

Draft Total Maximum Daily Loads for the Middle Columbia-Hood (Miles Creeks) Subbasin

Water Quality Management Plan

Temperature

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1 Introduction

DEQ provides this Water Quality Management Plan to guide implementation of the temperature Total Maximum Daily Load developed for the Middle Columbia-Hood (Miles Creeks) Subbasin (Figure 1, TMDL Figure 2-1). A WQMP is an element of a TMDL, as described by Oregon Administrative Rule 340-042-0040(4)(l), to guide implementation of management strategies to attain and maintain water quality standards. Each WQMP will guide the preparation of detailed TMDL implementation plans prepared by responsible persons including Designated Management Agencies.

This Middle Columbia-Hood (Miles Creeks) temperature WQMP will be proposed for adoption by Oregon's Environmental Quality Commission, by reference, into rule as OAR 340-042-0090(?)(b). This WQMP is intended to provide comprehensive information for implementation of the temperature TMDL, and will be amended, as needed, upon issuance of any future TMDLs within the Middle Columbia-Hood (Miles Creeks) Subbasin, from here on referred to as the Miles Creeks Subbasin. Any subsequently amended or renumbered rules cited in this document are intended to apply.

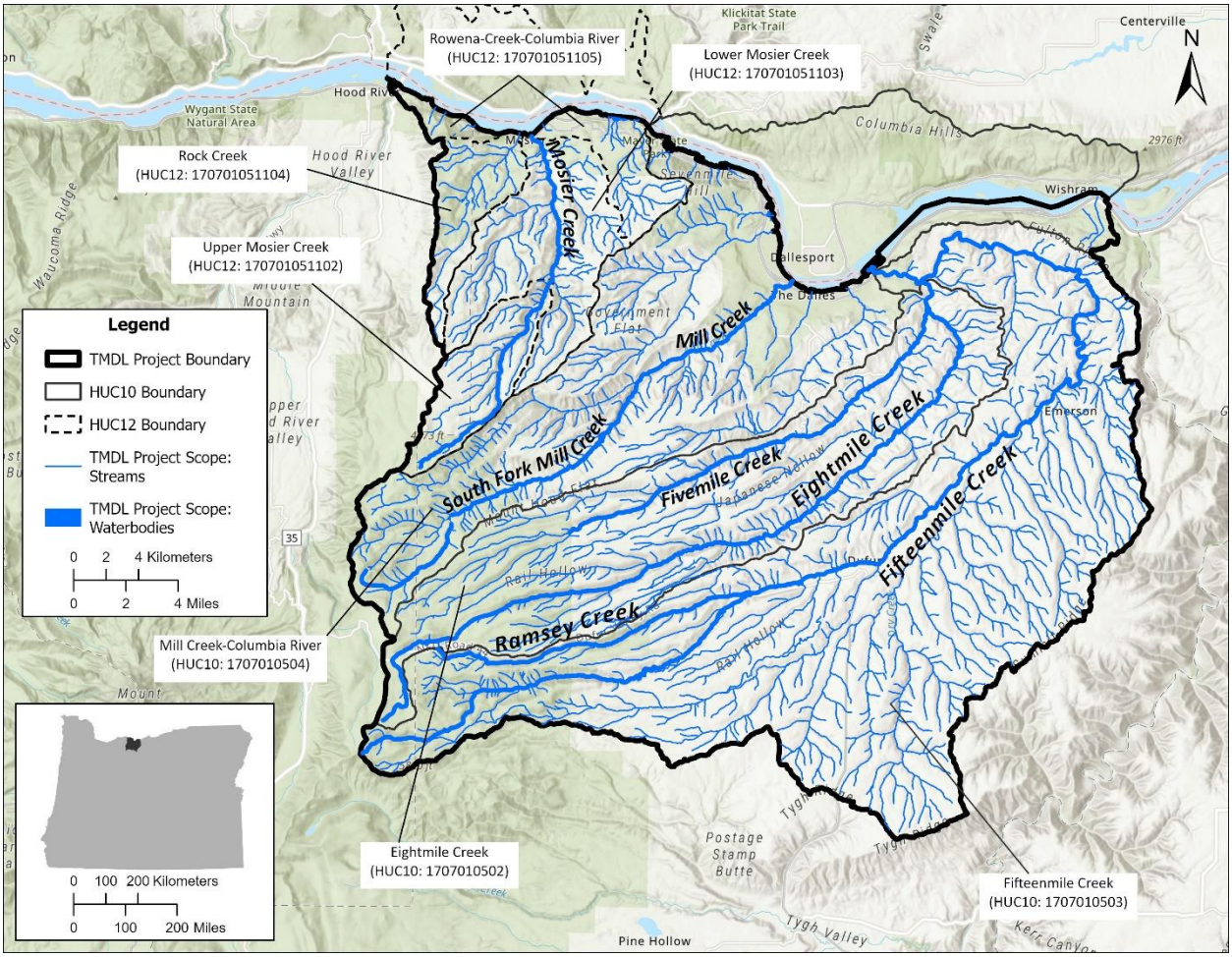


Figure 1: Map of Miles Creeks Subbasin.
The Miles Creeks Subbasin encompasses a portion of the Middle Columbia-Hood HUC 8 watershed. EPA previously approved the Middle Columbia-Hood (Miles Creeks) Subbasin temperature TMDL. However, in 2013, EPA disapproved the Natural Conditions Criterion contained in Oregon's water quality standard for temperature due to the 2012 U.S. District Court decision for Northwest Environmental Advocates v. EPA. On October 4, 2019, the U.S. District Court issued a judgment in the lawsuit requiring EPA and DEQ to reissue 15 Oregon temperature TMDLs that were based on the Natural Conditions Criterion, including the Miles Creeks Subbasin.

This TMDL replaces the 2008 Middle Columbia-Hood (Miles Creeks) Subbasin Temperature TMDL and WQMP (DEQ, 2008)

This TMDL applies to all waters of the state in the watersheds listed in Table 1. The watersheds and associated water bodies listed in Table 1 will hereafter be referred to as the "Miles Creeks Subbasin."

Table 1: Waterbodies included in Miles Creeks Subbasin TMDL.

Watershed	Waterbodies included
Eightmile Creek Watershed (1707010502)	All waters of the state.
Fifteenmile Creek Watershed (1707010503)	All waters of the state.
Mill Creek-Columbia River Watershed (1707010504)	All waters of the state.
Upper Mosier Creek Subwatershed (170701051102)	All waters of the state.
Lower Mosier Creek Subwatershed (170701051103)	All waters of the state.
Rock Creek Subwatershed (170701051104)	All waters of the state.
Rowena Creek-Columbia River Subwatershed (170701051105)	All waters of the state.

Section 2 of the Miles Creeks Subbasin Temperature TMDL Rule contains a listing of all Category 5 temperature impairments from the 2022 Integrated Report (DEQ, 2022a). The TMDL contains a complete listing of all the Assessment Units included in this rulemaking (DEQ, 2026a).

1.1 Condition assessment and problem description

The first element of the WQMP according to OAR 340-042-0040(4)(l)(A) is an assessment of water quality conditions in the Miles Creeks Subbasin with a problem description. There are assessment units in the Miles Creeks Subbasin listed as impaired (category 5 or 4A) for temperature in Oregon's 2022 Integrated Report, which was approved by the U.S. Environmental Protection Agency on September 1, 2022.

DEQ must develop TMDLs for pollutants causing temperature impairments of waters within the Miles Creeks Subbasin, as required by Section 303(d) of the federal Clean Water Act. These pollutants are solar radiation and heat from various sources and conditions that cause water temperatures to exceed criteria established to support aquatic life beneficial uses.

1.2 Goals and objectives

OAR 340-042-0040(4)(l)(B) requires identification of the goals and objectives of the WQMP. The goal of this WQMP is to provide an implementation framework for this Miles Creeks Subbasin Temperature TMDL. Implementing the TMDL is designed to achieve and maintain the temperature water quality criteria, including narrative criteria, and meet antidegradation requirements in streams within the Miles Creeks Subbasin. The primary objectives of this WQMP are to describe responsibilities for implementing TMDL management strategies and actions necessary to reduce excess pollutant loads to meet all TMDL allocations, and to provide a strategy to evaluate progress towards attaining water quality standards throughout the Miles Creeks Subbasin.

2 Proposed management strategies

The following section presents proposed management strategies, by pollutant source and activity, that are designed to meet the load and wasteload allocations required by the Miles Creeks Subbasin Temperature TMDL, as required by OAR 340-042-0040(4)(l)(C).

OAR 340-042-0030(6) defines management strategies as "measures to control the addition of pollutants to waters of the state and includes application of pollutant control practices, technologies, processes, siting criteria, operating methods, best management practices or other alternatives."

2.1 Nonpoint source management strategies

Waterbodies in the Miles Creeks Subbasin naturally warm during summer due to increased solar radiation and higher air temperatures. Natural sources, such as substrate and channel morphology conditions, streambank and channel elevations, near-stream vegetation, groundwater, hyporheic flow, tributary inflows, precipitation, cloudiness, air temperature, and relative humidity contribute to thermal loading in streams. Natural sources and anthropogenic sources not considered in this TMDL are considered as background sources. Background

sources may include anthropogenic sources of a pollutant that DEQ or another Oregon state agency does not have the authority to regulate, such as pollutants emanating from another state, tribal lands, or sources otherwise beyond the jurisdiction of the state. These include sources like climate change. Nonpoint sources are all remaining sources that are not considered to background sources or point sources in this TMDL. Nonpoint sources include human-caused alterations to the natural sources listed above. It is essential to manage nonpoint sources to reduce temperature impacts and protect water quality.

Section 7.2 of the TMDL identifies nonpoint sources contributing to temperature impairments, including riparian vegetation modification, flow modification, floodplain and channel modification, and reservoir management. To address these issues, the following subsections outline DEQ's proposed priority management strategies by source. This list is not comprehensive or mandatory, and entities are encouraged to propose additional strategies.

2.1.1 Streamside vegetation management strategies

DEQ's water quality analysis and modeling show that streamside vegetation planting and management are strategies necessary to meet water quality standards in the temperature impaired sections of streams in the Miles Creeks Subbasin. Streamside overstory vegetation reduces solar radiation loads to streams by providing shade. Protecting and restoring streamside overstory vegetation is essential to achieving the TMDL surrogate measure of effective shade. More information about the physical and ecological factors affecting effective shade can be found in [Section XX of the TMDL Technical Support Document.]

The primary streamside vegetation planting and management strategies are summarized as follows:

1. **Vegetation planting and establishment**
   This strategy restores locations that have little or no shade producing overstory vegetation. These locations are important for streamside tree and shrub planting projects. These sites may currently be dominated by invasive species.

2. **Vegetation protection (enhancement, maintenance and growth)**
   This strategy addresses streamside areas that have existing vegetation that needs to be protected from removal to maintain current shade levels. In some cases, protection is needed because effective shade can only be achieved with additional growth. Protecting and maintaining existing vegetation ensures that it can grow and mature, enhances vegetation success and survival, and provides for optimal ecological conditions.

3. **Vegetation thinning and management**
   This strategy addresses streamside areas that might need vegetation density reduction to achieve optimal benefits of shade in the long term. Current site conditions at some riparian areas have been shown to be overly dense with trees or dominated by invasive species that inhibit a healthy streamside community, and thinning may be an option to promote development of a healthy mature streamside forest. However, it must be ensured that riparian thinning and management actions will result in limited (i.e., quantity, duration, and spatial extent) stream shade loss.

[TSD Appendix XX] presents material describing potential shade and temperature impacts resulting from riparian buffer management and actions to limit these effects.

2.1.2 Flow management strategies

DEQ's modeling and evaluation of water quality data and research (DEQ, 2026a) found that water withdrawals decrease the capacity of streams to assimilate pollutant loads. Because temperature is a flow-related parameter, water withdrawals can result in warmer stream temperatures. In waterbodies where temperatures are already known to exceed standards, further withdrawals from the stream will reduce the stream's assimilative capacity and cause greater fluctuation in daytime and nighttime stream temperatures.

Water conservation is a best management practice that directly links the relationship between water quantity and water quality. Water conservation is a useful practice for addressing flow-related parameters of concern, such as temperature. Forgoing withdrawals when stream temperatures are high is one way to use water conservation to protect stream temperatures.

2.1.3 Channel management strategies

Channel modifications, such as widening and straightening, increase solar exposure and raise stream temperatures. Wide, shallow streams with high width-to-depth ratios absorb more solar radiation, exacerbating thermal loading (Larson and Larson, 1996). Uncontrolled livestock access can also contribute to bank erosion, making streams shallower and hotter. Additionally, urban development and road construction often lead to channelization, which disconnects streams from their floodplains and disrupts natural processes that help regulate temperature, such as slowing floodwaters and recharging groundwater (EPA, 2017).

