

## **CITY OF REDMOND STORMWATER MANAGEMENT ACTION PLAN (SMAP)—DRAFT PLAN 1.7.23**

### **SMAP Overview**

The City of Redmond selected Monticello Watershed in Northeast Redmond as its Stormwater Management Action Plan (SMAP) catchment area. The SMAP identifies actions to improve water quality and habitat conditions in Monticello Creek by addressing stormwater quality and quantity influences within Monticello Watershed. The City of Redmond SMAP is designed to satisfy provision S5.C.1.d.iii of the 2019 Western Washington Phase II Municipal Stormwater Permit (the NPDES permit). Following the requirements in the NPDES permit, this SMAP:

- Considered applications of actions within the following categories: a) stormwater facility retrofits; b) land management/development strategies and actions identified for water quality management; and c) customized implementation of programmatic actions such as IDDE field screening, source control inspections, stormwater facility inspections, maintenance, and education and outreach.
- Identifies potential actions within a near-term timeframe of 0-6 years and a longer timeframe of 7-20 years.
- Identifies alignment with, or needed changes to, established City long-range planning efforts.
- Identifies potential funding sources to implement SMAP actions.
- Includes the City's assessment of implemented activities and schedule for updates to the plan.

### **Selection of Monticello Watershed for the SMAP**

The City of Redmond 2013 Watershed Management Plan (WMP) identified Monticello Watershed as a “priority watershed” because Monticello Creek is in relatively good condition and will likely be more responsive to restoration activities than more heavily urbanized areas of Redmond. The City started developing the Monticello watershed restoration plan before the NPDES SMAP requirements went into effect. Redmond has also been working cooperatively with King County to address issues in the watershed that are outside of the City's limits.

In 2022, the City updated land use and stormwater characterizations for all of Redmond's 20 watersheds and re-examined the watershed prioritization as detailed in the 2013 WMP. The City used this re-evaluation process to satisfy the “Receiving Water Assessment” and “Receiving Water Prioritization” submittal requirements in section S5.C.1 of the Phase II Western Washington NPDES permit. The re-evaluation of the 2013 watershed prioritization confirmed the selection of Monticello Watershed as the “one high-priority catchment area” for which the City will create a stormwater action management plan.

### **Monticello Watershed Overview**

The Monticello Watershed is a 360-acre area located in the upper northeast corner of Redmond. Approximately 258 acres are within the City limits and 102 acres of the Upper Watershed are in unincorporated King County.

Monticello Creek is the name the City uses for the stream identified as Tributary 08-0119 in Washington State's stream identification system (Williams and Phinney 1975). The creek is classified as a Class II stream, meaning that it has “...salmonid fish use or the potential for salmonid fish use,” but is smaller than waterways such as nearby Bear Creek and the Sammamish River which qualify as “shorelines of the state” (RZC 21.64.020, City of Redmond 2021). Coho and cutthroat trout have been observed in lower portions of the stream's mainstem. Monticello Creek

flows east to Bear Creek, a salmon-bearing stream. The Monticello Watershed makes up approximately two percent of the greater Bear Creek Watershed.

A very small portion of the Monticello Watershed is within the City of Redmond's Critical Aquifer Recharge Area (CARA), an area subject to special drinking water protection provisions. Much of the watershed contains glacially derived tills soils that are infeasible for stormwater infiltration facilities. Areas lower in the Watershed near the Bear Creek floodplain, appear to contain outwash and alluvial soils that have a higher potential for infiltration.

Suburban single-family housing is the primary land use in Monticello Watershed. Other land uses include parks, schools, streets, and associated rights-of-way, stormwater infrastructure facilities and associated easements, native growth protection easements, and a small commercial area. Within City limits, Monticello Watershed has reached "built-out" conditions based on current zoning allowances, meaning that there are very few parcels expected to redevelop in the foreseeable future. A City of Redmond Planning Department study identified only three parcels out of 3377 within the City's portion of Monticello Watershed that are expected to redevelop by 2050 (Redmond 2020). Most of the development within the watershed occurred between the years 2000 and 2020.

Fifty-one percent of the watershed is served by flow control facilities that were built prior to 2010 flow control standards. In addition, 22 percent of the Watershed does not meet 2010 standards for basic treatment. Approximately 25 percent of the watershed is covered in land uses that have lower amounts of impervious area such as natural areas and parks, and the remaining 75 percent contains roads, residential plats, and other land uses with larger amounts of impervious area.

