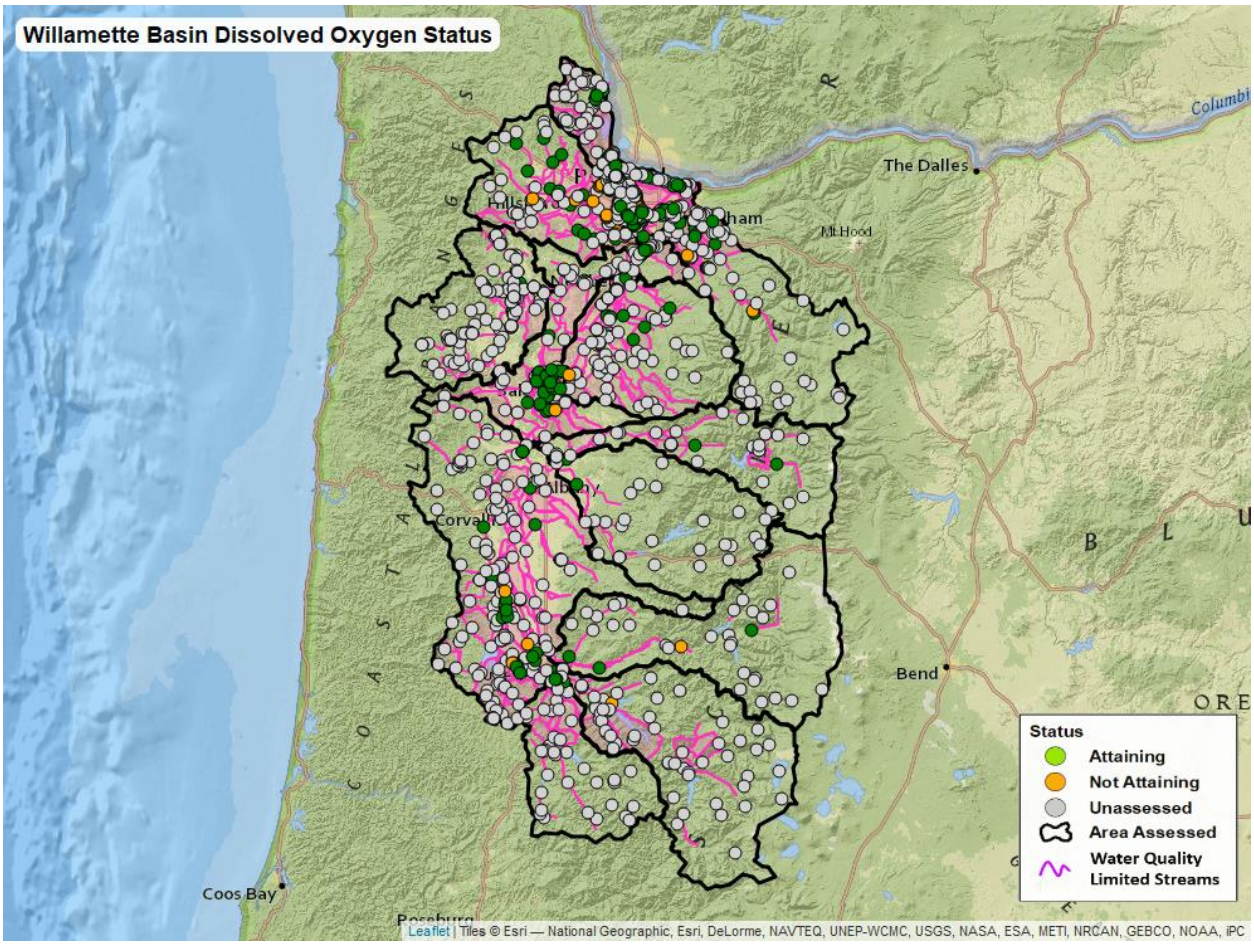

Figure 312: Summary map of the status of dissolved oxygen across the Willamette Basin.

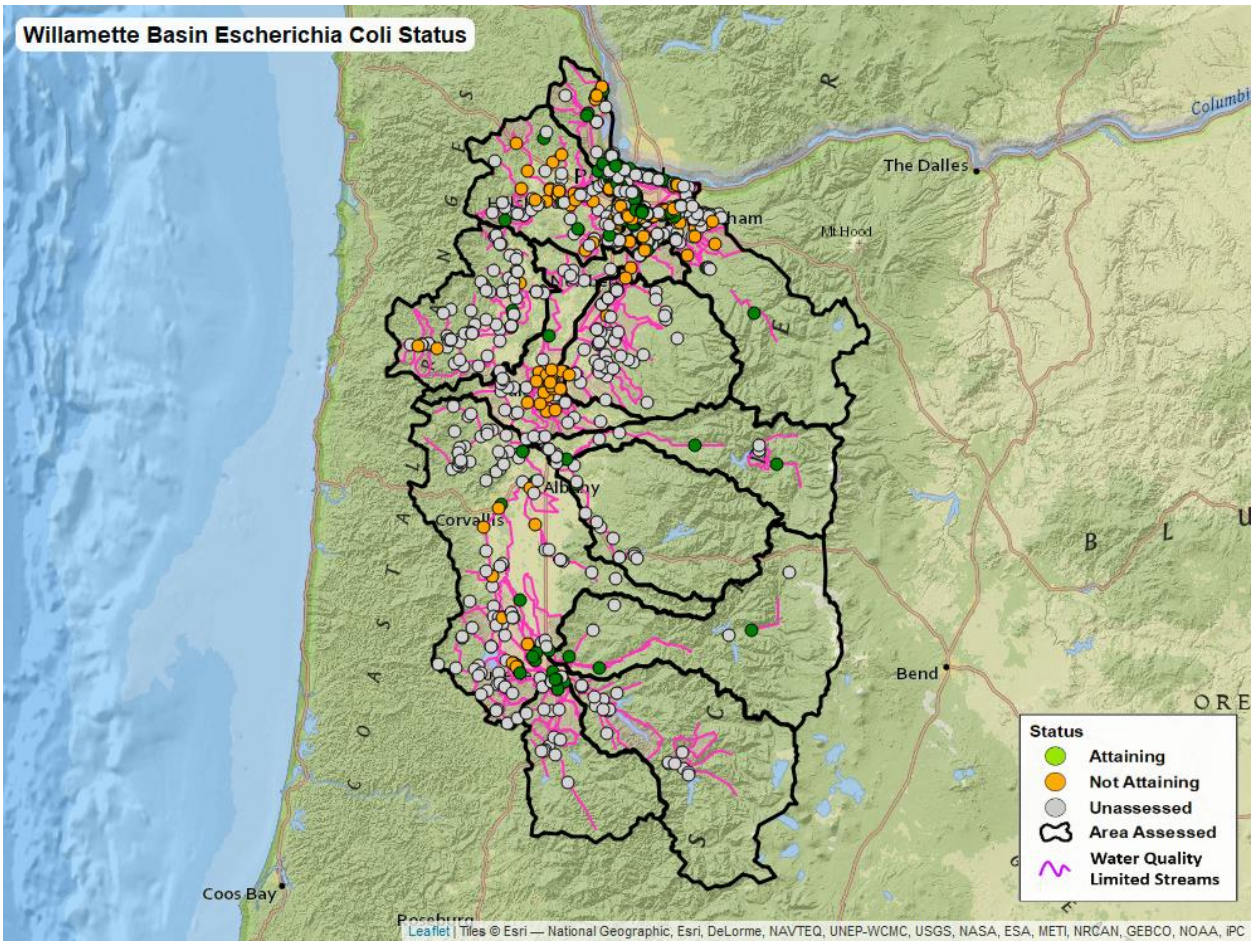

Figure 313: Summary map of the status of *Escherichia coli* across the Willamette Basin.

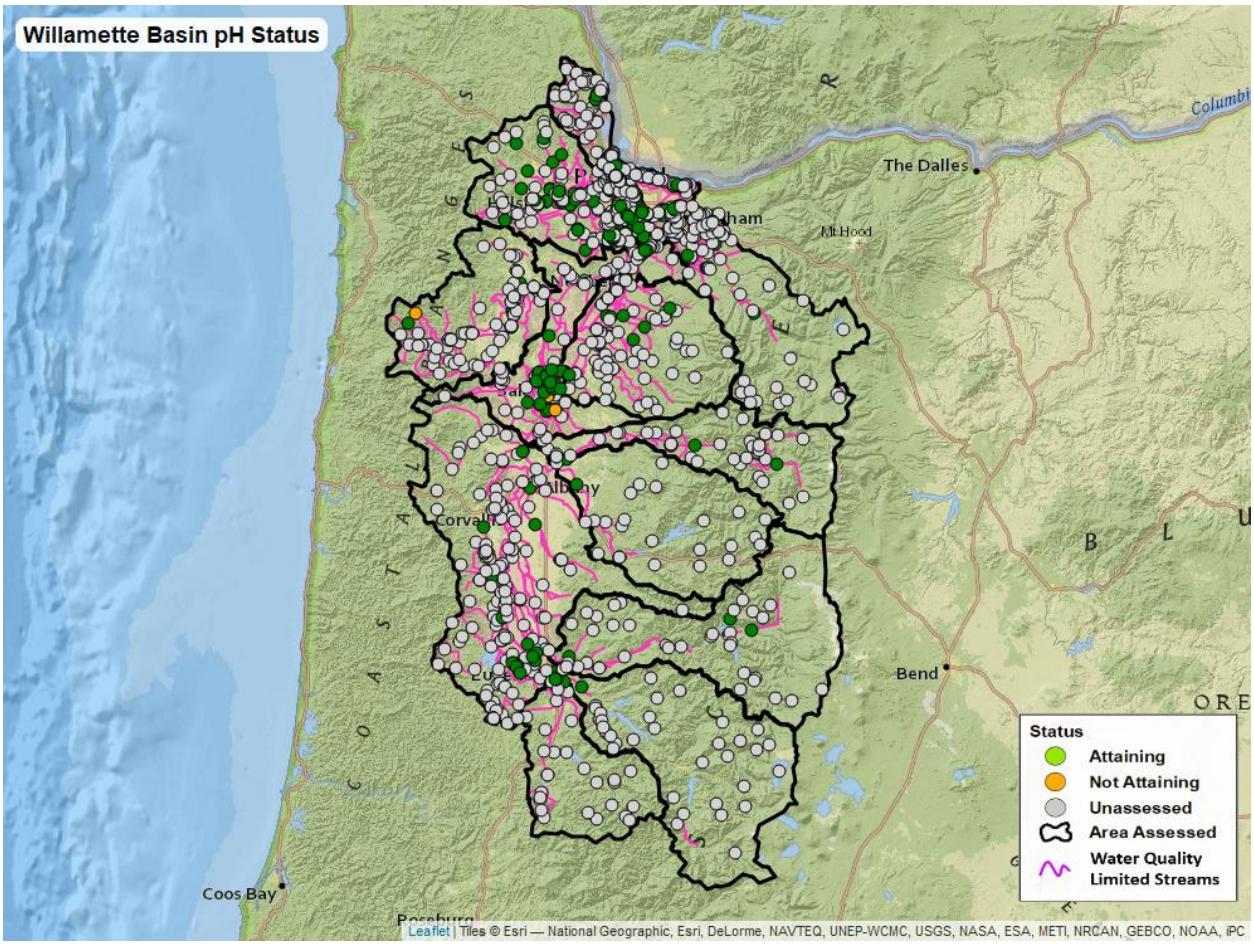

Figure 314: Summary map of the status of pH across the Willamette Basin.

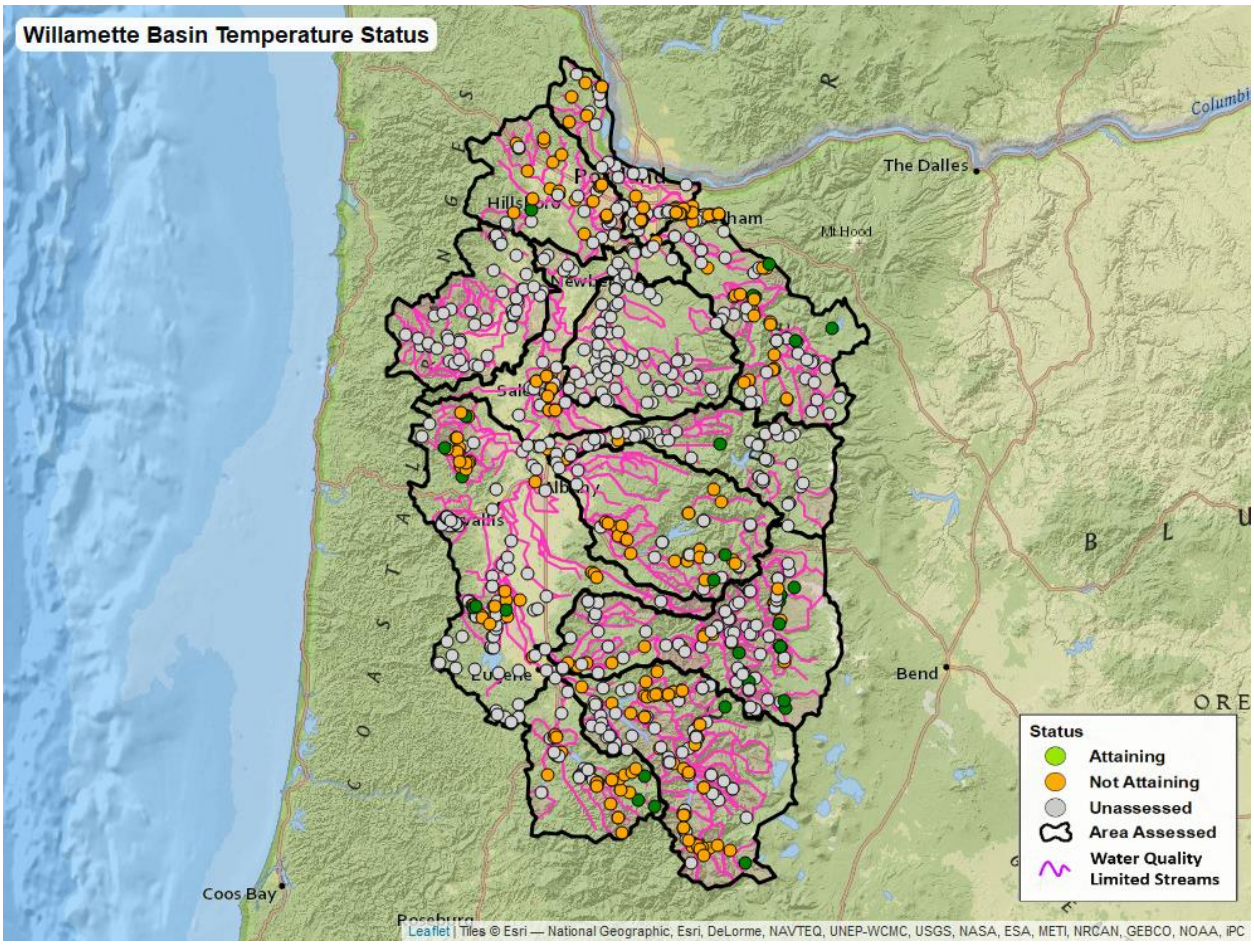

Figure 315: Summary map of the status of temperature across the Willamette Basin.

