City of Bellevue
Development Services Department
Land Use Staff Report

Proposal Name:	**Jere Enterprises LLC Stream Identification and Typing Code Interpretation**
Proposal Address:	**402 and 410 102nd Avenue SE**
Proposal Description:	Applicant seeks a formal interpretation of the Land Use Code regarding the classification of the onsite water feature
File Number:	**16-123911-DA**
Applicant:	Jere Enterprises LLC, via Duana T. Kolouskova of Johns Monroe Mitsunaga Kolouskova PLLC
Decisions Included:	Interpretation of the Land Use Code; (Process II, Part 20.30K LUC)
Assistant City Attorney:	**Catherine A. Drews**
State Environmental Policy Act Threshold Determination:	**EXEMPT**
Director's Decision:	**Interpretation of the Land Use Code** Michael A. Brennan, Director Development Services Department Carol V. Helland Carol V. Helland, Land Use Director Development Services Department

Application Date:	February 3, 2016
Notice of Application Publication Date:	March 31, 2016
Decision Publication Date:	July 7, 2016
Project Appeal Deadline:	July 21, 2016

For information on how to appeal a proposal, visit the Development Services Center at City Hall or call (425) 452-6800. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.

Interpretation of the Director
Bellevue File No. 16-123911-DA

I. INTRODUCTION

The Applicant, Jere Enterprises LLC owns property located at 402 and 410 102nd Avenue SE, Bellevue, Washington. The Applicant seeks a Formal Code Interpretation of the applicable land use regulations under Part 20.30K of the Land Use Code (LUC). A request for interpretation is processed pursuant to Part 20.30K LUC, and the Director's decision may be appealed as a Process II decision to the Hearing Examiner pursuant to Chapter 20.35 LUC.

Summary of the Interpretation Request: The Applicant seeks interpretation regarding the classification and typing of the onsite water feature and specifically whether the feature constitutes a stream pursuant to LUC 20.25H.075.

Short Answer: Yes. The facts associated with the requested interpretation support that the water feature is a stream pursuant to LUC 20.25H.075.A because although now artificial in location, the water feature is used to convey a stream that occurred naturally before construction of the artificial channel. Additionally, pursuant to LUC 20.25H.075, the water feature constitutes a Type F Stream because it contains fish habitat as defined by LUC 20.50.020 and is not a shoreline of the state.

II. INTERPRETATION

A. Site Description.

The water feature (also referred to as the water course or water channel) at 402 and 410 102nd Ave SE Bellevue was reviewed and analyzed by Kit Paulsen, the City's Environmental Scientist and Watershed Planning Supervisor.[1] Note that for ease of reference, certain information contained in this section reiterate those presented in the Paulsen Memorandum.

The water channel is located within and is a part of the Meydenbauer Drainage Area (Meydenbauer Basin), which is approximately 1,300 acres. The highest elevation within the Drainage Area is 339 feet and the lowest elevation is the Lake Washington shoreline.[2] The elevation of Lake Washington was lowered by approximately 9 feet with the opening of the Hiram M. Chittenden (Ballard) Locks in 1916 from 30 feet to a regulated level of 20 – 22 feet above mean low low water (MLLW). According to Bellevue topographic information the subject property is located at elevation 28 – 30 feet (MLLW). Therefore, it was likely that prior to 1916, the subject property and water channel was inundated by the lake during some times of the year.

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[1] *See*, Exhibit A—Technical Memorandum from Kit Paulsen (with attachments: Historical Photo (1936 aerial photo; 1971 aerial photo); USGS Map, full and enlarged partial), dated May 27, 2016 (Paulsen Memorandum) (attached and by this reference fully incorporated herein).

[2] (Basin Fact Sheet http://www.bellevuewa.gov/pdf/Utilities/12-MEYDENBAUER_CREEK.pdf).

Soils in the United States, its territories, and Puerto Rico have been assigned to hydrologic soil groups.[3] Soils in the Basin are classified as a dual hydrological soil group, B/D, based on their saturated hydraulic conductivity and the water table depth when drained. B/D group is "mucky" soils, which result in low permeability, estimated at 0.63-2 inches per hour. Any rainfall over 0.63 – 2 inches per hour will naturally run over the surface rather than infiltrate into the ground. Water in the described and subject soil conditions will also seep out slowly providing flow even when there has not been recent rainfall.

In Meydenbauer Basin, as in all City drainage areas, streams are part of the storm water conveyance system and the majority of stream channels have been modified in location or channel conditions. Drainage systems in the Meydenbauer Basin have been highly modified and a high flow diversion redirects storm flows from the central business district and northern areas directly to Lake Washington. This occurrence limits high flow storm water discharge into the channel that flows through the subject property.

In 2001, The Watershed Company (Watershed) performed a city-wide stream and critical area assessment and issued a document entitled "Final Report: City of Bellevue Stream Typing Inventory".[4] At the time, the Washington Forest Practices Board was in the process of developing a new model for the Department of Natural Resources (DNR) stream typing system. As per WAC 222-16-031, Watershed utilized interim rules and provided both the interim and permanent water types in its Final Report.

The previous DNR water typing system had five numeric classes, Types 1 through 5. Type 2 is defined as any waters that do not fall under Type 1 (shorelines of the state) and have high fish, wildlife, or human use. Type 3 are any segments of natural waters which do not constitute Type 1 or 2 and have moderate to slight fish, wildlife, or human use. The interim rules combine Type 2 and Type 3 classes. WAC 222-16-031 provides the following conversion table:

Water Type Conversion

Permanent Water Typing	Interim Water Typing
Type "S"	Type 1
Type "F"	Type 2 and 3
Type "Np"	Type 4
Type "Ns"	Type 5

[3] Engineering Staff. 2009. National Engineering Handbook. USDA-NRCS, Engineering Division. U.S. Gov. Print. Office, Washington, DC. Part 630, Chapter 7, available at http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=22526.wba. (Soils in hydrologic group A have low runoff potential or high rate of infiltration when thoroughly wet. Soils in hydrologic group B have a moderate rate of infiltration when thoroughly wet. Soils in hydrologic group C have a slow rate of infiltration when thoroughly wet. Soils in hydrologic group D have a very slow infiltration rate when thoroughly wet.).

[4] Exhibit B—The Watershed Company (2001) *Final Report: City of Bellevue Stream Typing Inventory* (select pages) (Final Report), p.11; *see also*, pp. 2 – 4 for additional information of Watershed's methods for sampling and evaluation.

