

APPENDIX A
TECHNICAL MEMORANDUM

Ecological Inventory and
Characterization of Existing and
Historical Conditions within the
Bel-Red Land Use Area

Prepared for

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Introduction

This technical memorandum presents the results of a preliminary natural resource inventory and characterization of the Bel-Red Corridor land use area within the city of Bellevue, Washington. The purpose of this memorandum is to identify historic and existing ecologically sensitive areas that could be integrated and/or rehabilitated as part of land use redevelopment plans in the future. The resources identified in this memorandum will be further investigated and characterized in a subsequent phase of the Bel-Red Corridor Study that will focus on opportunities and constraints for rehabilitating natural resources. Specific recommendations for natural resource rehabilitation projects will be developed in conjunction with the City of Bellevue.

Project Location and Size

The Bel-Red Corridor study area is located in the city of Bellevue and is bordered by Interstate 405 on the west, State Route 520 on the north, 148th Avenue NE on the east, Bel-Red Road on the southeast, and a small segment of NE 8th Street on the south. The study area is approximately 826 acres.

Methods

An inventory and assessment of ecologically sensitive areas was conducted through a combination of field visits, aerial photo interpretation, and compiling existing natural resource inventories. Existing inventories were compiled from King County, City of Bellevue, USFWS National Wetland Inventory, and StreamNet. Current and historic aerial photographs were used to help determine rehabilitation potential. Historic photos from 1944 and 1965 were assessed. The attached Figure 1 is a 1965 photo of the study area with current inventories of streams, wetlands, and roads overlaid.

Bel-Red Corridor Historic and Existing Conditions

In 1944, major roads were in place within the Bel-Red Corridor study area including Northrup Way and Bel-Red Road, but I-405 and SR 520 had not yet been developed. Large contiguous patches of upland forest were scattered throughout the study area, but to a large extent forest had been cleared for agriculture. By 1965, the conversion of agricultural land to commercial buildings had begun.

Between 1965 and 2005, commercial development continued and today the study area consists primarily of impervious surfaces composed of industrial/commercial buildings, parking lots and roads. Large warehouses and distribution centers are common. In addition, there are many car

dealerships, auto repair businesses, and retail centers. Within this urban matrix, open space is rare consisting of a single park, small wetlands, a lake, and narrow riparian areas surrounding segments of open stream channels. In addition, some small patches of coniferous forest or occasional mature trees remain on commercial properties.

Bel-Red Corridor Drainage Basins

From west to east, the Bel-Red Corridor study area consists of six drainage basins including the Sturtevant Creek Basin, West Tributary Basin, Goff Creek Basin, and Kelsey Creek Basin, Valley Creek Basin, and Sears Creek Basin. The following sections present ecologically sensitive areas associated with these drainage basins and associated stream systems that traverse the study area. For each basin, discussions are provided on existing conditions, historic conditions, and rehabilitation potential. Streams generally flow south through the study area and eventually drain to Kelsey Creek, which is tributary to Lake Washington. Sensitive areas are mapped on the attached Figure 2. Also attached is a photograph log and photos of ecologically sensitive areas.

Sturtevant Creek Basin: Lake Bellevue (a.k.a., Lake Sturtevant) and Sturtevant Creek

Existing Conditions

Lake Bellevue is located in the southwest portion of the study area. Lake Bellevue is a small lake of approximately 9 acres. Sturtevant Creek outlets from the west side of the lake, then flows south along a narrow upland forested riparian area on the east side of railroad tracks. The stream enters a pipe upstream of NE 8th Street and flows south outside of the study area.

Lake Bellevue has multi-family residences and commercial buildings built on piers around the entire lake edge. Parking lots surround the shoreline. The lake has very little shoreline vegetation.

Historic Conditions

In 1944, the area surrounding Lake Bellevue (then known as Sturtevant Lake) was used for agricultural with the exception of the railway along the west shore. In 1965, agricultural practices had been abandoned and replaced with commercial buildings.

Rehabilitation Potential

Lake Bellevue and Sturtevant Creek offer minimal rehabilitation potential because of the highly developed nature of the lake and railroad directly adjacent to Sturtevant Creek.