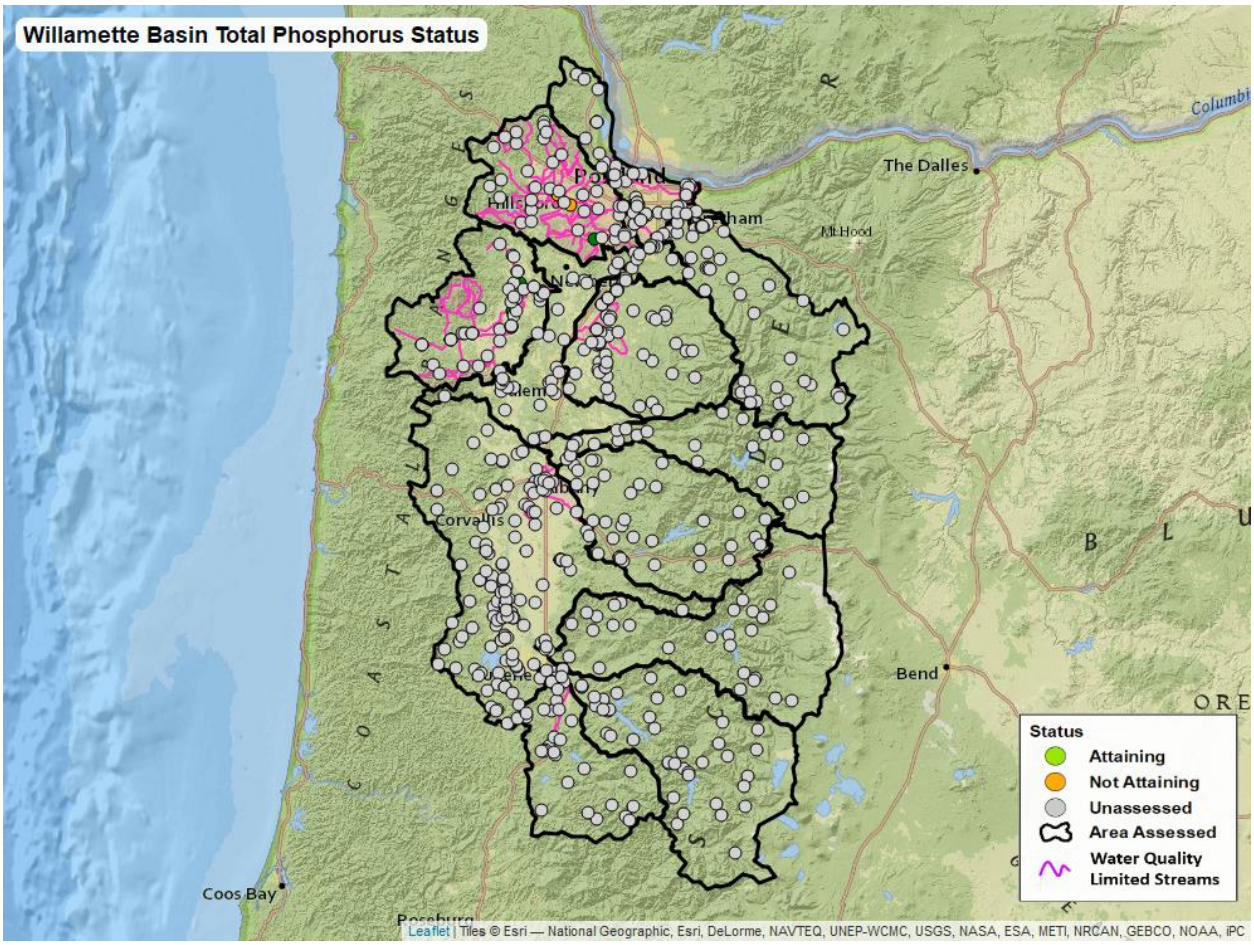

Figure 316: Summary map of the status of total phosphorus across the Willamette Basin.

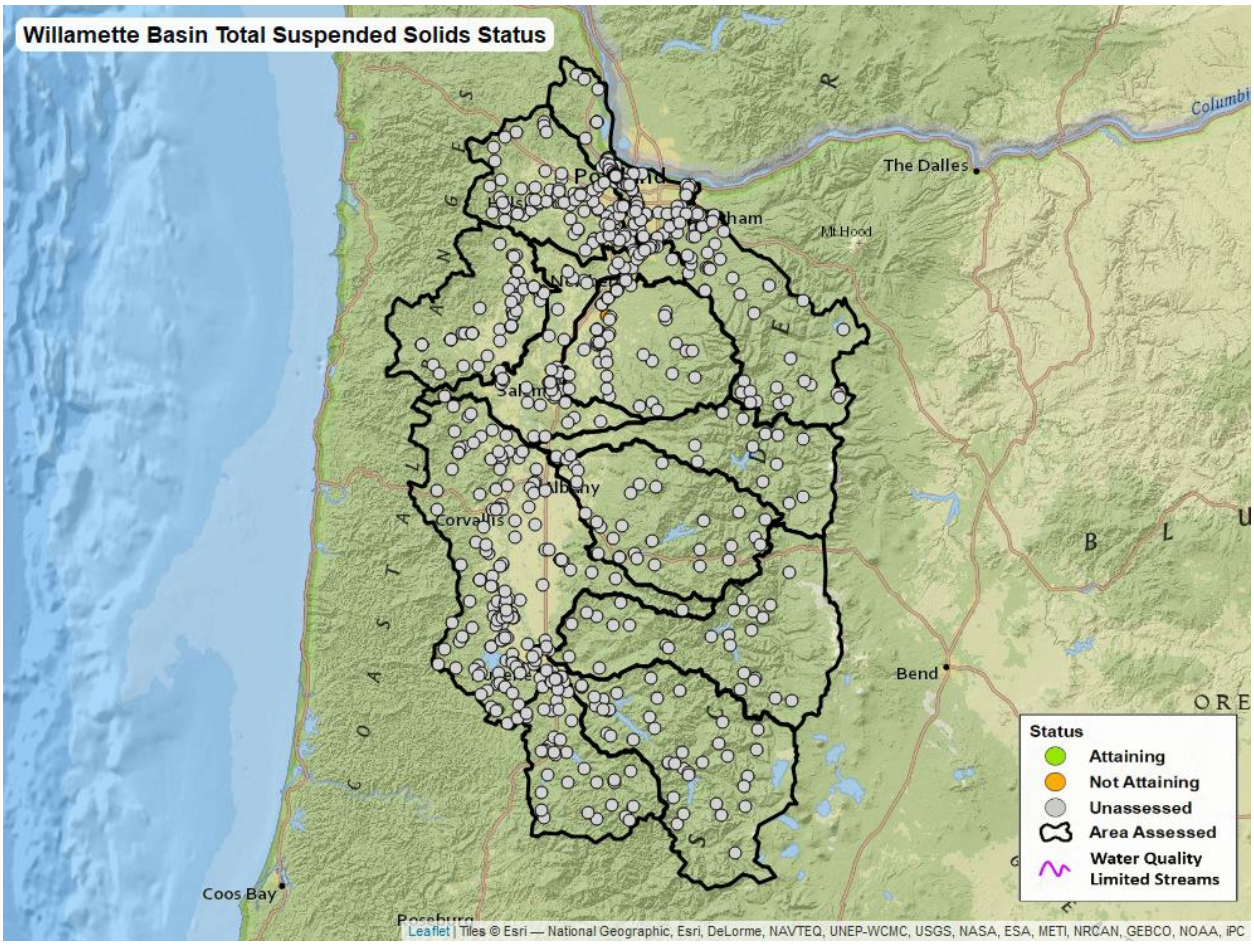

Figure 317: Summary map of the status of total suspended solids across the Willamette Basin.

4.22.3 Status

There are 500 assessment units within the Willamette Basin containing stations with available data for the parameters included in this report. Assessment units that did not contain stations with targets or sufficient available data are listed as unassessed. Table 449 shows the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016–2019 status period.

Table 449: Summary of the 2016–2019 assessment unit status within the Willamette Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	52	23	261
Escherichia coli	25	56	117
PH	80	3	250
Temperature	26	112	202
Total Phosphorus	2	1	269
Total Suspended Solids	0	3	289

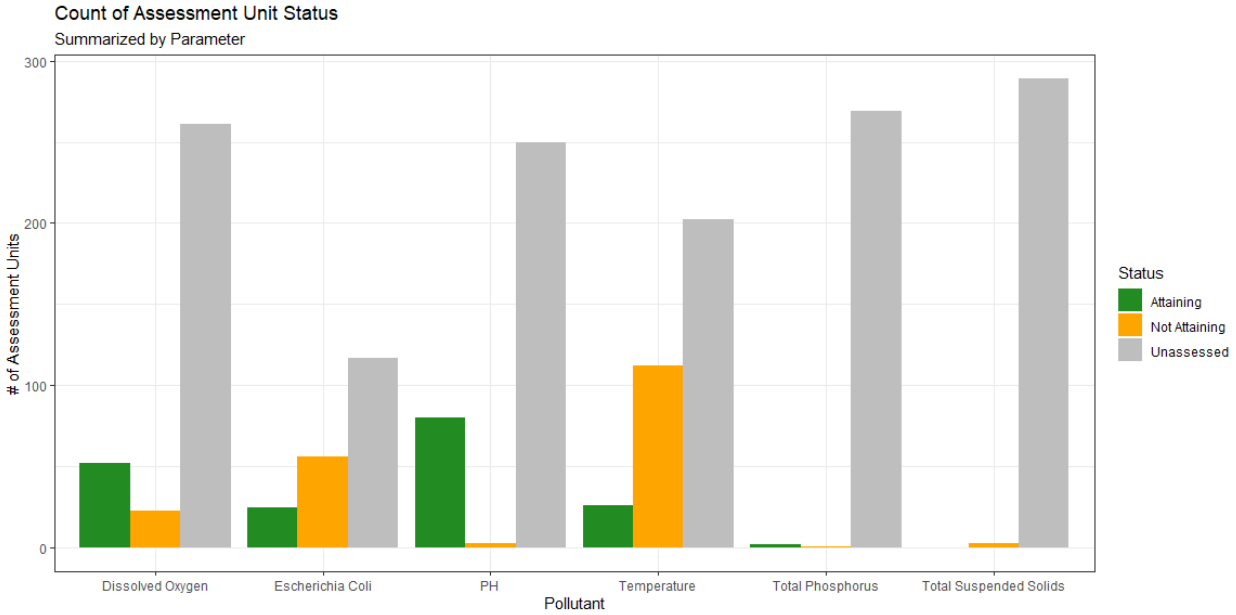

Figure 318: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Willamette Basin.

Table 450 and Figure 318 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Willamette Basin for the 2016–2019 status period.

Table 450: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Willamette Basin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	1	0	7
Lake	*Escherichia coli*	0	1	3
Lake	PH	1	0	8
Lake	Temperature	0	0	7
Lake	Total Phosphorus	0	0	3
Lake	Total Suspended Solids	0	0	3
Stream	Dissolved Oxygen	39	13	134
Stream	*Escherichia coli*	19	35	73
Stream	PH	57	0	125
Stream	Temperature	18	79	110
Stream	Total Phosphorus	2	1	148
Stream	Total Suspended Solids	0	3	161
Watershed Unit	Dissolved Oxygen	12	10	120
Watershed Unit	*Escherichia coli*	6	20	41
Watershed Unit	PH	22	3	117
Watershed Unit	Temperature	8	33	85
Watershed Unit	Total Phosphorus	0	0	118

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Total Suspended Solids	0	0	125

Table 451 and Figure 319 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016–2019 status period. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in Appendix U.

Table 451: Summary of the 2016–2019 status at monitoring stations within the Willamette Basin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	138	28	1010
Escherichia coli	136	110	595
PH	176	3	1152
Temperature	45	219	557
Total Phosphorus	2	1	556
Total Suspended Solids	0	3	752

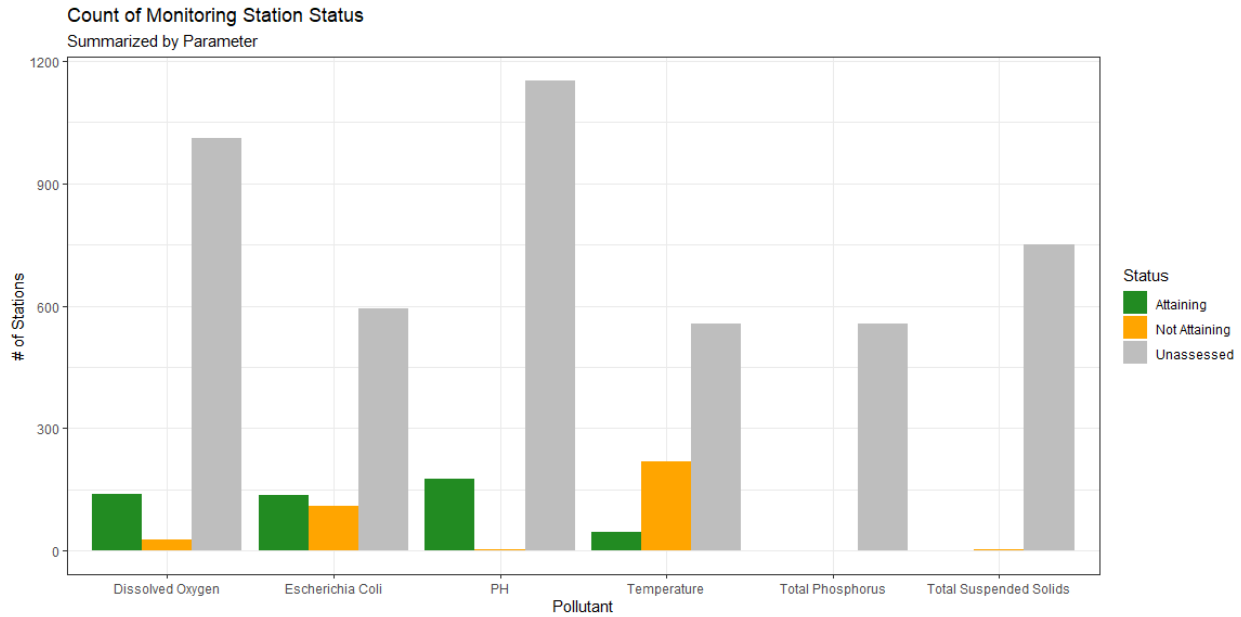

Figure 319: Summary plot of the 2016–2019 station status within the Willamette Basin by parameter.