Watershed's description of the channel at that time was:

> "The lower portion of this segment flows adjacent to an apartment complex parking lot. The reed canary grass and Himalayan blackberry buffer had been recently mowed and the clippings were choking the channel. Farther upstream, the creek flows through a forested greenbelt. No fish were found, despite suitable flow and one-foot deep pools. Poor water quality may play a role in the absence of fish. No fish have been documented in the past for this segment. Downstream of the culvert, west of 102nd Avenue, in segment 70-02 cutthroat trout, stickleback, and sculpin were caught."[5]

Based on its field studies and findings and state law and guidance, Watershed's typing inventory designated that the subject water course as interim Type 2 and permanent Type F.

In response to this Formal Code Interpretation request, the Paulsen Memorandum provides review and analysis of historical data and current information, including documents that the Applicant submitted. The Paulsen Memorandum concurs with Watershed's Final Report in finding that the water course is part of a "'fish bearing' stream with perennial flow."[6] The stream is low gradient at approximately 3%. Although the water channel is not a naturally located channel as it has been modified by development over time, an early USGS map and historical photographs show that there was a stream channel in approximately the same area and flows along the subject property boundaries.[7] The Paulsen Memorandum notes that based on such factors, the stream is presumed to be carrying flows that used to be carried by the previous natural channel.

B. Applicable Code Provisions.

LUC 20.25H.075.A defines a "stream" as follows:

> An aquatic area where surface water produces a channel, not including a wholly artificial channel, unless the artificial channel is:
>
> 1. Used by salmonids; or
>
> 2. Used to convey a stream that occurred naturally before construction of the artificial channel.

'Salmonid' is defined as "a member of the fish family Salmonidae, which includes salmon, trout, dolly varden, char and white fish." LUC 20.50.046.

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[5] Exhibit B, p. 11.

[6] Exhibit A, p. 1.

[7] *See*, Exhibit A, attachments.

Streams are designated as critical areas and are "typed" consistent with LUC 20.25H.075.B which provides the following:

1. "Type S water" means all waters, other than shoreline critical areas designated under LUC 20.25E.017, within their bankfull width, as inventoried as "shorelines of the state" under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.

2. "Type F water" means all segments of waters that are not type S waters, and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality.

3. "Type N water" means all segments of waters that are not type S or type F waters and that are physically connected to a type S or F waters by an above ground channel system, stream or wetland.

4. "Type O water" means all segments of waters that are not type S, F or N waters and that are not physically connected to type S, F or N waters by an above ground channel system, stream, or wetland.

'Fish habitat' is defined as "any habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management." LUC 20.50.020.

'Restore' is defined as "to re-establish ecological processes, structures, functions and biotic and abiotic linkages that lead to the recovery of an ecosystem that has been degraded, damaged or destroyed. Restoration does not mandate a return to pre-development conditions." LUC. 20.50.046.

C. Analysis.

1. <u>The subject water course is a stream under the City Code</u>.

The subject water course constitutes a stream pursuant to LUC 20.25H.075.A because it is used to convey a stream that occurred naturally before construction of the artificial channel.

Information provided by the applicant's consultant, Soundview Consultants (Soundview), included physical channel condition, water quality, and biotic information. Within this information, Soundview reported no fish, elevated temperatures, elevated nutrients, elevated fecal coliform, channel widths of 2 to 8.5 feet, and aquatic invertebrates (including caddis fly cases), thus no salmonid present.

However, pursuant to LUC 20.25H.075.A, a water course is a stream if salmonid is present ***or*** if it conveys a stream that had occurred naturally. As such, it is sufficient that the subject water course, albeit artificially located now, is used to convey flow from a prior natural stream. USGS map and historical photographs show an existing stream channel in the area.[8]

Furthermore, based on the soils information, natural runoff channels would be expected to form in the basin from rain runoff. Channels would also form within newly emerged upstream areas after the lake levels were lowered, but may have been braided and marshy due to low gradients along the shoreline. The channel has perennial flow flowing into the property and out to the lake, indicating natural sources such as seeps and springs, common to natural stream channels.

The perennial flow and the natural runoff potential are indicators that the channel conveys water that was once part of a natural stream. Stream channels are dynamic and the course of a stream can move across its floodplain in response to natural depositions of sediment or wood, and movement can be exacerbated by human activity.[9] Therefore, the exact historical channel could naturally have been located in different places through the course of time.[10] The location of many streams in Bellevue were altered by human activities in the past, including straightening channels, moving streams to flow along property lines, and other course changes to meet the owners' objectives for the property. Thus, because the subject water course is carrying flows that would otherwise be carried in a natural channel, it is a stream pursuant to LUC 20.25H.075.A.

2. <u>The subject water course is properly typed as a Type F stream</u>.

The City's current designation for this water channel is Type F. Per LUC 20.25H.075.B, this typing is based on either the presence of any type of fish, fish habitat or potential fish habitat through restoration (see definitions above). The channel is not identified in the Shoreline Critical Areas, so it cannot be Type S waters.

As explained above, the stream channel is not a natural channel, but one that has been redirected and channelized along property lines. Neither the applicant nor the city has direct evidence of fish inhabiting this localized channel. Therefore, the question becomes whether there is ***potential fish habitat***, including habitat that would likely to be used by fish which could be recovered by restoration or management, present in the stream as defined in LUC 20.50.020.

DNR provides statewide guidance on stream typing through WAC 222-16-031, the Forest Practices Program.[11] These guidelines provide additional information on potential fish habitat

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[8] Exhibit A.

[9] Randle, Timothy J. April 2-6, 2006, Eighth Federal Interagency Sedimentation Conference, Reno NV USA.

[10] Sullivan, Kathleen; Lisle, Thomas E.; Dolloff, C. Andrew; Grant, Gordon E.; Reid, Leslie M. 1987. Stream channels: The link between forests and fishes. Ch. Three. In: Ernest O. Salo and Terrance W. Cundy (eds.), Streamside Management: Forestry and Fishery Interactions, Proceedings of a Symposium held at University of Washington, 12-14 Feb. 1986. Contribution no. 57, Institute of Forest Resources, Seattle, Washington. pp. 39-97.

[11] Washington State Department of Natural Resources, Forest Practices Water Typing, http://www.dnr.wa.gov/forest-practices-water-typing.

should there be no fish presence in the stream. The Western Washington Water Type Classification Worksheet provides clear assessment questions including the following question:

> Are there segments within or above the assessed portion of the stream where the average BFW [bankfull width] is two feet or greater? AND the average stream gradient is less than or equal to 16%? ***If answer is yes, then it is Type F water.***[12]

In this case, the subject channel is greater than two-feet and the stream gradient is less than 16%. By DNR's guidance, the subject water course would be classified as a Type F water. This is consistent with Watershed's typing in 2001.

Soundview's report inserted WDFW guidelines for stream habitat restoration that call for returning to prior existing conditions, which Soundview presented as requiring significant impacts on other properties and the City in general. Soundview did not determine that fish habitat cannot occur in the subject water course. As stated above, LUC 20.50.046 specifically does not mandate restoration to pre-development conditions. The City Code also does not place limits on restorative tasks. Although water quality and other conditions may not be ideal for fish habitat at this time, restoration ***could*** result in fish or fish habitat.