According to the City of Bellevue, fish do not occur within Sturtevant Creek upstream of Interstate 405 which includes the segment of stream within the Bel-Red Corridor study area. To

justify rehabilitation measures within the study area, fish passage improvements would be necessary under I-405.

West Tributary Basin: West Tributary of Kelsey Creek

Existing Conditions

The West Tributary of Kelsey Creek starts in the northwest portion of the study area and flows southeast eventually crossing Bel-Red Road. The west tributary has two large riparian wetlands within the study area located upstream of 120th Avenue NE and upstream of 127th Place NE. The 120th Avenue NE wetland is a forested wetland with areas of permanent flooding. The 127th Place NE wetland with open water, braided channels, emergent, shrub, and forested communities. Both wetlands provide high-quality habitat for fish and wildlife.

Between these two wetlands, the West Tributary largely flows through a low-gradient, open channel, within a narrow shrub or forested upland riparian corridor. Culverts convey flow under roadways. Downstream of 127th Place NE, the West Tributary is entirely piped within the study area. Surface flow starts again within a wetland downstream of Bel-Red Road.

Historic Conditions

In 1944 and 1965 the riparian corridor associated with the West Tributary was much wider than it is today and included a combination of native forest and agricultural land. In 1965, commercial development had begun to encroach on the riparian corridor. There were very few roads that bisected the stream corridor.

Rehabilitation Potential

The West Tributary offers excellent rehabilitation potential because the stream remains largely within surface channels and two high quality wetlands remain. The extended length of piped stream at the southern portion of the study area could be restored to a surface channel. In addition, throughout the study area the riparian area adjacent to stream and wetlands could be widened and planted with native vegetation. Many portions of the stream channel are in need of habitat enhancement and erosion protection.

According to the City of Bellevue, fish are absent upstream of NE 8th Street within the West Tributary. To justify rehabilitation measures within the study area, fish passage improvements would be necessary underneath NE 8th Street or further downstream in the system.

Goff Creek Basin

Existing Conditions

Goff Creek traverses the middle of the study area flowing from north to south. The stream consists largely of low-gradient, surface channels in the northern portion of the study area, west of 132nd Avenue NE and is piped through the southern study area east of 132nd Avenue NE. Segments of open channel are typically narrow resembling a ditch more than a natural stream. In

places the banks have been armored with riprap to prevent erosion. The vegetated riparian corridor is typically narrow and consists of lawn or sparsely planted pine and fir trees.

Stream and riparian conditions on the west side of 132nd Avenue NE in this segment consist of a native plant community with mature forested canopy and shrub understory. This stream segment contains natural features such as meanders, spawning gravels, and woody debris.

Historic Conditions

In 1944 and 1965, there was only a narrow forested riparian corridor along much of Goff Creek, but there were forested corridors extending away from the stream to other patches of forest. Agriculture was responsible for clearings and encroachment on the native riparian corridor.

Rehabilitation Potential

The relatively undisturbed segment of Goff Creek in the middle of the study area is a good example of what the stream and riparian corridor could look like if other stream segments were restored. The piped segment at the southern portion of the study area could be converted back to a surface channel. In addition, throughout the study area the riparian area adjacent to stream and wetlands could be widened and planted with native vegetation. Many portions of the stream channel are in need of habitat enhancement and erosion protection.

Fish would benefit from rehabilitation measures immediately because according to the City of Bellevue, Goff Creek supports cutthroat trout throughout the entire length of stream.

Kelsey Creek Basin: Unnamed Tributary to Kelsey Creek

Existing Conditions

An unnamed tributary to Kelsey Creek is located between Goff Creek and Valley Creek. The low-gradient stream originates south of Northup Way and flows south, eventually crossing Bel-Red Road and entering Kelsey Creek. The stream is piped between Northup Way and 136th Place NE, and then emerges as a surface channel with many culverts under driveways and roadways.

In the upstream segments, the stream channel is swale-like and contains wetlands. Within most of the study area, the stream channel resembles a straight ditch with riprap-armored banks. The vegetated riparian corridor is typically very narrow and shrub dominated. A short segment at the southern limits of the study area has a mature forested canopy, but the understory is largely invasive blackberry and ivy.

