## 1.0 Introduction

Section 303(d) of the Clean Water Act requires states to identify waterbodies that are not meeting water quality standards. Once identified, these waterbodies are placed on a list of "water quality limited" streams, called the 303(d) list. For each waterbody on the list, the state identifies the specific pollutants (or parameters) that are a problem for that waterbody. The state must then develop "Total Maximum Daily Loads" (TMDLs) for each of the identified parameters.

A TMDL defines the theoretical amount of pollution that can be present in the waterbody without causing impairments to the designated beneficial uses (see page 8 for a list of Bear Creek designated beneficial uses). The TMDL, or allowable pollutant load, is then allocated among the different sources of pollution including point discharges, nonpoint sources, and natural levels. The state then identifies the agencies responsible for meeting their allocated portion of the TMDL. These identified agencies are called "Designated Management Agencies" or DMAs and include the cities of Medford, Phoenix, Talent, Ashland, Jacksonville, Central Point and Jackson County. The DMAs must then develop and implement Water Quality Management Plans (WQMPs) that describe how they are going to meet the established TMDLs.

Once TMDLs are developed for specific streams and approved by EPA, streams are removed from the 303(d) list. *This does not mean that the streams now meet water quality standards, the removal merely denotes that the TMDL is completed.*

## 1.2 Bear Creek TMDLs

Bear Creek was first placed on the 303(d) list by the Oregon Department of Environmental Quality (ODEQ) in November 1987. TMDLs were developed for ammonia, biological oxygen demand, and total phosphorus. The Environmental Protection Agency accepted these TMDLs in December 1992. New TMDLs for temperature, and bacteria were developed by DEQ in 2007. See Table 1-2 for a complete list of the parameters of concern for Bear Creek and its tributaries.

**Table 1-2: Parameters of Concern for Bear Creek and Its Tributaries**

**303(d) Listed Streams**

| **Stream Segments** (All listed streams are from mouth to headwaters, unless otherwise stated) | **Parameters Covered in 2007 TMDL** | | | | | **Parameters Covered in 1992 TMDL** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bacteria | Temperature | Sediments | Flow | Habitat | DO | Nutrient [P] | pH | Toxics | Chlorophyll(a) | Periphyton |
| Ashland Creek (Mouth to Ashland City) | Y | | | | | | | | | | |
| Ashland Creek (Mouth to Ashland STP) | | | | | | | I | | I | | |
| Baldy Creek | | S | | | | | | | | | |
| Bear Creek (Mouth to Neil Creek) | Y | S | | * | * | Y | I | Y | I | S | Y |
| Butler Creek | FWS | S | | | | | | | | | |
| Carter Creek | | S | | | | | | | | | |
| Coleman Creek | Y | S | | | | | | | | | |
| Crooked Creek | Y | S | | | | | | | | | |
| Emigrant Creek (mouth to dam) | | S | | | | | | Y | | | |
| Emigrant Creek (dam to Green Mtn. Crk) | | S | | | | | | | | | |
| Griffin Creek | Y | S | | | | | | | | | |
| Hobart Creek | | S | | | | | | | | | |
| Jackson Creek | Y | S | | | | | | | | | |
| Larson Creek | Y | S | | | | | | | | | |
| Lazy Creek | Y | | | | | | | | | | |
| Lone Pine Creek | | S | | | | | | | | | |
| Meyer Creek | Y | S | | | | | | | | | |
| Neil Creek (mouth to I-5) | | S | | | | | | | | | |
| Payne Creek | Y | | | | | | | | | | |
| Reeder Reservoir | | | Y | | | | | | | | Y |
| Tyler Creek | | S | | | | | | | | | |
| Walker Creek | | S | | | | | | | | | |
| Wagner Crk (Horn Gulch to headwaters) | | S | | | | | | | | | |

**Y**=*year round* **S**=*summer June 1-September 30* **I** = *irrigation Season May1-November 30*
FWS = *fall/winter/spring October 1-May 31*
* Status change; sediment and habitat modification are considered a source of pollution but not a pollutant, and therefore are not parameters covered in the 2007 TMDL.

### 1.3 Existing Standards

Applicable standards for water quality in Oregon are outlined in Oregon Administrative Rules Section 340 (OAR 340), and are enforced by the Department of Environmental Quality (DEQ). Additional standards used for comparison of monitoring results are based on TMDL loadings, fish spawning and rearing needs, and other considerations. Tables 1-3 and 1-4 summarize the current standards.

**Table 1-3: Water Quality Standards Based on the 1992 TMDL Requirements**

| **Parameter Covered Under 1992 TMDL** | **Low Flow (summer season) May 1-Nov 30** | **High Flow (winter season) Dec 1-April 30** |
|---|---|---|
| Ammonia as Nitrogen | 0.25 mg/l | 1.0 mg/l |
| Biological Oxygen Demand | 3.0 mg/l | 2.5 mg/l |
| Dissolved Oxygen | 8.0 mg/l or 90% saturated[3] | 11 mg/l or 90% saturated[3] |
| Total Phosphorus | 0.08 mg/l | - |

**Table 1-4: Water Quality Standards Based on the 2007 TMDL Requirements**

| **Parameter Covered under 2007 TMDL** | **Low Flow (summer season) May1-Nov 30** | **High Flow (winter Season) Dec 1-April 30** |
|---|---|---|
| Fecal Coliform [4]<br><br>E. coli | 200 cfu[1] (median value)<br>10%samples > 400 cfus<br>126 E. coli/100 ml average<br>406 E. coli/100 ml absolute<br>June 1- Sept. 30 | 200 cfu[1] (median value)<br>Same values<br>Oct. 1 - May 31 |
| Temperature* | 64º F[2] | |
| Sedimentation | Narrative Standard | Narrative Standard |
| Habitat Modification | No numerical standard | No numerical standard |
| Flow Modification | No numerical standard | No numerical standard |