In addition, there is documented fish presence immediately downstream of the channel, including cutthroat trout (a type of salmonid), indicating that there is potential for fish, including salmonids, to inhabit this channel with restoration of habitat. Thus, although there is no existing fish or fish habitat present, the ***potential fish habitat*** in the subject water course makes a Type F classification proper.

D. Conclusion.

The onsite water course on the Applicant's property is properly classified as a stream pursuant to LUC 20.25H.075 because although it is now artificial in location, it conveys a stream that previously occurred naturally. This determination is supported by USGS map and historical photographs showing an existing stream channel in the area, soils information, physical conditions, and the perennial nature of the flow into the property and out to the lake.

The water course is properly typed as Type F because there is potential for fish habitat through restoration or management based on its physical conditions and documented fish presence immediately downstream. Type F for this water course is also consistent with DNR's guidance for water classification as the stream channel is greater than two-feet and the stream gradient is less than 16%.

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[12] Washington State Department of Natural Resources, Western Washington Water Type Classification Worksheet, http://file.dnr.wa.gov/publications/fp_form_wwwtcw.pdf. (emphasis added).

III. FACTORS FOR CONSIDERATION

In making an interpretation of the provisions of the LUC, the Director shall take the following factors into consideration. LUC 20.30K.140.

A. Applicable Provisions of the Land Use Code.

The applicable LUC provisions considered in this formal code interpretation include the following:

1. Chapter 20.25H LUC – Critical Areas Overlay
2. Chapter 20.25E LUC – Shoreline Overlay District
3. LUC 20.50.020 – Definition of Fish Habitat
4. LUC 20.50.046 – Definition of Restoration; Salmonid
5. Part 20.30K LUC – Interpretation of the Land Use Code

B. The Impact of the Interpretation on other Provisions of the Land Use Code.

This interpretation impacts solely the application of the relevant code provisions to the subject water course and does not have consequential impacts on interpretation of other provisions of the Land Use Code.

C. Implications of the Interpretation for Development within the City as a whole.

This interpretation impacts only the subject water course described herein and does not impact classification of other subject water courses within the City.

D. Applicable Provisions of the Comprehensive Plan and other Relevant Codes and Policies.

This interpretation is consistent with the City's Comprehensive Plan Environment Goals and Policies and Relevant Codes, specifically and including:

> Land Use Element Goal: To develop and maintain a land use pattern that protects natural systems and retains trees and open space; maintains and strengthens the vitality, quality and character of Bellevue's neighborhoods; and focuses development activity in Downtown and other commercial and residential centers.
>
> Environment Element Goal: Ensure that planning efforts, infrastructure investments, and municipal operations proactively manage natural resources to meet the needs of current and future generations while maintaining the integrity, stability and beauty of natural systems.

Environment Element Water Resources Policy:

EN-18. Integrate site-specific development standards with urban watershed-scale approaches to managing and protecting the functions of critical areas.

IV. EFFECT OF INTERPRETATION

Pursuant to LUC 20.30K.150, an interpretation of any Land Use Code provision issued under Chapter 20.30K LUC shall have the same effect as any provision of the Land Use Code. An interpretation of the Land Use Code remains in effect until or if rescinded in writing by the Director. LUC 20.30K.155.

V. APPEAL

An Interpretation of the Land Use Code under Chapter 20.35.015 is a Process II administrative land use decision made by the Director. Pursuant to LUC 20.35.250, Process II decisions may be appealed to the Hearing Examiner by providing a written statement of appeal and the appeal notification form to the City Clerk not later than 5:00 p.m. on the 14th day following the date of publication of the decision of the Director.

EXHIBIT A

City of Bellevue

Post Office Box 90012 • Bellevue, Washington • 98009 9012

TECHNICAL MEMO

TO: Catherine Drews, City Attorney
FROM: Kit Paulsen, Environmental Scientist/Watershed Planning Supervisor
DATE: May 27, 2016
SUBJECT: Stream and Stream Typing Analysis

Issue

- Is the water course at 402 and 410 102nd Ave SE, Bellevue, a stream?
- If it is determined to be a stream, what stream type should it be?

Code Language

Definition of Stream: An aquatic area where surface water produces a channel, not including a wholly artificial channel, unless the artificial channel is:

1) Used by salmonids; or
2) Used to convey a stream that occurred naturally before construction of the artificial channel.

Stream Typing

Designation of Streams

The following streams are hereby designated as critical areas subject to the regulations of this part:

1) "Type S water" means all waters, other than shoreline critical areas designated under LUC 20.25E.017, within their bankfull width, as inventoried as "shorelines of the state" under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including inundated areas of their associated wetlands.
2) "Type F water" means all waters, that are not type S waters, and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality" (LUC 20.25H).
3) Type N water" means all segments of waters that are not type S or type F waters and that are physically connected to type S, F, or N waters by an above ground channel system, stream, or wetland.
4) "Type O water" means all segments of waters that are not type S, F, or N waters and that are not physically connected to type S, F, or N waters by an above ground channel system, stream or wetland. (LUC 20.25H.065)

Shoreline Overlay District (LUC 20.25E.017)
The following water bodies are hereby designated as shoreline critical areas:

A. Lake Washington, including Mercer Slough upstream to Interstate 405 – The lake waters, underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas;

B. Lake Sammamish – The lake waters and underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas;

C. Lower Kelsey Creek – The creek waters, underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas; and

D. Phantom Lake – The lake waters, underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas.

"Fish Habitat" is defined as "Any habitat which is used by any fish at any life stage at any time of year, including potential habitat likely to be used by fish which could be recovered by restoration or management" (LUC 20.50.010)

Description and Available Information

The water course at 410 102nd Ave SE, Bellevue, is currently identified as a "fish bearing" stream with perennial flow. The stream has perennial flow and is low gradient, approximately 3%. The channel has been modified and flows along the property boundaries.

The Meydenbauer drainage area is approximately 1,300 acres. The highest elevation is 339 ft and lowest is the Lake Washington shoreline (Basin Fact Sheet http://www.bellevuewa.gov/pdf/Utilities/12-MEYDENBAUER_CREEK.pdf). The elevation of Lake Washington was lowered by approximately 9 feet with the opening of the Hiram M. Chittenden (Ballard) Locks in 1916 from 30 feet to a regulated level of 20-22 above mean low low water (MLLW). According to Bellevue topographic information this property is located at elevation 28 -30 ft (MLLW). Therefore, it was likely that prior to 1916, this property was inundated by the lake during some times of the year.