Historic Conditions

In 1944 and 1965, the unnamed tributary to Kelsey Creek had the same road crossings at 136th Place NE and NE 16th Street, but there were not driveways or parking lots between. A forested riparian corridor existed along most of the stream.

Rehabilitation Potential

Unlike the West Tributary and Goff Creek, this unnamed tributary to Kelsey Creek is in close proximity to Kelsey Creek on the south side of Bel-Red Road. Anadromous fish (i.e., salmonids) are documented within Kelsey Creek south of Bel-Red Road. Rehabilitation efforts on the unnamed tributary could involve restoring salmonid access and habitat. However, extensive rehabilitation efforts would be necessary because the area surrounding the stream is highly developed.

Valley Creek Basin

Existing Conditions

Valley Creek traverses the eastern portion of the study area flowing from north to south. The low-gradient stream enters the study area south of SR 520 and roughly parallels the east side of 140th Avenue NE. The entire segment of Valley Creek within the study area is mapped as containing anadromous fish. The stream is largely an open channel with very few culverts or pipes.

Most of the channel is in good condition and has diverse habitats consisting of wetlands, glides, riffles, and pools. Riffles contain good spawning gravels. Unlike other streams in the study area, Valley Creek's channel is meandering and braided. Portions of the channel have been recently restored and include installations of large woody debris. The vegetated riparian corridor is typically narrow, but includes portions of mature forested canopy.

Historic Conditions

Between 1944 and 1965 the riparian corridor had not changed significantly. During this time, the forested riparian corridor is narrow with adjacent agricultural lands.

Rehabilitation Potential

A segment of stream channel in the south portion of the study area is in need of rehabilitation. This segment is ditched with riprap-armored banks and little to no vegetated riparian buffer. Further upstream, the stream channel is in good condition, but the vegetated riparian corridor could be widened and planted with native vegetation.

Fish would benefit from rehabilitation measures immediately because according to the City of Bellevue, Valley Creek supports cutthroat trout throughout the Bel-Red Corridor study area and upstream of the study area.

Sears Creek Basin

Existing Conditions

Sears Creek traverses the far eastern portion of the study area. Unlike the other streams, this stream flows from southeast to northwest, entering Valley Creek near the intersection of NE 21st

Street and 140th Avenue NE. There are two long segments of piped stream. The open segments of stream channel are a combination of low-gradient in the west and steep ravine in the east.

The segment of channel between the piped segments is in good condition and has diverse habitats consisting of pools, riffles, and glides. Riffles contain good spawning gravels. This segment also meanders. The vegetated riparian corridor is narrow, but includes mature forested canopy.

Historic Conditions

Between 1944 and 1965 the riparian corridor had not changed significantly. During this time, the forested riparian corridor is narrow with adjacent agricultural lands.

Rehabilitation Potential

A long, straight segment of stream channel parallel to NE 21st Street is in need of rehabilitation. This segment of stream is ditched with riprap-armored banks. This segment has little to no vegetated buffer.

The entire tributary offers an excellent opportunity for anadromous fish spawning habitat, especially because of the anadromous fish presence in Valley Creek and Sears Creek. High concentrations of gravel were observed within segments of the stream channel. Piped segments of channel could be converted back to surface channels and the riparian corridor could be widened and planted with native vegetation.