4.22.4 Trend

A summary of the trends across parameters is shown in Table 452. Note that trend requires significantly more data than status and may result in many stations with sufficient data for assessing status, but insufficient data for assessing trend.

Table 452: Willamette Basin summary of trends at stations across the state.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	46	29	3	39	1059

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Escherichia coli	29	12	3	67	730
PH	0	60	30	65	1176
Temperature	10	60	4	7	740
Total Phosphorus	12	0	21	16	510
Total Suspended Solids	21	11	11	47	665

4.22.5 Subbasin Summary

4.22.5.1 Upper Willamette Subbasin

4.22.5.1.1 Water Quality Limited Assessment Units

Table 453: Number of water quality limited assessment units in the Upper Willamette Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	4
Total Phosphorus, mixed forms	2

4.22.5.1.2 Status

There are 65 assessment units within the Upper Willamette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 454 and Figure 320 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 454: Summary of the 2016–2019 assessment unit status within the Upper Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	7	5	40
Escherichia coli	3	8	26
PH	11	0	39
Temperature	3	10	22
Total Phosphorus	0	0	47
Total Suspended Solids	0	0	48

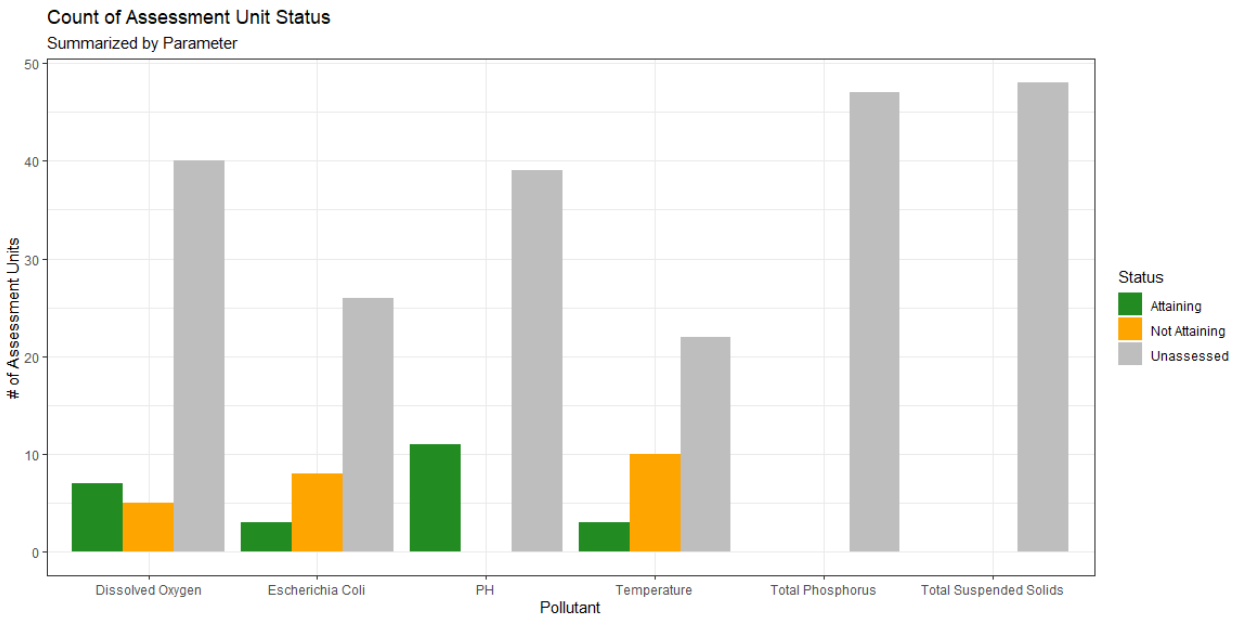

Figure 320: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Willamette Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 455 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Upper Willamette Subbasin for the 2016 – 2019 status period.

Table 455: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Upper Willamette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	6	1	22
Stream	*Escherichia coli*	2	5	14
Stream	PH	7	0	21
Stream	Temperature	1	6	10
Stream	Total Phosphorus	0	0	25
Stream	Total Suspended Solids	0	0	26
Watershed Unit	Dissolved Oxygen	1	4	18
Watershed Unit	*Escherichia coli*	1	3	12
Watershed Unit	PH	4	0	18
Watershed Unit	Temperature	2	4	12
Watershed Unit	Total Phosphorus	0	0	22
Watershed Unit	Total Suspended Solids	0	0	22

There are 325 stations within the Upper Willamette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 456 and Figure 321

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 456: Summary of the 2016–2019 status at monitoring stations within the Upper Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	21	5	152
Escherichia coli	11	9	90
PH	20	0	153
Temperature	7	32	84
Total Phosphorus	0	0	134
Total Suspended Solids	0	0	153

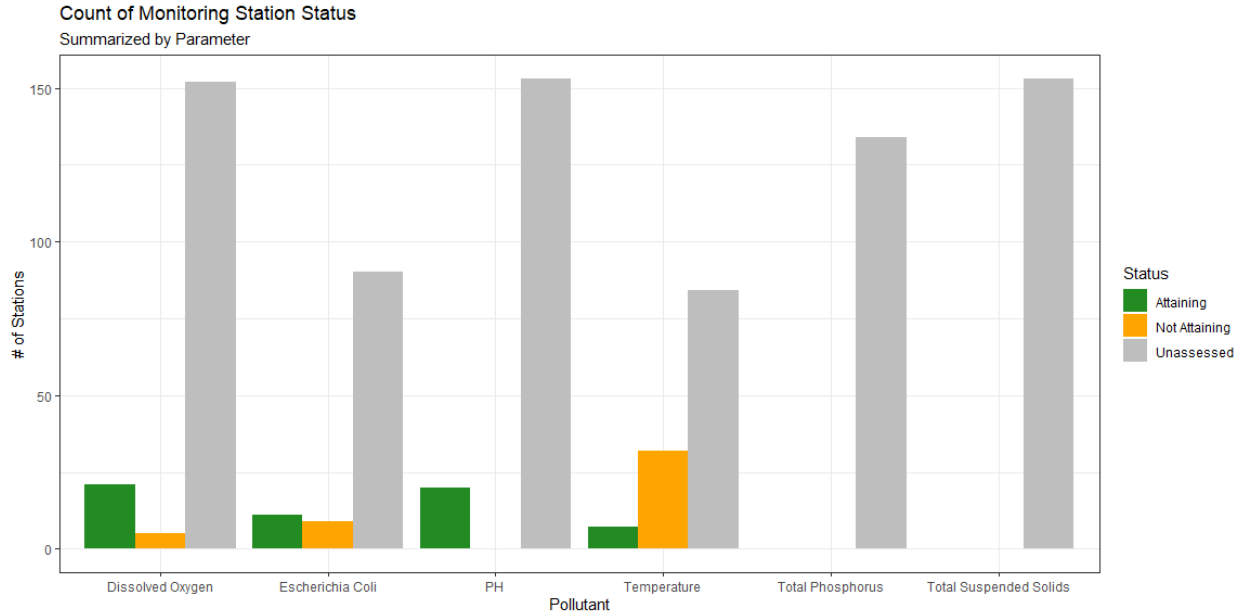

Figure 321: The number of stations in each status category by parameter for the 2016–2019 status period within the Upper Willamette Subbasin.

4.22.5.1.3 Trend

A summary of the trends within parameters is shown in Table 457. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 457: Subbasin Summary of trend results at stations across the Upper Willamette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	8	4	0	17	149
Escherichia coli	2	0	0	15	93
PH	0	7	1	20	145
Temperature	1	2	0	1	119
Total Phosphorus	4	0	4	9	117

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	6	4	1	9	133

4.22.5.2 Tualatin Subbasin

4.22.5.2.1 Water Quality Limited Assessment Units

Table 458: Number of water quality limited assessment units in the Tualatin Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Enterococcus	1
Fecal Coliform	12
Total Phosphorus, mixed forms	33

4.22.5.2.2 Status

There are 39 assessment units within the Tualatin Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 459 and Figure 322 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 459: Summary of the 2016–2019 assessment unit status within the Tualatin Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	5	8	15
Escherichia coli	3	17	8
PH	19	0	17
Temperature	2	12	4
Total Phosphorus	0	0	15
Total Suspended Solids	0	0	33

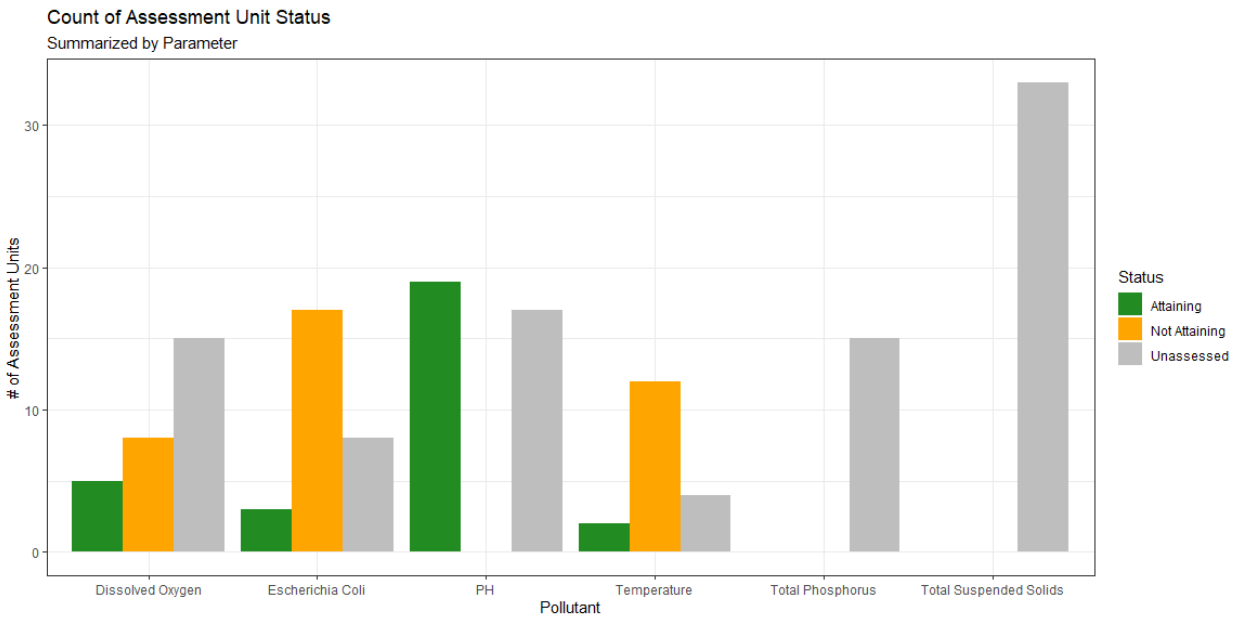

Figure 322: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Tualatin Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 460 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Tualatin Subbasin for the 2016 – 2019 status period.

Table 460: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Tualatin Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	5	6	6
Stream	*Escherichia coli*	1	13	4
Stream	PH	14	0	6
Stream	Temperature	1	10	2
Stream	Total Phosphorus	0	0	9
Stream	Total Suspended Solids	0	0	18
Watershed Unit	Dissolved Oxygen	0	2	9
Watershed Unit	*Escherichia coli*	2	4	4
Watershed Unit	PH	5	0	11
Watershed Unit	Temperature	1	2	2
Watershed Unit	Total Phosphorus	0	0	6
Watershed Unit	Total Suspended Solids	0	0	15

There are 190 stations within the Tualatin Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 461 and Figure 323 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 461: Summary of the 2016–2019 status at monitoring stations within the Tualatin Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	17	13	65
Escherichia coli	23	34	59
PH	51	0	124
Temperature	2	22	20
Total Phosphorus	0	0	28
Total Suspended Solids	0	0	89

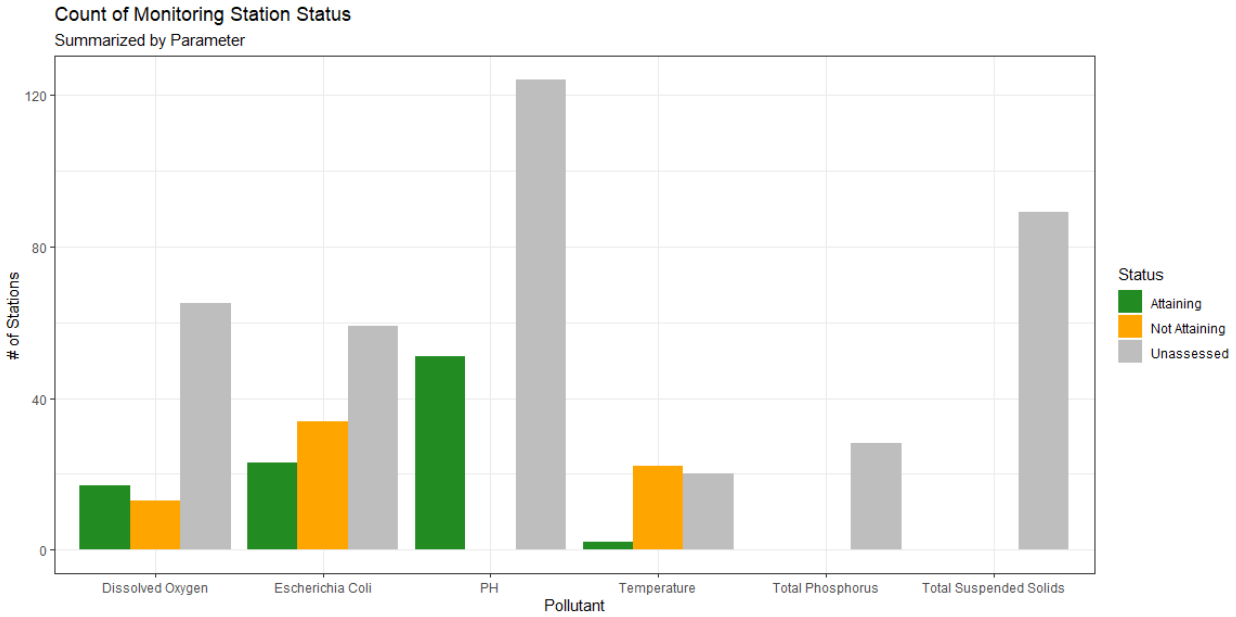

Figure 323: The number of stations in each status category by parameter for the 2016–2019 status period within the Tualatin Subbasin.