The following strategies can help manage channel modifications and support temperature improvements:

1. **Restore natural channel features**: Implement restoration activities that reintroduce natural channel complexity, reduce channel width, and improve habitat for aquatic species. As riparian vegetation matures, channel width should naturally decrease, improving shading and cooling effects.
2. **Stabilize streambanks and reconnect floodplains**: Use bioengineering techniques to stabilize streambanks, prevent erosion, and enhance floodplain connectivity. Reconnecting floodplains improves groundwater recharge, supports riparian wetlands, and restores natural processes that regulate temperature.
3. **Reduce sediment runoff and erosion**: Implement erosion control measures, such as reducing upland and channel erosion, to prevent sediment from reaching streams. Reducing sediment runoff helps maintain channel depth and minimizes the warming effects of shallow, sediment-laden water.
4. **Promote hyporheic exchange and groundwater recharge**: Increase hyporheic exchange by restoring floodplains and groundwater-surface water interactions. Enhancing groundwater recharge improves temperature stability by buffering against extreme temperature fluctuations.
5. **Manage livestock access**: Control livestock access to streams to prevent bank erosion and habitat degradation. Encourage riparian fencing and controlled watering points to protect streambanks and improve water quality.

6. **Encourage ecosystem-based solutions**: Implement nature-based solutions, such as beaver reintroduction and wetland restoration, to support natural hydrology and temperature regulation.

2.1.4 Reservoir management strategies

Dams of all sizes can increase stream temperatures by increasing the exposure of water to solar radiation. Several other factors influence the impact of reservoirs and dams on stream temperature including dam and stream characteristics, location, and density of dams in a watershed.

There are 6 reservoirs located within the Miles Creeks Subbasin temperature TMDL project area that are identified as potential nonpoint sources (see Appendix D). This list consists of data from the U.S. Army Corps of Engineers (USACE) National Inventory of Dams (NID) database and Oregon Water Resources Department's (OWRD), Dam Inventory database. These reservoirs are primarily used for water supply, irrigation, recreation, and livestock operations. Reservoirs excluded from Appendix D include reservoirs that discharge directly into the Columbia River (not via a tributary to the Columbia River), wastewater treatment lagoons that are not connected to waters of the state, and reservoirs that were not listed in either database mentioned above.

Strategies for mitigating the impact of dams and reservoirs include:

- Decrease residence time to reduce heating.
- Increase shading to reduce heating.
- Increase depth to increase the size of the cool pool of water at depth.
- Install an inflow buffer to trap sediment to retain reservoir depth and the associated cool pool of water at depth.
- Blend top and bottom releases to manage temperature of releases.
- Study seasonal and diurnal temperature patterns and minimize reservoir releases when temperature differences between the reservoir and stream are greatest.
- To reduce the impact of storage withdrawals on stream temperatures in a bypass reach, limit diversion volume and timing.

2.1.5 Monitoring strategies

Monitoring and assessment can track status of implementation actions and identify locations where nonpoint source management strategies need to be implemented.

Performance monitoring can track progress towards implementation goals over time. Performance monitoring is accomplished by setting milestones and completion dates and tracking status.

Effectiveness monitoring can track progress towards filling shade gaps. Effectiveness monitoring is discussed further in Sections 5.3.1.1, 5.3.1.2.

Water quality monitoring can track progress towards meeting water quality standards for stream temperature. Water quality monitoring is discussed further in Section 6.3.

2.1.6 Information sharing strategies

Regular knowledge sharing between entities in the watershed can increase access to funding, technical resources, and partnerships that result in more efficient and effective implementation of nonpoint source strategies. Knowledge sharing can include information about implementation practices, obstacles to successful implementation, and strategies used to overcome obstacles, resources, opportunities for partnership and collaboration, etc.

2.1.7 Outreach and education strategies

Outreach and education by entities to their constituents increases the acceptance and support for the implementation of nonpoint source strategies and can increase implementation opportunities on private lands. Outreach and education can include content on the entity's website, tabling at local events, presentations at schools or public forums, attendance at local public meetings related to water resources (e.g. watershed council or SWCD meetings), information in regular mailings, updates from staff to executives, boards, and elected officials on the TMDL and implementation progress.

2.1.8 Priority management strategies

Table 2 includes proven strategies (and practices within the strategies) summarized by pollutant source. These strategies and practices are adapted from published sources. DEQ used the categories and terminology from Oregon Watershed Enhancement Board's Oregon Aquatic Habitat Restoration and Enhancement Guide and Oregon Watershed Restoration Inventory Online List of Treatments. Additional strategies included in Table 2 are supported by Oregon Department of Agriculture, the U.S. Department of Agriculture Natural Resources Conservation Service, Oregon State University Extension Service, Oregon Plan for Salmon and Watersheds, and other available published sources. DEQ identified the strategies in Table 2 as appropriate for the conditions and sources within the subbasins. These are considered priority strategies and practices that should receive special focus during TMDL implementation plan development.

DEQ identifies implementation responsibilities in Section 5.1 and expects the identified entities to include strategies and practices listed in **Error! Not a valid bookmark self-reference.** that are applicable to their jurisdiction in their implementation plans. Implementation plans must include specifics on where and when priority and other strategies and practices will be applied. Implementation plans must also include measurable objectives and milestones to document efficacy of each strategy and practice. See Section 5.3.1.1 and 5.3.1.2 for methods for determining where land conditions require restoration, protection, and enhancement.

Table 2: Priority temperature management strategies by source.

Source or activity	Management strategies
Insufficient riparian vegetation height, density or width	The primary goal is to increase site effective shade (combination of vegetation height, buffer width and canopy density) through streamside vegetation management strategies using regulatory programs and voluntary activities, including incentive-based projects. Streamside tree planting (conifer and hardwood); streamside vegetation planting (shrub or herbaceous cover); streamside vegetation management (invasive thinning, removal or other treatment); voluntary streamside tree retention; streamside invasive plant control; streamside

	fencing or other livestock streamside exclusion methods; identify and protect cold water refuges Maintain plants until free to grow; monitor survival rates. Develop, update and/or enforce streamside code/ordinance to ensure streamside native vegetation and intact bank conditions are protected or restored following site development; purchase, acquire, designate conservation easements along streamside areas.
Water withdrawals, flow alteration	Pursue instream water right transfers and leases; water right application reviews; irrigation conservation and management; repair or replace leaking pipes and infrastructure; provide incentives for water conservation.
Channel modification and hydromodification	Conduct whole channel restorations (e.g., enhance channel, wetlands, and floodplain interactions, reduce width-to-depth channel ratios, bank stabilization, reduce upland erosion, large wood placement, create/connect side channels, etc.); streamside road re-construction/obliteration activities; streamside fencing or other livestock exclusion methods; protect and enhance cold water refuges; remove in-channel ponds or modify pond structures to reduce temperature increases downstream; and protect areas that don't require restoration actions.

2.2 Point source priority management strategies

Point sources may be assigned wasteload allocations and/or other requirements under the TMDL. These point sources are required to have National Pollutant Discharge Elimination System (NPDES) permits for any wastewater discharges. Under federal rules, effluent limits within NPDES permits are required to be consistent with the assumptions and requirements of any available wasteload allocation.

The primary way DEQ addresses numeric wasteload allocations is by including effluent limits in permits (though different mechanisms may be used if they are consistent with the TMDL). There are many ways to achieve compliance with these limits and requirements, which can be incorporated into NPDES permits during renewal or issuance. These include, but are not limited to, immediate compliance with the limits, the use of compliance schedules, water quality trading, and other pathways allowed under state and federal rules.

2.3 Water quality trading opportunities

DEQ encourages Miles Creeks Subbasin DMAs to develop water quality credit trading plans that meet the TMDL allocations for the Miles Creeks Subbasin. Water quality trading is a well-established feature of TMDL implementation in Oregon that is designed to achieve water quality goals more efficiently and with enhanced outcomes. Trading is allowed statewide so long as the requirements of OAR 340-039 are met. Trading is based on a more holistic understanding that pollutant sources are distributed throughout a watershed, and that eliminating these pollutant sources benefits the entire watershed. Trading programs allow facilities to meet their regulatory

obligations by exchanging environmentally equivalent (or greater) pollution reductions from sources elsewhere in a watershed. Trading in Oregon includes the use of green infrastructure, which has the additional benefits of enhancing the resilience of natural systems to the effects of climate change. Many trading plans can achieve the higher levels of heat load reduction at a lower cost. For more information, please refer to DEQ's web page on water quality credit trading.

3 Timelines for implementing strategies

OAR 340-042-0040(4)(l)(D) requires schedules for implementing management strategies. This WQMP establishes benchmarks and reporting expectations. Responsible persons, including DMAs, must include detailed timelines and milestones in their implementation plans. Timelines support accountability through annual reports and five-year reviews.

3.1 DEQ permit revisions

NPDES permits have five-year terms. DEQ incorporates any required TMDL wasteload allocations into NPDES permits when the permit is renewed. NPDES permittees with assigned wasteload allocations are available in the TMDL document (TMDL Rule, Section 9.1.2)

3.2 Management strategies implemented 2010- 2023 by responsible persons including DMAs

DEQ uses multiple sources to establish current conditions and track implementation progress in the Miles Creeks Subbasin project area. One of these sources is the Oregon Watershed Enhancement Board's Oregon Watershed Restoration Inventory which is a repository for watershed restoration activities. OWRI contains project level information from watershed councils, landowners and other groups who have implemented restoration projects to improve aquatic habitat and water quality conditions. Stream temperature projects in OWRI that have been implemented in the Miles Creeks Subbasin include riparian fencing, channel modification, voluntary riparian tree retention, and others. The OWRI database reflects 5.2 total miles of riparian area planted in the Miles Creeks Subbasin between 2010 and 2024. The database also reflects 2.32 miles of channel restoration through large wood placement, boulder placement, and other methods. The database also reflects 32 instream flow projects.

DEQ also utilized effective shade gap modelling to assess current conditions within the project area. Where DEQ completed modeling for this TMDL, effective shade targets were calculated at 50-meter node intervals (Eightmile Creek model area), 50-meter node intervals (Ramsey Creek model area), and 100-meter node intervals (Fifteenmile Creek model area). A mean effective shade was then calculated for DMAs where this modeling occurred, and a shade gap assessment was completed. The shade gap results for the modeled areas include shade

conditions that may have been impacted by streamside planting projects that were completed following the approval of the 2008 Miles Creeks TMDL.

3.3 Timeline for implementation of management strategies

Based on analyses (TSD REFERENCE), DEQ estimated timelines to attain excess pollutant load reductions. These are presented in Section 4.2 as the schedule for achieving appropriate incremental and measurable water quality targets. DEQ also estimated reasonable timelines for implementation of several priority management strategies specific to DMAs and RPs, shown in tables in subsections of Section 5.1. DEQ expects these entities to consider the timelines presented in Section 5.1 when establishing commitments for management strategies and actions in TMDL implementation plans.

As discussed in Section 6, DEQ evaluates completion of implementation schedules and measurable milestones during review of annual reports. DEQ periodically evaluates progress toward TMDL goals, typically in five-year increments, by evaluating all available monitoring data and other relevant information.

4 Attaining water quality standards

This chapter fulfills the elements in OAR 340-042-0040(4)(I)(E) and (F), which require a description of how implementing management strategies will result in attainment of water quality standards and the timelines for achieving those standards.

4.1 How management strategies support attainment of water quality standards

OAR 340-042-0040(4)(I)(E) requires an explanation of how implementing the management strategies will result in attainment of water quality standards.

Management strategies proposed in Section 2 reduce excess thermal loading from both point and nonpoint sources and support attainment of Oregon's temperature criteria. For nonpoint sources, the TMDL establishes effective shade as the primary surrogate target to evaluate whether load allocations are being met. The TMDL [REFERENCE] provides site-specific effective shade targets. Where site-specific targets are unavailable, the TMDL provides effective shade curves that describe the expected shade for a given stream width, orientation, and vegetation type.

Implementation plans must include strategies sufficient to meet load allocations and surrogate measure targets. While individual actions may not immediately change stream temperatures, cumulative increases in shade reduce solar loading over time. In addition to riparian shading, channel restoration and flow enhancement, can provide measurable temperature benefits.

Consistent with the TMDL, implementation success depends on the achievement of load allocations measured through meeting surrogate measure targets, not solely on measured in-stream temperatures. DEQ tracks progress through annual reports and monitoring data.

Modeled shade gap data (TMDL [Figure X]) reflect conditions from 1999 – 2002. They may not reflect more recent vegetation changes from wildfire, restoration, land use change, or policy shifts. Monitoring of streamside conditions and shade assessments are necessary to identify protection and restoration priorities, evaluate progress towards surrogate measure targets, and refine management strategies. These evaluations provide the technical foundation for implementation planning, including streamside evaluations and shade gap analysis (see [TMDL Section XX]). They also support adaptive updates to implementation plans, basin-wide tracking, and compliance evaluations through annual reports and five-year reviews.

This monitoring framework allows for locally tailored strategies. It also maintains accountability through measurable milestones, adaptive updates, and performance tracking. When actions align with the WQMP and approved implementation plans, responsible persons remain in compliance even if full attainment of numeric criteria by all sources takes decades.