Soils in the basin are classified as B/D, "mucky" soils, meaning there is low permeability. Permeability estimates for B/D soils is 0.63-2 inches per hour. Therefore, any rainfall over this amount will naturally run over the surface rather than infiltrate into the ground. Water in these soils will also seep out slowly providing flow even when there has not been recent rainfall.

In Meydenbauer, as in all city drainage areas, streams are part of the stormwater conveyance system and most stream channels have been modified in location or channel conditions. Drainage in the Meydenbauer basin has been highly modified and a high flow diversion redirects storm flows from the central business district and northern areas directly to the lake. This limits high flow stormwater discharge into the channel that flows through the property in question.

The water course was typed as Type 2/ fish bearing in July, 2001, by The Watershed Company as part of a city-wide assessment.[1] Type 2/fish bearing are identified as not being a water course that is identified as a "shoreline of the state" but have high fish, wildlife, or human use.

The description of the channel at that time was:

> The lower portion of this segment flows adjacent to an apartment complex parking lot. The reed canarygrass and Himalyan blackberry buffer had been recently mowed and the clippings were choking the channel. Farther upstream, the creek flows through a forested greenbelt. No fish were found, despite suitable flow and one-foot deep pools. Poor water quality may play a role in the absence of fish. No fish have been documented in the past for this segment. Downstream of the culvert, west of 102nd Avenue, in segment 70-02 cutthroat trout, stickleback, and sculpin were caught."

Information provided by the petitioner included physical channel condition, water quality, and biotic information.[2] They reported no fish, elevated temperatures, elevated nutrients, elevated fecal coliform, channel widths of 2-8.5 ft, and aquatic invertebrates (including caddis fly cases).

Staff have an early USGS map and a 1936 aerial photo that both show an existing stream channel in the area[3].

Analysis

Is the water course at 402 and 410 102nd Ave SE, Bellevue, a "stream?"

Based on the soils information, natural runoff channels would be expected to form in the basin from rain runoff. Channels would also form within newly emerged upstream areas after the lake levels were lowered, but may have been braided and marshy due to low gradients along the shoreline.

The channel has perennial flow flowing into the property and out to the lake, indicating natural sources such as seeps and springs, common to natural stream channels. The aerial photograph and USGS map show a stream channel.

Given the perennial flow and the natural runoff potential, it is reasonable to assume that this channel conveys water that was once part of a natural stream.

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[1] The Watershed Company (2001) *Final Report: City of Bellevue Stream Typing Inventory*, p.11
[2] Soundview Consultants (2016) Meydenbauer Stream Habitat Inventory: Tamasha Apartments-Bellevue. Pp 5-7.
[3] Personal communication, Michael Paine, 4/20/2016.

Stream channels are dynamic and the course of a stream can move across its floodplain in response to natural depositions of sediment or wood, and can be exacerbated by human activity[4]. Therefore, the exact historical channel could naturally have been located in different places through the course of time.[5] The location of many streams in Bellevue were altered by human activities in the past, including straightening channels, moving streams to flow along property lines, and other course changes to meet the owners' objectives for the property.

<u>If it is determined to be a stream, what stream type should it be?</u>

The current designation for this channel "Type F" for fish bearing. This typing is based on either the presence of any type of fish or fish habitat or potential fish habitat through restoration (see definitions above).

The channel is not identified in the Shoreline Critical Areas, so cannot be Type S waters.

The stream channel is not a natural channel, but one that has been redirected and channelized along property lines. Neither the petitioner nor the city has direct evidence of fish inhabiting this localized channel.

Therefore, the question is whether there is potential fish habitat.

The Washington Department of Natural Resources provides statewide guidance on stream typing through WAC 222-16-031, the Forest Practices Program (http://www.dnr.wa.gov/forest-practices-water-typing). These guidelines provide additional information on potential fish habitat should there be no fish presence in the stream. The Western Washington Water Type Classification Worksheet provides clear assessment questions (http://file.dnr.wa.gov/publications/fp_form_wwwtcw.pdf). Included is the following applicable criteria:

4. Are there segments within or above the assessed portion of the stream where the average BFW [bankfull width] is two feet or greater? AND the average stream gradient is less than or equal to 16%? If answer is yes, then it is Type F water.

The channel is greater than 2 feet and the stream gradient is less than 16%. By the state guidance, this would be classified at Type F water.

In addition, there is documented fish presence immediately downstream of the channel, including cutthroat trout (a type of salmonid), indicating that there is potential for fish, including salmonids, to inhabit this channel with restoration of habitat. Therefore, according to Bellevue code, this would be a Type F stream due to the habitat restoration potential, despite the absence of fish.

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[4] Randle, Timothy J. April 2-6, 2006, Eighth Federal Interagency Sedimentation Conference, Reno NV USA

[5] Sullivan, Kathleen; Lisle, Thomas E.; Dolloff, C. Andrew; Grant, Gordon E.; Reid, Leslie M. 1987. Stream channels: The link between forests and fishes. Chapter Three. In: Ernest O. Salo and Terrance W. Cundy (eds.), Streamside Management: Forestry and Fishery Interactions, Proceedings of a Symposium held at University of Washington, 12-14 February 1986. Contribution no. 57, Institute of Forest Resources, Seattle, Washington. pp. 39-97.

Conclusions

Is the water course at 402 and 410 102nd Ave SE, Bellevue, a "stream?"

Yes, it is reasonable to believe surface water would normally have run off the basin causing a stream channel.

If it is determined to be a stream, what stream type should it be?

The perennial flow, channel width, low gradient, and presence of salmonids and other fish immediately downstream indicate that this is a Type F, potentially fish bearing stream.

Attachments

Historical photo
USGS Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

MERCER ISLAND QUADRANGLE
WASHINGTON—KING CO
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped by the Army Map Service
Published by the Civil Use as the Geological Survey
Contour by USCAGO, USGS, and King County Engineer office
Topography from aerial photographs by multiplex methods
Aerial photography Series 1945 Field Check 1950
Polyconic projection 1927 North American datum
UTM/SC Grid based on Washington coordinate system
North Zone
Red and indicates area in which only
landmark buildings are shown
Red extinction is made between parts, meetings,
commercial and industrial buildings
Unlabeled elevations are shown in blown
Dashed lines indicate approximate location
1000 meter Universal Transverse Mercator grid ticks
and 10 meter contour