4.22.5.2.3 Trend

A summary of the trends within parameters is shown in Table 462. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 462: Subbasin Summary of trend results at stations across the Tualatin.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	7	5	2	2	79
Escherichia coli	18	2	1	17	78
PH	0	23	15	7	130
Temperature	2	8	0	1	33
Total Phosphorus	0	0	2	2	24
Total Suspended Solids	14	4	7	12	52

4.22.5.3 Lower Willamette Subbasin

4.22.5.3.1 Water Quality Limited Assessment Units

Table 463: Number of water quality limited assessment units in the Lower Willamette Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	1
pH	6
Total Phosphorus, mixed forms	3

4.22.5.3.2 Status

There are 30 assessment units within the Lower Willamette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 464 and Figure 324 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 464: Summary of the 2016–2019 assessment unit status within the Lower Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	11	1	16
Escherichia coli	5	10	7
PH	13	0	17
Temperature	0	8	11
Total Phosphorus	0	0	15
Total Suspended Solids	0	1	15

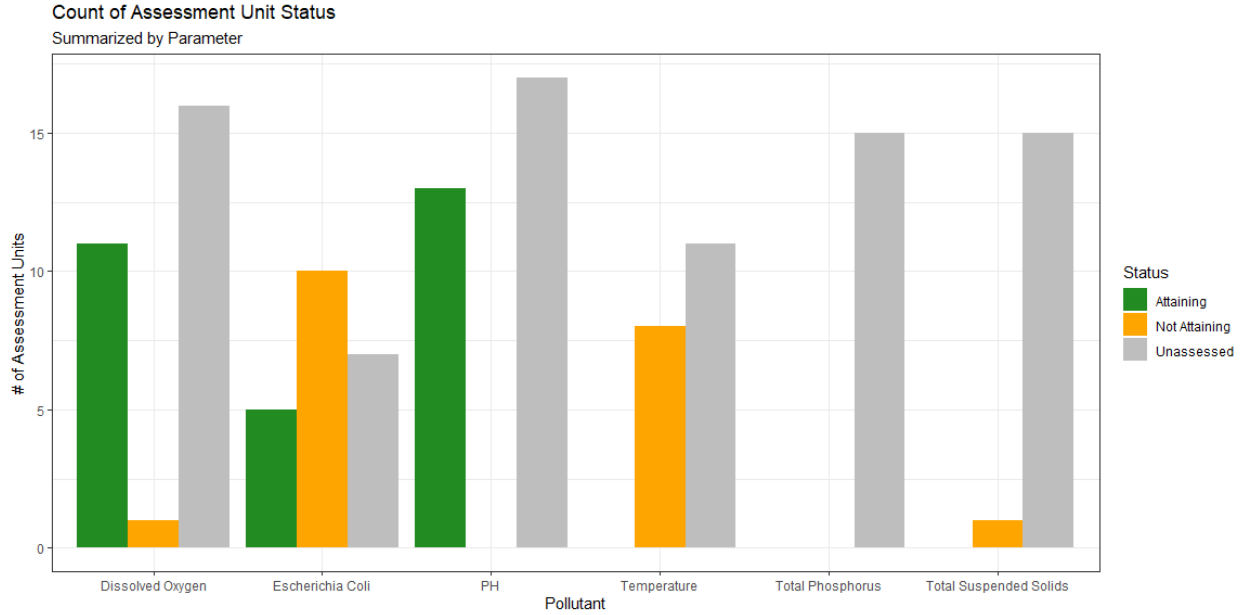

Figure 324: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Willamette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 465 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Lower Willamette Subbasin for the 2016 – 2019 status period.

Table 465: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Lower Willamette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	1	0	3
Lake	*Escherichia coli*	0	1	1
Lake	PH	1	0	4
Lake	Temperature	0	0	2
Lake	Total Phosphorus	0	0	2
Lake	Total Suspended Solids	0	0	2
Stream	Dissolved Oxygen	4	1	8
Stream	*Escherichia coli*	3	4	4
Stream	PH	6	0	7
Stream	Temperature	0	5	4
Stream	Total Phosphorus	0	0	6
Stream	Total Suspended Solids	0	1	5
Watershed Unit	Dissolved Oxygen	6	0	5
Watershed Unit	*Escherichia coli*	2	5	2
Watershed Unit	PH	6	0	6
Watershed Unit	Temperature	0	3	5
Watershed Unit	Total Phosphorus	0	0	7
Watershed Unit	Total Suspended Solids	0	0	8

There are 594 stations within the Lower Willamette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix U**. Table 466 and Figure 325 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 466: Summary of the 2016–2019 status at monitoring stations within the Lower Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	44	1	317
Escherichia coli	81	32	198
PH	45	0	387
Temperature	4	31	50
Total Phosphorus	0	0	48
Total Suspended Solids	0	1	146

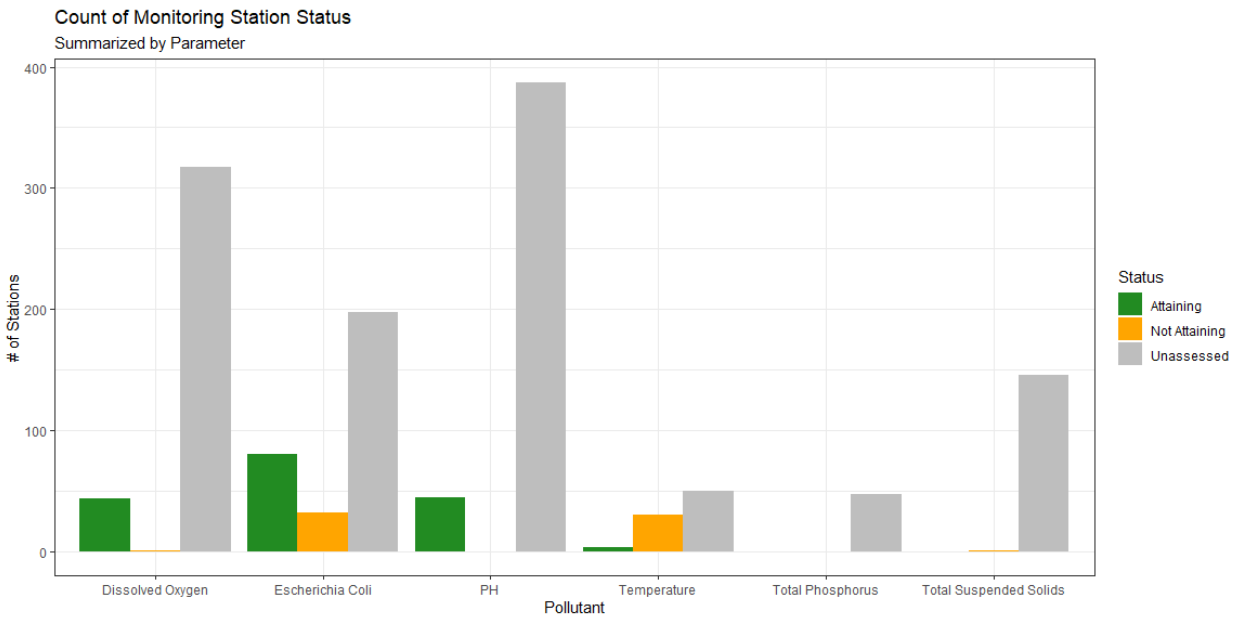

Figure 325: The number of stations in each status category by parameter for the 2016–2019 status period within the Lower Willamette Subbasin.

4.22.5.3.3 Trend

A summary of the trends within parameters is shown in Table 467. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 467: Subbasin Summary of trend results at stations across the Lower Willamette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	5	6	0	6	345
Escherichia coli	6	1	0	9	295
PH	0	10	1	9	412
Temperature	3	4	0	0	78
Total Phosphorus	4	0	2	0	42
Total Suspended Solids	1	0	0	5	141

4.22.5.4 Middle Willamette Subbasin

4.22.5.4.1 Water Quality Limited Assessment Units

Table 468: Number of water quality limited assessment units in the Middle Willamette Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	1

4.22.5.4.2 Status

There are 33 assessment units within the Middle Willamette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 469 and Figure 326 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 469: Summary of the 2016–2019 assessment unit status within the Middle Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	9	1	16
Escherichia coli	1	9	11
PH	8	2	15
Temperature	0	5	10
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	23

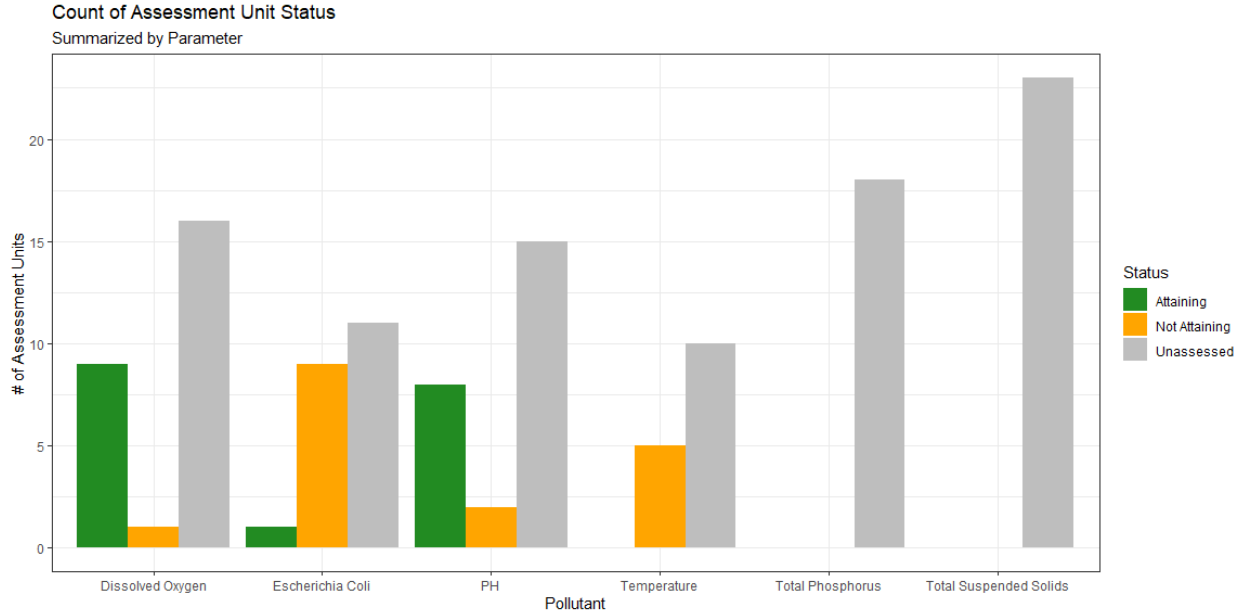

Figure 326: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Willamette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 470 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Willamette Subbasin for the 2016 – 2019 status period.

Table 470: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Willamette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	0	1

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	PH	0	0	1
Stream	Dissolved Oxygen	6	0	8
Stream	*Escherichia coli*	1	5	5
Stream	PH	6	0	7
Stream	Temperature	0	2	7
Stream	Total Phosphorus	0	0	10
Stream	Total Suspended Solids	0	0	12
Watershed Unit	Dissolved Oxygen	3	1	7
Watershed Unit	*Escherichia coli*	0	4	5
Watershed Unit	PH	2	2	7
Watershed Unit	Temperature	0	3	3
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	11

There are 138 stations within the Middle Willamette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 471 and Figure 327 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 471: Summary of the 2016–2019 status at monitoring stations within the Middle Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	25	1	71
Escherichia coli	4	20	43
PH	24	2	76
Temperature	0	8	29
Total Phosphorus	0	0	36
Total Suspended Solids	0	0	53

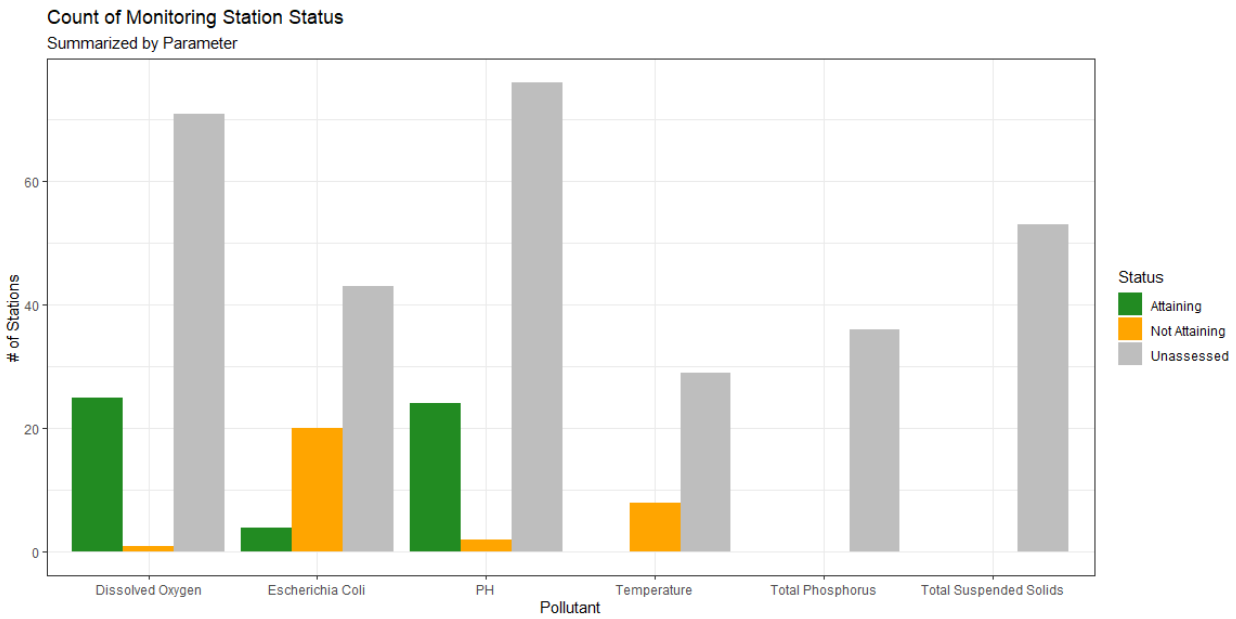

Figure 327: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Willamette Subbasin.