FIGURES

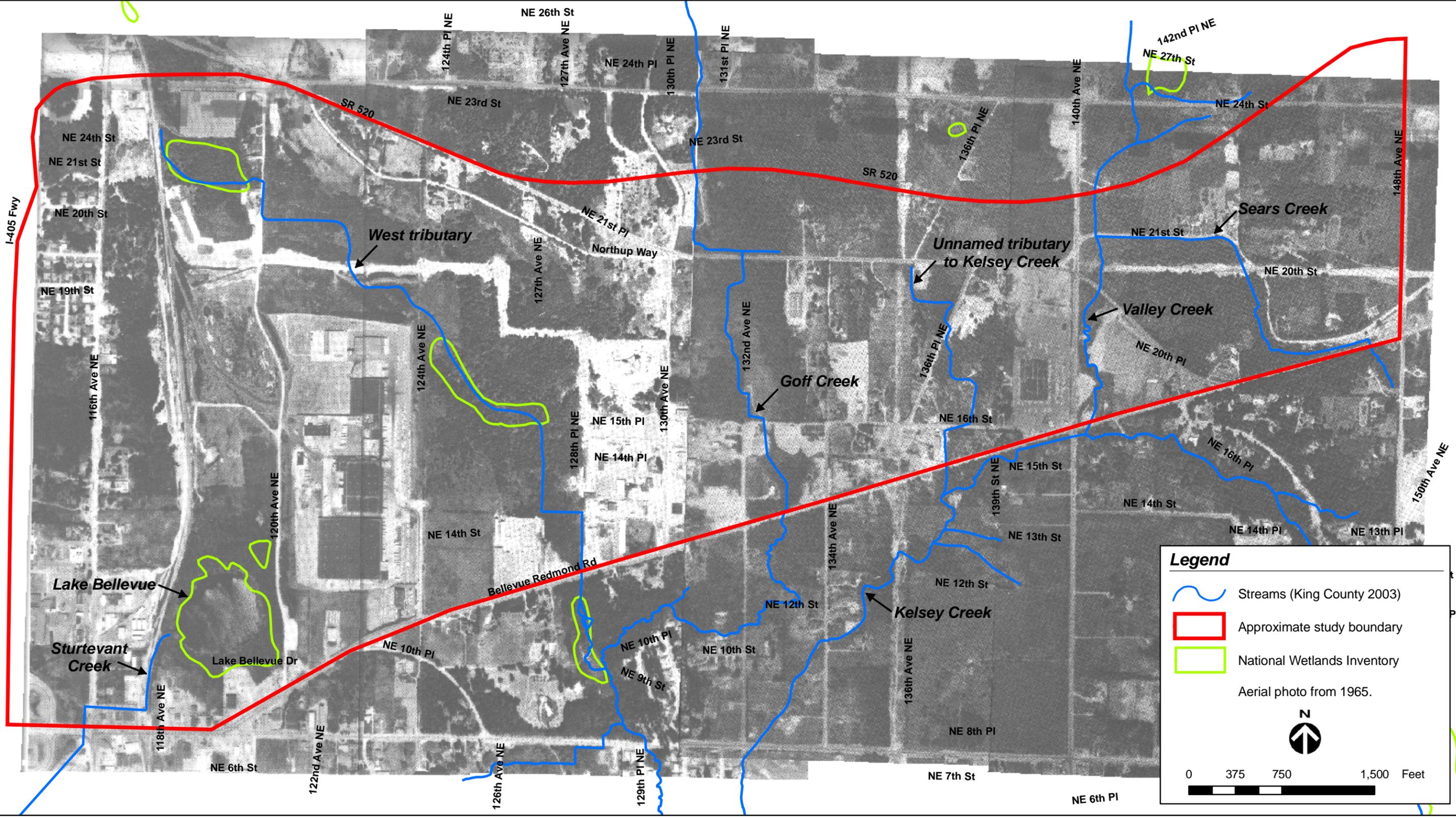


Figure 1. 1965 aerial photo of the Bellevue-Redmond Road study corridor.