SCALE 1:24000

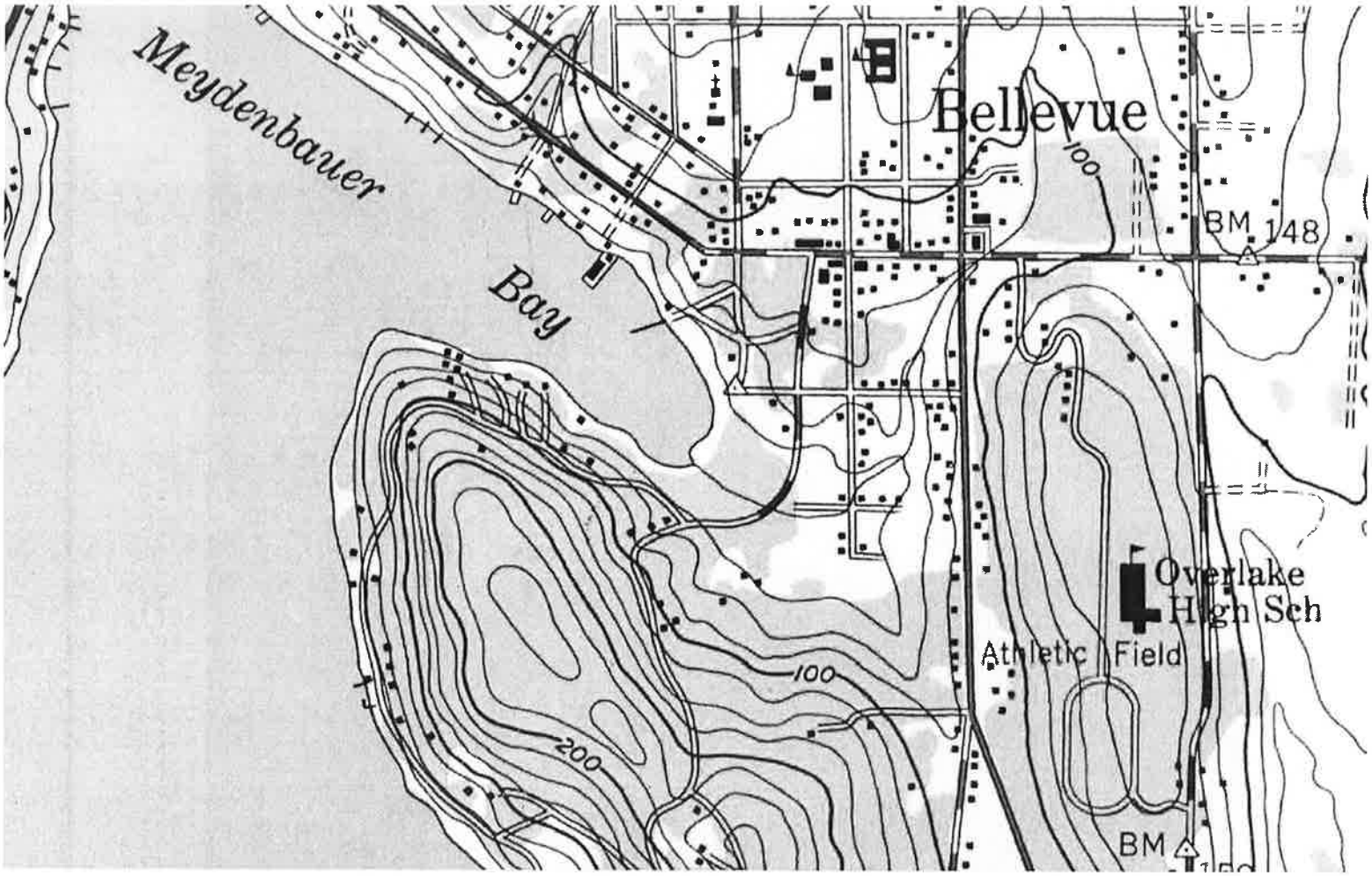
CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR WASHINGTON, D.C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SERVICES IS AVAILABLE ON REQUEST

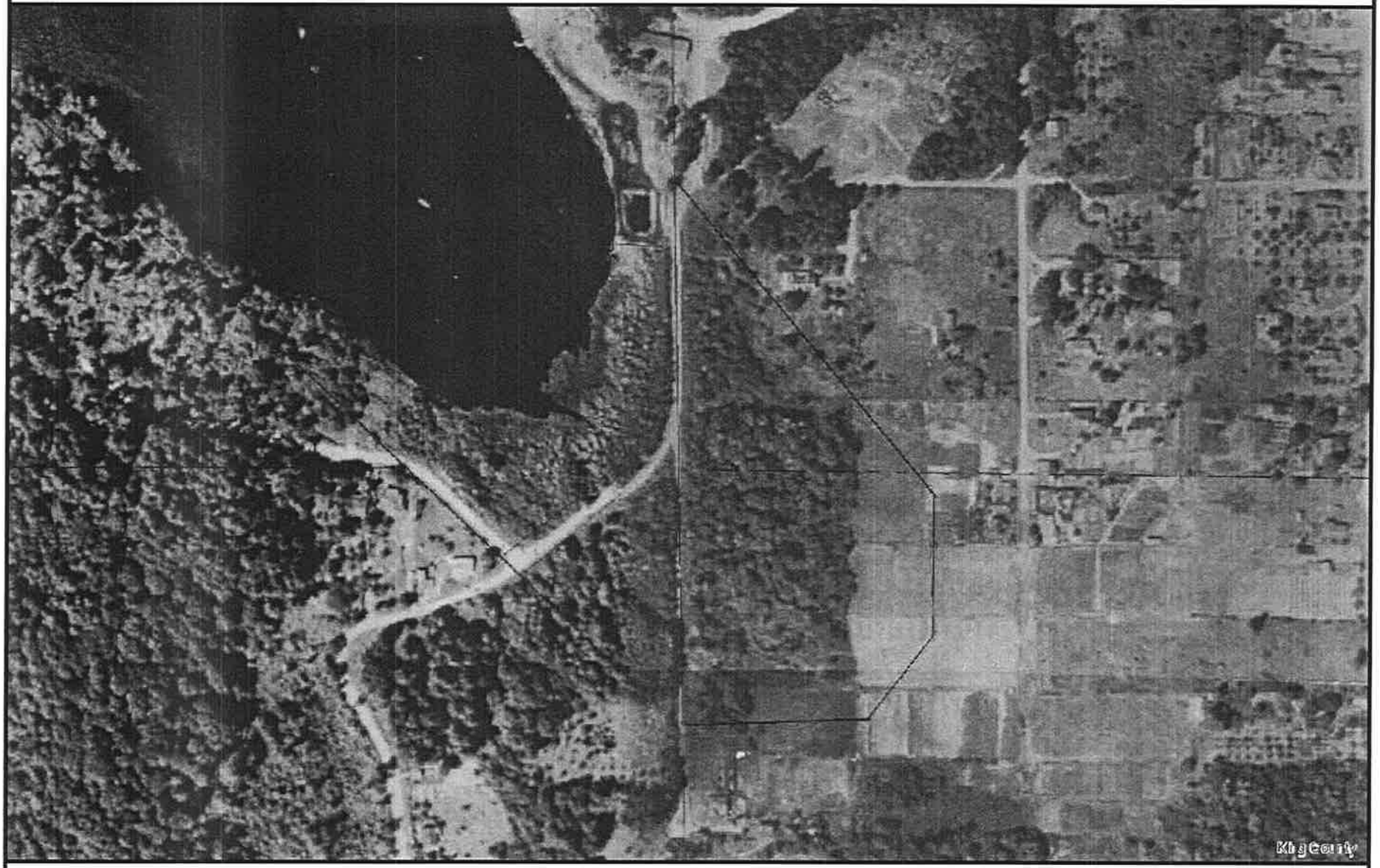
ROAD CLASSIFICATION
Primary Hwy — Light Hwy
Medium Hwy — Unimproved Hwy
U.S. Route — State Route