4.22.5.4.3 Trend

A summary of the trends within parameters is shown in Table 472. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 472: Subbasin Summary of trend results at stations across the Middle Willamette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	8	10	0	5	74
Escherichia coli	1	6	0	12	48
PH	0	11	3	8	80
Temperature	0	7	0	1	29
Total Phosphorus	3	0	0	0	33
Total Suspended Solids	0	1	0	4	48

4.22.5.5 Clackamas Subbasin

4.22.5.5.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.22.5.5.2 Status

There are 41 assessment units within the Clackamas Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 473 and Figure 328 summarizes

the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 473: Summary of the 2016–2019 assessment unit status within the Clackamas Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	4	20
Escherichia coli	2	4	2
PH	6	0	19
Temperature	2	10	18
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	25

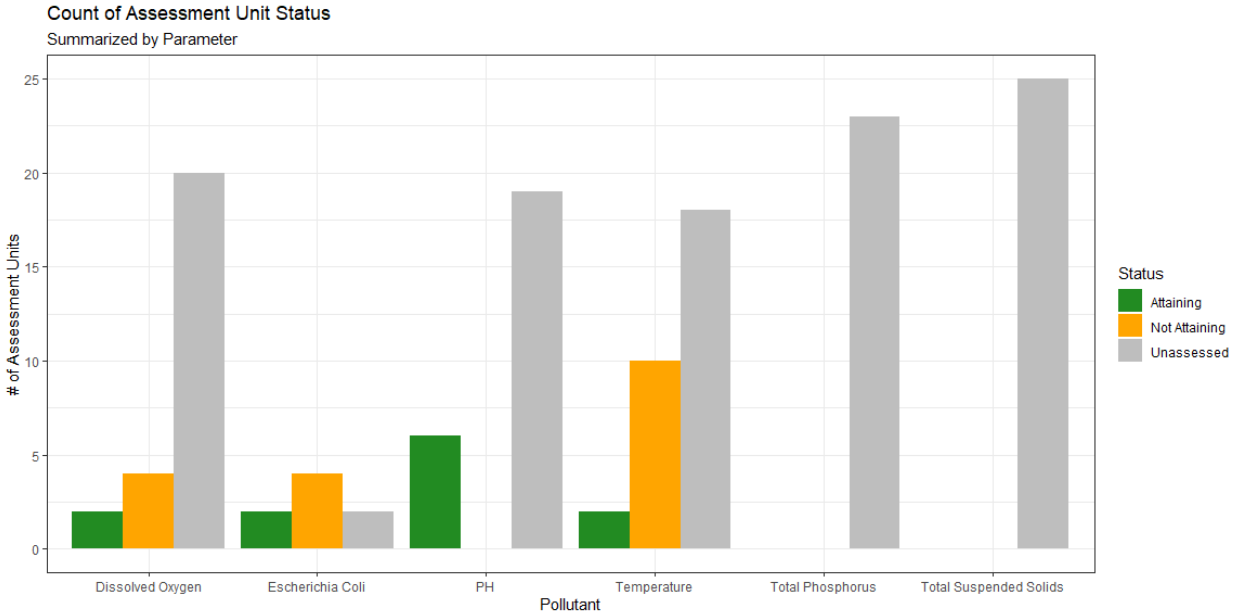

Figure 328: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Clackamas Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 474 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Clackamas Subbasin for the 2016 – 2019 status period.

Table 474: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Clackamas Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	1
Lake	*Escherichia coli*	0	0	1
Lake	PH	0	0	1
Lake	Total Phosphorus	0	0	1
Lake	Total Suspended Solids	0	0	1
Stream	Dissolved Oxygen	1	2	6

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	*Escherichia coli*	2	1	1
Stream	PH	3	0	6
Stream	Temperature	1	8	5
Stream	Total Phosphorus	0	0	8
Stream	Total Suspended Solids	0	0	9
Watershed Unit	Dissolved Oxygen	1	2	13
Watershed Unit	*Escherichia coli*	0	3	0
Watershed Unit	PH	3	0	12
Watershed Unit	Temperature	1	2	13
Watershed Unit	Total Phosphorus	0	0	14
Watershed Unit	Total Suspended Solids	0	0	15

There are 160 stations within the Clackamas Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 475 and Figure 329 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 475: Summary of the 2016–2019 status at monitoring stations within the Clackamas Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	4	52
Escherichia coli	3	7	21
PH	10	0	83
Temperature	7	19	37
Total Phosphorus	0	0	44
Total Suspended Solids	0	0	54

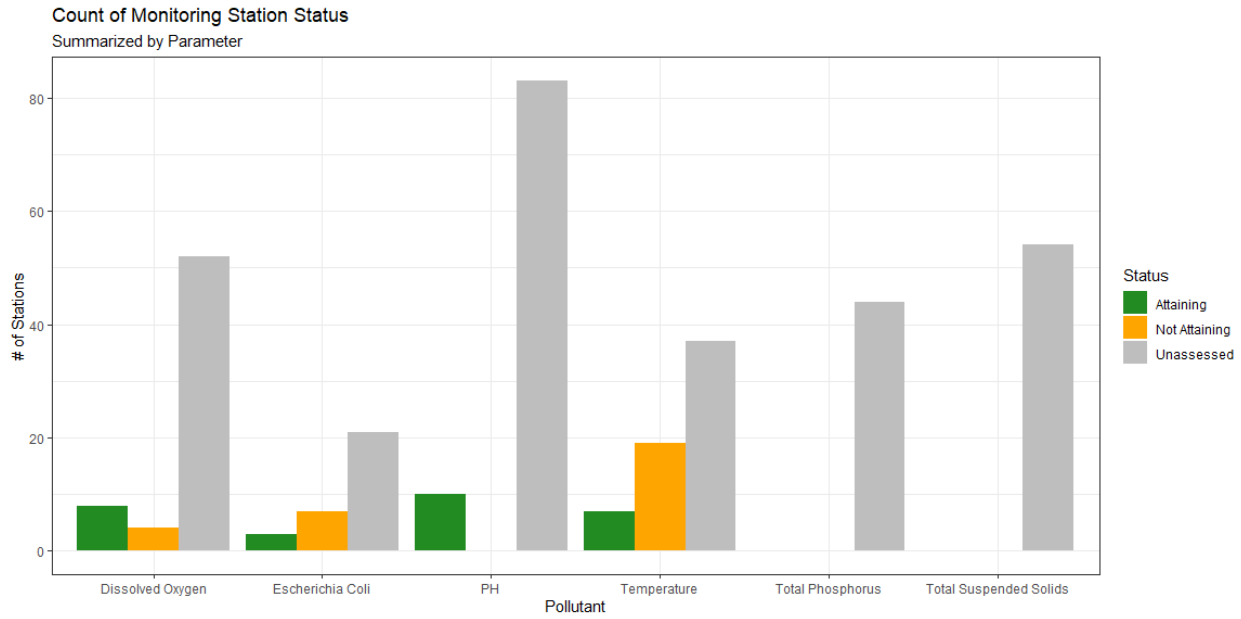

Figure 329: The number of stations in each status category by parameter for the 2016–2019 status period within the Clackamas Subbasin.

4.22.5.5.3 Trend

A summary of the trends within parameters is shown in Table 476. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 476: Subbasin Summary of trend results at stations across the Clackamas.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	1	1	2	57
Escherichia coli	0	0	1	2	28
PH	0	0	3	4	86
Temperature	0	3	0	0	60
Total Phosphorus	0	0	3	0	41
Total Suspended Solids	0	0	0	4	50

4.22.5.6 Molalla-Pudding Subbasin

4.22.5.6.1 Water Quality Limited Assessment Units

Table 477: Number of water quality limited assessment units in the Molalla-Pudding Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	3
pH	1
Total Phosphorus, mixed forms	1

4.22.5.6.2 Status

There are 40 assessment units within the Molalla-Pudding Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 478 and Figure 330 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 478: Summary of the 2016–2019 assessment unit status within the Molalla-Pudding Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	1	22
Escherichia coli	0	4	15
PH	9	0	24
Temperature	0	0	30
Total Phosphorus	0	0	24
Total Suspended Solids	0	2	19

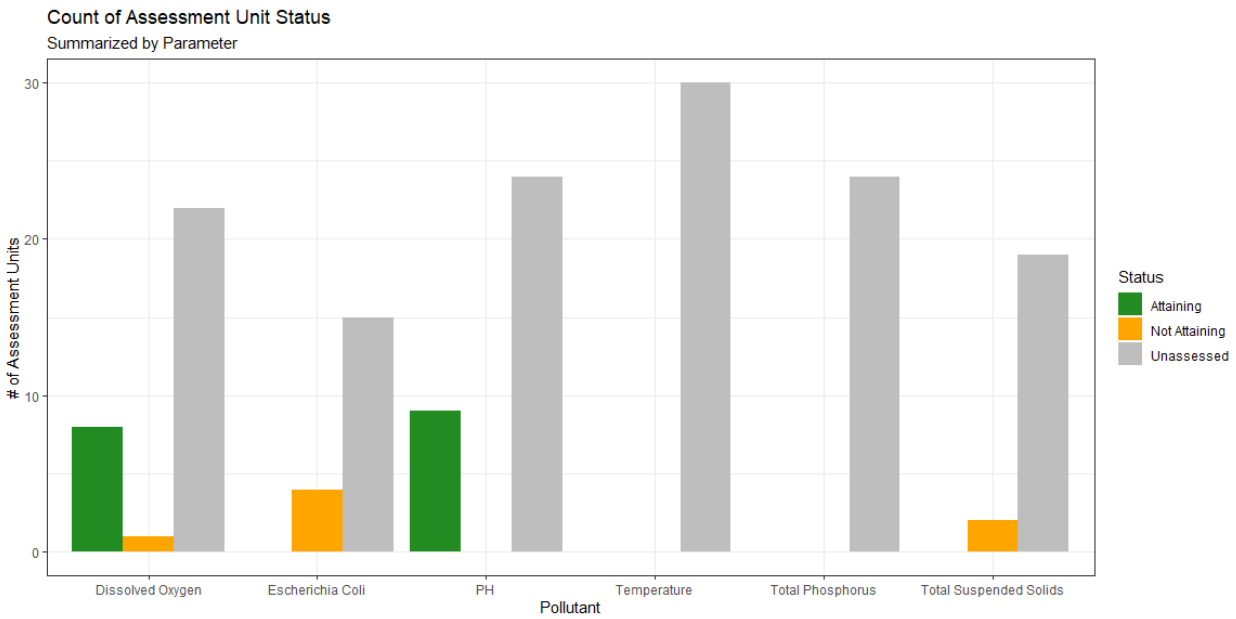

Figure 330: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Molalla-Pudding Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 479 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Molalla-Pudding Subbasin for the 2016 – 2019 status period.

Table 479: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Molalla-Pudding Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	7	0	12
Stream	*Escherichia coli*	0	3	10
Stream	PH	7	0	12
Stream	Temperature	0	0	17
Stream	Total Phosphorus	0	0	14
Stream	Total Suspended Solids	0	2	12
Watershed Unit	Dissolved Oxygen	1	1	10
Watershed Unit	*Escherichia coli*	0	1	5
Watershed Unit	PH	2	0	12
Watershed Unit	Temperature	0	0	13
Watershed Unit	Total Phosphorus	0	0	10
Watershed Unit	Total Suspended Solids	0	0	7

There are 128 stations within the Molalla-Pudding Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 480 and Figure 331

summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 480: Summary of the 2016–2019 status at monitoring stations within the Molalla-Pudding Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	8	1	76
Escherichia coli	0	4	55
PH	9	0	85
Temperature	0	0	69
Total Phosphorus	0	0	60
Total Suspended Solids	0	2	49

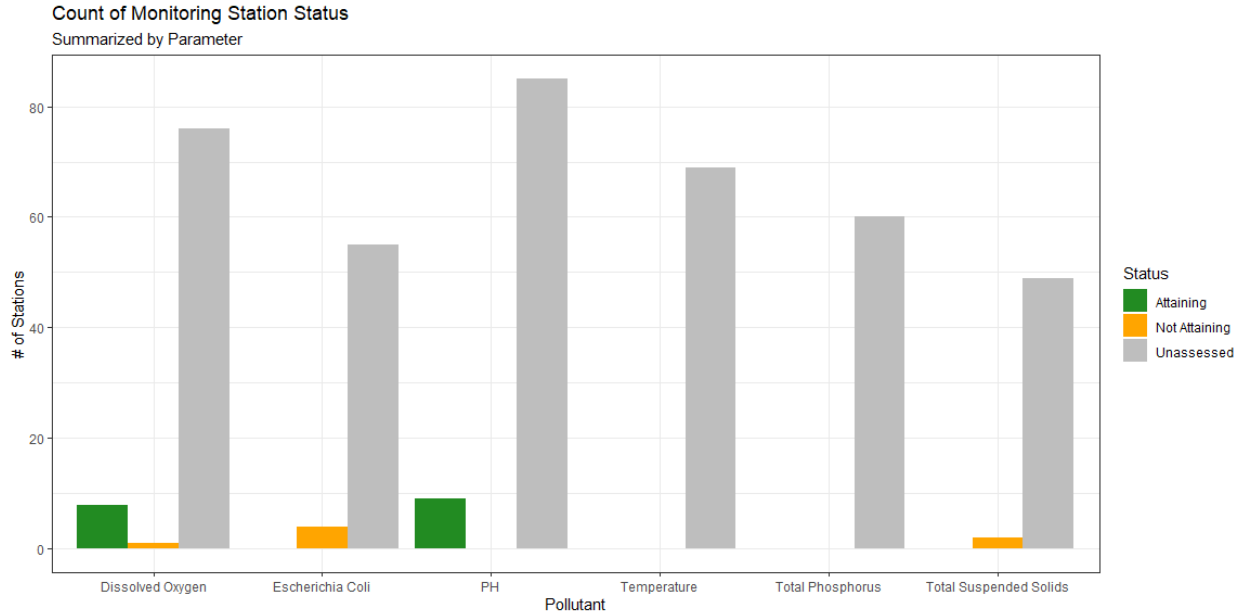

Figure 331: The number of stations in each status category by parameter for the 2016–2019 status period within the Molalla-Pudding Subbasin.