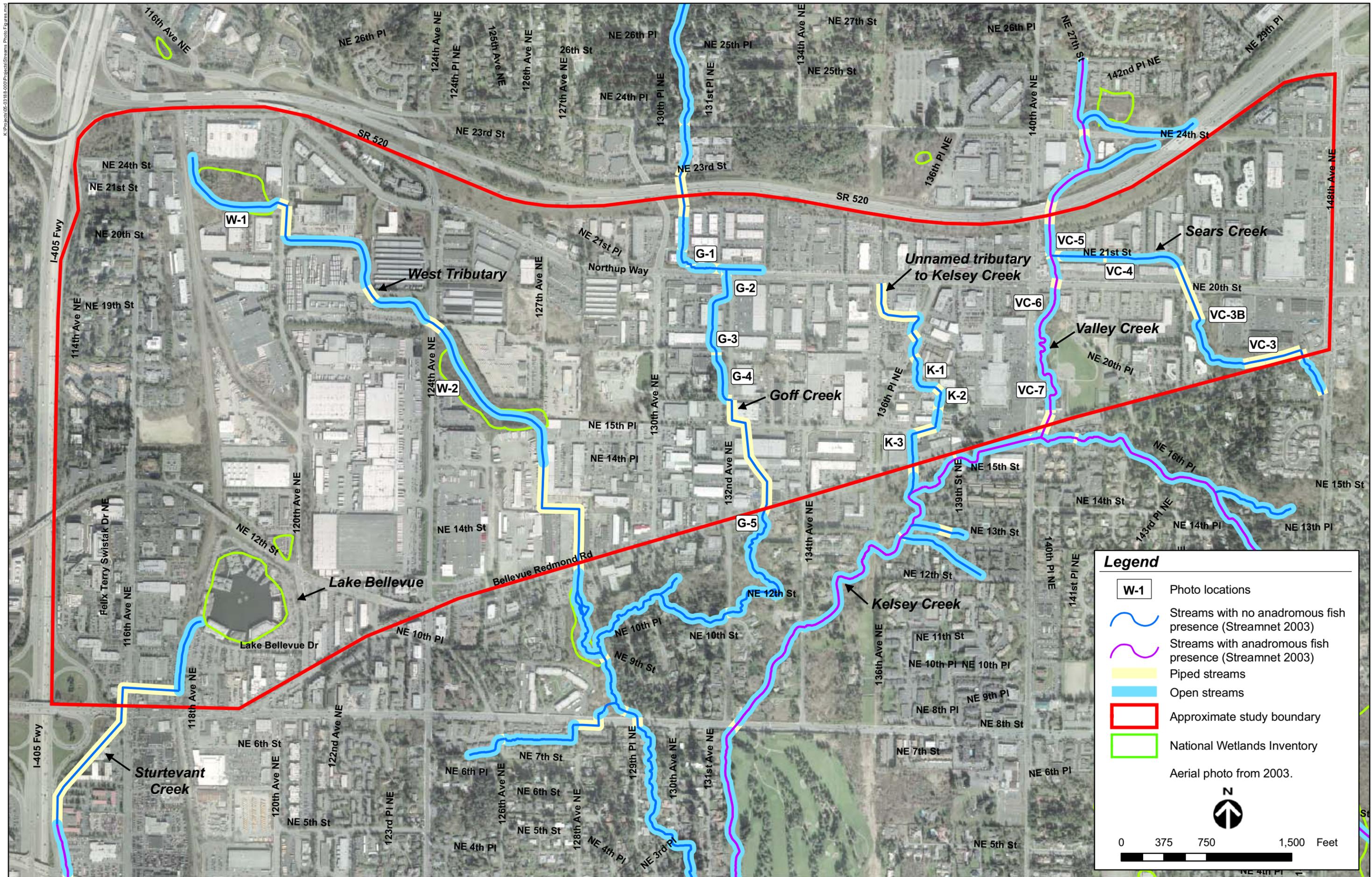


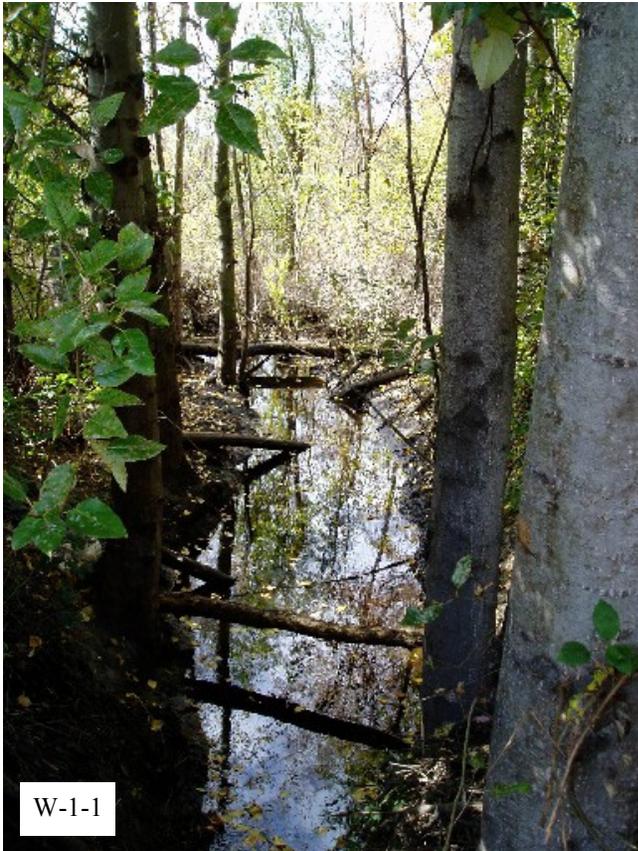
Figure 2. 2003 aerial photo of the Bellevue-Redmond Road study corridor.