4.2 Timelines for attaining temperature water quality standards

OAR 340-042-0040(4)(l)(F) requires an estimated timeline for attaining water quality standards through implementation of the TMDL, WQMP and associated TMDL implementation plans.

Restoring stream temperatures to meet Oregon's water quality standards is a long-term effort. Some localized improvements may occur within a few years but full attainment across the basin requires decades and sustained implementation across land uses and jurisdictions.

Effective shade surrogate measure targets are the primary measure of progress towards meeting load allocations. DEQ uses a benchmark of 10% cumulative improvement in effective shade every 10 years. At this pace, basin-wide targets are projected to be achieved by the mid-2100s. The benchmark is an estimate based on vegetation growth rates and assumes consistent implementation across the basin. Actual progress varies with site conditions, land use, restoration actions, and natural disturbances such as wildfire. Recovery rates vary by stream size, vegetation potential, disturbance history, and restoration opportunity. DEQ expects responsible persons, including DMAs, to consider these projections and interim targets when establishing implementation plan timelines.

This WQMP does not assign a fixed deadline to meet load allocations. Instead, it emphasizes consistent implementation of temperature control measures, incremental progress toward surrogate measure targets, adaptive updates, and accountability through annual reports and five-year reviews. DEQ assesses progress using annual reports, condition assessments, and monitoring data. For nonpoint sources, meeting load allocations expressed through surrogate measure targets demonstrates compliance.

5 Implementation responsibilities and schedule

5.1 Identification of implementation responsibility

OARs 340-042-0040(4)(I)(G) and 340-042-0080(1) require identification of persons, including Designated Management Agencies, responsible for implementing management strategies and preparing and revising implementation plans.

OAR 340-042-0030(2) defines Designated Management Agency as a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants and is identified as such by DEQ in a TMDL.

The TMDL rule provides numerous mentions of the term 'responsible person' with associated requirements. OAR 340-042-0025(2) indicates that responsible sources must meet TMDL load allocations through strategies developed in implementation plans. OAR 340-042-0030(9) defines 'reasonable assurance' as a demonstration of TMDL implementation by governments or individuals. OARs 340-042-0040(4)(I)(G) requires identification of persons, including DMAs, responsible for developing and revising implementation plans. OAR 340-042-0040(4)(I)(I) requires a schedule for submittal and revision of implementation plans by responsible persons, including DMAs. OAR 340-042-0080(4) reiterates the requirement for persons, including DMAs, responsible for development, submittal and revision of implementation plans, along with the required elements of those plans. For purposes of this Miles Creeks Subbasin, for implementation of the temperature TMDLs, 'responsible person' is defined as any entity responsible for any source of pollution addressed by the TMDL.

For purposes of this TMDL, all entities, except for sovereign nations, that have jurisdiction over land or activities that impact water quality in the TMDL area are named as responsible persons, including DMAs.

Appendix A contains a complete list of responsible persons, including DMAs, for the Miles Creeks Subbasin. There are 21 responsible persons, including DMAs, such as cities, counties, federal and state agencies, and other entities. Appendix A also contains estimated jurisdictional acres associated with many responsible persons, including DMAs. Jurisdictional authority for ODA and ODF will be different year to year based on whether agricultural or forestry activities are occurring on a given parcel of land in a given year.

5.1.1 Responsible persons, including DMAs, not required to develop a TMDL implementation plan

Some responsible persons, including DMAs, will not be required to submit implementation plans at this time. Table 3 lists the responsible persons, including DMAs, that are not required to submit implementation plans at this time, based on the narrative criteria. DEQ may require implementation plans from these entities in the future if ownership or jurisdiction over

streamside areas increases, or other data or information indicates a TMDL implementation plan is needed to achieve temperature allocations and shade targets identified in this TMDL. DEQ may revise the WQMP or issue individual orders to notify them of the required schedule for submitting an implementation plan.

Table 3: Responsible persons, including DMAs, exempt from implementation plan submittal requirements and the narrative criteria for exemption.

Narrative Criteria	Responsible Persons, including DMAs, exempted from implementation plan requirements at this time
Responsible person or DMA has de minimus jurisdiction over land or activities that could impact water quality in the TMDL area.	The Dalles Irrigation District
Responsible person or DMA has implementation responsibilities in another TMDL for the same parameter, is implementing strategies in this TMDL area, and no additional strategies are required.	Hood River County. Hood River County has already developed a TMDL Implementation Plan in response to the Western Hood Subbasin TMDL (approved by EPA in 2002) and was approved by DEQ on December 30, 2004. The Implementation Plan includes all lands in Hood River County, including the small portion of Hood River County which lies within the westernmost portion of the Miles Creeks TMDL area.
Responsible person or DMA cannot take actions to protect water quality because of state and federal requirements to prioritize safety and security.	Bonneville Power Administration Union Pacific Railroad
Responsible person's or DMA's jurisdiction in this TMDL area discharges directly (not through tributaries) to a waterbody which is managed under a different TMDL.	Port of Hood River City of Hood River
Responsible person or DMA is a small dam owner.	Reservoir owners listed in Appendix D
Responsible person's or DMA's water quality protection actions are implemented through water quality permits or water quality certifications.	Oregon Department of Transportation – for areas and activities regulated under the MS4 permit

5.1.2 Responsible persons, including DMAs, required to develop a TMDL implementation plan

Table 4 lists the responsible persons, including DMAs, that are required to submit implementation plans at this time. DEQ may not require implementation plans from these entities if information is provided that demonstrates that the entity meets one of the narrative criteria listed in Table 3. Responsible persons, including DMAs, listed in Table 4 must submit implementation plans to DEQ according to the requirements described in Section 5.3.

Table 4: List of Responsible Persons, including Designated Management Agencies, with TMDL implementation plan responsibilities

Responsible Persons including Designated Management Agencies	Area of jurisdiction	Implementation plan required	Streamside evaluation required	Shade gap analysis required
U.S. Bureau of Land Management	BLM managed lands, roads, and facilities	Yes	Yes	No
U.S. Forest Service – Mt Hood NF	USFS managed lands, roads, and facilities	Yes	Yes	Yes
U.S. Columbia River Gorge National Scenic Area	Special Management Area and General Management Area lands	Yes	Yes	No
Oregon Department of Agriculture	ODA managed lands and facilities and agricultural-related activities on other nonfederal lands	Yes	Yes	Yes
Oregon Department of Forestry	ODF managed lands and facilities and forestry-related activities on other nonfederal lands	Yes	Yes	Yes
Oregon Department of State Lands	DSL managed lands and facilities	Yes	No	No
Oregon Department of Transportation	Lands and facilities not covered under ODOT's MS4 permit	Yes	No	No
Oregon Parks and Recreation Department	OPRD managed lands and facilities	Yes	Yes	No
Oregon Department of Fish and Wildlife	ODFW managed lands and facilities	Yes	No	No
Wasco County	Urban, rural land use, including zoning, permitting and riparian protection; operation and maintenance of governmental facilities	Yes	Yes	No

Responsible Persons including Designated Management Agencies	Area of jurisdiction	Implementation plan required	Streamside evaluation required	Shade gap analysis required
	including transportation corridors, not including forestry or agricultural activities			
City of The Dalles	City land use, including zoning, permitting and riparian protection; operation and maintenance of governmental facilities including transportation corridors.	Yes	Yes	No
City of Dufur	City land use, including zoning, permitting and riparian protection; operation and maintenance of governmental facilities including transportation corridors.	Yes	No	No
City of Mosier	City land use, including zoning, permitting and riparian protection; operation and maintenance of governmental facilities including transportation corridors.	Yes	No	No
Port of The Dalles	Port managed lands and facilities	Yes	No	No
Northern Wasco County Parks and Recreation District	NWPRD managed lands and facilities	Yes	No	No

5.2 Existing implementation plans

OAR 340-042-0040(4)(I)(H) requires identification of any source or sector-specific implementation plans available at the time of TMDL issuance. Following the issuance of the 2008 Miles Creeks Subbasin TMDL and WQMP, DEQ required responsible persons, including DMAs, to develop implementation plans that included specific management strategies and best management practices to meet load allocations for temperature.

City of The Dalles, City of Mosier, Northern Wasco County Parks and Recreation District, and Wasco County are all existing DMAs operating under DEQ approved implementation plans developed for the 2008 Miles Creeks Subbasin TMDL. They must update the temperature elements of their implementation plans to comply with this WQMP (see Section 5.5 for timelines)

Reporting requirements for many of these entities included an annual progress report and a comprehensive assessment of activities every five years. For information on each DMA, including which DMAs are existing DMAs, seeAppendix AA. DEQ notes that not all existing DMAs have DEQ-approved TMDL implementation plans. Existing DMAs will need to update their current implementation plans to ensure any new requirements in this WQMP are met.

The paragraphs that follow evaluate both state and federal forestry and agriculture programs. For state-managed non-federal forest and agricultural lands, this evaluation specifically considers the programs identified in OAR 340-042-0080(2) and (3), which serve as the existing implementation plans. If any agency revises its rules or updates its management plans in the future, DEQ may revisit this adequacy analysis and adjust implementation plan expectations to meet load allocations.

5.2.1 Oregon Department of Forestry: adequacy of Forest Practices Act to meet TMDL load allocations

Waterway protection measures were established in 1994 for state and private forest practices in Oregon, as codified in Oregon Revised Statutes 527.610 through 527.992, Oregon's Forest Practices Act (OAR 629-600 through 629-665) and Oregon's Plan for Salmon and Watersheds (Executive Order 99-01). As provided in ORS 527.770, forest operations conducted in accordance with the Forest Practices Act and other voluntary measures are generally considered to be in compliance with water quality standards. However, as provided in OAR 340-042-0080(2), revisions to the Forest Practices Act rules may be required when DEQ determines that these rules are not adequate to implement load allocations in an approved TMDL.

Periodic revisions to the Forest Practices Act rules occurred between the 1990s through 2022. With the publication of the Private Forest Accord Report and subsequent passage of Senate Bill 1501, 1502 and HB 4055, Forest Practices Act rule revisions were adopted by the Board of Forestry in October 2022 and additional amendments were adopted in 2025. Implementation of these rules, including increased riparian widths and additional tree retention, may be effective at meeting shade allocations. The streamside vegetation retention and riparian management area distances in the current Forest Practices Act are summarized in Table 4 below. There are multiple other requirements or exceptions found in the forest practice rules not included in the table.

Table 4: Summary streamside vegetation retention riparian management area distances in Forest Practices Act rules OAR 629-643.

Stream Type	Practice Type	Inner (ft)	Outer (ft)	Notes
Large Type SSBT/F	Standard Practice	30	70	-
Large Type SSBT/F	Small Forestland	30	70	-

Stream Type	Practice Type	Inner (ft)	Outer (ft)	Notes
Medium Type SSBT/F	Standard Practice	30	70	-
Medium Type SSBT/F	Small Forestland	30	50	-
Small Type SSBT/F	Standard Practice	30	45	-
Small Type SSBT/F	Small Forestland	30	30	-
Large Type N	Standard Practice	30	45	-
Large Type N	Small Forestland	30	45	-
Medium Type N	Standard Practice	30	45	-
Medium Type N	Small Forestland	30	30	-
Small Type Np terminal flows into Type F/SSBT	Standard Practice	30	45	Upstream retention distance = shorter of RH Max or uppermost Flow Feature; RMA width = 30’ inner + 30’ outer for 500 ft
Small Type Np terminal into Type F/SSBT	Small Forestland	30	30	Upstream retention distance = shorter of RH Max or uppermost Flow Feature; RMA width = 20’ inner + 20’ outer for 500 ft
Small Type Np lateral into Type F/SSBT	Standard Practice	30	0	Upstream retention distance = shorter of RH Max or uppermost Flow Feature; RMA width = 30’ inner only for 250 ft
Small Type Np lateral into Type F/SSBT	Small Forestland	20	0	Upstream retention distance = shorter of RH Max or uppermost Flow Feature; RMA width = 20’ inner only for 250 ft
Small Type Ns into Type F/SSBT	Standard Practice	-	-	30’ R-ELZ extending 750 ft upstream from confluence; ELZ applies on remainder of channel
Small Type Ns	Standard Practice	-	-	30’ Equipment Limitation Zone (ELZ) from edge of inner zone

ODF Stream Type Definitions:
SSBT—salmon, steelhead, or bull trout
F—fish-bearing (non-SSBT)
N—non-fish-bearing, non-domestic
Np—perennial, Type-N
Ns—seasonal, Type-N

[2] “Small Forestland” means forestland that has an owner that owns or holds common ownership interest in less than 5,000 acres of forestland.

[3] “Inner” zone is the area immediately near the stream channel extending 30 feet out

[4]“Outer” zone is the area extending from the outside edge of the inner zone that extends to variable widths based on the stream’s size and classification.

[5]"RH Max" means the maximum distance described for any particular small Type Np stream. Total RMA width is equal to the sum of the inner and outer zone widths.

