

City of Bellevue Watershed Management Plan



Coal Creek Watershed Assessment Report

EXECUTIVE SUMMARY



Purpose of This Assessment

The purpose of this report is to assess the conditions in the Coal Creek Watershed that are limiting the health of its streams. The evaluation of potential limiting factors from the Conceptual Model that describes the primary effects of urban runoff on streams (brown boxes in Figure 1, next page) and their consequences for stream health.

The City is preparing a series of watershed assessment reports (ARs) that will provide the basis for the recommended actions to improve stream health culminating into a city-wide Watershed Management Plan (WMP). One Watershed Assessment report will be prepared for each of the City of Bellevue's (City) major watersheds: Coal Creek, Greater Kelsey Creek, the Lake Sammamish tributaries within Bellevue (including Lewis Creek), and the small Lake Washington tributaries within Bellevue.

In addition to the watershed assessment, each report will include limiting factors, data gaps (if any), and identified opportunities for improving in-stream conditions. The Watershed Assessments are based on data from three primary sources: 1) A recent Open Streams Condition Assessment performed by the City (2018-2020); 2) Existing data collected by the City from past projects and ongoing monitoring efforts; and 3) Existing project and environmental monitoring data collected by a variety of public resource agencies.

Description and History of the Coal Creek Watershed

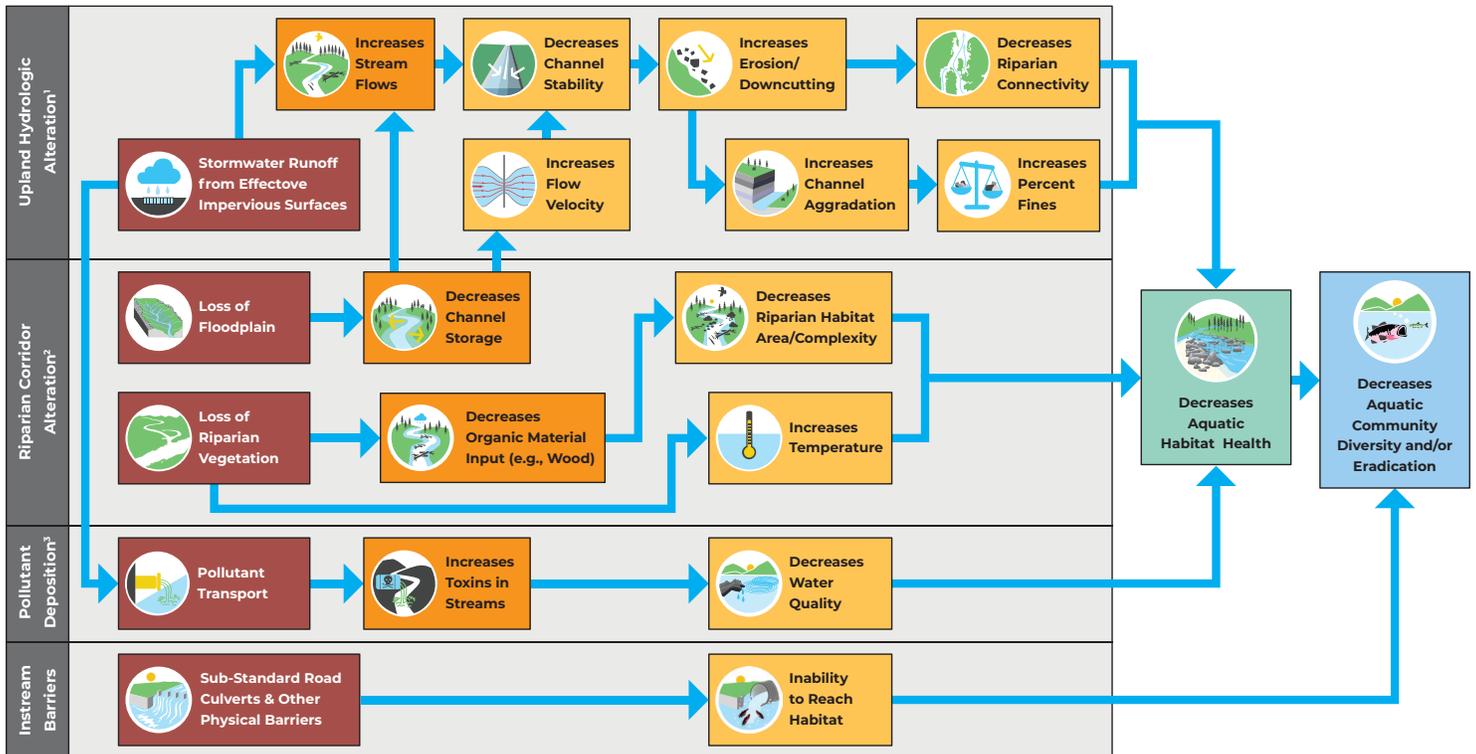
The headwaters of Coal Creek originate in the steep terrain of Cougar Mountain at an elevation of about 1,400 feet. The creek flows for about seven miles through a series of steep, narrow ravines before entering Lake Washington. The Coal Creek Watershed encompasses a total area of approximately 4,550 acres, with 63 percent of this area located within the City of Bellevue and the remainder is within King County and the City of Newcastle.