ATTACHMENT A

Photographic Documentation

Bel-Red Road Land Use Photographic Log

Creek	Site	Picture ID	Notes
West Tributary Creek	W-1	W-1-1	Looking upstream from 120 th Avenue NE culvert to eroded stream channel
West Tributary Creek	W-2	W-2-1	View of wetland area from right bank side of parking lot
Goff Creek	G-1	G-1-1	Looking upstream at grass-lined, ditched creek
Goff Creek	G-2	G-2-1	Looking upstream at armored creek through Harley Davidson's property
Goff Creek	G-3	G-3-1	Looking downstream at armored creek behind parking lots
Goff Creek	G-4	G-4-1	View upstream of natural channel through maintained, native vegetation
Goff Creek	G-5	G-5-1	View upstream of channel behind office park
Tributary to Kelsey Creek	K-1	K-1-1	View of first concentrated flow in tributary, looking downstream from culvert in commercial area
Tributary to Kelsey Creek	K-2	K-2-1	Looking upstream at vegetation bordering the ditched/armored creek
Tributary to Kelsey Creek	K-3	K-3-2	Looking upstream from Bellevue-Redmond Road culvert
Valley Creek Main Channel	VC-5	VC-5-1	View of mainstem Valley Creek channel, just upstream of NE 20 th Street
Valley Creek Main Channel	VC-5	VC-5-2	View of mainstem Valley Creek channel, just downstream of NE 20 th Street, taken from right bank side of culvert
Valley Creek Main Channel	VC-5	VC-5-3	View of mainstem Valley Creek channel, just downstream of NE 20 th Street, taken from left bank side of culvert
Valley Creek Main Channel	VC-6	VC-6-1	Looking downstream, located in restored reach, just upstream of the Chinese restaurant – Noble Court
Valley Creek Main Channel	VC-7	VC-7-1	Looking upstream at armored reach of Valley Creek through the Chinese restaurant property
Valley Creek Tributary	VC-3	VC-3-2	View downstream, from left bank, at boulder armored channel
Valley Creek Tributary	VC-3b	VC-3b-6	View of flow/flood control structure at culvert
Valley Creek Tributary	VC-3b	VC-3b-4	Looking downstream at flow control structure and culvert from left bank
Valley Creek Tributary	VC-3b	VC-3b-2	View upstream from right bank, upstream of culvert under commercial area and NE 20 th Street
Valley Creek Tributary	VC-4	VC-4-1	View upstream of 36" creek culvert inlet to reach