DEQ finds the vegetation retention buffers of 100 (e.g. large SSBT, large F, medium SSBT/F standard practice) may be sufficient to meet some shade targets, depending on density of residual trees, stream orientation, topography, and other site-specific factors [see TSD Appendix XX]. However, based on the findings in [TSD Appendix], it is probable that in some cases these buffers will not provide shade equivalent to a no-harvest buffer width that is equivalent to site potential tree height. Depending on site potential tree heights, smaller no-harvest buffers are less likely to meet shade targets and more likely to result in temperature increases beyond the assigned TMDL human use allowance of (0.0°C) and equivalent load allocation for all fish-bearing and perennial non-fish-bearing streams. This is more pronounced for the Small Forestland Option. Adoption of forest conservation tax credits on small forestlands to align protections with standard practice will increase the effectiveness. Overall, required riparian protections under the Forest Practices Act are unlikely to consistently meet shade targets and load allocations. For these reasons, ODF is required to develop a TMDL implementation plan to be submitted**Error! Reference source not found.**8 for the schedule.

As agreed, in the 2021 Memorandum of Understanding between DEQ and ODF, DEQ will work with ODF to identify additional regulatory or non-regulatory measures that could be implemented by rule revisions, stewardship agreements, incentive programs or other means to provide reasonable assurance of achieving TMDL solar radiation load allocations. Collaboration on these additional measures may occur during development of ODF's implementation plan.

5.2.2 Oregon Department of Agriculture: adequacy of agricultural water quality management programs in attaining TMDL load allocations and effective shade surrogate measures

The Oregon Legislature passed the Agricultural Water Quality Management Act in 1993, which directed Oregon Department of Agriculture to adopt rules as necessary and to develop plans to prevent water pollution from agricultural activities (ORS 568.900 to 568.933 and ORS 561.191 and OAR chapter 603, division 90 and 95). Subsequently, ODA worked with Local Advisory Committees and Soil and Water Conservation Districts to develop Agricultural Water Quality Area Rules and Area Plans for 38 watershed-based management areas across the state.

The Miles Creeks Subbasin TMDL includes two ODA Agricultural Water Quality Management Areas that each have an Area Plan (TSD [section]). DEQ participates in ODA's Area Plan review process by providing water quality status and trends for each management area, as well as assessments of land conditions, agricultural activities and implementation gaps that likely contribute to water quality impairments. The Area Plans for the two management areas included in this TMDL were reviewed by DEQ within the last five years, however not all reviews resulted in Area Plan revisions.

Miles Creeks Subbasin streams continue to be identified as impaired by Oregon's Section 303(d) list for temperature in part due to inadequate implementation of the protections provided in the Area Plans and Rules. As agreed, in the 2023 Memorandum of Agreement between DEQ and ODA, ODA will either adapt the Area Plan and Area Rules to act as the TMDL implementation plan or develop a separate TMDL implementation plan. The additional measures will subsequently be incorporated into Area Plans or Area Rules affected by the TMDL. The approach will be decided as part of the TMDL process. In the case of the Miles

Creeks Subbasin temperature TMDL, ODA has agreed to develop an implementation plan for DEQ review and approval. DEQ will assist ODA in developing an approvable TMDL implementation plan that includes appropriate measurable objectives and timelines to address identified water quality priorities and allocations (or surrogate measures). In addition, DEQ will work with ODA to identify additional measures that could be implemented by rule revisions, incentive programs, and resources that may be available to help with program and project implementation to provide reasonable assurance of achieving TMDL targets.

5.2.3 U.S. Bureau of Land Management: adequacy of streamside management strategies in attaining TMDL load allocations and effective shade surrogate measures

The BLM manages approximately 2,770 acres in the Subbasin (refer back to Figure 2-4), most of which does not include streams or riparian habitat. The majority of the tracts are considered "unalloted", (e.g. there are no grazing allotments or the land is not currently managed for grazing). Two allotments (the K and P allotment and the Ketchum allotment) have been grazed most recently. However, the K and P allotment does not have a current permittee and has not been grazed for many years. The Ketchum allotment is currently grazed and contains riparian habitat in the headwaters of Browns Creek. BLM currently manages this allotment according to standards and guides for Riparian Habitat Conservation Areas as described in PACFISH/INFISH (USDA & USDI, 1995; USDA, 1995) and monitors designated management areas according to R6/BLM, PACFISH/INFISH Biological Opinion – Clarification of Riparian Monitoring and Assessment Protocols and Implementation (USDI, 2005).

BLM defines Riparian Management Areas using slope distance from the flood-prone areas on each side of a stream. Slope distance is specific to different types of waterbodies as summarized in Table 5.

Table 5: Summary of BLM Riparian Management Area width for different waterbody features.

Feature	Riparian Management Area minimum widths measured as slope distance
Perennial and intermittent stream channels	300 feet on both sides of the flood-prone area
Lentic areas (still or slow moving water)	300 feet from the edge of wetland vegetation
Ephemeral draws* where average annual precipitation is less than 14 inches	25 feet on both sides
Ephemeral draws where average annual precipitation is greater than 14 inches	50 feet on both sides

* Ephemeral draws (streams that flow only in direct response to precipitation) are unlikely to flow during times that contribute to thermal loading.

Given the limited riparian land managed by BLM in the Subbasin, DEQ will rely on continued BLM adherence to standards and guides as outlined in PACFISH/INFISH for protection of riparian corridors. In addition, BLM is in the process of developing an Implementation Monitoring Program for PACFISH/INFISH which guides monitoring of grazing allotments (e.g., designated monitoring areas). If monitoring identifies that standards and guides are not being adhered to on BLM lands in the Subbasin, or if additional BLM lands in the Subbasin are grazed, DEQ will

expect BLM to develop a WQRP describing the specific strategies which will be used to ensure continued riparian protections.

Because current status of riparian vegetation on BLM lands in the Miles Creeks Subbasin TMDL area is unknown, BLM is required submit a TMDL implementation plan incorporating the requirements outlined in this WQMP. See Table 7 for schedule.

5.2.4 U.S. Forest Service: adequacy of streamside management strategies in attaining TMDL load allocations and effective shade surrogate measures

The USFS manages lands in the upper part of the Subbasin, along its western boundary. This area is administered by the Mt. Hood National Forest, through the Supervisor's Office in Sandy and the District Office in Dufur. Management activities are guided by the Northwest Forest Plan (USDA, 1994a) and the Mt. Hood National Forest Land and Resource Management Plan (USDA 1990). When standards and guidelines from both documents apply, the one that controls is the one more restrictive or which provides greater benefits to late-successional forest related species. The Mt. Hood National Forest also developed the Mile Creeks Watershed Analysis (1994b) which provides specific management guidelines for federal lands in the Fifteenmile Watershed.

Riparian reserves in the Aquatic Conservation Strategy in the Northwest Forest Plan (USDA 1990) are defined as:

a. ***Fish-bearing streams*** *- Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.*

b. ***Permanently flowing nonfish-bearing streams*** *- Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.*

c. ***Constructed ponds and reservoirs, and wetlands greater than 1 acre*** *- Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than Standards and Guidelines C-31 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.*

d. ***Lakes and natural ponds*** *- Riparian Reserves consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable*

areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

e. ***Seasonally flowing or intermittent streams, wetlands less than 1 acre, and unstable and potentially unstable areas*** *- This category applies to features with high variability in size and site-specific characteristics. At a minimum, the Riparian Reserves must include:*

   - *The extent of unstable and potentially unstable areas (including earthflows),*
   - *The stream channel and extend to the top of the inner gorge,*
   - *The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation, and*
   - *Extension from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest*

A site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class. Intermittent streams are defined as any nonpermanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria.

Standards and guidelines allow for some timber management, and fire management in riparian reserves to ensure Aquatic Conservation Strategy objectives are met.

The Mt. Hood National Forest Land and Resource Management Plan also has Standards and Guidelines for Riparian Management Areas including

- Within 100 feet of a riparian management area no more than 10 percent of a project activity area e.g. timber harvest unit or recreation site should have exposed or compacted soils
- Summer water temperatures shall be maintained to protect existing on and off-forest beneficial water uses
- Forest management activities shall not cause water temperatures to
  - exceed 58 degrees F on any day or
  - increase more than 2 degrees F
- Where natural maximum stream temperatures exceed 58 degrees F forest management activities shall not cause any measurable increase in the maximum water temperature
- Stream shading should be increased where
  - State water quality standards are routinely exceeded (e.g. annual occurrence) during summer low water flow periods
  - Elevated water temperatures due to management activities are likely to reduce on Forest or off Forest water related values

DEQ finds that USFS's streamside vegetation management strategies on fish-bearing streams, perennial streams, non-fish bearing streams, constructed ponds and reservoirs, lakes and

natural ponds, and wetlands greater than 1-acre are adequate and will likely lead to achievement of the TMDL load allocation and effective shade targets. Vegetation management strategies on intermittent streams, and wetlands less than 1-acre may not be adequate to achieve the load allocation or effective shade targets (see summary in [TSD Appendix XX]). Streamside management on intermittent streams is a concern because they may contain residual pools that support aquatic life; or be flowing during periods when thermal loading is relevant and therefore the TMDL allocations apply. The classification and mapping of intermittent streams often do not account for these situations [TSD Appendix XX].

For these reasons, USFS is required to develop a TMDL implementation plan to be submitted to DEQ for review and approval. See Table 7 for schedule.

5.3 Implementation plan requirements

Appendix A lists the responsible persons, including DMAs, that are required to submit an implementation plan. As required in OAR 340-042-0080(4)(a), implementation plans must include:

- Management strategies that the entity will use to achieve load allocations and reduce pollutant loading;
- Timeline for strategy implementation and a schedule for completing measurable milestones;
- Performance monitoring and a plan for periodic review and revision of implementation plans;
- To the extent required by ORS 197.180 and OAR chapter 340, division 18, provide evidence of compliance with applicable statewide land use requirements; and,
- Any other analyses or information specified in this WQMP.

The following subsections provide detail on each implementation plan required component. DEQ recognizes that the scale and scope of implementation will vary depending on each responsible person's or DMA's contribution to heat sources and their capacity to implement effective strategies.

5.3.1 Management strategies

Responsible persons, including DMAs, fall into one of three categories for implementation plan requirements based on their water quality impact.

Table 5. Categories of water quality impact by responsible persons, including DMAs.

	High Impact	Medium Impact	Low Impact

Water quality impact thresholds	Jurisdiction over agricultural or forestry activities and lands, and >= 500 acres within 150ft of stream centerline	Jurisdiction over >= 100 acres within 150ft of stream centerline and not already categorized as high impact	Jurisdiction over < 100 acres within 150ft of stream centerline or has a no cut buffer requirement >= site potential tree height.
Implementation plan requirements	Shade gap analysis. Streamside evaluation. Implementation of vegetation, flow, channel, monitoring, info sharing, and outreach and education strategies.	Streamside evaluation. Implementation of vegetation, flow, channel, monitoring, info sharing, and outreach and education strategies.	Implementation of info sharing, and outreach and education strategies.
Monitoring requirements	Performance monitoring (status of implementation activities) Effectiveness monitoring (status of shade gaps) Water quality monitoring (status of stream temperature)	Performance monitoring (status of implementation activities) Effectiveness monitoring (status of shade gaps)	Performance monitoring (status of implementation activities)
Responsible persons, including DMAs, with implementation plan requirements	ODA ODF USFS	BLM Col River Gorge NSA Wasco County OPRD City of The Dalles	ODFW ODOT DSL Port of The Dalles City of Dufur City of Mosier NWPRD

All responsible persons, including DMAs, must include management strategies from Section 2.1 in their implementation plan. See Table 5 for required management strategies for each responsible person, including DMAs.

Responsible persons, including DMAs, that fall under the high or medium water quality impact categories in Table 5 are required to include applicable priority management strategies from DEQ identifies implementation responsibilities in Section 5.1 and expects the identified entities to include strategies and practices listed in **Error! Not a valid bookmark self-reference.** that are applicable to their jurisdiction in their implementation plans. Implementation plans must include specifics on where and when priority and other strategies and practices will be applied. Implementation plans must also include measurable objectives and milestones to document efficacy of each strategy and practice. See Section 5.3.1.1 and 5.3.1.2 for methods for determining where land conditions require restoration, protection, and enhancement.

Table 2 in their implementation plan. Other practices and actions appropriate for activities and landscape conditions specific to their pollutant sources or source sectors should also be included.

5.3.1.1 Streamside evaluation

Table 3 and Table 5 identify the responsible persons, including DMAs, that are required to complete and submit a streamside evaluation as part of their implementation plan. The streamside evaluation helps the responsible person or DMA prioritize the implementation of management strategies. DEQ will approve streamside evaluations that adequately describe the responsible person's or DMA's review of current conditions and identification of appropriate measurable objectives and milestones for implementing priority management strategies from Table 2.

