

December 18, 2009

Richard Leary
Innis Arden Club
P. O. Box 60038
Richmond Beach, WA 98160

Re: Innis Arden Bear Reserve drainage located between NW 180th Street and Ridgefield Road NW, Shoreline, Parcels #358530TRCT and #358590TRCT. City of Shoreline Jurisdictional Stream Determination. TWC Ref. #080917

Dear Dr. Leary:

We recently, on December 3, 2009, re-visited Bear Reserve per a request by The Innis Arden Club for the purpose of updating our initial jurisdictional stream determination and classification for a drainage that passes through the Reserve. As a result of our December 3 observations, review of data and definitions, and further consideration, we are providing you with this updated determination letter which supersedes the one dated 15 October, 2008.

The Bear Reserve, located in the community of Innis Arden in the City of Shoreline, consists of two open space tracts, #358530TRCT and #358590TRCT, extending north and slightly westward from NW 180th Street near 10th Avenue NW and extending to Ridgefield Road NW (see Figure 1). The drainage passing through Bear Reserve eventually flows into the south stem of “Innis Arden North Creek” as identified in the City’s adopted Surface Water Master Plan. The south stem is joined by the north stem in Blue Heron Reserve.

We understand that the primary purpose of this investigation is to determine if a City of Shoreline regulatory stream channel is present passing through the Bear Reserve and, if so, its type and associated buffer widths as they relate to potential tree topping or thinning within the Reserve. In connection with our site visit on October 2, 2008, you provided us with the mapped location of Bear Reserve and we spent some time documenting existing site conditions, which were somewhat drier then, in early October, than they were in early December this year. On the December 3, 2009 site visit, we again spent considerable time making observations of existing drainage pathway conditions from one end of the Reserve to the other and back. We have also reviewed the *City of Shoreline Surface Water Master Plan* (adopted July 2005) (see Figure 2), the City’s *Streams and Basins* map, updated 6/6/07, as downloaded from the City’s website (see Figure 3), King County iMAP website information for the parcels and vicinity, Washington DNR Forest Practice Water Type Mapping (Figure 4), the 1975 Washington Department of Fisheries’ *Catalog of Washington Streams and Salmon Utilization*, and the *King County Water Features* map. Although City mapping (Figures 2 and 3) shows the presence of a water course through the Reserve, the iMAP parcel map (Figure 1) and the DNR Forest Practice Water Type Map (Figure 4) do not.

No flow was being carried by the drainage at the time of our site visit with you on October 2nd, 2008 or during our more recent visit on December 3rd, 2009. November rainfall at Sea-Tac in 2009 totaled 9.0 inches; September 2008 rainfall totaled 0.78 inches.

The outfall of a 12-inch-diameter concrete pipe is located at the upper, south end of the drainage pathway through the Reserve (see Photo 1). Flow discharged from this pipe appears to originate entirely from the ditched and piped City road stormwater drainage system in the vicinity of the intersection of NW 180th Street and 10th Avenue NW (see Photo 2).