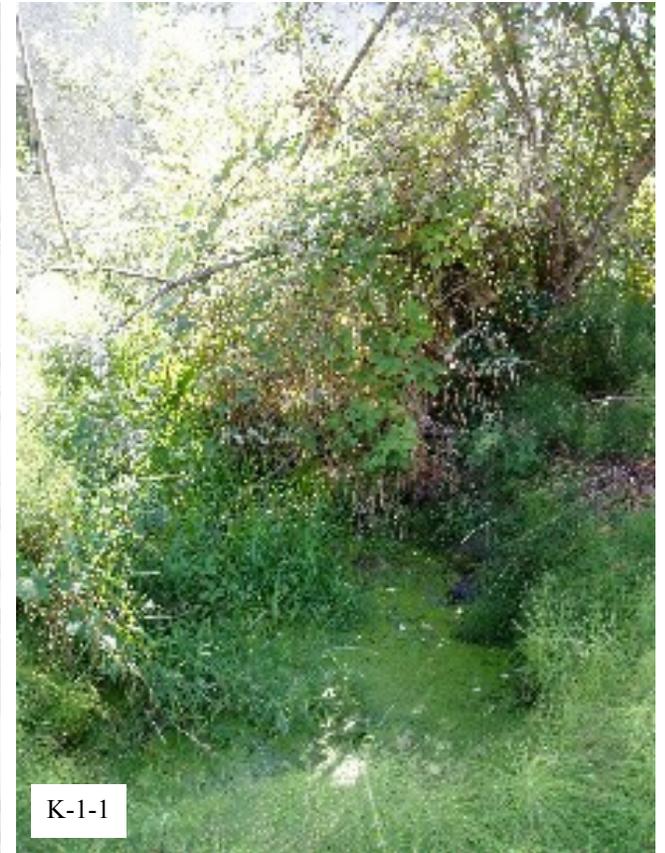
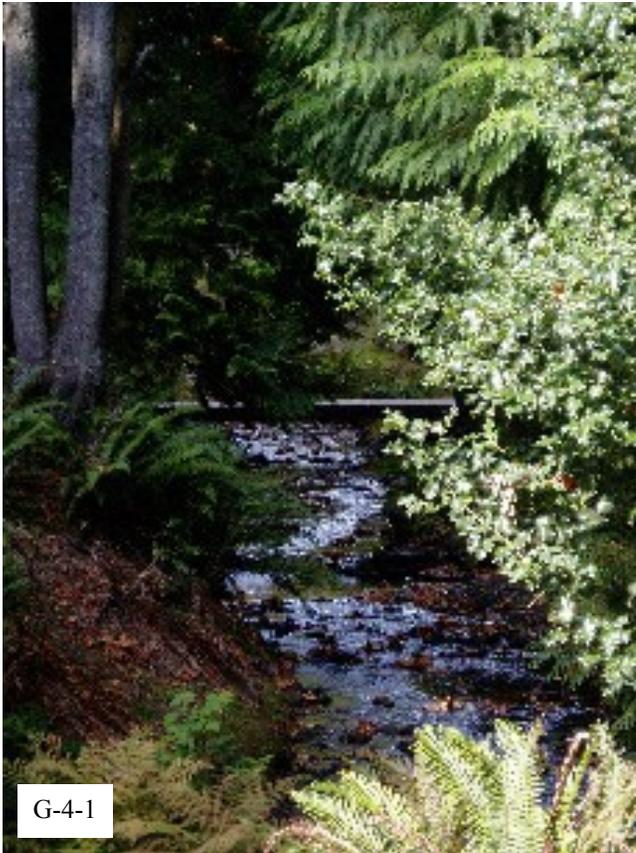
G-1-1