The streamside evaluation may include the following data and information:

- **a.** Quantify the streamside area in acres that needs enhancement (e.g., areas that do not currently meet shade targets, are comprised of non-native vegetation, need additional planting)
- **b.** Quantify the streamside area in acres that may not need action beyond protection.
- **c.** Quantify the streamside area in acres where physical constraints exist (e.g., buildings) that preclude implementation of vegetation management strategies that provide stream shade.
- **d.** Quantify the streamside area in acres where jurisdictional constraints (e.g., private ownership) limit implementation of vegetation management strategies that provide stream shade.
- **e.** Opportunities that may exist to address constraints to implementing vegetation management strategies that provide stream shade.
- **f.** Any areas within your jurisdiction where there is the potential to implement best management practices such as in-stream restoration, flow augmentation projects, experimental temperature management techniques, as well as enhancing and protecting cold water refuges where identified.
- **g.** An evaluation of the data from **a - f** to prioritize implementation. This evaluation must include a description of the rationale utilized to prioritize implementation in addition to a description of the data and analysis methods used to estimate quantities **a - d** and the reasoning specific areas will or will not be prioritized for implementation actions. It is expected that DMAs prioritize areas with the greatest shade gaps for implementation of riparian restoration, unless physical, jurisdictional, or other identified constraints exist.
    - i. Entities that have a DEQ shade gap analysis, and entities that must complete a shade gap analysis (i.e. ODA, ODF, and USFS), must include the shade gap analysis results in their streamside evaluation.
    - ii. DEQ expects entities that do not have a DEQ shade gap analysis to use other available data to estimate the quantities outlined in items **a - d** and address these data in their streamside evaluation.

DEQ recognizes that responsible persons, including DMAs, may not have adequate resources or expertise to perform all the actions listed in a – g. DEQ encourages responsible persons, including DMAs, reach out to and partner with local watershed groups and Soil and Water Conservation districts in the area to help evaluate areas within the DMAs jurisdiction and target locations for implementation activities. Additionally, DEQ will provide technical assistance to DMAs and may modify expectations to suit their abilities and capacity. DEQ recognizes that

organizations working in the Miles Creeks Subbasin are under no obligation to collaborate with responsible parties or DMAs to meet implementation requirements. However, DEQ encourages DMAs to support these organizations—whether in existing projects or new initiatives—through direct funding or by partnering to seek external funding opportunities. Groups identified in Table 6 have played an important role in improving water quality in the Miles Creeks Subbasin.

Table 6. Groups with expertise in the Miles Creeks Subbasin that DEQ encourages collaboration with to meet TMDL load allocations

Subbasin (HUC)	Groups working in the subbasin
EightmileCreek Watershed (1707010502)	Fifteenmile Watershed Council
Fifteenmile Creek Watershed (1707010503)	Fifteenmile Watershed Council
Mill Creek-Columbia River Watershed (1707010504)	The Dalles Watershed Council
Upper Mosier Creek Subwatershed (170701051102)	Mosier Watershed Council
Lower Mosier Creek Subwatershed (170701051103)	Mosier Watershed Council
Rock Creek Subwatershed (170701051104)	Mosier Watershed Council
Rowena Creek-Columbia River Subwatershed (170701051105)	The Dalles Watershed Council
Basin Wide	Wasco County Soil and Water Conservation District

DEQ acknowledges that factors such as climate change and local geology, geography, soils, climate, legacy impacts, wildfires and floods may hinder achieving the target effective shade. No enforcement action will be taken by DEQ for reductions in effective shade caused by natural disturbances. Where natural disturbances have occurred, DEQ expects responsible persons, including DMAs, to assess and prioritize these areas for streamside restoration following an event.

The streamside evaluation must be completed according to the timeline assigned in **Error! Reference source not found.**. The streamside evaluation will be utilized during the year five review (see Section 5.3.3.2) to help assess progress in meeting implementation timelines, milestones, and measurable goals in subsequent five-year implementation cycles.

5.3.1.2 Streamside shade gap analysis

Table 3 and Table 5 identify the responsible persons, including DMAs, that are required to complete and submit a streamside shade gap analysis as part of their implementation plan. The shade gap analysis helps the responsible person or DMA identify locations where shade restoration is needed. DEQ will approve shade gap analyses based on the criteria below.

The responsible person or DMA chooses one of the following options:

1. Use DEQ's shade gap analysis, if available for the jurisdiction.
2. Perform a shade gap analysis using DEQ approved methodology.

3. Establish and protect overstory, woody vegetation within a buffer width that is greater than or equal to the site potential tree height, or 35ft, whichever is greater, measured at top of bank.

5.3.1.2.1 Option 1: Use DEQ's shade gap analysis

If DEQ has provided a shade gap analysis for a jurisdiction, then DMAs are encouraged to use DEQ's analysis to inform their streamside evaluation (Sec. 5.2.2). DEQ conducted a vegetation height and shade gap analysis within approximately 100 meters of modeled waterbodies in the Miles Creeks Subbasin (partial analysis completed) as detailed in [Tables X and X] in the TMDL Rule. DEQ did not complete a shade gap analysis for all responsible persons, including DMAs.

The shade gap analysis calculates the difference between current effective shade (i.e., assessed) versus the target effective shade. Where DEQ calculated a shade gap, DEQ averaged the percent shade gap across all waterbodies within a DMA's jurisdiction. DEQ will provide the site-specific shade gap results upon request.

5.3.1.2.2 Option 2: Perform a shade gap analysis

Whether or not DEQ has provided a shade gap analysis for a jurisdiction, the responsible person or DMA can perform their own shade gap analysis. The responsible person or DMA may choose their own methods, with DEQ approval, to assess the current effective shade within their jurisdiction and whether effective shade allocations along Miles Creeks assessment units are met. Optional methods include:

1. Measure current effective shade at the stream surface using monitoring equipment, such as the Solar Pathfinder™, or using a hemispherical camera system and imagery analysis software.
    a. Determine general vegetation category, canopy density, stream width and stream orientation.
    b. Compare current effective shade results to either target effective shade from DEQ's shade gap analysis, or to the target percent effective shade values derived from the shade curves in the TMDL to assess the percent effective shade gap.
    c. Entities choosing to use this methodology must submit their assessment strategy to DEQ for approval. Assessments should conform to guidelines outlined in OWEB's Addendum to Water Quality Monitoring Technical Guide Book, Ch. 14: (OWEB, 1999).
2. Conduct modeling using the Heat Source model (as used in the TMDL).
3. Another method approved by DEQ through the TMDL implementation plan approval process.

The shade gap analysis requirement includes intermittent streams as defined in the TMDL. For more information on intermittent streams and which are included in temperature TMDLs see [TSD Section XX].

A project plan, which includes a description of the shade gap assessment methodology including any methodology that proposes target effective shade values different from shade curves developed by DEQ, must be submitted to DEQ for review and approval according to the timeline assigned in **Error! Reference source not found.**. Please see the Method documentation for Solar Pathfinder™ for more information.

5.3.1.2.3 Option 3: Establish a protective buffer

The responsible persons, including DMAs, can choose to establish a protective streamside buffer instead of using DEQ's shade gap analysis or performing their own shade gap analysis. An acceptable buffer must include the establishment and protection of overstory, woody vegetation within a buffer width that is greater than or equal to the site potential tree height, or 35ft, whichever is greater, as measured up-slope along the ground's contour from top of bank ([TSD Appendix XX]). The streamside buffer must be established through development of enforceable ordinances or regulations. The literature review presented in [TSD Appendix XX] indicates that potential stream shade loss associated with a 120-foot buffer will not cause stream temperature increases for most waterbodies. For this option, responsible persons including DMAs must ensure that any activity occurring within this 120-foot slope buffer would result in limited stream shade reduction and ensure that stream shade targets are still achieved at that location following management actions.

5.3.1.3 Target effective shade values and shade curves

Shade curves, which are charts that represent the mean effective shade target for different mapping units, stream aspects, and active channel widths ([TMDL Section XX]), were developed ([Figures X – X] in the TMDL Rule) to allow users to find target percent effective shade values for streams based on several stream characteristics. Unlike the site-specific shade targets and shade gap analysis ([TMDL Section X]), shade curves do not calculate current effective shade. Any responsible person including DMAs can use DEQ shade curves, site-specific shade targets or other DEQ- approved method to assess and recommend an effective shade target for their jurisdiction.

TMDL implementation plans must include the mean effective shade targets calculated by DEQ, if available, ([Table X through Table X] in the TMDL Rule document), or any updated effective shade target assessment approved or performed by DEQ in the future.

5.3.2 Timeline and schedule

Each implementation plan must include a commitment to enact specific management strategies on a reasonable timeline, including a schedule for meeting measurable milestones to demonstrate progress. To meet the intent of this requirement and be useful for the requirement to track and report progress, entities should develop management strategies using the SMART elements: Specific, Measurable, Achievable, Relevant, Time-bound (Doran, 1981).

Timelines and milestone schedules should be informed by the Streamside Evaluation, as described in Section 5.3.1.1 above, and each entity should consider all factors relevant to their situation.

5.3.3 Reporting of performance monitoring and plan review and revision

5.3.3.1 Reporting on performance monitoring

Each implementation plan must include a commitment to prepare annual reports on performance monitoring and specify a day of the year they will be submitted to DEQ. These reports must include implementation tracking for each of the identified management strategies,

progress toward timelines and measurable milestones specified in the implementation plan, and evaluation of the effectiveness of each strategy.

DMAs should track and report implementation actions including the number, type and location of projects, best management practices, education activities, or other actions taken to improve or protect water quality. Most DMAs will track implementation actions they are directly responsible for completing, and some may need to track and report on actions that they implement through their support of other land managers, e.g., private landowners.

5.3.3.1.1 Oregon Watershed Restoration Inventory reporting requirement

Projects designed to control thermal pollution that use practices listed in OWEB's Oregon Watershed Restoration Inventory (OWRI) Online List of Treatments must be reported by responsible persons including DMAs to the OWRI database (OWEB 2025) upon project completion. DEQ utilizes OWRI's database to track implementation activities statewide and within watersheds for various reporting metrics. Responsible persons including DMAs must also report BMP implementation annually to DEQ to document progress and track actions over time.

Other publicly accessible databases may be used to document restoration activities when approved by DEQ.

5.3.3.1.2 Adaptive management

Implementation plans must include a commitment to use adaptive management to evaluate the effectiveness of implementation activities in improving streamside conditions including stream shade. Annual reports must summarize the status and results of these evaluations on the relevant time scale. At a minimum, reports in year five must summarize implementation and effectiveness over the preceding five years.

5.3.3.2 Implementation plan review and revision

Implementation plans must be reviewed by each responsible person including DMAs, revised to incorporate lessons learned, and approved by DEQ every five years. At a minimum, plans must be revised to reflect updated timelines for the continuation of implementation activities for the next five years. DEQ will use implementation and effectiveness evaluations from annual reports for this review. If implementation plan revisions are needed to correct deficiencies or otherwise ensure the plan is effective following the year five review, DEQ will identify a date for submission of the revised plan for DEQ approval.

5.3.4 Land Use Compatibility

Implementation plans are no longer required to provide evidence of compliance with applicable statewide land use requirements.

5.3.5 Other required analyses and information

5.3.5.1 Information

Implementation plans must identify all lands and all activities that can impact water quality within the responsible person's or DMA's jurisdiction or responsibility.

5.3.5.2 Public involvement

Implementation plans must include a plan to involve the public in implementation of management strategies. Public engagement and education must be included to meet this requirement.

TMDL implementation plans and annual reports must be posted to each DMA's website for public transparency. If a DMA does not have a website, these documents must be made available to the public in another manner.

5.3.5.3 Maintenance of strategies over time

Implementation plans must include discussion of planned efforts to maintain management strategies over time.

5.3.5.4 Implementation costs and funding

Implementation plans must include a discussion of the resources needed to develop, execute and maintain the programs and projects described in implementation plans to the extent that these costs can be accounted for or estimated. DEQ recommends that implementation plans include a cost analysis for each strategy or action including:

- Staff salaries, supplies, volunteer coordination and regulatory fees
- Installation, operation and maintenance of management measures
- Monitoring, data analysis and plan revisions
- Public education and outreach efforts
- Ordinance development (if needed to implement a management strategy)

Costs may vary in relation to pollutant sources and loading, proximity to waterways and type or extent of preventative controls already in place.

Certain management practices, such as preventative infrastructure maintenance, may result in long-term cost savings to responsible persons including DMAs, or landowners. Cost savings should be calculated into the cost analyses.

These analyses should be in five-year increments to estimate costs, demonstrate sufficient funding is available to begin implementation and identify potential future funding sources to sustain management strategy implementation. Responsible persons, including DMAs, may include actual costs spent on implementation activities as part of annual TMDL reporting. This information may help DEQ estimate actual costs associated with implementing current and future temperature TMDLs.