### **Biotic Integrity, Water Quality, and Hydrology**

Aquatic insect sampling has been consistently conducted at a site near the confluence of Monticello and Bear Creek since 2005. This monitoring indicates that the stream is in "fair" condition with current Benthic Index of Biotic Integrity (BIBI) scores between 40 and 60 out of 100.

From 2005 to 2016, the City also collected monthly water quality samples at additional sites also near the confluence of Bear Creek. The results from this sampling were evaluated using the Washington State Department of Ecology's Water Quality Index. The index characterizes water quality concerns in Monticello Creek as "low" or "moderate" for all but two of the years sampled. Fecal coliform counts, total nitrogen, and total phosphorus were the individual analytes most frequently listed as "moderate" or "high" reasons for concern. Other analytes generally were listed as "moderate" or "low" reasons for concern.

From 2015 to 2016, the City partnered with King County Natural Resources and Parks Division to conduct hydrologic modeling of Monticello Watershed. Modeling identified numerous stormwater detention facilities that were built to pre-2009 standards and illustrated that these older facilities led to an increase in the frequency of high-volume, high-energy flows to the stream during storm events. Such flows can scour the stream bed and banks, dislodge aquatic insects and salmon redds, and otherwise disrupt vital instream habitat.

An evaluation of water quality sampling results, land use considerations in the Watershed, and results from the modeling data, indicates that altered hydrology is the primary stressor to the biotic integrity in Monticello Creek. Stormwater management actions that reduce flashy, high-

flow discharges to Monticello Creek, provide the best opportunity to improve overall Monticello Watershed health by addressing the impact of stormwater influence on conditions in the creek. Actions that address water quality — street sweeping, maintenance activities, and educational source-control programs — will further support improvements to stream health and have been included in this Plan.

### **SMAP Development Process**

The City of Redmond Watershed Management Plan and Monticello Watershed Restoration Plan are foundational documents supporting this SMAP. These documents detail the scientific basis and methodologies used to analyze conditions in the Watershed. Results of analysis contained in these two plans are summarized in two products the City produced to meet the NPDES permit submittal requirements: 1) a characterization of conditions for all watersheds within Redmond and b) the prioritization of those watersheds based on that characterization. The City's [Redmond Watersheds webpage](#) contains links to Redmond's citywide Watershed Management Plan, the Monticello Watershed Restoration Plan, and the NPDES-required SMAP submittal documents.

Actions identified within this SMAP were identified and selected by an interdisciplinary Watershed Planning Team of consultants and City staff that included stormwater engineers, ecologists, geologists, planners, outreach specialists, and environmental scientists. The planning team evaluated existing information on environmental conditions in the watershed, conducted new field investigations and modeling analyses, and sought input from residents and other stakeholders. Using this information, the team identified key issues, identified potential actions to address them, and ranked the potential actions using criteria that acknowledge economic, social, and environmental considerations.

The planning team considered a wide array of actions. Certain actions such as enhanced IDDE screening and source control were deemed of less value relative to other actions, given that residential neighborhoods typically have a much lower pollutant loading rate when compared to other land uses. The team also found that land use measures designed to promote greater environmental protection as private properties redevelop are also less applicable to this watershed because of its limited potential for re-development (City of Redmond 2020).

The public has been invited to comment on updates to the Redmond Watershed Management Plan, the development of the Monticello Watershed Plan, and SMAP-related documents including the development of this Plan. During the development of the 2013 Redmond Watershed Management Plan, the City consulted with the Department of Ecology and the Muckleshoot Indian Tribe. Staff has also used the City's Environmental Sustainability Advisory Committee to gather input on updates and revisions to its watershed planning initiatives.

The following tables detail watershed restoration activities for Monticello Watershed in the near-term (0-6 years) and longer-term (7-20 years).