The geology of the Coal Creek Watershed is primarily sedimentary deposits that overlay bedrock, yet there are many locations within the middle and upper portions of the watershed with exposed bedrock which is fairly unique for Bellevue streams. The coal beds and seams for which the watershed is named, formed within organic material that was deposited between 56 to 33.9 million years ago. These coal beds and seams can extend 1,500 feet below the ground surface.

Naturally erosive and unstable soil conditions have been exacerbated by past logging and nearly a century of coal-mining activities that began in the late 1860s. The legacy of this coal mining includes channelized portions of streams and some destabilized hillslopes. Mine tailings were disposed along the streambanks and within the canyon at the historic Cinder Mine, located approximately a mile downstream of Lakemont Boulevard.

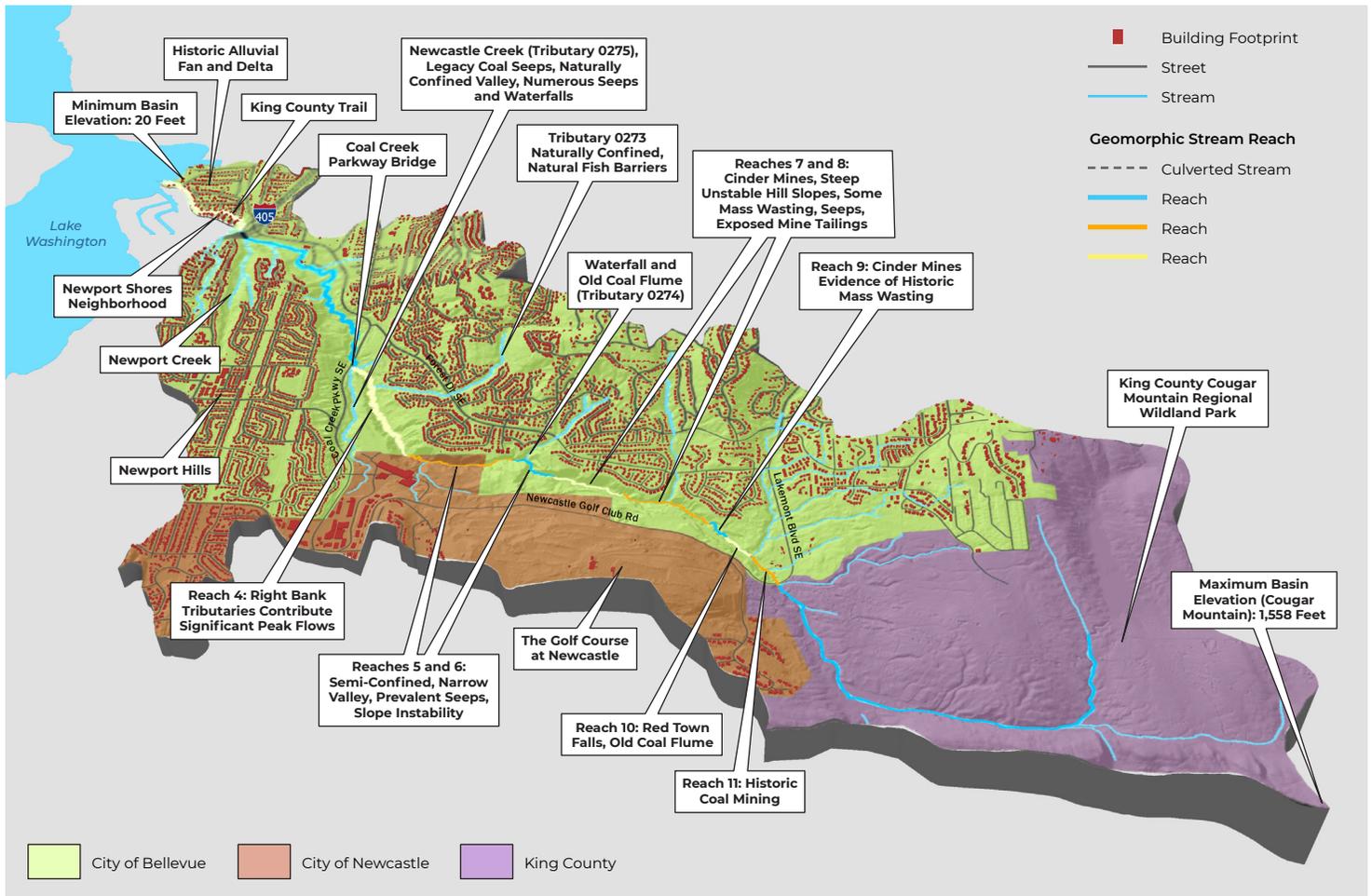
The riparian corridor of Coal Creek has been designated as a priority habitat by the Washington State Department of Fish and Wildlife. Several rare and sensitive species with special status have been documented within the Coal Creek Watershed. The aquatic habitat in the Coal Creek Watershed, with a largely intact riparian corridor, has significant potential to support salmonids. Several factors, however, such as uncontrolled stormwater runoff, high rates of sediment loading and sedimentation, and limited off-channel habitat, are severely limiting that potential.