There are multiple sources of local, state, and federal funds available for implementation of pollutant management strategies and control practices. Appendix B provides a partial list of financial incentives, technical assistance programs, grant funding and low interest loans for public entities and with principal forgiveness available in Oregon that may be used to support implementation of assessment, pollution controls and watershed restoration actions or land condition improvements that improve water quality in the Miles Creeks Subbasin. Soil and water conservation districts and watershed councils are additional resources that may support responsible persons including DMAs in implementation of pollutant management strategies and control practices through the programs listed in Appendix B.

5.4 Schedule for implementation plan submittal

OAR 340-042-0040(4)(l)(I) specifies that the WQMP contain a schedule for submittal of implementation plans. As stated in OAR 340-042-0080(4)(a), entities identified in the WQMP with responsibility for developing implementation plans are required to prepare and submit an implementation plan for DEQ approval according to the schedule in the WQMP.

Within 18 months of Environmental Quality Commission's adoption of the Miles Creeks Subbasin TMDL, persons, including DMAs, responsible for developing implementation plans must submit**Error! Reference source not found.7**).

OAR 340-012-0055(2)(e) identifies failure to timely submit or implement a TMDL implementation plan, as required by DEQ order or rule, as a Class II violation. OAR 340-012-0053(1) identifies failure to report by the reporting deadline, as required by DEQ order or rule, as a Class I violation.

Should a sector or sector-wide DMA fail to submit an approvable TMDL implementation plan or fail to timely implement the plan, DEQ may pursue enforcement under OAR 340-012-0055(2)(e). DEQ may revise the WQMP or issue individual orders to identify additional responsible persons, including DMAs, and notify them of the required schedule for submitting source-specific implementation plans.

Following the issuance of this TMDL and WQMP, DEQ may determine that nonpoint source implementation plans are not necessary for certain entities identified in the WQMP based on available information or new information provided by those entities. For these entities, DEQ will provide a written determination for why a plan is not required. This determination could be based on a variety of factors, such as inaccurate identification within the geographic scope of the TMDLs, or documentation that an entity is not a source of pollution or does not discharge pollutants to a waterbody within the geographic scope of a TMDL.

Once approved, DEQ expects implementation plans to be fully implemented according to the timelines and schedules for achieving measurable milestones specified within the plans. Implementation plans must be reviewed and revised as appropriate for DEQ approval every five years and submitted on the date specified in DEQ's approval letter for an implementation plan.

DEQ may approve reporting due dates that differ from the timeframes stated below.

Table 7: Due dates for implementation plans, information, and analyses. See sections 5.2.1 through 5.2.6 for more details.

Requirement	Due Date / Timeframe
New TMDL implementation plan (Appendix A)	18 months after EQC adoption of Miles Creeks Subbasin TMDL
Updated TMDL implementation plan (Appendix A)	18 months after EQC adoption of Miles Creeks Subbasin TMDL
Project plan and description of the assessment methodology to	18 months after EQC adoption of Miles Creeks Subbasin TMDL

be used to complete a shade gap analysis (Sec. 5.3.1.2)	
Streamside Evaluation (Sec. 5.3.1.1)	Five years after implementation plan approval
Streamside shade gap analysis (Sec. 5.3.4) and updated streamside evaluation OR Site potential tree height equivalent streamside buffer that establishes and protects overstory, woody vegetation (sec. 5.3.3)	Five years after implementation plan approval

6 Monitoring and evaluation of progress

OAR 340-042-0040(4)(l)(K) requires that the WQMP include a plan to monitor and evaluate progress toward achieving the TMDL allocations and associated water quality standards for the impairments addressed in the TMDL. Additional objectives of monitoring efforts are to assess progress towards reducing excess pollutant loads and to better understand variability associated with environmental or anthropogenic factors. This section summarizes DEQ's approach, including the required elements of identification of monitoring responsibilities and the plan and schedule for reviewing monitoring information to make TMDL revisions, as appropriate.

There are two fundamental components to DEQ's approach to monitoring and evaluating TMDL progress:

1. Tracking the implementation and effectiveness of activities committed to by responsible persons, including DMAs, in DEQ-approved implementation plans, and
2. Periodically monitoring the physical, chemical and biological parameters necessary to assess water quality status and trends for the impairments that constitute the basis for this TMDL.

DEQ effective shade targets are regulatory and can be used to assess implementation progress in the future. In areas where stream temperature criteria are not met, DEQ will assess the status of current conditions and effective shade targets as part of the adaptive management process. DEQ will also evaluate other restoration efforts that have been implemented to improve stream temperature, for example channel morphology and stream flow restoration, protection and enhancement of cold-water refuges, etc. In cases where DEQ determines implementation actions are not making sufficient progress, DEQ will rely on the adaptive management process and our enforcement authority to assess compliance with the load allocations.

Although DEQ encourages responsible persons, including DMAs, to conduct physical, chemical or biological monitoring to better evaluate how implementation actions may impact water quality

conditions, DEQ is only requiring the DMAs listed under Section 6.3 to conduct water column monitoring associated with this TMDL.

6.1 Persons responsible for performance monitoring

All responsible persons, including DMAs, are responsible for tracking the implementation of their actions and meeting milestones where established (see Table 5).

6.2 Persons responsible for effectiveness monitoring

For those responsible persons, including DMAs, who are required to submit streamside evaluations (see Table 3 or Table 5), the streamside evaluation (Section 5.3.1.1) will provide a baseline description of shade gaps against which implementation progress will be assessed. These responsible persons, including DMAs, must reassess their progress towards filling shade gaps every five years and submit their re-assessment to DEQ as part of their year five report submittal.

6.3 Persons responsible for water quality monitoring

DEQ is requiring ODA, ODF, and USFS to undertake temperature monitoring actions in areas within their jurisdiction or ownership to help determine the status of instream water quality and landscape conditions associated with water quality. Existing monitoring activities may be sufficient to achieve the goals of this monitoring requirement. These three agencies have jurisdiction over approximately 86 percent of streamside areas in the Miles Creeks Subbasin TMDL. For this reason, DEQ considers it appropriate for these large agencies to collaborate with DEQ and other basin partners to ensure data are collected in strategic locations to support TMDL implementation and adaptive management.

ODA, ODF, and USFS must include strategies and measurable objectives for monitoring and assessment in their implementation plans. The objectives for monitoring and assessment must include, but are not limited to:

1. Provide information necessary to determine locations for applying management strategies or to assess the effectiveness of those strategies.
2. Refine information on source-specific or sector-specific pollutant loading.
3. Provide information necessary to demonstrate progress towards meeting load allocations.
4. Provide information used to identify roles and participate in collaborative effort among responsible persons, including DMAs, to characterize water quality status and trends.
5. Provide information integral to an adaptive management approach to inform and adjust management strategies over time.

Some responsible persons, including DMAs, may also perform certain types of monitoring for administration of a regulatory or voluntary program, separately from activities conducted under elements of a TMDL implementation plan. These entities should provide information from those activities in their annual reporting to DEQ that is relevant to the above objectives.

Environmental media and water column monitoring activities conducted by ODA, ODF, USFS, or other responsible persons, including DMAs, to meet TMDL objectives, data collection and management must be performed in adherence to quality control procedures and quality assurance protocols established by DEQ, U.S. EPA, or other appropriate organizations. This requirement must be met through developing or adapting quality assurance project plans or project-specific sampling and analysis plans, and submitting to DEQ for review and approval based on a schedule determined by DEQ once development of the Monitoring Strategy has been initiated. ODA, ODF,, USFS or other responsible persons, including DMAs, can also agree to participate in a collaborative monitoring plan under an umbrella QAPP. DEQ staff will coordinate QAPP development with ODA, ODF, and USFS upon request in advance of submission. Resources for developing QAPPs and SAPs are available on DEQ's water quality monitoring website (DEQ, 2023).

In addition, ODA, ODF, and USFS must acknowledge in their implementation plans their responsibility in collaborating with DEQ and other basin partners to determine where data gaps exist. DEQ encourages these agencies to begin evaluating their existing temperature monitoring networks, if any, and explore opportunities to establish future long-term monitoring sites. Data collected by responsible persons, including DMAs, to monitor TMDL implementation activity effectiveness must be in a format accessible to DEQ.

6.4 Plan and schedule for reviewing monitoring information and revising the TMDL

DEQ recognizes that it will take time before management practices identified in a WQMP are fully implemented and effective in reducing and controlling pollution. DEQ also recognizes that despite best efforts, natural events beyond the control of humans may interfere with or delay attainment of the TMDL. Such events include, but are not limited to, floods, fire, insect infestations and drought. In addition, DEQ recognizes that technology and practices for controlling nonpoint source pollution will continue to develop and improve over time. DEQ will use adaptive management to refine implementation as technology, and knowledge about these approaches progress.

DEQ will track implementation compliance through DEQ approved implementation plans, annual reports, and comprehensive year five reviews (Sections 5.2.6 and 5.2.7) in the coming years.

Adaptive management is a process that acknowledges and incorporates improved technologies and practices over time to refine implementation. A conceptual representation of the TMDL adaptive management process is presented in Figure 2igure 2.

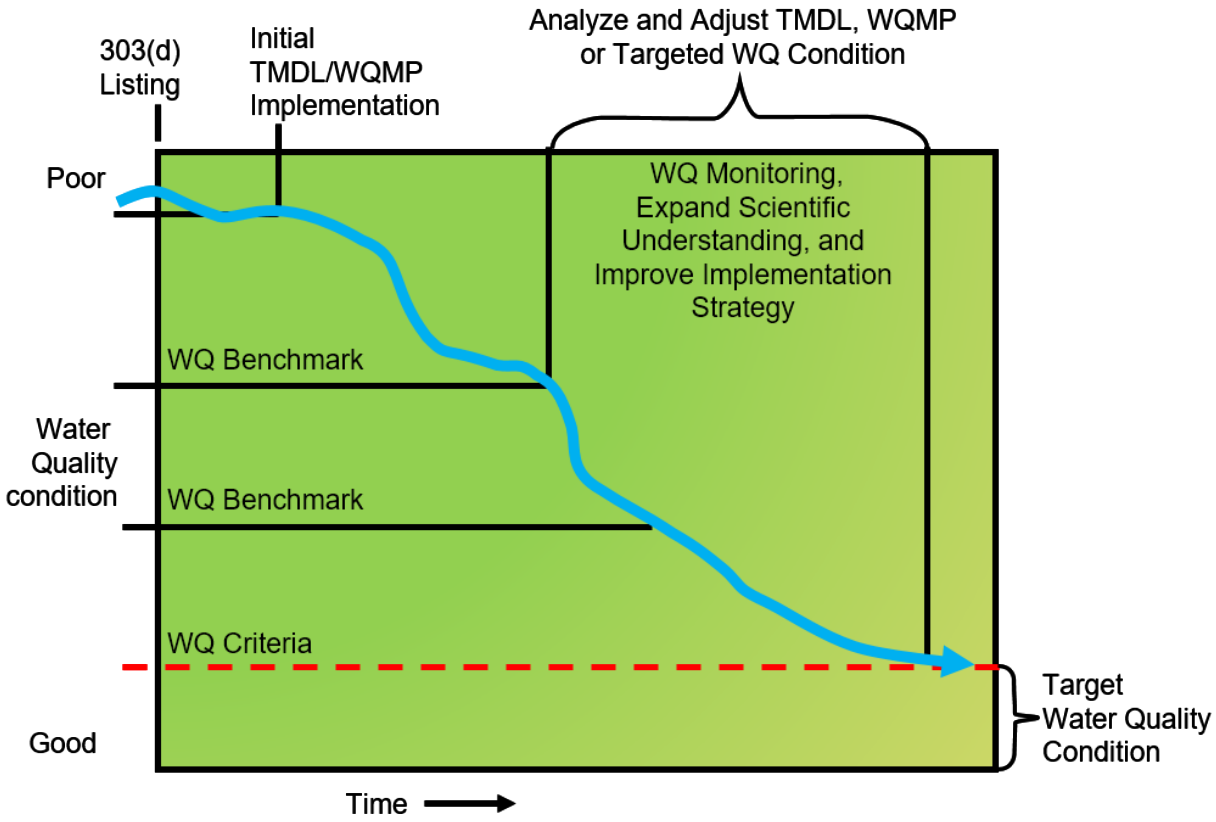


Figure 2: Conceptual representation of adaptive management.

DEQ considers entities complying with DEQ-approved TMDL implementation plans to be in compliance with their respective requirements contained in the TMDLs. The annual reports and Year Five Reviews submitted to DEQ by each of the responsible persons, including DMAs, in the Miles Creeks Subbasin will be evaluated individually and collectively. DEQ will use this information to determine whether management actions are supporting progress towards TMDL objectives, or if changes in management actions and/or TMDLs are needed.

DEQ will review annual reports, participate with responsible persons, including DMAs, in review of monitoring information, and participate in implementing the Miles Creeks Subbasin Monitoring Strategy.

Every five years, DEQ will collectively evaluate annual reports and all available monitoring data and information to assess progress on meeting the goals of the TMDLs and WQMP.