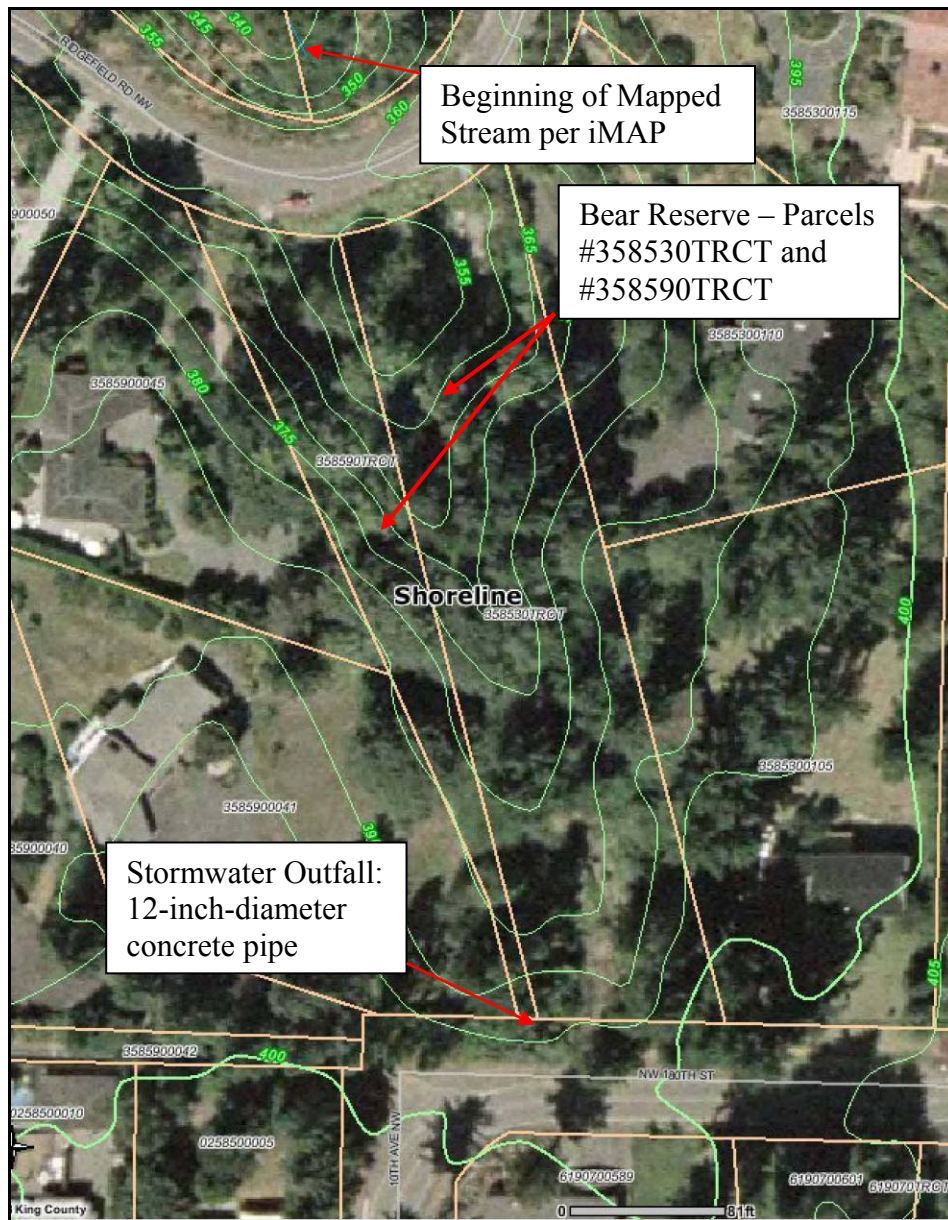


Figure 1 - Parcel map from King County iMAP.



Figure 2 – From Figure 2-1 of the City’s 2005 Surface Water Master Plan.

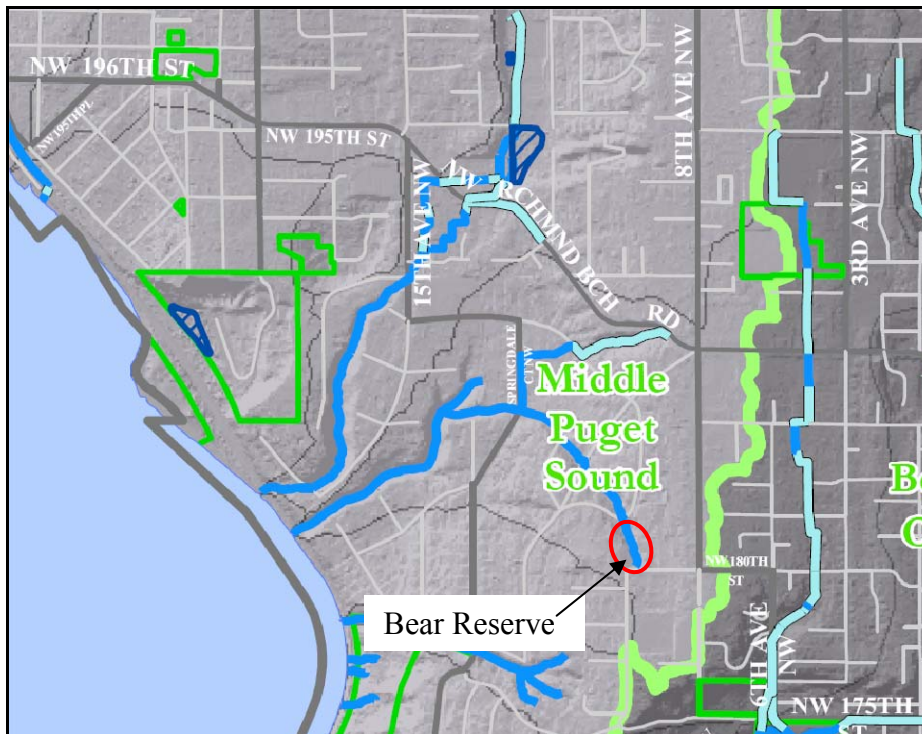


Figure 3 - City Streams and Basins Mapping (updated 6/6/07).