## Near-Term Actions (0-6 years)

Action Type	Potential SMAP Actions	Anticipated timeline (yr)	Anticipated funding source	Estimated Cost*	Affected City Plans/Program
Capital Improvement Project (CIP)	Whistler Ridge Pond Continuous Monitoring Active Control (CMAC) Retrofit Pilot Construction	Installed in 2021/22	Redmond SW Utility Funds	\$142,000	No change to Plans needed; Aligns with Environmental Sustainability Action Plan
CIP	Curry Ridge Pond CMAC Retrofit Pilot Construction	Installed in 2021/22	Redmond SW Utility Funds	\$142,000	No change to plans needed; Aligns with Environmental Sustainability Action Plan
CIP	Cogen Allen Pond CMAC Retrofit Pilot Construction	Installation scheduled 2023	Redmond SW Utility Funds	\$150,000	No change to plans needed; Aligns with Environmental Sustainability Action Plan
CIP	Wynstone Pond CMAC Retrofit Pilot Construction	Installation scheduled 2023	Redmond SW Utility Funds	\$150,000	No change to plans needed; Aligns with Environmental Sustainability Action Plan
CIP/Operations	Pond Large-Scale Sediment Removal Retrofit Program Development	2024-2028	SFAP Grant	\$350,000 for program development and a pilot project at one pond	Need to include this program in the City's Asset Management Program
Operations	Ongoing CMAC Operation and Maintenance	2023 - 2028	Redmond SW Utility Funds; Stormwater Capacity Grants	\$175,000 for 2023 to 2028 for all 4 CMAC ponds	No change to plans needed; Aligns with Environmental Sustainability Action Plan
Education	Adopt-A-Drain Program	2023-28	Redmond SW Utility Funds; Stormwater Capacity Grants	\$30,000 for 2023-28	No change to plans needed; Aligns with Utility Communication Plan
Education	Nature Vision Watershed Curriculum	2023-28	Utility Funds paid to Cascade Water Alliance (CWA) Fees	\$130,000 for 2023-2028	No change to plans needed; Aligns with Environmental Sustainability Action Plan
Land use/ Planning	Riparian Tree Planting as per City Tree Canopy Strategic Plan	2022-ongoing	\$150,000 every two years for projects Citywide	Amount earmarked for Monticello--TBD	No change to plans needed; Aligns with City Tree Canopy Strategic Plan; Aligns with Environmental Sustainability Action Plan
Land use/ Planning	Participation in King County CIP Planning and collaboration with King County CMAC Pilot Projects at Crown Heights and Wyndum Knoll Ponds.	2022-Ongoing; Installation scheduled 2023	King County Stormwater Utility Funds	\$500,000 budgeted for CMAC design, construction, and 2 years of operation	No change to plans needed; Aligns with King County Bear Creek Watershed Study

Evaluation	Redmond Paired Watershed Study (RPWS), including: --Curry CMAC Effectiveness Monitoring --Whistler Ridge CMAC Effectiveness Monitoring --Watershed Trend Analysis	2023-2024	SAM grant-- Redmond Paired Watershed Study	\$750,000 for WY 2023-2024 for the entire program throughout the City of Redmond	No change to plans needed; Aligns with Redmond Paired Watershed Study QAPP
Restoration	Ray Meadows Native Growth Protect Easement (NGPE) Restoration	2022 - 2028	Redmond SW Utility Funds; King Conservation District Member Grants	\$50,000	No change to plans needed; Aligns with Surface Water CIP prioritization process; 2019 Strategic Tree Canopy Plan; Aligns with Environmental Sustainability Action Plan
Restoration	Ray Meadows Stream Reach—large woody material placement (instream)	2022 - 2028	Redmond SW Utility Funds, King Conservation District Member Grants	\$25,000	
Restoration	Phase 1 116 <sup>th</sup> Wetland Restoration—native plant enhancement	2024 - 2028	Redmond SW Utility Funds	\$25,000	
Restoration	Wetland @ Avondale and 184 <sup>th</sup> Ave NE	2025-26	Redmond SW Utility Funds	\$25,000	
O &M	Enhanced Street Sweeping	2023-2028	Redmond SW Utility Funds	\$175,000 for 5 years at once a month; \$225,000 for 5 years at twice a month (assuming private contractor service)	
Operation and Maintenance/IDDE (O &M)	Inspection of Private Facilities Built Before 2010	2023-2024	Redmond SW Utility Funds	20 hours of additional staff time on years when inspections occur	Aligns with Environmental Sustainability Action Plan; No changes to City code needed