4.22.5.6.3 Trend

A summary of the trends within parameters is shown in Table 481. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 481: Subbasin Summary of trend results at stations across the Molalla-Pudding.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	5	1	0	2	77
Escherichia coli	0	2	0	2	55
PH	0	3	1	5	85
Temperature	0	0	0	0	69
Total Phosphorus	1	0	1	1	57

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	1	1	1	48

4.22.5.7 Yamhill Subbasin

4.22.5.7.1 Water Quality Limited Assessment Units

Table 482: Number of water quality limited assessment units in the Yamhill Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Fecal Coliform	14
Total Phosphorus, mixed forms	19

4.22.5.7.2 Status

There are 36 assessment units within the Yamhill Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 483 and Figure 332 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 483: Summary of the 2016–2019 assessment unit status within the Yamhill Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	24
Escherichia coli	1	4	18
PH	4	1	22
Temperature	0	0	30
Total Phosphorus	2	1	13
Total Suspended Solids	0	0	17

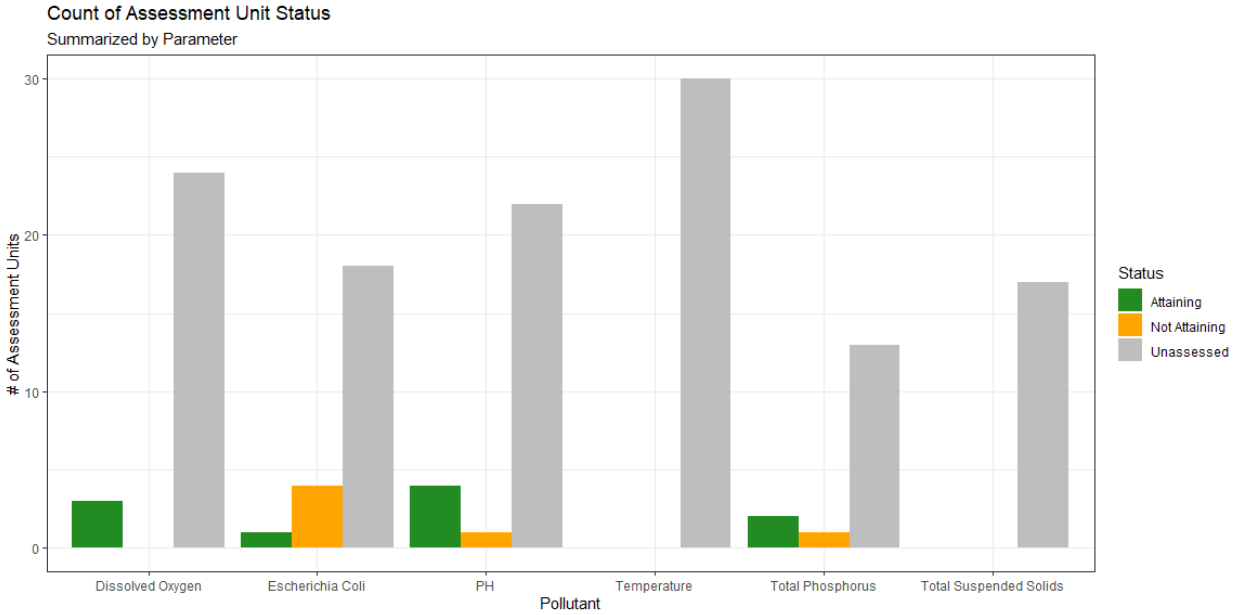

Figure 332: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Yamhill Subbasin.

Oregon DEQ groups assessment units into five types: "Stream", "Watershed Unit", "Lake", "Estuary or Bay", and "Coastline". Table 484 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Yamhill Subbasin for the 2016 – 2019 status period.

Table 484: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Yamhill Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	3	0	16
Stream	*Escherichia coli*	1	4	14
Stream	PH	4	0	14
Stream	Temperature	0	0	23
Stream	Total Phosphorus	2	1	8
Stream	Total Suspended Solids	0	0	12
Watershed Unit	Dissolved Oxygen	0	0	8
Watershed Unit	*Escherichia coli*	0	0	4
Watershed Unit	PH	0	1	8
Watershed Unit	Temperature	0	0	7
Watershed Unit	Total Phosphorus	0	0	5
Watershed Unit	Total Suspended Solids	0	0	5

There are 135 stations within the Yamhill Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 485 and Figure 333 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 485: Summary of the 2016–2019 status at monitoring stations within the Yamhill Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	100
Escherichia coli	1	4	68
PH	4	1	77
Temperature	0	0	49
Total Phosphorus	2	1	46
Total Suspended Solids	0	0	52

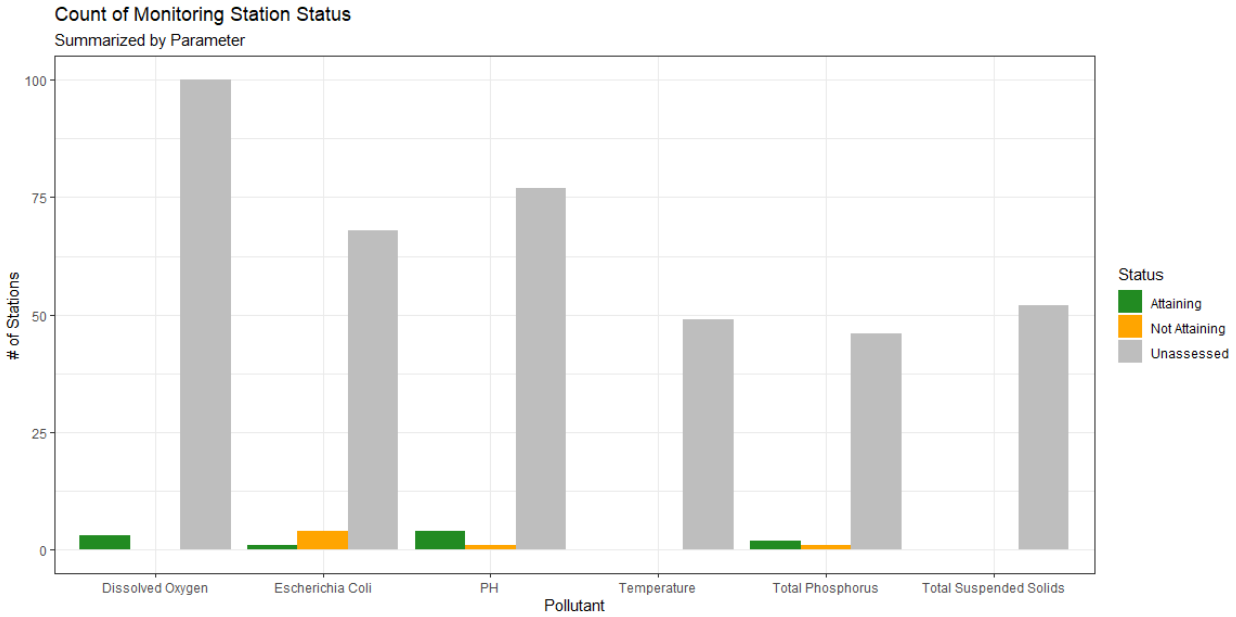

Figure 333: The number of stations in each status category by parameter for the 2016–2019 status period within the Yamhill Subbasin.

4.22.5.7.3 Trend

A summary of the trends within parameters is shown in Table 486. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 486: Subbasin Summary of trend results at stations across the Yamhill.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	2	100
Escherichia coli	1	0	0	2	70
PH	0	1	0	2	79
Temperature	0	0	0	0	49
Total Phosphorus	0	0	2	1	46
Total Suspended Solids	0	0	0	3	49

4.22.5.8 North Santiam Subbasin

4.22.5.8.1 Water Quality Limited Assessment Units

Table 487: Number of water quality limited assessment units in the North Santiam Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
pH	1

4.22.5.8.2 Status

There are 29 assessment units within the North Santiam Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 488 and Figure 334 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 488: Summary of the 2016–2019 assessment unit status within the North Santiam Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	13
Escherichia coli	3	0	3
PH	3	0	15
Temperature	3	4	15
Total Phosphorus	0	0	18
Total Suspended Solids	0	0	14

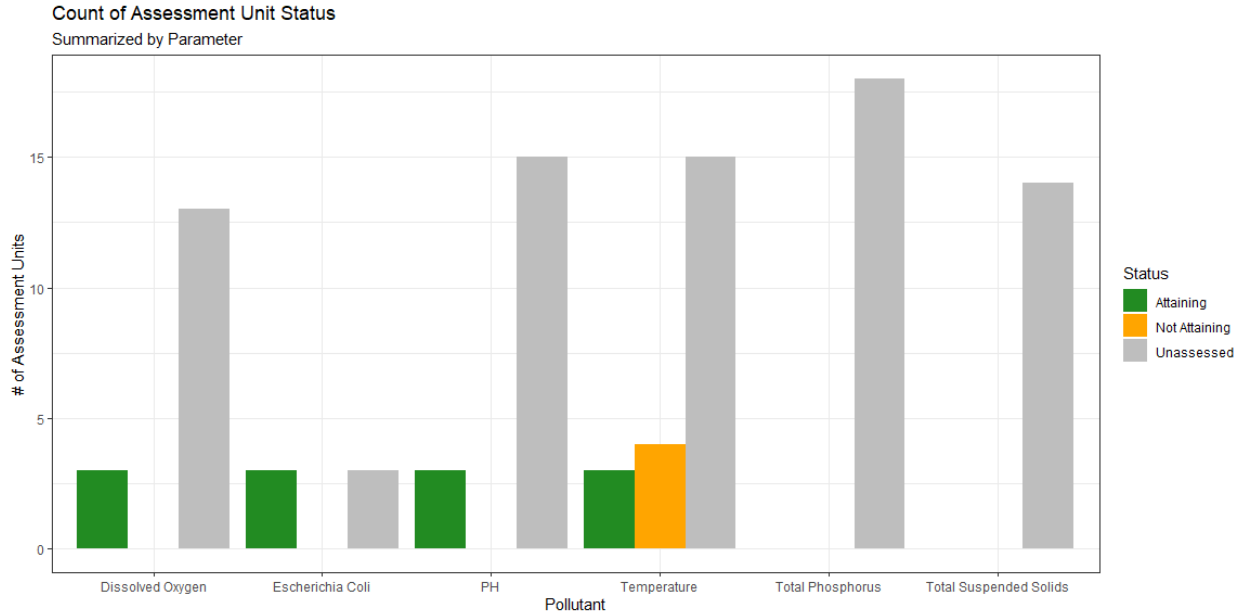

Figure 334: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the North Santiam Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 489 summarizes of the number of attaining, not attaining, and unassessed

assessment units by parameter and assessment unit type within the North Santiam Subbasin for the 2016 – 2019 status period.

Table 489: The number of assessment units in each status category by parameter for the 2016–2019 status period within the North Santiam Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	PH	0	0	1
Stream	Dissolved Oxygen	3	0	9
Stream	*Escherichia coli*	3	0	2
Stream	PH	3	0	10
Stream	Temperature	3	3	10
Stream	Total Phosphorus	0	0	13
Stream	Total Suspended Solids	0	0	12
Watershed Unit	Dissolved Oxygen	0	0	4
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	4
Watershed Unit	Temperature	0	1	5
Watershed Unit	Total Phosphorus	0	0	5
Watershed Unit	Total Suspended Solids	0	0	2

There are 88 stations within the North Santiam Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 490 and Figure 335 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 490: Summary of the 2016–2019 status at monitoring stations within the North Santiam Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	29
Escherichia coli	3	0	11
PH	3	0	39
Temperature	3	4	52
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	15

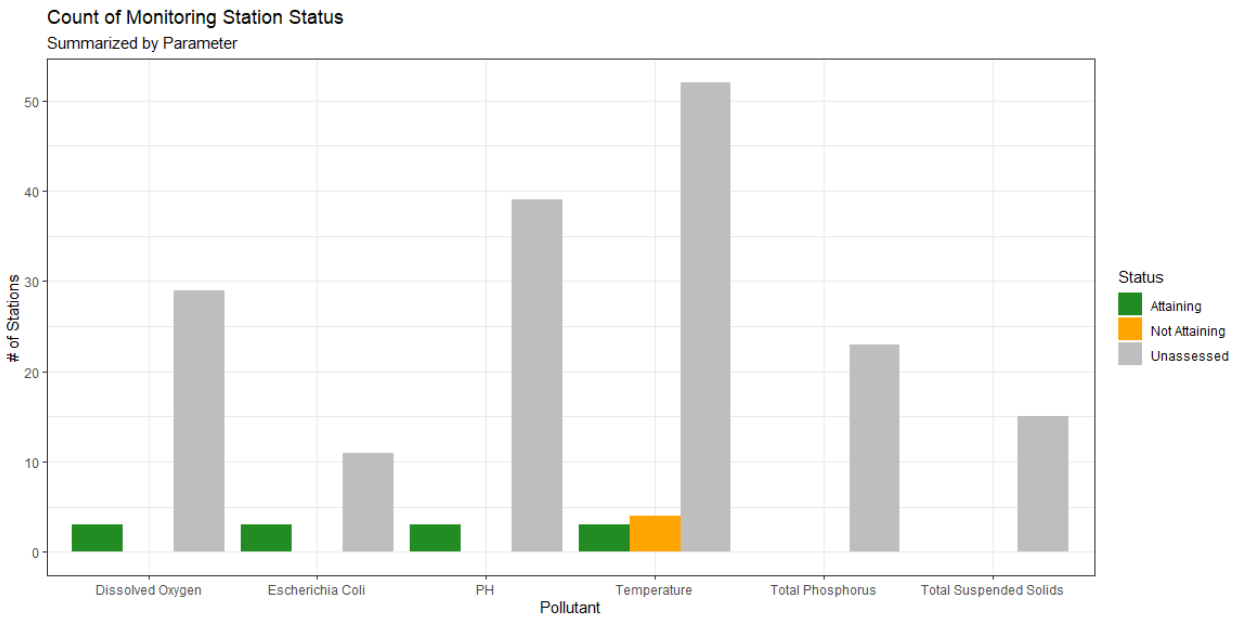

Figure 335: The number of stations in each status category by parameter for the 2016–2019 status period within the North Santiam Subbasin.