- DEQ will require responsible persons, including DMAs, to revise their implementation plans to address deficiencies where DEQ determines that implementation plans or effectiveness of management strategies are inadequate.
- DEQ and partners will revise sampling and analysis plans or other aspects of the monitoring strategy where progress toward meeting monitoring strategy objectives is not being made.
- DEQ will consider TMDL revisions if DEQ's evaluation of water monitoring data and supporting information indicate that the TMDL load allocations for a given pollutant-impairment are insufficient to meet state numeric criteria or narrative criteria, or insufficient to protect the designated beneficial uses.

- DEQ will follow all public participation requirements, including convening a local technical or rulemaking advisory committee to provide input on TMDL revisions per OAR 340-042-0040(7).

7 Reasonable assurance of implementation

OAR 340-042-0030(9) defines Reasonable Assurance as “a demonstration that a TMDL will be implemented by federal, state or local governments or individuals through regulatory or voluntary actions including management strategies or other controls.” OAR 340-042-0040(4)(l)(J) requires a description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions. As a factor in consideration of allocation distribution among sources, OAR 340-042-0040(6)(g) states that “to establish reasonable assurance that the TMDL’s load allocations will be achieved requires determination that practices capable of reducing the specified pollutant load: (1) exist; (2) are technically feasible at a level required to meet allocations; and (3) have a high likelihood of implementation.” This three-point test is consistent with EPA past practice on determining reasonable assurance in the Chesapeake Bay TMDL (EPA, 2010) and supports federal antidegradation rules and Oregon’s antidegradation policy (OAR 340-041-0004).

The Clean Water Act section 303(d) requires that a TMDL be “established at a level necessary to implement the applicable water quality standard.” Federal regulations define a TMDL as “the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background” [40 CFR 130.2(i)]. For TMDL approval, EPA guidance documents and memos on the TMDL process requires determinations that allocations are appropriate to implement water quality standards and reasonable assurance that nonpoint source controls will achieve load reductions, when WLAs are based on an assumption that nonpoint source load reductions will occur (EPA, 1991, 2002 and 2012).

Although TMDL implementation is anticipated to improve rather than lower water quality, federal antidegradation rules at 40 CFR 131.12(a)(2), require states to “assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control,” when allowing any lowering of water quality.

When a TMDL is developed for waters impaired by point sources only, the existence of the NPDES regulatory program and the issuance of NPDES permits provide the reasonable assurance that the wasteload allocations in the TMDL will be achieved. That is because federal regulations implementing the Clean Water Act require that water quality-based effluent limits in permits be consistent with “the assumptions and requirements of any available wasteload allocation” in an approved TMDL [40 CFR 122.44(d)(1)(vii)(B)].

Where a TMDL is developed for waters impaired by both point and nonpoint sources, it is the state’s best professional judgment as to the three-point test in OAR 340-042-0040(6)(g) on reasonable assurance that the TMDL’s load allocations will be achieved.

Where there is a demonstration that nonpoint source load reductions can and will be achieved; a determination that reasonable assurance exists and allocation of greater loads to point sources is appropriate. Without a demonstration of reasonable assurance that relied-upon nonpoint source reductions will occur, reductions to point sources wasteload allocations are needed.

The Miles Creeks Subbasin TMDL was developed to address both point and nonpoint sources with load reduction allocations proportional to estimated source contributions and in consideration of opportunities for effective measures to reduce those contributions. There are several elements that combine to provide the reasonable assurance to meet federal and state requirements, including for antidegradation. Education, outreach, technical and financial assistance, permit administration, permit enforcement, responsible persons', including DMAs', implementation and DEQ enforcement of TMDL implementation plans will all be used to ensure that the goals of this TMDL are met.

7.1 Accountability framework

Reasonable assurance that needed load reductions will be achieved for nonpoint sources and antidegradation requirements and narrative water quality criteria will be met is based primarily on an accountability framework incorporated into the WQMP, together with the implementation plans of persons responsible for implementation. This approach is similar to the accountability framework adopted by EPA for the Chesapeake Bay TMDL, which was adopted in 2010 (EPA, 2010). Figure 3 presents the accountability framework elements, which are intended to work in concert to demonstrate reasonable assurance of implementation.



Figure 3: Representation of the reasonable assurance accountability framework led by DEQ.

Pollutant reduction strategies are identified in Section 2 and more specific strategies, practices and actions will be detailed in each required implementation plan, to be submitted per the timelines in Section 5.2. These strategies and actions are comprehensively implemented through a variety of regulatory and non-regulatory programs. Many of these are existing strategies and actions that are already being implemented within the watershed and demonstrate reduced pollutant loading. These strategies are technically feasible at an appropriate scale to meet the allocations. A high likelihood of implementation is demonstrated because DEQ reviews the individual implementation plans and proposed actions for adequacy and establishes a monitoring and reporting system to track implementation and respond to any inadequacies.

In Oregon, forestry and agricultural related nonpoint source best management strategies are implemented through the state Forest Practices Act and agricultural Water Quality Management Area Plans and Rules. In Sections 5.1.2 and 5.1.3, DEQ determined that ODF and ODA must also develop and implement TMDL implementation plans that describe strategies specific to the Miles Creeks Subbasin. This adds to the accountability for implementation of cost-effective and reasonable best management and further assures that antidegradation requirements and narrative criteria will be met.

Approximately 15 responsible persons including DMAs in Appendix A are responsible for implementation of pollutant reduction strategies. General timelines, milestones and measurable objectives are identified in Sections 3 and 4.2, respectively. More specific timelines, milestones and measurable objectives will be specified in each required implementation plan. Attaining the relevant water quality criteria are provided in Sections 3 and 4.2, respectively. These elements support timely action by both DEQ and other entities responsible for implementation so that enforcement and adaptive management actions can be triggered and evaluation of attainment of TMDL goals occurs.

DEQ periodically reviews reporting by persons and agencies responsible for implementing pollutant reduction strategies to track the management strategies being implemented and evaluate achievements against established timelines and milestones.

Following up on reviews to track progress of implementation plans, DEQ will take appropriate action if responsible persons, including DMAs, fail to develop or effectively implement their implementation plan or fulfill milestones. DEQ's actions can include enforcement or engagement in voluntary initiatives. DEQ uses both, as appropriate within the process, to achieve optimal pollutant reductions. In some cases, DEQ will also take enforcement actions where necessary based on authorities listed in Section 8 or raise the issue to the Environmental Quality Commission as provided in OAR 340-042-0080.

DEQ tracks water quality status and trends concurrently with implementation of management strategies. DEQ relies on a system of interconnected evaluations, which include responsible persons, including DMAs, meeting measurable objectives, effectiveness demonstration of pollutant management strategies, accountability of implementation, periodically assessing progress on Oregon's Nonpoint Source Program Five-Year Plan Goals (approved by EPA), discharge monitoring and instream monitoring. DEQ also periodically evaluates water quality data collected through ambient and specific monitoring programs. DEQ regularly prepares Status and Trends reports and conducts water quality assessments on status of all waterways in Oregon every two years, as required by the Clean Water Act for submittal to EPA for approval as DEQ's Integrated Report. Together, these data and evaluations allow refinement of focus on specific geographic areas or discharges and appropriate implementation of adaptive management actions to attain, over time, the objectives of the TMDL.

7.2 Reasonable assurance conclusions

DEQ's implementation approach is multi-faceted and requires many targeted management practices across the entire basin to reduce anthropogenic pollutants, regardless of source origination.

The management strategies and practices that must be employed to reduce excess solar radiation loading are spatially distributed and involve multiple responsible persons, including DMAs. Also, highly variable lag times are anticipated following the establishment of shade-producing vegetation to decrease solar radiation reaching streams. For these reasons, there is some uncertainty about the pace of achieving the needed reductions necessary in the Miles Creeks Subbasin to attain water quality criteria. DEQ's WQMP addresses this uncertainty by including an extensive monitoring, reporting, and adaptive component that is designed to match the accountability framework used by EPA in its Chesapeake Bay TMDL (2010).

The rationale described in this document stems from robust evaluations, implements an accountability framework and provides opportunities for adaptive management to maximize pollutant reductions. In addition, DMAs and other groups have been continuing to implement on-the-ground actions since the establishment of the 2008 Miles Creeks Subbasin TMDL. Together this approach provides reasonable assurance to meet state and federal requirements, including for antidegradation, and attain the goals of the TMDL.

8 Legal authorities

As required in Oregon Administrative Rule 340-042-0040(4)(l)(O), this section cites legal authorities relating to implementation of management strategies.

Clean Water Act, Section 303(d)

The DEQ is the Oregon state agency responsible for implementing the Clean Water Act in Oregon. Section 303(d) of the 1972 Federal Clean Water Act as amended requires states to develop a list of rivers, streams and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. These waters are referred to as “water quality limited.” Water quality limited waterbodies must be identified by the EPA or by a state agency which has this authority. In Oregon, the responsibility to delegate water quality limited waterbodies rests with DEQ and DEQ’s list of water quality limited waters is updated every two years. The list is referred to as the 303(d) list. Section 303 of the Clean Water Act further requires that TMDLs be developed for all waters on the 303(d) list. The Oregon Environmental Quality Commission granted DEQ authority to implement TMDLs through OAR 340-042, with special provisions for agricultural lands and nonfederal forestland as governed by the Agriculture Water Quality Management Act and the Forest Practices Act, respectively. The EPA has the authority under the Clean Water Act to approve or disapprove TMDLs that states submit. When a TMDL is officially submitted by a state to EPA, EPA has 30 days to take action on the TMDL. In the case where EPA disapproves a TMDL, EPA must issue a TMDL within 30 days. A TMDL defines the amount of pollution that can be present in the waterbody without causing water quality standards to be violated. A WQMP is developed to describe a strategy for reducing water pollution to the level of the load allocations and waste load allocations prescribed in the TMDL, which is designed to restore the water quality and result in compliance with the water quality standards. In this way, the designated beneficial uses of the water will be protected for all users.

Endangered Species Act, Section 6

Section 6 of the 1973 federal Endangered Species Act, as amended, encourages states to develop and maintain conservation programs for federally listed threatened and endangered species. In addition, Section 4(d) of the ESA requires the National Marine Fisheries Service to list the activities that could result in a “take” of species they are charged with protecting. With regard to this TMDL, NMFS’ protected species are salmonid fish. NMFS also described certain precautions that, if followed, would preclude prosecution for take even if a listed species were harmed inadvertently. Such a provision is called a limit on the take prohibition. The intent is to provide local governments and other entities greater certainty regarding their liability for take.

NMFS published their rule in response to Section 4(d) in July of 2000 (see 65 FR 42421, July 10, 2000). The NMFS 4(d) rule lists 12 criteria that will be used to determine whether a local

program incorporates sufficient precautionary measures to adequately conserve fish. The rule provides for local jurisdictions to submit development ordinances for review by NMFS under one, several or all of the criteria. The criteria for the Municipal, Residential, Commercial and Industrial Development and Redevelopment limit are listed below:

1. Avoid inappropriate areas such as unstable slopes, wetlands, and areas of high habitat value;
2. Prevent stormwater discharge impacts on water quality;
3. Protect riparian areas;
4. Avoid stream crossings – whether by roads, utilities, or other linear development;
5. Protect historic stream meander patterns;
6. Protect wetlands, wetland buffers, and wetland function;
7. Preserve the ability of permanent and intermittent streams to pass peak flows (hydrologic capacity);
8. Stress landscaping with native vegetation;
9. Prevent erosion and sediment run-off during and after construction;
10. Ensure water supply demand can be met without affecting salmon needs;
11. Provide mechanisms for monitoring, enforcing, funding and implementing; and
12. Comply with all other state and federal environmental laws and permits.

Oregon Revised Statute Chapter 468B

DEQ is authorized by law to prevent and abate water pollution within the State of Oregon. Particularly relevant provisions of this chapter include:

ORS 468B.020 Prevention of pollution

(A) Pollution of any of the waters of the state is declared to be not a reasonable or natural use of such waters and to be contrary to the public policy of the State or Oregon, as set forth in ORS 468B.015.

(B) In order to carry out the public policy set forth in ORS 468B.015, the Department of Environmental Quality shall take such action as is necessary for the prevention of new pollution and the abatement of existing pollution by:

a) Fostering and encouraging the cooperation of the people, industry, cities and counties, in order to prevent, control and reduce pollution of the waters of the state; and

b) Requiring the use of all available and reasonable methods necessary to achieve the purposes of ORS 468B.015 and to conform to the standards of water quality and purity established under ORS 468B.048.

ORS 468B.110 provides DEQ and the EQC with authority to take actions necessary to achieve and maintain water quality standards, including issuing TMDLs and establishing wasteload allocations and load allocations.

NPDES and WPCF Permits

DEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the NPDES permits for waste discharge into waters of the United States; and Water Pollution Control Facilities permits for waste disposal on land. The

NPDES permit is also a federal permit and is required under the Clean Water Act. The WPCF permit is a state program.