MERCER ISLAND, WASH.
NAD83—RECTANGLE
1950
AND USGS 1:24 SERIES 1951

U.S.G.S.
FILE COPY


Meydenbauer
Bay
Bellevue
100
BM 148
Overlake
High Sch
Athletic Field
100
200
BM

King County iMap



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

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King County
GIS Center

Date: 7/1/2016 Notes:

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EXHIBIT B

FINAL REPORT

City of Bellevue Stream Typing Inventory

Prepared for:

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Final Report
City of Bellevue Stream Typing Inventory

1. Introduction

The City of Bellevue Utilities Department has requested that the approximately 64 miles of stream flowing within the City be inventoried according to the water typing standards set forth by the Washington State Department of Natural Resources (DNR). The City of Bellevue currently classifies all streams within City limits according to the City of Bellevue Land Use code for sensitive areas, which defines riparian corridors according to three types (A, B, or C). These classifications are habitat based and do not specifically include information regarding fish use. However, the DNR typing system is primarily based on the presence/absence of fish[1] or fish habitat within a stream corridor. To accurately determine the presence/absence of fish in all streams, the City has contracted with The Watershed Company to perform a stream-typing inventory on all identified streams within the City of Bellevue, and to retype those streams using the DNR typing system.

Streams within the City of Bellevue range from shoreline streams (Mercer Slough), major tributaries to Lake Washington and Lake Sammamish (Coal Creek, Kelsey Creek, and Lewis Creek), and smaller tributaries and headwater segments. The City has identified the streams by segment numbers, dividing them according to topography changes (gradients) and physical features (i.e. culverts). A total of 308 segments comprise the 64 miles of stream within the City, of which 232 segments (~40 miles) have not been investigated for fish use (City of Bellevue 2001). DNR has previously typed approximately 23 miles of stream within the City limits (DNR Water Type Maps). However, since this data is greater than twenty years old and includes some obvious errors, the records needed review and amendment. The remaining streams needed reclassification based upon either existing data from the City of Bellevue Utilities Department or new field investigations of fish use. The Watershed Company has inventoried Bellevue's streams or stream segments with unknown fish use and has reviewed existing fish use data and DNR Water Type Maps, and with that information, has retyped the City's streams using the DNR typing system. Field investigations were performed between 5 June and 1 August 2001. This report presents the methods used for, and results of that retyping effort.

[1] According to the DNR definition, "fish" means species of the vertebrate taxonomic groups *Cephalospidomorphi* (lampreys) and *Osteichthyes* (bony fish).

The Washington Forest Practices Board (FPB) has recently revised the DNR stream typing system (effective 1 July 2001) in an effort to establish a model-based stream classification system. It is the intent of the FPB to eventually use a multi-parameter, field-verified geographic information system (GIS) logistic-regression model (WAC 222-16-030) to determine suitable fish habitat based on certain geomorphic indicators such as gradient, basin size, and elevation. However, the model will not become effective until the FPB adopts the fish habitat water type maps, which are currently being developed. During the interim, stream typing will follow rules similar to the old system (WAC 222-16-031).

The previous water typing system had five numeric classes, Types 1 through 5: "Type 1" are all waters inventoried as "shorelines of the state" under chapter 90.58 RCW; "Type 2" are any waters which do not fall under Type 1 and have high fish, wildlife, or human use; "Type 3" are any segments of natural waters which do not fall under Type 1 or 2 and have a moderate to slight fish, wildlife, or human use; "Type 4" are all segments within the bankfull width that are perennial[2], non-fish habitat streams; "Type 5" are any segments which cannot be classified as Type 1, 2, 3, or 4. Type 5 streams have seasonal flow and lack fish habitat. Habitat features are used for stream typing when fish-use studies are not possible. Electrofishing data supercedes a habitat assessment when typing a stream.

The interim rules combine the Type 2 and Type 3 classes. The new permanent rules are strictly habitat-based regarding fish use. Thus, the new designations are Type S water (shoreline), Type F water (fish habitat), Type Np water (non-fish habitat perennial), and Type Ns water (non-fish habitat seasonal). The conversion table is listed below.

Water Type Conversion [3]

Permanent Water Typing	Interim Water Typing
Type "S"	Type 1
Type "F"	Type 2 and 3
Type "Np"	Type 4
Type "Ns"	Type 5

2. Methods

For the purposes of this study and the benefit of the City of Bellevue, our analysis entailed a direct study of fish use and did not constitute a habitat assessment. The City wished to determine which streams within its boundaries contain fish or the

[2] Meaning the stream does not go dry during a normal rainfall year
[3] WAC 222-16-031

potential for fish use. Therefore, we sampled all identified streams with unknown fish use. Electrofishing was performed downstream to upstream, beginning with the farthest downstream segment with unknown fish use. Although resident fish are known to exist above fish barriers, the decision was made—based on a time constraint[4]—to make fish use determinations at the farthest point downstream. Thus, if fish were discovered within a given segment, that segment and all segments downstream were considered to have fish use. Likewise, if no fish were discovered in a segment, that segment and all segments upstream were considered not to support fish. If fish were found anywhere within a segment, the entire segment was considered to have fish.

In the DNR interim rules, the protocol for distinguishing between Type 2 and Type 3 streams based on electrofishing data is never clearly defined. The difference between "high" and "moderate to slight" depends on personal interpretation. For this investigation, we considered most streams with observed fish presence to be Type 2, and for streams with minimal observed fish use, or without observed fish but with habitat suitable for fish use to be Type 3.

Each stream segment in the City of Bellevue received an identification number. The numbering system is based on two-digit blocks. The first two digits identify through which basin the stream flows. The next two digits indicate a segments position relative to other segments within that basin (e.g., 01 represents the furthest downstream segment within each basin, and segment 02 would be immediately upstream of segment 01). A tributary to the main channel is represented by an additional two-digit block. The first digit identifies the tributary along a particular segment. The second digit represents how far upstream the segment is along the tributary. For example, in segment 84_04_12, the number 84 identifies that the segment lies within the Coal Creek basin, the number 04 refers to the fourth segment upstream from the mouth, and the number 12 refers to the second segment along the first tributary to segment 84_04.