4.22.5.8.3 Trend

A summary of the trends within parameters is shown in Table 491. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 491: Subbasin Summary of trend results at stations across the North Santiam.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	2	0	1	27
Escherichia coli	0	0	1	2	11
PH	0	3	3	5	31
Temperature	1	5	2	1	50
Total Phosphorus	0	0	3	0	20
Total Suspended Solids	0	0	0	4	11

4.22.5.9 South Santiam Subbasin

4.22.5.9.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.22.5.9.2 Status

There are 38 assessment units within the South Santiam Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 492 and Figure 336

summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 492: Summary of the 2016–2019 assessment unit status within the South Santiam Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	17
Escherichia coli	1	0	3
PH	1	0	16
Temperature	3	13	7
Total Phosphorus	0	0	22
Total Suspended Solids	0	0	18

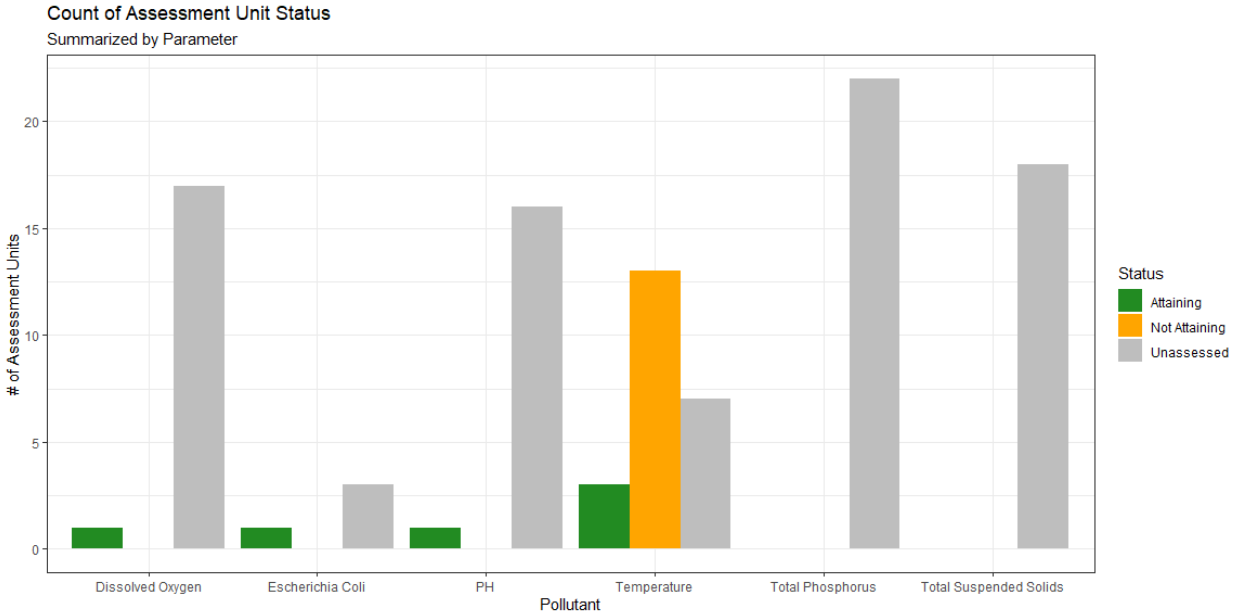

Figure 336: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the South Santiam Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 493 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the South Santiam Subbasin for the 2016 – 2019 status period.

Table 493: The number of assessment units in each status category by parameter for the 2016–2019 status period within the South Santiam Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	0	8
Stream	*Escherichia coli*	1	0	2
Stream	PH	1	0	8
Stream	Temperature	3	12	5
Stream	Total Phosphorus	0	0	12
Stream	Total Suspended Solids	0	0	10

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Watershed Unit	Dissolved Oxygen	0	0	9
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	8
Watershed Unit	Temperature	0	1	2
Watershed Unit	Total Phosphorus	0	0	10
Watershed Unit	Total Suspended Solids	0	0	8

There are 83 stations within the South Santiam Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 494 and Figure 337 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 494: Summary of the 2016–2019 status at monitoring stations within the South Santiam Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	0	26
Escherichia coli	1	0	12
PH	1	0	24
Temperature	3	21	17
Total Phosphorus	0	0	35
Total Suspended Solids	0	0	30

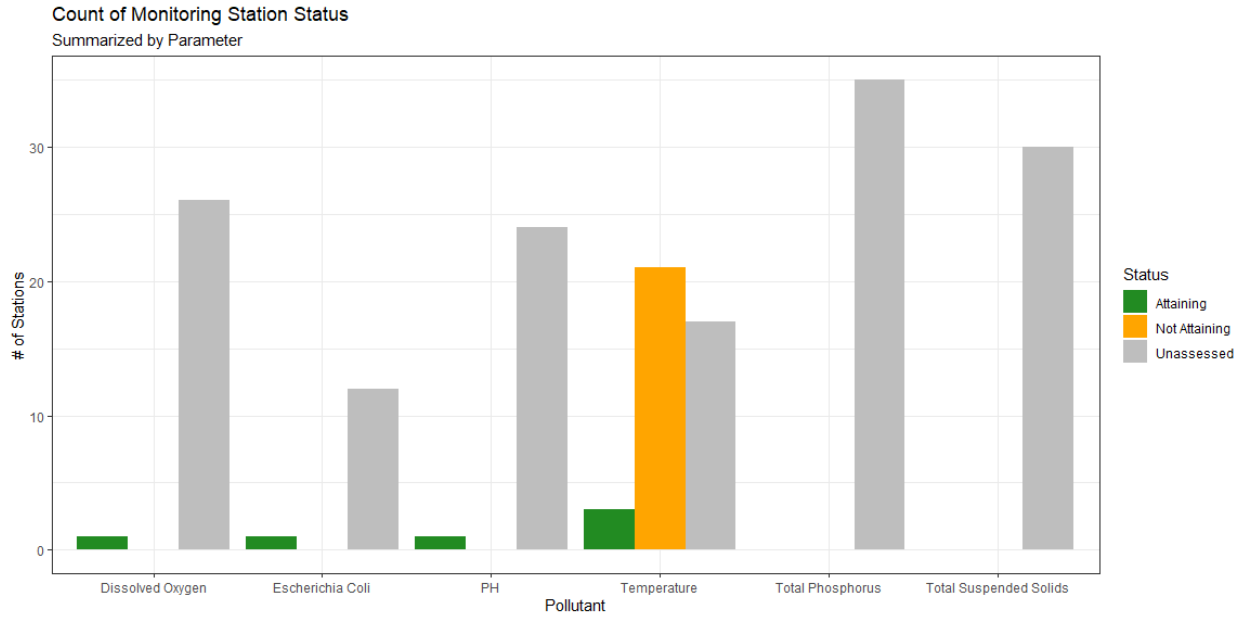

Figure 337: The number of stations in each status category by parameter for the 2016–2019 status period within the South Santiam Subbasin.

4.22.5.9.3 Trend

A summary of the trends within parameters is shown in Table 495. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 495: Subbasin Summary of trend results at stations across the South Santiam.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	0	26
Escherichia coli	0	0	0	1	12
PH	0	0	1	0	24
Temperature	0	9	1	1	30
Total Phosphorus	0	0	1	0	34
Total Suspended Solids	0	0	0	1	29

4.22.5.10 Mckenzie Subbasin

4.22.5.10.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.22.5.10.2 Status

There are 59 assessment units within the Mckenzie Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 496 and Figure 338 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 496: Summary of the 2016–2019 assessment unit status within the Mckenzie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	2	1	22
Escherichia coli	3	0	3
PH	4	0	24
Temperature	9	12	30
Total Phosphorus	0	0	23
Total Suspended Solids	0	0	23

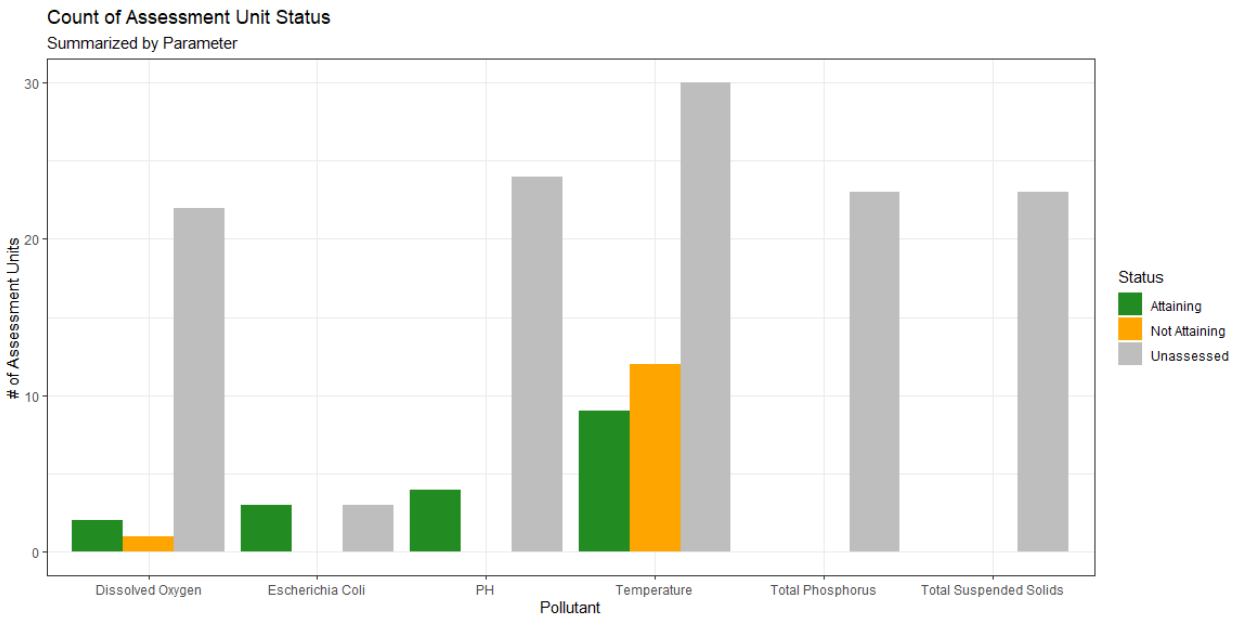

Figure 338: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Mckenzie Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 497 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Mckenzie Subbasin for the 2016 – 2019 status period.

Table 497: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Mckenzie Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Temperature	0	0	3
Stream	Dissolved Oxygen	2	1	12
Stream	*Escherichia coli*	3	0	2
Stream	PH	4	0	15
Stream	Temperature	6	8	13
Stream	Total Phosphorus	0	0	15
Stream	Total Suspended Solids	0	0	15
Watershed Unit	Dissolved Oxygen	0	0	10
Watershed Unit	*Escherichia coli*	0	0	1
Watershed Unit	PH	0	0	9
Watershed Unit	Temperature	3	4	14
Watershed Unit	Total Phosphorus	0	0	8
Watershed Unit	Total Suspended Solids	0	0	8

There are 130 stations within the Mckenzie Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for

a station's unassessed status can be found in **Appendix U**. Table 498 and Figure 339 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 498: Summary of the 2016–2019 status at monitoring stations within the Mckenzie Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	4	1	30
Escherichia coli	4	0	4
PH	5	0	38
Temperature	14	18	67
Total Phosphorus	0	0	29
Total Suspended Solids	0	0	28

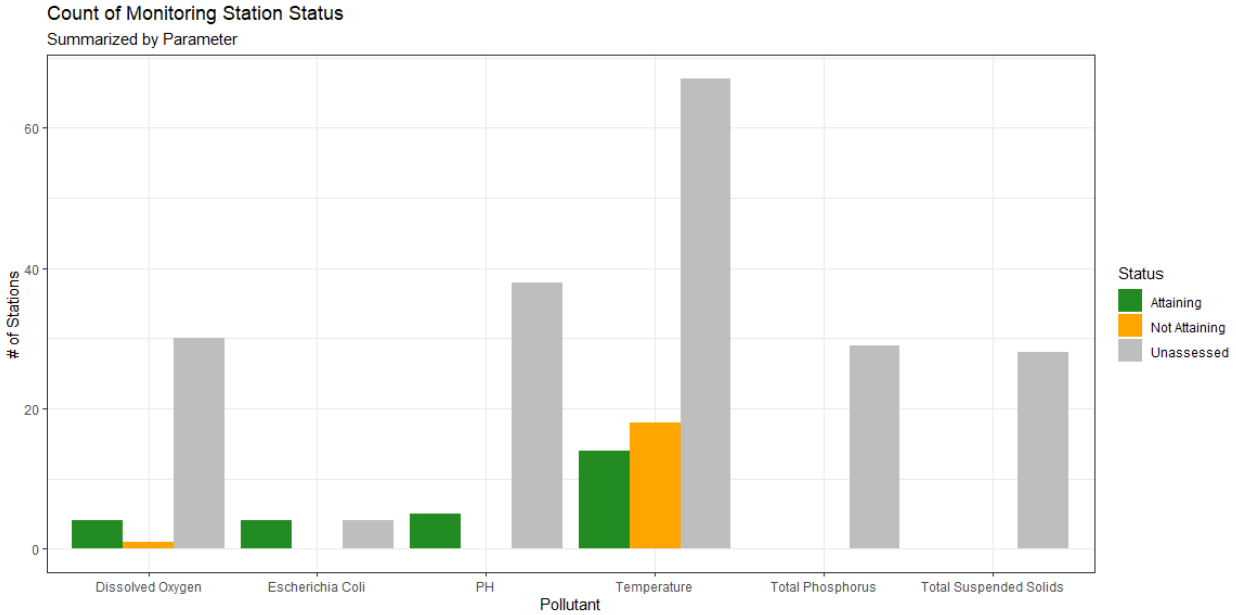

Figure 339: The number of stations in each status category by parameter for the 2016–2019 status period within the Mckenzie Subbasin.

4.22.5.10.3 Trend

A summary of the trends within parameters is shown in Table 499. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 499: Subbasin Summary of trend results at stations across the Mckenzie.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	3	0	0	1	31
Escherichia coli	0	1	0	3	4
PH	0	1	2	2	38
Temperature	2	3	0	1	93
Total Phosphorus	0	0	2	2	25

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Total Suspended Solids	0	0	1	3	24

4.22.5.11 Coast Fork Willamette Subbasin

4.22.5.11.1 Water Quality Limited Assessment Units

Table 500: Number of water quality limited assessment units in the Coast Fork Willamette Subbasin for the parameters assessed in this report. Listed assessment units are summarized from the 2018/2020 Integrated Report submitted for EPA approval.