Figure 1. Conceptual Model of the Major Unmanaged Effects of Urbanization on Stream Health



1 = Conversion of upland forest/ other vegetated areas to: Impervious areas (roads, roofs, sidewalks, driveways, parking lots, sport courts) that drain to streams
 2 = Removal of vegetation, paving, and armoring of riparian corridor
 3 = Vehicle deposits on roads and other impervious surfaces (petroleum products, antifreeze, brake and tire residue, etc.)
 - Releases from septic tanks/drain fields regulated by King County Public Health
 - Releases categorized as "Illicit Discharges" (illegal dumping, misuse of herbicides/ pesticides/ other chemicals, accidental spills, etc.) regulated by COB Phase II NPDES program

Figure 2. Features of the Coal Creek Watershed



Since 1988, well-trained and committed City of Bellevue Stream Team volunteers have monitored streams in the Coal Creek Watershed, visiting each site twice a week from September through December, and reporting when, where, and what type of salmon are sighted. From 1997 to 2015, volunteers with the King County Salmon Watcher Program recorded salmon observations at various locations along the mainstem of Coal Creek. They consistently observed Coho, Chinook, and Sockeye salmon. Beginning in the late 2000's, the City of Bellevue implemented weekly surveys throughout the salmon spawning season in the lower and middle reaches of the mainstem to document spawning activity and location of salmon redds (or nests) in Coal Creek.

The earlier survey results suggest that adult salmonids (primarily Coho Salmon and adfluvial Cutthroat Trout) were returning to spawn in relatively low numbers. Data from 2008 to the present suggest that, in conjunction with fish passage improvements, Chinook and Coho utilization of Coal Creek spawning habitat is increasing.

Past and Present Investments in the Coal Creek Watershed

The City and King County collaborated on a Coal Creek Basin Plan (published in 1987), which identified needs of the then largely unincorporated Coal Creek Watershed. In addition to the improvements implemented from the 1987 Plan, the City has invested tens of millions of dollars in the Coal Creek Watershed over the past 15 years on projects that include repairing stormwater outfalls, stabilizing stream slopes, removing fish passage barriers, catching and removing large amounts of transported sediment (on a regular basis), and improving conveyance to reduce flooding.

Factors that Limit the Health of the Coal Creek Watershed

The following were identified as limiting factors for the Coal Creek Watershed per the Conceptual Model (Figure 1), in general order of importance:

1. Stormwater Runoff from Impervious Surfaces:

Increased stormwater runoff flow rates and volumes during storm events from impervious surfaces in the watershed, in combination with historic channel alterations from logging and coal mining land uses, are contributing to negative effects on fish & wildlife habitat. As shown in Figure 1, these effects can include channel, bank, and slope instability. These effects are noticeable in the middle and upper reaches of Coal Creek. The majority of the development in the Coal Creek Watershed was built prior to the requirement for stream protection-based stormwater controls. Changes in rainfall patterns in the region may also be contributing to increased effects of stormwater runoff on stream health.

2. Loss of Floodplain: Urban development in the middle and lower reaches of the watershed has largely confined Coal Creek to its channel and limited any interaction with its historic floodplain. This artificial confinement has significantly reduced floodplain connectivity and thereby reduced access to flood, sediment, and nutrient storage within the floodplain.

3. Pollutant Transport: Even though three segments of Coal Creek are identified as “impaired” water bodies by the Department of Ecology, the computed Water Quality Index (WQI) scores from the available data generally indicate water quality is a “moderate concern.” Stormwater runoff from impervious surfaces (limiting factor #1) causes erosion from higher flows, and transports pollutants (metals, nutrients, fecal coliform, and others) associated with urban development that are detrimental to the health of aquatic organisms. Approximately 97 percent of the developed area within the Bellevue portion of the watershed does not include treatment of stormwater runoff based upon an analysis of age of development and the associated stormwater requirements at the time of that development that are detrimental to the health of aquatic organisms.



4. Loss of Riparian Vegetation: The tree canopy in the Coal Creek Watershed is largely concentrated in the Cougar Mountain Regional Wildland Park (outside of Bellevue) and Coal Creek Park and Natural Area (within Bellevue) which spans the riparian corridor down to the point where it intersects Interstate Highway 405. The riparian canopy vegetation is primarily deciduous and more coniferous canopy is needed to promote riparian diversity and habitat. Given that the riparian corridor is relatively intact, loss of riparian vegetation is likely a less constraining limiting factor relative to those identified above.

5. Sub-Standard Road Culverts and Other Physical Barriers: Although a number of physical barriers to fish passage have been identified in Coal Creek, removal of these barriers would only provide substantial benefit once the quality of physical habitat in upstream reaches constrained by the aforementioned limiting factors can be improved. Efforts to improve fish passage should be focused on City of Bellevue and private infrastructure downstream of Reach 6 to prioritize access to migratory salmonid species.

¹ Waters whose beneficial uses (such as for drinking, recreation, aquatic habitat, and industrial use) are impaired by pollutants.