Sampling Protocol

Sampling for fish use followed the DNR protocol, section 13 of the FPB Manual: "Guidelines for Determining Fish Use for the Purposes of Typing Waters Under WAC 222-16-030." No potential shoreline areas were to be sampled under this study and we anticipated sampling only a limited number of major tributaries. Section 13 of the Manual describes the method for determining the absence of fish through electroshocking. To determine the absence of fish, a minimum of 12 pools that are 3 feet square and 1 foot deep must be sampled within a quarter-mile length of stream. If these conditions do not exist, then the area is sampled where

[4] According to DNR, sampling for fish use must be completed between March 1st and July 15th

possible and the discrepancy noted. During the course of the study, very few streams fit the Section 13 criteria. All streams that did meet the criteria were found to support fish. For the purposes of this study, any capture of fish was deemed to constitute fish use within the segment, except when sampling at the confluence of a known fish-bearing stream. In such circumstances, sampling was to begin above the first gradient change upstream from the confluence. According to the DNR Manual, a continuous gradient of greater than 20 percent indicates the absence of fish.

If fish were found in a given segment, then the sampling protocol was halted and a new sampling point was established at the beginning of the next upstream segment. From there, the protocol was repeated, until it could be sufficiently determined that fish were no longer present, at which point sampling for that tributary ceased.

3. Results

The results of our field studies are reported individually for each of the 22 stream basins. Tables at the end of each section list the key results regarding fish use, species presence, observation source, and stream type designation. The City of Bellevue has provided basin maps found at the end of each section that include color-coded stream type designations.

Rainfall over the current year was taken into consideration when determining between Type 4 and Type 5 waters, because precipitation has been well below normal for most of the past water year. This makes the determination between seasonal and perennial streams more difficult, because a perennial stream may stop flowing during especially dry years. For our field study, streams that were dry or very nearly dry were considered Type 5 waters.

A comprehensive collection of stream data can be found in Appendix A. This appendix contains the physical properties (length and gradient), stream type, fish species present, and sampling information for each segment. Like the data tables in the results section, the appendix only lists fish usage for segments that have documented fish presence. Segments that were not visited in the field were typed based on either fish use upstream or fish absence downstream. Field notes from each survey site have been reproduced in Appendix B.

Yarrow Creek Basin (#70)

Overview:

Meydenbauer Creek Basin (#72)

Overview:

Located within downtown Bellevue, Meydenbauer Creek is perhaps the most urbanized of all the City's streams. Its short length of less than one-half mile flows through commercial and multi-family residential lots before flowing into Lake Washington's Meydenbauer Bay. It is a low-gradient stream with fairly gentle flow, but there are few riffles. The substrate is sandy with a silt layer in some places.

Fish Use:

Survey efforts during this study covered the three upstream segments of Meydenbauer Creek. The upstream segment (72_04) was accessed from 102nd Avenue SE, just upstream of a 220-foot culvert. The lower portion of this segment flows adjacent to an apartment complex parking lot. The reed canarygrass and Himalayan blackberry buffer had been recently mowed and the clippings were choking the channel. Farther upstream, the creek flows through a forested greenbelt. No fish were found, despite suitable flow and one-foot deep pools. Poor water quality may play a role in the absence of fish. No fish have been documented in the past for this segment. Downstream of the culvert, west of 102nd Avenue, in segment 72_02 cutthroat trout, stickleback, and sculpin were caught. In-stream habitat is slightly better along this stretch, with more woody debris and a wider forested buffer, although it is still lined with reed canarygrass.

Table 2: Meydenbauer Creek Fish Data

Segment ID #	Cutthroat	Coho	Other	Interim Type	Permanent Type	Date Sampled
72_01				2	F	
72_02	1 (0+)	–	3 Stickleback, 1 Sculpin	2	F	7/2/01
72_03	–	–	–	4	Np	7/2/01
72_04	–	–	–	4	Np	7/2/01

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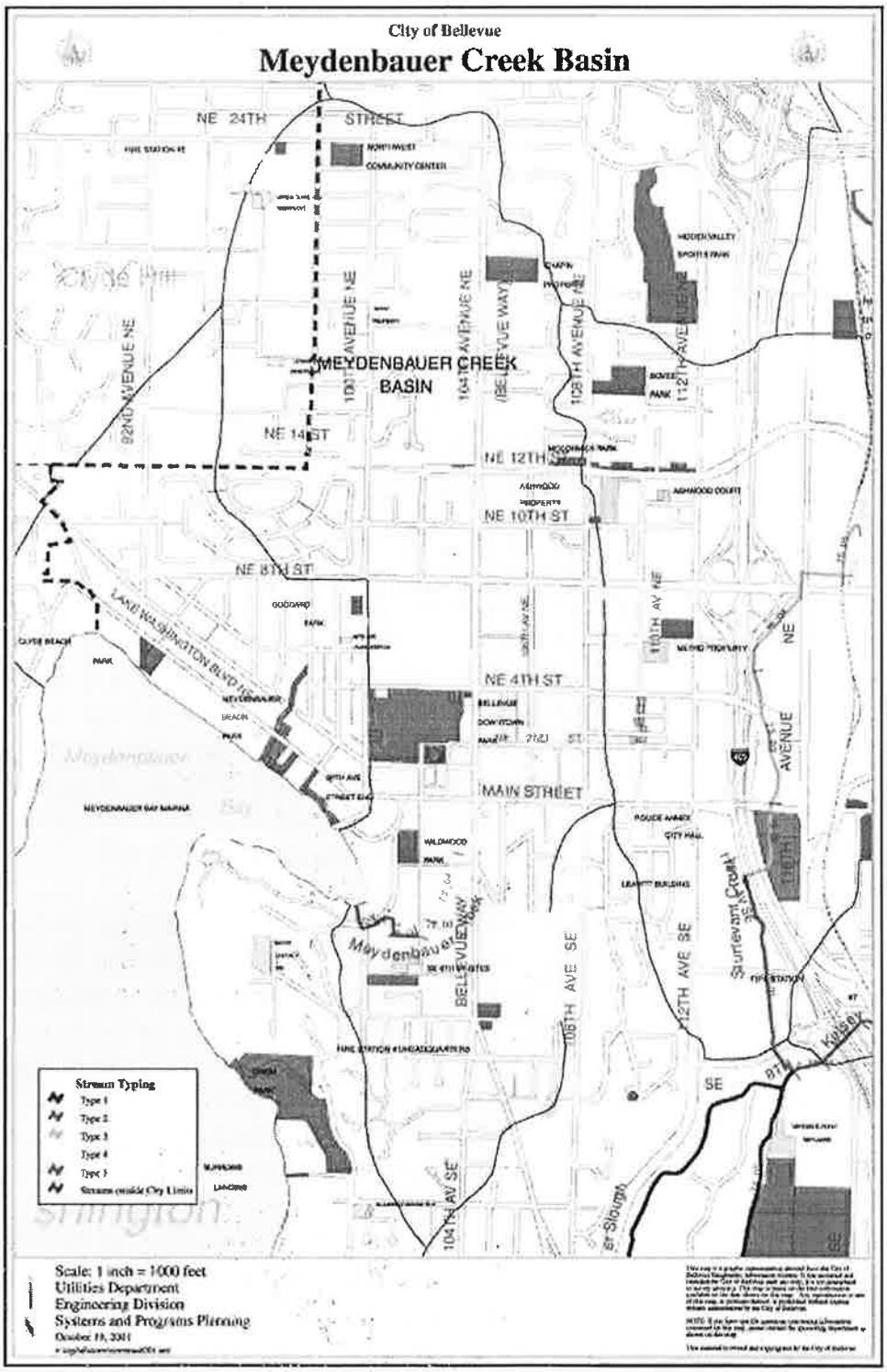
Map 2: Meydenbauer Creek Basin