Pollutant	Number of Water Quality Limited Assessment Units
Total Phosphorus, mixed forms	1

4.22.5.11.2 Status

There are 31 assessment units within the Coast Fork Willamette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 501 and Figure 340 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 501: Summary of the 2016–2019 assessment unit status within the Coast Fork Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	1	22
Escherichia coli	3	0	7
PH	2	0	21
Temperature	2	13	4
Total Phosphorus	0	0	20
Total Suspended Solids	0	0	23

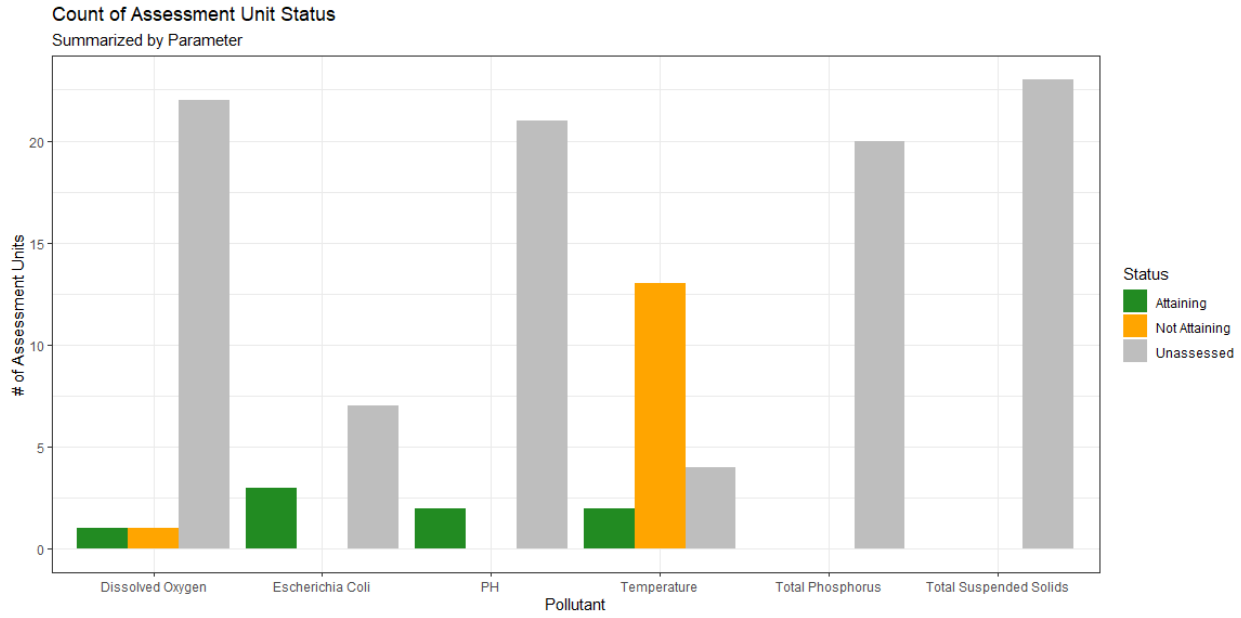

Figure 340: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Coast Fork Willamette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 502 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Coast Fork Willamette Subbasin for the 2016 – 2019 status period.

Table 502: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Coast Fork Willamette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Dissolved Oxygen	1	1	11
Stream	*Escherichia coli*	2	0	4
Stream	PH	2	0	11
Stream	Temperature	2	10	3
Stream	Total Phosphorus	0	0	11
Stream	Total Suspended Solids	0	0	13
Watershed Unit	Dissolved Oxygen	0	0	11
Watershed Unit	*Escherichia coli*	1	0	3
Watershed Unit	PH	0	0	10
Watershed Unit	Temperature	0	3	1
Watershed Unit	Total Phosphorus	0	0	9
Watershed Unit	Total Suspended Solids	0	0	10

There are 81 stations within the Coast Fork Willamette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station’s unassessed status can be found in **Appendix U**. Table 503 and Figure 341 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 503: Summary of the 2016–2019 status at monitoring stations within the Coast Fork Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	3	0	39
Escherichia coli	4	0	16
PH	3	0	31
Temperature	3	21	16
Total Phosphorus	0	0	31
Total Suspended Solids	0	0	41

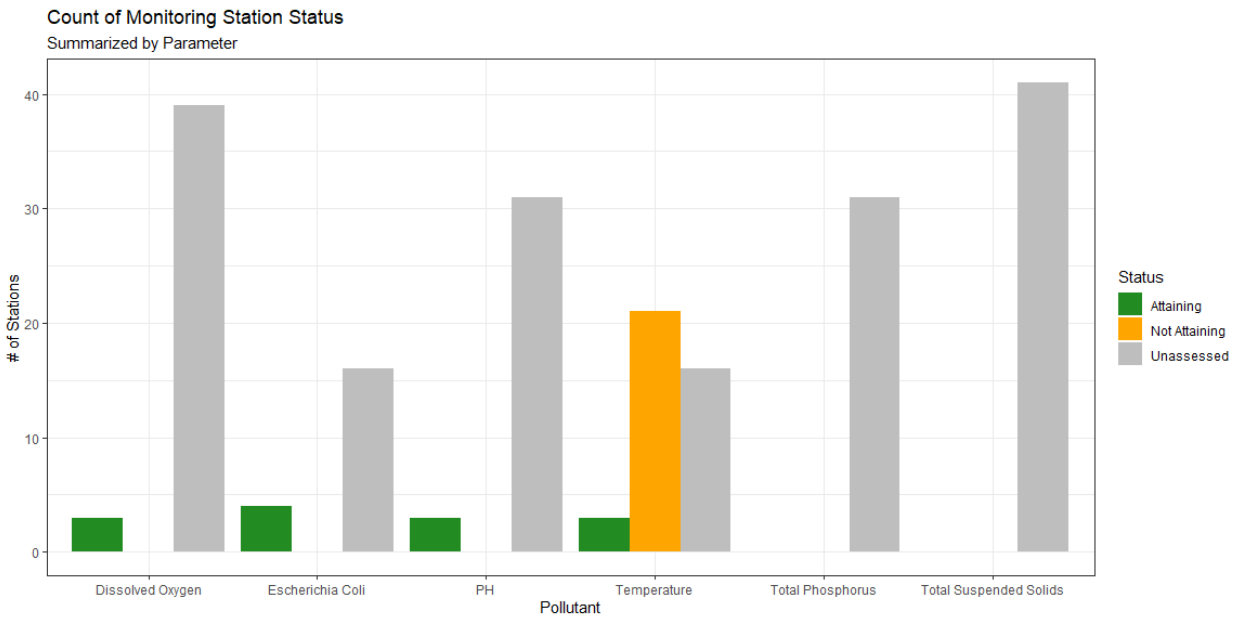

Figure 341: The number of stations in each status category by parameter for the 2016–2019 status period within the Coast Fork Willamette Subbasin.

4.22.5.11.3 Trend

A summary of the trends within parameters is shown in Table 504. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 504: Subbasin Summary of trend results at stations across the Coast Fork Willamette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	2	0	0	0	40
Escherichia coli	0	0	0	2	18
PH	0	1	0	1	32
Temperature	0	12	0	0	28
Total Phosphorus	0	0	1	0	30
Total Suspended Solids	0	1	0	1	39

4.22.5.12 Middle Fork Willamette Subbasin

4.22.5.12.1 Water Quality Limited Assessment Units

There are no water quality limited Category 4A or Category 5 assessment units in this subbasin.

4.22.5.12.2 Status

There are 61 assessment units within the Middle Fork Willamette Subbasin that had stations with available data to be included in this report. Some assessment units did not contain stations with targets or sufficient available data to determine attainment status and are listed as unassessed. Table 505 and Figure

342 summarizes the number of attaining, not attaining, and unassessed assessment units by parameter for the 2016 – 2019 status period.

Table 505: Summary of the 2016–2019 assessment unit status within the Middle Fork Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	2	34
Escherichia coli	2	0	14
PH	2	0	21
Temperature	2	26	22
Total Phosphorus	0	0	33
Total Suspended Solids	0	0	33

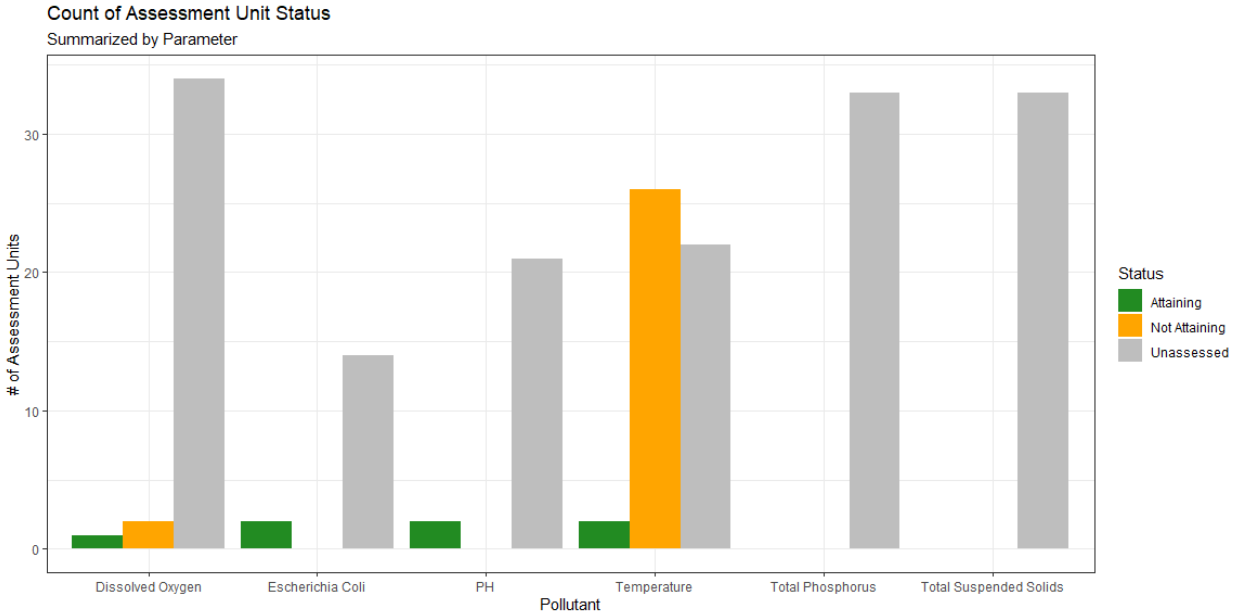

Figure 342: Summary plot showing the number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Fork Willamette Subbasin.

Oregon DEQ groups assessment units into five types: “Stream”, “Watershed Unit”, “Lake”, “Estuary or Bay”, and “Coastline”. Table 506 summarizes of the number of attaining, not attaining, and unassessed assessment units by parameter and assessment unit type within the Middle Fork Willamette Subbasin for the 2016 – 2019 status period.

Table 506: The number of assessment units in each status category by parameter for the 2016–2019 status period within the Middle Fork Willamette Subbasin.

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Lake	Dissolved Oxygen	0	0	2
Lake	PH	0	0	1
Lake	Temperature	0	0	2
Stream	Dissolved Oxygen	1	2	16
Stream	*Escherichia coli*	2	0	11
Stream	PH	2	0	8

AU Type	Pollutant	Attaining	Not Attaining	Unassessed
Stream	Temperature	1	16	12
Stream	Total Phosphorus	0	0	19
Stream	Total Suspended Solids	0	0	19
Watershed Unit	Dissolved Oxygen	0	0	16
Watershed Unit	*Escherichia coli*	0	0	3
Watershed Unit	PH	0	0	12
Watershed Unit	Temperature	1	10	8
Watershed Unit	Total Phosphorus	0	0	14
Watershed Unit	Total Suspended Solids	0	0	14

There are 161 stations within the Middle Fork Willamette Subbasin with available data included in this report. Stations without targets or without sufficient data to determine attainment are listed as unassessed. The reason for a station's unassessed status can be found in **Appendix U**. Table 507 and Figure 343 summarizes the number of attaining, not attaining, and unassessed stations by parameter for the 2016 – 2019 status period.

Table 507: Summary of the 2016–2019 status at monitoring stations within the Middle Fork Willamette Subbasin.

Pollutant	Attaining	Not Attaining	Unassessed
Dissolved Oxygen	1	2	53
Escherichia coli	1	0	18
PH	1	0	35
Temperature	2	43	67
Total Phosphorus	0	0	42
Total Suspended Solids	0	0	42

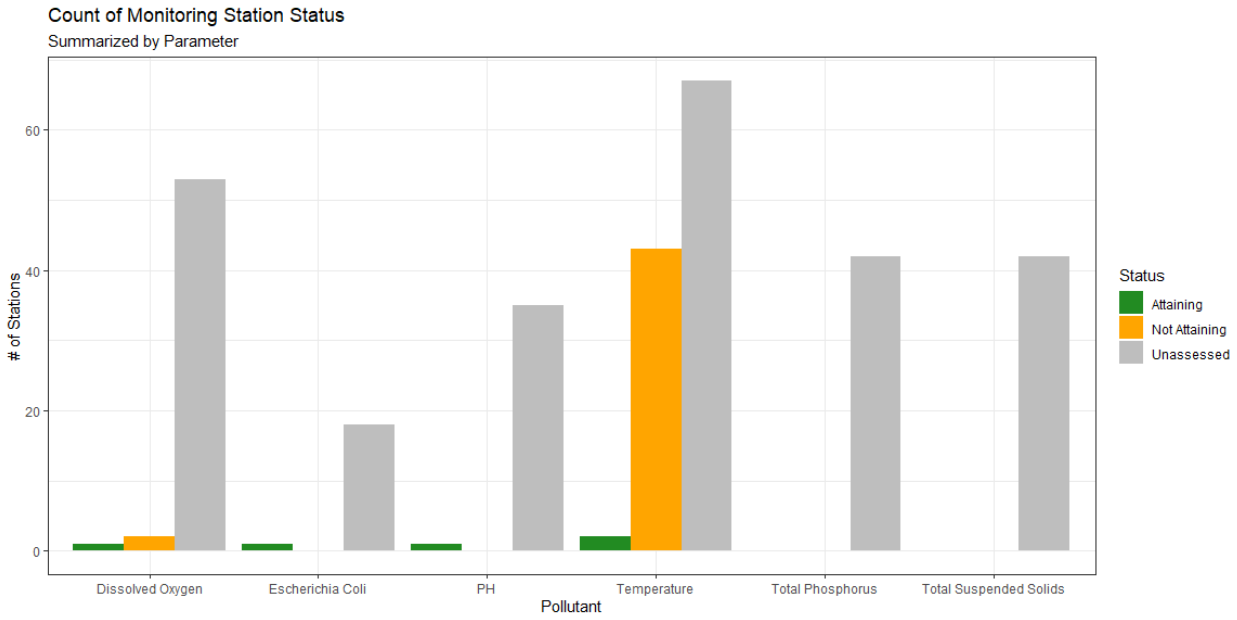

Figure 343: The number of stations in each status category by parameter for the 2016–2019 status period within the Middle Fork Willamette Subbasin.

4.22.5.12.3 Trend

A summary of the trends within parameters is shown in Table 508. Note that trend requires significantly more data than status and may result in many stations with insufficient data for trend analysis.

Table 508: Subbasin Summary of trend results at stations across the Middle Fork Willamette.

Pollutant	Improving	Degrading	Steady	No Significant Trend	Insufficient Data
Dissolved Oxygen	1	0	0	1	54
Escherichia coli	1	0	0	0	18
PH	0	0	0	2	34
Temperature	1	7	1	1	102
Total Phosphorus	0	0	0	1	41
Total Suspended Solids	0	0	1	0	41

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