\*All costs are expressed as 2022 dollars

<b>Longer-Term Actions (7-20 years)</b>		
<b>Potential SMAP Actions</b>	<b>Cost estimate and anticipated funding source*</b>	<b>Affected City Plans</b>
116th Wetland mitigations and stream enhancement	\$250,000 of mitigation funds associated with 116 <sup>th</sup> Street upgrades; Redmond General Fund	Aligns with Redmond Transportation Master Plan
Pond Large-Scale Sediment Removal Retrofit Program Implementation	\$1,000,000 over 13 years Redmond SW Utility Funds; SFAP Grant (\$250,00 per pond)	Include as part of the Asset Management Program
Continued Tree Planting as per City Strategic Tree Canopy Plan	\$150,000 every two years Citywide, Redmond General Fund/KCD funds	No change to plans needed; Aligns with City Canopy Strategic Plan
Cogen Allen Pond, Wynstone Pond, Whistler Ridge Pond, Curry Pond CMAC Operation, Subscription, and Adaptive Management	\$500,000 for 2028-2041 Redmond SW Utility Funds; Stormwater Capacity Grants	No change to plans needed; Aligns with Environmental Sustainability Action Plan
Continued Enhanced Street Sweeping	\$430,00 total for sweeping once per month or \$585,000 for sweeping twice monthly from 2028-2041; Redmond SW Utility Funds/Stormwater Capacity Grants	No change to plans needed; aligns with Environmental Sustainability Action Plan

\*All costs are expressed as 2022 dollars

### **Program Assessment and Adaptive Management**

Evaluation of actions implemented to date and near-term actions detailed in the SMAP will include confirming when activities have been implemented, and effectiveness monitoring conducted as part of the Redmond Paired Watershed Study (RPWS). The RPWS is a study funded by the Stormwater Action Monitoring Group that is designed to evaluate the effectiveness of watershed restoration efforts in two watersheds within Redmond. Monticello is one of these two watersheds. Information from this study will be particularly useful in managing CMAC facilities. With the anticipated end of the RPWS effectiveness monitoring program, the City is now re-configuring its staff-run surface water quality monitoring efforts and is slated to develop the Quality Assurance Project Plan (QAPP) in 2023.

The foundation documents that support this SMAP—the City Watershed Management Plan and the Monticello Watershed Restoration Plan-- are slated for periodic updates every 5-10 years. These updates will provide an opportunity for a systematic review and update of the SMAP document to determine what changes should be incorporated to improve stormwater management in Monticello Creek Watershed.