4. Summary

This study finds that the majority of streams within the City of Bellevue continue to be productive areas for fish spawning and rearing, extending up to many of the headwater segments. Many areas with previously unidentified fish use were found to support fish, sometimes in spite of the environmental condition of the stream. Of the 64 total miles of inventoried stream within the City limits, approximately 35 miles (52%) support fish. Most of these stream miles fall within the three major systems: Coal Creek, Kelsey Creek, and Lewis Creek.

Prior to this study, approximately 40 miles (232 segments) of stream had undetermined fish use according to the City of Bellevue. This study has found that 11 of those 40 miles (28%) support fish use. Results from some of these streams were not surprising, such as the main stem of Yarrow Creek, areas along East Creek, and some of the tributaries to major streams. However, fish use was documented in some areas that were not anticipated to contain fish, such as Sears Creek, small tributaries to Goff and Valley Creeks, as well as upper Richards Creek next to the Factoria Mall. Surprisingly, upper Richards Creek supports spawning-size (>7 inch) cutthroat trout.

Stream typing according to the DNR protocol has been completed for all identified segments within the City of Bellevue. See Appendix A for a data summary of all stream segments. The interim protocol for typing streams according to high, moderate, or slight fish use is vague, making the determination between Type 2 and Type 3 streams somewhat ambiguous. For this study, most streams with documented fish use were considered Type 2, and streams perceived to have potential fish use or very minimal observed fish presence were considered Type 3. Excluding the Mercer Slough which was already designated as a "shoreline of the state" or a Type 1 water, approximately 31 miles were designated as Type 2.

The classification of Type 4 and Type 5 waters was also somewhat ambiguous due to the unusually dry conditions during 2001. The total precipitation to date for the 2001 water year was well below normal, although rainfall during the spring was just below normal. This makes the determination between seasonal and perennial streams more difficult, because a perennial stream may stop flowing during especially dry years. To make the determination between Type 4 and Type 5, any stream without fish (with the exception of those with significant subsurface flows), which was dry or very nearly dry, was considered Type 5.

Previous stream typing by DNR included approximately 23 miles of stream within City limits. However, this information is more than 20 years old and is not considered a reliable source. For example, DNR maps included a Type 1 stream connecting Phantom Lake to the Kelsey Creek drainage, even though this

connection was eliminated during the early 1900s when the discharge from Phantom Lake was routed to Lake Sammamish. All streams previously typed by DNR were reviewed for accuracy and modified as necessary. In general, the ability of young fish to survive in the smaller streams invalidated the old DNR maps. During the study, fish were found in many segments that DNR had classified as Type 4 or Type 5, including Sunset Creek, Newport Creek, and upper Yarrow Creek. Most of the 23 miles of stream typed by DNR were streams previously identified by the City of Bellevue for fish use and thus did not necessitate field exploration.

Areas of questionable fish use, which were problematic in using the interim stream typing protocol, were identified during field exploration for the following stream segments: Yarrow Creek tributary 70_03_11, Sturtevant Creek, Vasa Creek, and Phantom Creek. For the Yarrow Creek tributary, Sturtevant Creek, and Phantom Creek, fish use was not documented during electrofishing. However, each of these areas is either directly connected to fish-bearing streams (i.e. no gradient changes) or downstream of fish-bearing lakes such that fish use is likely. Vasa Creek's unusual subsurface flow upstream of I-90 does not preclude its use by fish. Resident populations of cutthroat trout may exist upstream in areas that are outside of City limits, and thus a complete determination of fish absence could not be made.

Several stream segments were also identified as areas in which future fish use could be anticipated. The City of Redmond is currently planning on restoring fish passage to stream segment 87_31 in the Ardmore drainage. A downstream barrier near Lake Sammamish currently inhibits fish use in the upper segments lying in the City of Bellevue. Currently, the upstream segments are considered non-fish-bearing. However, if the fish passage barrier is removed, the stream type would possibly change to a Type 2 or 3. Other streams which have the potential for fish use improvements are upper Meydenbauer Creek, Sturtevant Creek, and the upper West Tributary. None of these stream segments had documented fish use although with improved water quality, fish use would be considered possible. Each of these streams flows through heavy commercial development, subject to a variety of chemical influences from surface water runoff as well as numerous physical barriers. However, each of these three streams was carrying a significant amount of flow at the time of observation and would likely support fish with improved water quality. Of these creeks, at least Sturtevant Creek probably has intolerable current velocities during storm events and no appreciable velocity refuge, evidenced by large scour holes below perched culverts.

Recommendations

Several changes are recommended for segmenting streams to improve the stream typing system for the City of Bellevue. First, it is recommended that new stream segments begin at City boundaries. In several instances, it was not possible to determine downstream fish use when the segment extended outside City limits (Ardmore drainage 87_31 and Coal Creek tributaries 84_05_31 and 84_07_11). For this reason, all segments which cross City boundaries should be terminated at the boundary line. Second, some segments were too long. Segmentation was originally derived based on topography (gradient differences) and significant physical features (e.g. culverts). However, some segments identified during fieldwork should be further segmented if stream typing is revisited in the future. The following segments could benefit from further segmentation: 76_11, 76_12, 78_04, and 84_04_3. For the latter two segments, more details can be found in the basin descriptions. Segments 76_11 and 76_12 are too complex to be considered single segments.

Additional reconnaissance may be necessary for the upper Ardmore Drainage (above segment 87_31) if the City of Redmond completes the anticipated removal of a fish passage barrier near Lake Sammamish. This would require re-typing the upper stream segments if fish use is determined.

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