G-2-1



G-3-1







VC-5-2



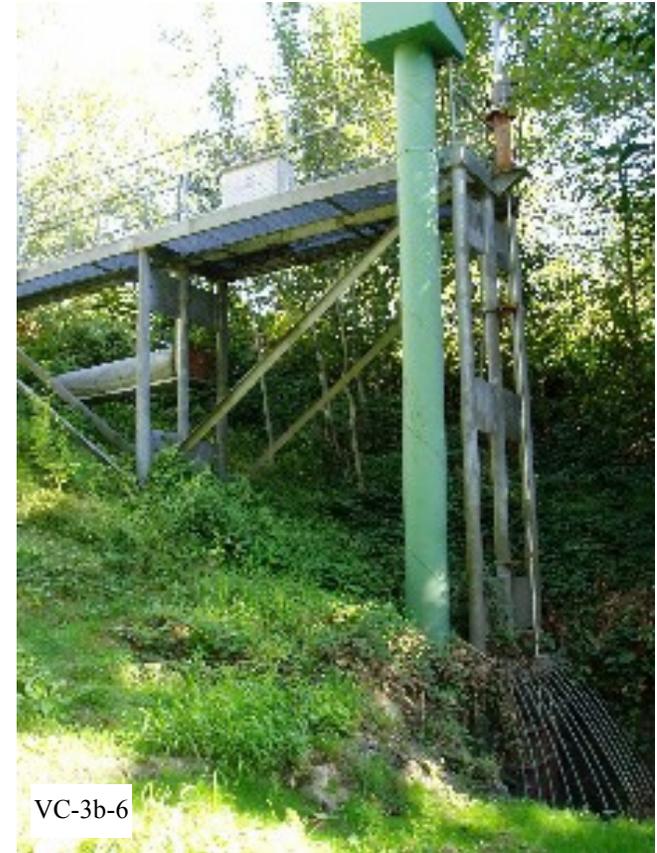
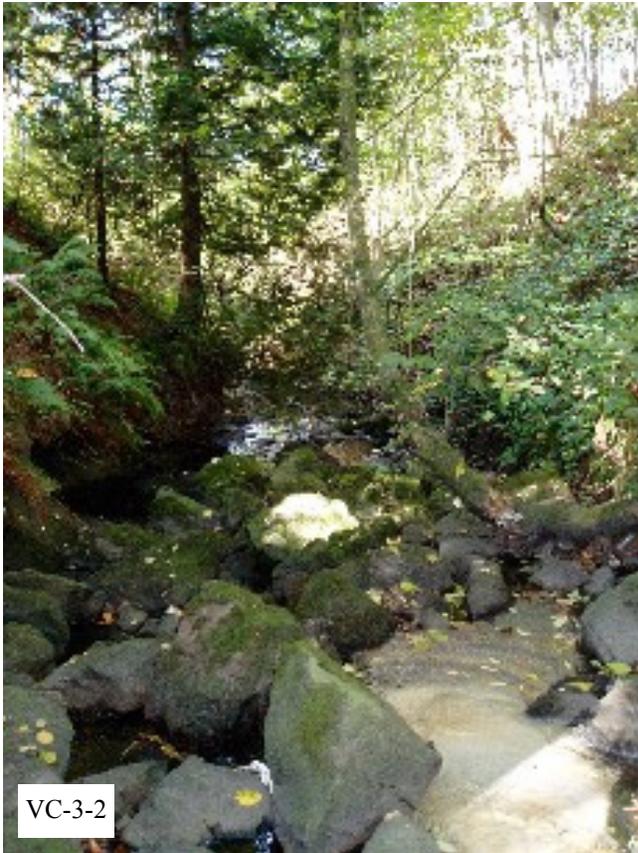
VC-5-3



VC-6-1



VC-7-1

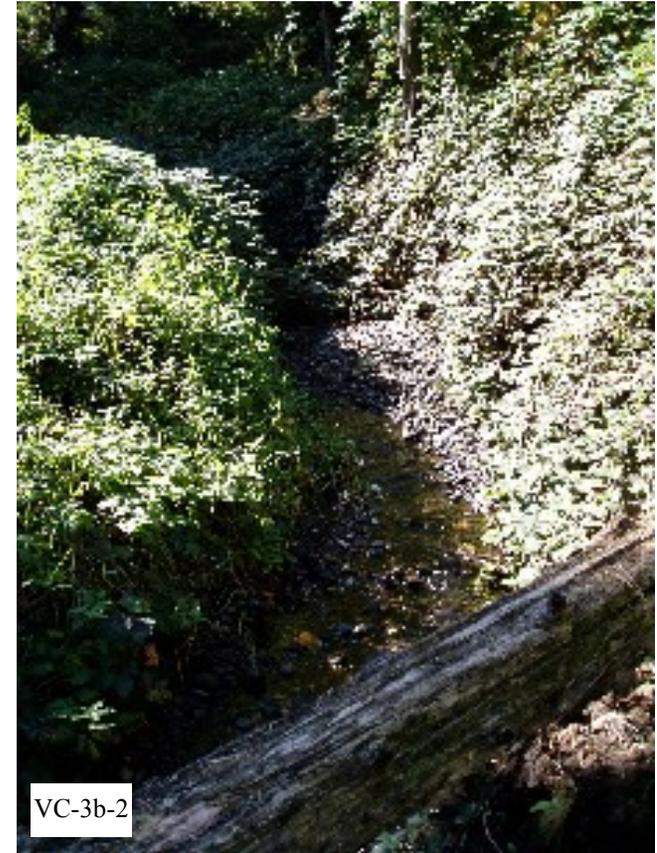




VC-3b-4



VC-4-1



VC-3b-2