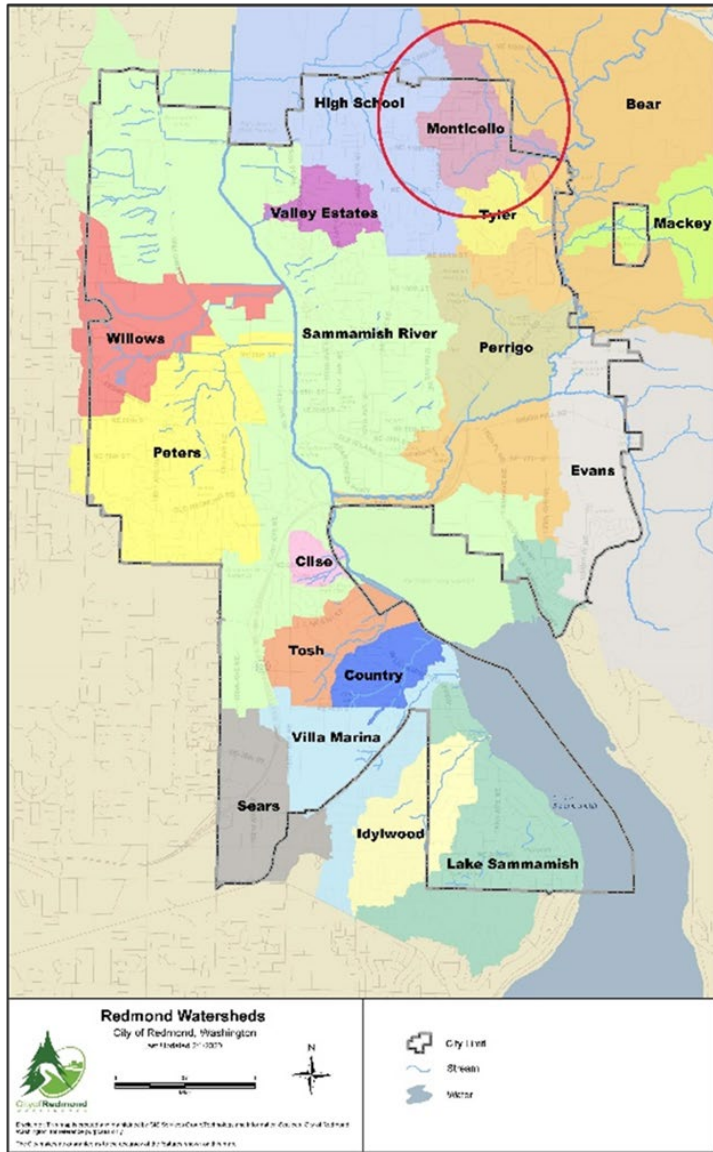


Figure 1: Monticello Watershed Location in the City of Redmond

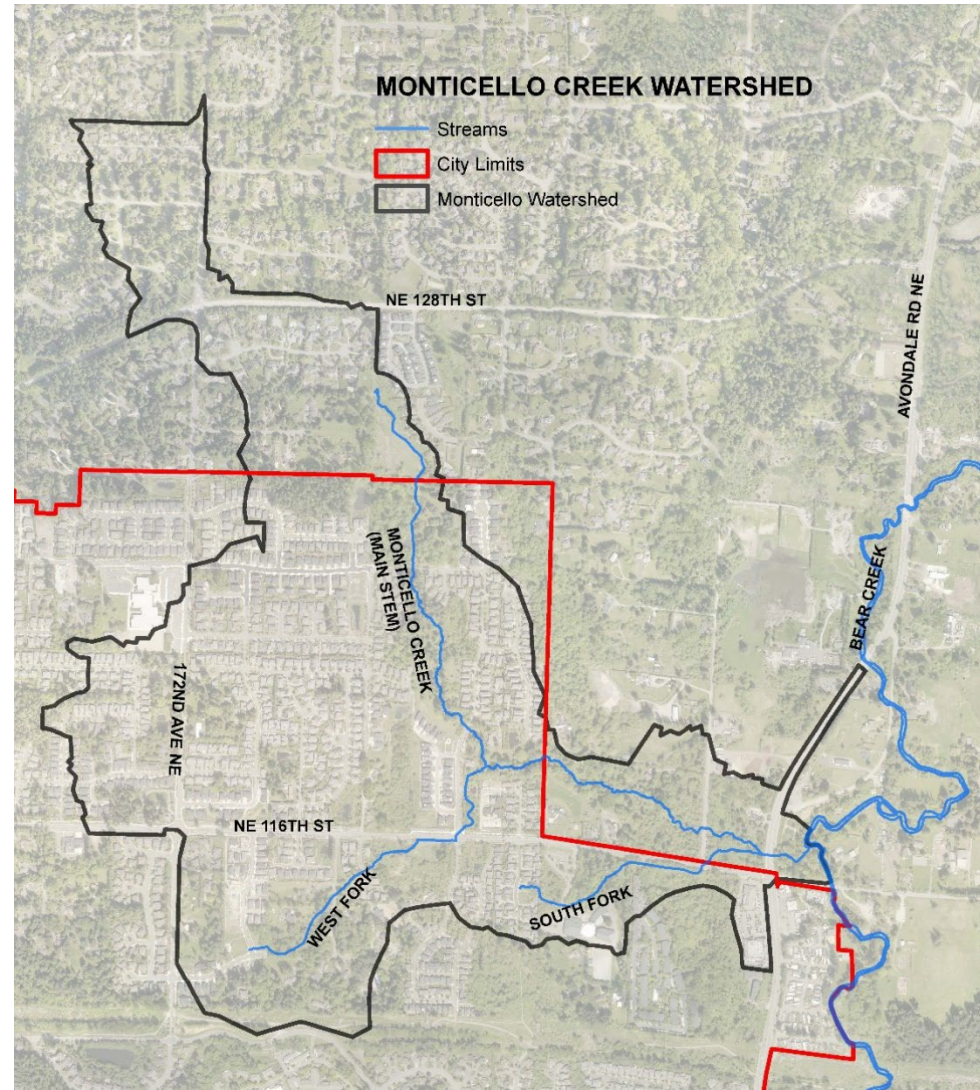
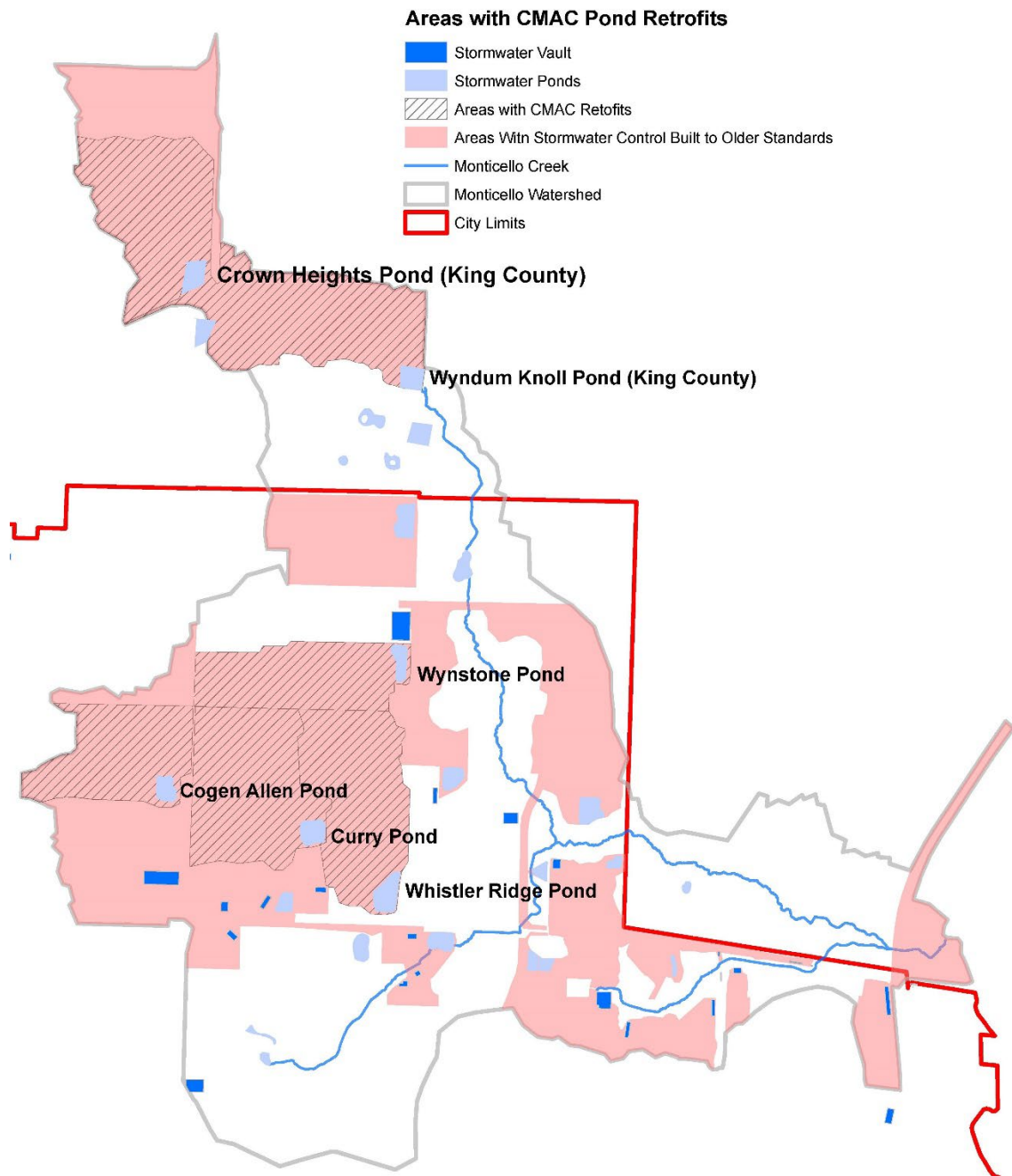


Figure 2: The three tributaries of Monticello Creek, confluence with Bear Creek, and major roads in the watershed.



**Figure 3: Continuous Monitoring Adaptive Control (CMAC) Stormwater Facility Retrofits.**

CMAC technology uses cloud-based software to monitor water levels in stormwater detention facilities and adjust an actuated valve placed on the facility's outfall to better control the release of stormwater. This optimizes storage capacity within a facility's existing footprint.

The City has installed two of these facilities in Monticello Creek Watershed. The City and King County will each place two additional facilities—for a total of six within the watershed. The RPWS will evaluate CMAC's ability to reduce high-energy, flashy discharges from these facilities.



## References

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