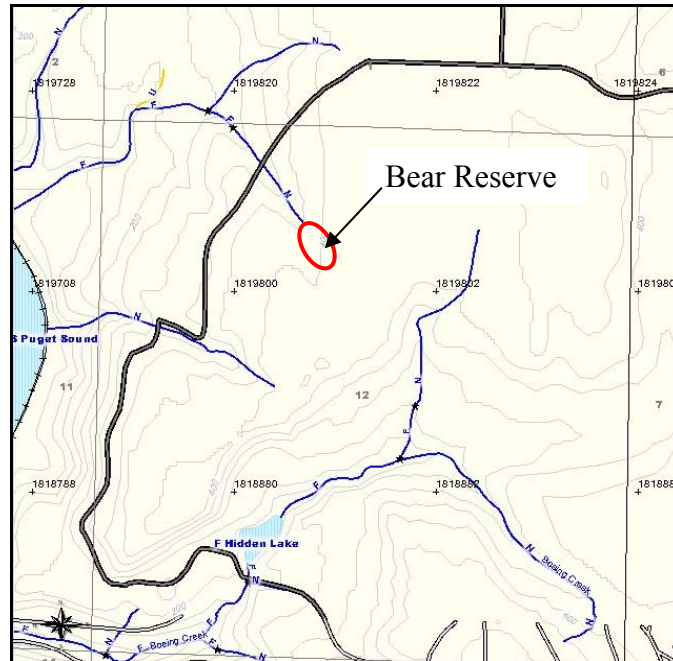


Figure 4 - DNR Forest Practice Water Type Map (web site accessed on 12/14/09). Note that the mapped non-fish stream does not extend as far upslope as the Bear Reserve.



Photo 1, 12-inch-diameter concrete pipe stormwater outlet culvert below NW 180th Street (Oct. 2, 2008). Puddled water at the outfall does not extend downslope.



Photo 2, facing eastward along NW 180th Street, showing the swale-like, non-stream streetside storm drainage system which discharges to Bear Reserve (Oct. 2, 2008).

The issues at hand are to determine if the mapped drainage across the Reserve meets the definition of a jurisdictional stream under City of Shoreline Code and, if so, its classification and applicable buffer width under the Code. According to Shoreline Municipal Code (SMC) Chapter 20, Section 20, *Definitions*, regulated stream features in the City are:

Those areas where surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff devices or other entirely artificial watercourses, unless they are used by salmonids or are used to convey streams naturally occurring prior to construction. A channel or bed need not contain water year-round; provided, that there is evidence of at least intermittent flow during years of normal rainfall.

As stated above, all of the drainage channels and other pathways upslope of the upper end of the site at NW 180th Street are either roadside ditches or piped roadside stormwater conveyances and are therefore “entirely artificial watercourses” that convey only collected stormwater as opposed to naturally-occurring stream flow. While ephemeral flows across the Reserve from the aforementioned stormwater discharge pipe at NW 180th Street have, over time, resulted in the formation of a sporadically-defined channel across the site (See Photos 3 and 4), this feature does not rise to the standard of a defined stream according to the above-quoted City of Shoreline stream definition for at least two reasons.

First, since the only identified source of flow to Bear Reserve is the stormwater outfall pipe at NW 180th Street, the drainage channel across the site, poorly-defined as it is, is effectively an extension of that “*storm or surface water runoff device.*” As such, the drainage should not be considered to be a stream, either in terms of habitat function or under the City’s Code definition. Management of stormwater has resulted in the discharge of water to a swale which was ill-suited for such discharge, as evidenced by the erosion it has caused which mimics a defined channel in

places. Depending on drainage area and soil permeability, ravine-like features do not always include stream channels at their bottoms. Ravines in this area were typically formed by the abundant melt-water present as the glaciers from the last ice age receded. As such, it cannot be assumed that they carry flow today, particularly along their upper reaches as in the case of Bear Reserve.

Second, the Bear Reserve drainage pathway does not show “*evidence of at least intermittent flow during years of normal rainfall.*” To reach this conclusion, a distinction must be made between *ephemeral* flow, which the channel carries, and *intermittent flow* which it does not carry but which is required for it to rise to the level of a stream by the City’s code definition. Consistent with definitions from various sources, (see below) ephemeral flows such as are observed in the Bear Reserve swale occur “only during, and for a short duration after, precipitation events in a typical year.” Literally, ephemeral means “lasting only one day,” but in practice this can extend to at least several days. In contrast, intermittent flows would occur “only at certain times of the year” and so would be seasonal or last on the order of at least several weeks. As such, to be intermittent, as required, flow would need to last for more protracted periods than the ephemeral flows observed following very wet periods and extreme storm events. Additional definitions of seasonal and intermittent flow are given following the text and signature of this letter report.

Neither does the drainage provide any discernible habitat function beyond biofiltration and infiltration, which are functions of bioswales as much as or more so than streams. A lack of salmonid fish use is apparent due to the drainage’s small size in an extreme headwater area, steep gradient, ephemeral flow, a lack of beneficial habitat features including pool/riffle sequences and in-channel wood, and likely downstream migration barriers. The State’s criteria for the presumption of salmonid fish use are provided in WAC 222-16-031 (3)(b)(i)(A and B). In Western Washington, channels 2 feet in width or wider at bankfull flow and 16 percent gradient or less are presumed to be used by fish until demonstrated otherwise. Though less than 16 percent gradient, the Bear Reserve drainage feature, where defined at all, is typically less than 2 feet in width and so does not meet these presumption criteria.