[1.] CFU = colony forming unit (Current Standard is for E. coli, 126 CFU/100 ml)

[2.] 7 day consecutive average high temperature. Temperature standard for *salmonid fish rearing* is from June1 - September 30
[3.] Dissolved Oxygen Standard, April 1 - September 30 (summer), October 1 - May 31 (winter)
[4.] Fecal coliform standard was changed to E. coli in 1996.
* Currently the temperature standard is 55.4 F for streams identified as having salmon and steelhead spawning use (October 15- May 15) and 64.4 F for streams identified as having salmon and trout rearing and migration (May 16- October 14).

Additional parameters not covered by this table include turbidity, TSS, and pH. According to Oregon Administrative Rules (OAR) 340-041-0765, the following standards apply:

- No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity.
- pH values ranging from 6.5 to 9.0.

## 1.4 Bear Creek Water Quality

Temperature, bacteria and phosphorous levels are a problem for Bear Creek watershed streams particularly in the summer months. This trend is consistent with the historic water quality data collected by RVCOG during the summer months. Water quality generally decreases due to a variety of influences including climate (low flows and warmer temperatures), domestic usage (lawn watering, fertilization, and pet waste), recreational useage, agricultural influences (canals), leaking septic systems, wildlife and feral animals, construction and other factors. During the winter season temperature and phosphorous levels continue to be a problem. Low water quality during the winter may be attributed to winter runoff, leaking septic systems, wildlife and feral animals, construction and other factors.

Despite Bear Creek water quality index rating of “very poor”, overall water quality is showing a significant increase over the past ten years according to DEQ. Of the 136 DEQ ambient water quality monitoring sites, Bear Creek showed the most significant increase in water quality for the water years of 1996 to 2006 (DEQ, 2006).

### 1.5 RVCOG Monitoring Locations

## Routine Run Collection Sites

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|---|
| R1: Headwaters of Bear Creek at Dead Indian Memorial below confluence of Emigrant and Walker Creeks. |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

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|---|
| R2: Ashland Creek at Lithia Park |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R3: Bear Creek at South Valley View Road, Ashland |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R4: Bear Creek at West Valley View Road by Lynn Newbry Park, Talent |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R5: Bear Creek at R.V. Park, Phoenix |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

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|---|
| R6: Lazy Creek at Highland Road, Medford |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R7: Bear Creek at Ninth Street, Medford |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R8: Bear Creek at Pine Street, Central Point |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R9: Jackson Creek at Scenic Road, Central Point |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E.coli, pH |
| Frequency of Sampling: Once per month, year- round |

| |
|---|
| R10: Baby Bear Creek at Bear Creek Park, Medford |
| Parameters tested: Bacteria (E.coli) |
| Frequency of Sampling: Once per month, year- round |

## TMDL Run Collection Sites

| |
|---|
| T2: Neil Creek on Dead Indian Memorial Road, Ashland |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T3: Ashland Creek below Waste Water Treatment Plant, Ashland |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate, ammonia |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T4: TID canal at Eagle Mill Road, Ashland |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly |

| |
|---|
| T5: Butler Creek at Eagle Mill Road, Ashland |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T6: Wagner Creek at Hwy.99 |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T7: MID Diversion at Suncrest Road |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly |

| |
|---|
| T8: Payne Creek at Rear Tree, Phoenix |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T9: Coleman Creek, Phoenix |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T10: Larson Creek at Ellendale, Medford |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| **T11: Bear Creek above Jackson St. Diversion** |
| * Site discontinued in November, 2001. |

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|---|
| **T12: Bear Creek below Jackson St. Diversion** |
| * Site discontinued in November 2001. |

| |
|---|
| T13: RRVID canal at Biddle Road, Medford |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly |

| |
|---|
| T14: Lone Pine Creek at Table Rock Road, Medford |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

| |
|---|
| T15: Griffin Creek at I-5 |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

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|---|
| T16: Jackson Creek at Blackwell Road |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

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|---|
| T17: Bear Creek at Kirtland Road |
| Parameters tested: Temperature, turbidity, conductivity, Total Suspended Solids, E. coli, pH, Dissolved Oxygen, total phosphate |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |
| Ashland Creek |
| Parameters tested: ammonia |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

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|---|
| Bear Creek at Valley View |
| Parameters tested: ammonia |
| Frequency of Sampling: April-Oct twice monthly, November-March monthly |

**Table1-1: Beneficial Uses in Bear Creek.**

There are 13 *Beneficial Uses* assigned to the Bear Creek mainstem in OAR 340-041-362. Those marked with the check are identified by ODEQ as being impaired.

| ***Beneficial Use*** | **Impaired** | **Beneficial Use** | **Impaired** |
|---|---|---|---|
| Industrial water Supply | | Livestock watering | |
| Resident fish and aquatic life | ✓ | Wildlife and hunting | ✓ |
| Fishing | ✓ | Water contact recreation | ✓ |
| Anadromous fish passage | | Salmonid fish rearing | ✓ |
| Irrigation | ✓ | Salmonid fish spawning | ✓ |
| Aesthetic quality | ✓ | Municipal sources | ✓ |
| Boating | | | |