401 Water Quality Certification

Section 401 of the CWA requires that any applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the state must provide the licensing or permitting agency a certificate from DEQ that the activity complies with water quality requirements and standards. These include certifications for hydroelectric projects and for 'dredge and fill' projects. The legal citations are: 33 U.S.C. 1341; ORS 468B.035 – 468B.047; and OAR 340-048-0005 – 340-048-0040.

USACE Dam Operation and Management

In association with other federal statues, including House Document No. 531 Volume V, the River and Harbor Act, the Flood Control Act, and the Water Resources Development Act, the USACE is charged with operating its projects in compliance with the federal Clean Water Act, and in accordance with all federal, State, interstate and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water quality pollution as per Title 1 Section 313 (33 U.S.C. 1323).

Oregon Forest Practices Act

The Oregon Department of Forestry is the designated management agency for regulating land management actions on non-federal forestry lands that impact water quality (ORS 527.610 to 527.992, and OAR 629 Divisions 600 through 665). The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 625, 630, and 635-660, which describe best management practices for forest operations. The Oregon Environmental Quality Commission, Board of Forestry, DEQ, and ODF have agreed that these pollution control measures will primarily be relied upon to result in achievement of state water quality standards. Statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, OAR 629-035-0100, and OAR 340-042-0080.

Agricultural Water Quality Management Act

The Oregon Department of Agriculture is responsible for the prevention and control of water pollution from agricultural activities as directed and authorized through the Agricultural Water Quality Management Act, adopted by the Oregon legislature in 1993 (ORS 568.900 to ORS 568.933). It is the lead state agency for regulating agriculture for water quality (ORS 561.191). The Agricultural Water Quality Management Plan Act directs the ODA to work with local communities to develop water quality management plans for specific watersheds that have been identified as violating water quality standards and have agriculture water pollution contributions. The agriculture water quality management plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct the problems. Water Quality area rules for areas within the Miles Creeks Subbasin include OAR 603-095-0600 to 0660.

Local Ordinances

Local governments are expected to describe in their implementation plans their specific legal authorities to carry out the management strategies necessary to meet the TMDL allocations. If new or modified local codes or ordinances are required to implement the plan, the DMA will identify code development as a management strategy. Legal authority to enforce the provisions of a city's NPDES permit would be a specific example of legal authority to carry out specific management strategies.

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Appendix A: List of responsible persons, including designated management agencies

No.	Responsible persons, including designated management agencies	Type	Total Acres in Basin	Acres 150ft from stream centerline	Status	TMDL implementation plan needed?
1	U.S. Bureau of Land Management	Federal	3227	449	Existing	Yes
2	U.S. Forest Service Mt. Hood National Forest	Federal	56,108	7,494	Existing	Yes
3	U.S. Forest Service Columbia River Gorge National Scenic Area	Federal			New	Yes
4	Bonneville Power Administration	Federal	1	0	New	No
5	Oregon Department of Agriculture	State	199,072	25,983	Existing	Yes
6	Oregon Department of Fish and Wildlife	State	104	23	Existing	Yes
7	Oregon Department of Forestry	State	58,921	8,213	Existing	Yes
8	Oregon Department of State Lands	State	239	39	Existing	Yes
9	Oregon Department of Transportation	State	2353	212	Existing	Yes – for jurisdiction and activities not covered under the MS4 permit

10	Oregon Parks and Recreation Department	State	1,114	101	Existing	Yes
11	Wasco County	County	44,838	5397	Existing	Yes
12	Hood River County	County	3,678	397	Existing	No
13	City of Dufur	City	336	24	Existing	Yes
14	City of Mosier	City	213	19	Existing	Yes
15	City of the Dalles	City	3,959	128	Existing	Yes
16	City of Hood River	City	46		Existing	No
17	Northern Wasco County Parks and Recreation District	Special District			Existing	Yes
18	Port of Hood River	Special District	20		New	No
19	Port of The Dalles	Special District	91	14	New	Yes
20	The Dalles Irrigation District	Special District			New	No
21	Union Pacific Railroad	Private	471	46	New	No

Appendix B: Partial list of funding programs available in the Miles Creeks Subbasin

Program	General Description	Contact
Clean Water State Revolving Fund	Loan program for below-market rate loans for planning, design, and construction of various water pollution control activities.	DEQ
Conservation Reserve Enhancement Program (CREP)	Provides annual rent to landowners who enroll agricultural lands along streams. Also cost-shares conservation practices such as riparian tree planting, livestock watering facilities, and riparian fencing.	NRCS
Conservation Reserve Program (CRP)	Competitive CRP provides annual rent to landowners who enroll highly erodible lands. Continuous CRP provides annual rent to landowners who enroll agricultural lands along seasonal or perennial streams. Also cost-shares conservation practices such as riparian plantings.	NRCS
Conservation Stewardship Program (CSP)	Provides cost-share and incentive payments to landowners who have attained a certain level of stewardship and are willing to implement additional conservation practices.	NRCS
Drinking Water Source Protection Fund	These funds allow states to provide loans for certain source water assessment implementation activities, including source water protection land acquisition and other types of incentive-based source water quality protection measures.	OHA
Emergency Watershed Protection Program (EWP)	Available through the USDA-Natural Resources Conservation Service. Provides federal funds for emergency protection measures to safeguard lives and property from floods and the products of erosion created by natural disasters that cause a sudden impairment to a watershed.	NRCS
Emergency Forest Restoration Program (EFRP)	Available through the USDA-Natural Resources Conservation Service. Helps owners of non-industrial private forests restore forest health damaged by natural disasters.	USDA
Oregon 319 Nonpoint Source Implementation Grants	Fund projects that reduce nonpoint source pollution, improve watershed functions and protect the quality of surface and groundwater, including restoration and education projects.	DEQ

Environmental Quality Incentives Program (EQIP)	Cost-shares water quality and wildlife habitat improvement activities, including conservation tillage, nutrient and manure management, fish habitat improvements, and riparian plantings.	NRCS
Agriculture Water Quality Support Grant	Provides capacity to support voluntary agricultural water quality work in small watersheds and to meet the goals of the Agricultural Water Quality Management Area Plans and the SIA initiative.	ODA
Agricultural Conservation Easement Program (ACEP)	Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.	NRCS
Farm and Ranchland Protection Program (FRPP)	Cost-shares purchases of agricultural conservation easements to protect agricultural land from development.	NRCS, SWCDs, ODF
Federal Reforestation Tax Credit	Provides federal tax credit as incentive to plant trees.	Internal Revenue Service
Grassland Reserve Program (GRP)	Provides incentives to landowners to protect and restore pastureland, rangeland, and certain other grasslands.	NRCS
Landowner Incentive Program (LIP)	Provides funds to enhance existing incentive programs for fish and wildlife habitat improvements.	U.S. Fish and Wildlife Service
Oregon Watershed Enhancement Board (OWEB)	Provides grants for a variety of restoration, assessment, monitoring, and education projects, as well as watershed council staff support. 25 percent local match requirement on all grants.	OWEB
Oregon Watershed Enhancement Board Small Grant Program	Provides grants up to $10,000 for priority watershed enhancement projects identified by local focus group.	OWEB
Partners for Wildlife Program	Provides financial and technical assistance to private and non-federal landowners to restore and improve wetlands, riparian areas, and upland habitats in partnership with the U.S. Fish and Wildlife Service and other cooperating groups.	U.S. Fish and Wildlife Service
Public Law 566 Watershed Program	Program available to state agencies and other eligible organizations for planning and implementing watershed improvement and management projects. Projects should reduce erosion, siltation, and flooding; provide for agricultural water management; or improve fish and wildlife resources.	NRCS
Resource Conservation & Development (RC & D) Grants	Provides assistance to organizations within RC & D areas in accessing and managing grants.	Resource Conservation and Development

ODF Small Forestland Investment in Stream Habitat (SFISH) Grants	Provides funding for Small Forestland Owners (SFO's) to improve road conditions and stream crossings as part of forest operations.	ODF
State Forestation Tax Credit	Provides for reforestation of under-productive forestland not covered under the Oregon Forest Practices Act. Situations include brush and pasture conversions, fire damage areas, and insect and disease areas.	ODF
Forest Stewardship Program	Provides cost share dollars through USFS funds to family forest landowners to have management plans developed.	ODF
Western Bark Beetle Mitigation	ODF administers a cost share program for forest management practices pertaining to bark beetle mitigation for forest health and is funded through the USFS.	ODF
State Tax Credit for Fish Habitat Improvements	Provides tax credit for part of the costs of voluntary fish habitat improvements and required fish screening devices.	ODFW
Wetlands Reserve Program (WRP)	Provides cost-sharing to landowners who restore wetlands on agricultural lands.	NRCS
Wildlife Habitat Tax Deferral Program	Maintains farm or forestry deferral for landowners who develop a wildlife management plan with the approval of the Oregon Department of Fish and Wildlife.	ODFW
Funding Resources for Watershed Protection and Restoration	EPA's Funding Resources for Watershed Protection and Restoration (EPA, 2023) contains links to multiple funding sources	Various

Appendix C: Reservoirs in the Miles Creeks Subbasin TMDL project area

DEQ compiled this list of 6 reservoirs located within the Miles Creeks Subbasin temperature TMDL project area from the U.S. Army Corps of Engineers National Inventory of Dams (NID; USACE, 2025) database and a similar database maintained by the Oregon Water Resources Department, dam safety program (i.e. large dams 10 feet or higher, or store 9.2 acre-feet or more (OAR 690-020-0000)).

No.	Reservoir Name	NID/DAM ID	Owner Names	Owner Types	Primary Purpose	NID Reservoir Storage (Acre-Ft)	NID Height (Ft)
1	Crow Creek	OR00464	City of The Dalles	Local government	Water supply	1150	115
2	Ketchum	OR00189	William Ketchum, et al	Private	Recreation	160	38
3	Evans	OR00217	Kortge Brothers, LLC The Dalles, 97058	Private	Irrigation	135	14
4	Lake Camp Baldwin	OR02133	Boy Scouts of America, Portland 97201	Private	Recreation	49.1	25
5	Wolf Run Dam	OR04068		Private		35.5	29
6	Chase 1	OR01364	Alice Lindell	Private	Livestock	25	14

Appendix D: Summary table of required submittals for responsible persons, including DMAs

Responsible Persons, including DMAs	Required Implementation Plan Management and Monitoring Strategies	Required Submittals and Due Dates
U.S. Forest Service - Mt. Hood National Forest	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1) Water quality monitoring (status of stream temperature) (Sec. 6.3)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 18 months after EQC Adoption of Miles Creeks Subbasin TMDL - Project plan and description of the assessment methodology to be used to complete a shade gap analysis (Sec. 5.3.1.2) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Shade gap analysis (Sec. 5.3.1.2) - Streamside Evaluation (Sec. 5.3.1.1)
U.S. Forest Service - Columbia River Gorge National Scenic Area	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following

	Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1)	- Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Streamside Evaluation (Sec. 5.3.1.1)
U.S. Bureau of Land Management	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Streamside Evaluation (Sec. 5.3.1.1)
Oregon Department of Agriculture	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1) Water quality monitoring (status of stream temperature) (Sec. 6.3)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 18 months after EQC Adoption of Miles Creeks Subbasin TMDL - Project plan and description of the assessment methodology to be used to complete a shade gap analysis (Sec. 5.3.1.2) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Shade gap analysis (Sec. 5.3.1.2) - Streamside Evaluation (Sec. 5.3.1.1)

Oregon Department of Forestry	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1) Water quality monitoring (status of stream temperature) (Sec. 6.3)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 18 months after EQC Adoption of Miles Creeks Subbasin TMDL - Project plan and description of the assessment methodology to be used to complete a shade gap analysis (Sec. 5.3.1.2) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Shade gap analysis (Sec. 5.3.1.2) - Streamside Evaluation (Sec. 5.3.1.1)
Oregon Department of State Lands	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)
Oregon Department of Transportation	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1)

		5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)
Oregon Parks and Recreation Department	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Streamside Evaluation (Sec. 5.3.1.1)
Oregon Department of Fish and Wildlife	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)
Wasco County	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)

		- Streamside Evaluation (Sec. 5.3.1.1)
City of The Dalles	Vegetation, flow, channel strategies, where appropriate (Sec. 2.1.1-2.1.3) Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1) Effectiveness monitoring (status of shade gaps) (Sec. 5.3.1.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2) - Streamside Evaluation (Sec. 5.3.1.1)
City of Dufur	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)
City of Mosier	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)

Northern Wasco County Parks and Rec	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)
Port of The Dalles	Information sharing and outreach and education strategies (Sec. 2.1.6-2.1.7) Performance monitoring (status of implementation activities) (Sec. 5.3.3.1)	18 months after EQC Adoption of Miles Creeks Subbasin TMDL, and every 5 years following - Implementation plan or revised implementation plan (Sec. 5.3) 12 months after implementation plan approval, and every year following - Annual report (Sec. 5.3.3.1) 5 years after implementation plan approval, and every 5 years following - Year five review (5.3.3.2)