At the times of our site visits, we were able to observe that an extensive amount of recent and ongoing native revegetation and non-native, invasive vegetation removal had been undertaken by the Innis Arden Reserves Committee. Newly-planted native vegetation within Bear Reserve had been flagged for identification, and non-natives cleared to make way for them (notably laurel). As you may recall, we identified a specimen of butterfly bush (see Photo 5), which is generally considered to be an invasive weed, though many find it pleasing and plant it in their gardens. Maturing native vegetation in adjoining Grouse Reserve downslope (north from NW Ridgefield Road) was also observed, the results of a native planting plan carried out several years ago.



Photo 3, facing upslope in Bear Reserve, showing a typical, marginally-defined section of channel (Oct. 2, 2008).



Photo 4, swale section within Bear Reserve which does not exhibit defined-channel characteristics (Oct. 2, 2008).



Photo 5, lush vegetation at the lower end of Bear Reserve,
note non-native butterfly bush near left edge, center (Oct. 2, 2008).

Regardless of the extent of intended tree topping or thinning, we encourage the Club to continue to manage the vegetation within the Reserves to include comparatively low, dense, shrubby stands of native vegetation. Such a management approach would allow the topping or cutting of some of the taller trees to provide view corridors while still capitalizing on the flow attenuation, biofiltration, and wildlife habitat functionality of the Reserve buffer areas. Some of the taller trees could also be preserved where view corridors are not overly impacted. However, areas vegetated primarily with dense shrubs can provide a higher degree of stormwater management and wildlife habitat function than more open ones forested with taller trees, particularly adjacent to seasonal, headwater drainages such as is the case in Bear Reserve. Of note, shading issues are much less relevant for seasonal drainages because no flow is typically present in them during the warmer times of year.

In summary, we have concluded that the drainage feature passing through the Bear Reserve at Innis Arden does not have the characteristics necessary for categorization as a regulated stream according to the definition provided by the City of Shoreline Municipal Code. Rather, it has been formed by and is an extension of the street storm drainage system discharging from NW 180th Street.

Please contact us if you have any questions, would like to discuss this project further, or if we can otherwise be of any further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Gregory P. Johnston". The signature is fluid and cursive, written over a white background.

Greg Johnston
Certified Fisheries Professional

The information contained in this letter report is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the included references. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, state and federal regulatory authorities. No other warranty, expressed or implied, is made.

Ephemeral Flow:

- Ephemeral things (from Greek εφήμερος - ephemeros, literally "lasting only one day") are transitory, existing only briefly. ...
en.wikipedia.org/wiki/Ephemeral_stream
- A stream or reach of a stream that flows briefly only in direct response to precipitation in the immediate locality and whose channel is at all times higher than the water table.
nm.water.usgs.gov/glossary.html
- An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. ...
www.wetlands.com/pro/fr21jul99pte.htm
- A stream that flows during, and for short periods, following a precipitation event. The stream may or may not have a well-defined channel.
www.forestasyst.org/glossary.html
- A watercourse generally without a well-defined channel which flows only in response to rainfall or snowmelt. Ephemeral streams, generally, flow for less than 20% of the year during normal rainfall.
www.in.gov/dnr/forestry/4703.htm
- A stream that only flows right after a rain. These streams may only flow for a short time in any year, yet they support more vegetation than ...
www.pima.gov/cmo/sdcp/kids/gloss.html
- A channel that carries water only during and immediately following rainstorms. Sometimes referred to as a dry wash.
www.epa.gov/nps/MMGI/Chapter3/ch3-3.html

Intermittent Flow:

- stream with a defined channel, but dry for periods of the year, usually the late summer and fall period of low precipitation and no snowmelt.
wlapwww.gov.bc.ca/wld/documents/wrp/wrt6/glossary.html
- An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.
www.wetlands.com/pro/fr21jul99pte.htm
- A stream that ceases to flow in very dry periods.
www.hancockcoingov.org/surveyor/drainage_glossary_of_terms.asp
- In hydrological terms, a stream that flows periodically
forecast.weather.gov/glossary.php
- A stream that ceases to flow occasionally or seasonally because evaporation and leakage to ground water exceed the available water supply.
nm.water.usgs.gov/glossary.html
- A stream that flows part of the time because of a connection with groundwater or because of seasonal snow melt.
www.pima.gov/cmo/sdcp/kids/gloss.html
- that which does not flow year-round
www.pskf.ca/publications/glossary.html

- A stream through which water flows only part of the time.
imnh.isu.edu/digitalatlas/glossary/letter.asp