# 20KIRKLAND<br/>WATERSHED<br/>REPORT<br/>CARDS

Kirkland Public Works Storm & Surface Water Division <u>www.kirklandwa.gov/CreekHealth</u>





### **2023 Watershed Report Card**

We're excited to report that water quality scores for almost all Kirkland creeks **increased in 2022.** While we're cautiously optimistic that the long-term trends are showing slight improvement, it's also important to remember that water quality scores can fluctuate widely year to year due to many different factors.

It's also vital that we all continue to take simple actions in our daily lives to help improve Kirkland's creeks. Learn more about specific actions on each watershed report card.



#### What's new this year?

We're excited to share that Kirkland has launched an interactive, web-based watershed dashboard that allows you to explore the health of Kirkland's creeks over time. Visit the dashboard online at **www.kirklandwa.gov/kirklandwatersheds**.

#### Kirkland's Watersheds

A **watershed** is the area of land that drains water to a specific creek or waterbody. The thick black lines on the map of Kirkland outlines the various watersheds in the city. Watersheds are also referred to as "basins" in these report cards.

#### **What We Measure - Watershed Health Indicators**



Kirkland monitors the health of 12 watersheds, using physical, chemical, and biological factors. These report cards share the results of these monitoring efforts and data collected in 2022.

**Water quality** is a measure of the chemical and physical characteristics of the water that affect stream health. The **Water Quality Index (WQI)** presents water quality data as a number ranging from 1 to 100. A higher number indicates better overall water quality. The WQI Score results from a combination of scores for the following indicators:

**Dissolved Oxygen (DO)** is the amount of oxygen dissolved in water. All aquatic plants and animals need dissolved oxygen to survive. Higher levels of dissolved oxygen indicate healthier streams. Low levels of DO are primarily caused by high water temperature and decomposing algae/plants in the water.

**pH** is a measure of how acid or alkaline the water is. In general, a balanced pH is optimal for salmon and other stream life. The pH level can be affected by polluted runoff, polluted rainfall, and decaying vegetation.

**Temperature** measures the intensity of heat. Water temperature can increase due to seasonal climate cycles, removal of streamside trees and plants, and polluted runoff. Warm temperatures reduce dissolved oxygen in the water. This impacts the spawning, rearing, feeding, and migration behavior of fish and other aquatic species.

**Total Nitrogen and Total Phosphorus** are the amount of nitrogen and phosphorus in water. High levels of nitrogen and phosphorus cause excessive algae and plant growth. When these plants die and decompose, they consume large amounts of dissolved oxygen. Common sources of nitrogen and phosphorus are fertilizers and human/animal waste. **Total Suspended Solids (TSS)** is the measure of particles that are suspended in the water. Materials like silt, decaying plants, industrial waste, and sewage contribute to TSS. Metals, pesticides, and other contaminants "stick" to sediment particles. High TSS can cover fish spawning grounds, clog fish gills, and increase water temperature.

**Turbidity** is a measure of water clarity. Algae and TSS can increase turbidity, making the water cloudy. Particles in the water increase water temperature and reduce dissolved oxygen. Heavy metals and other toxics can attach to the suspended materials. High turbidity can block sunlight and reduce plant photosynthesis and affect the food chain for fish.



**Stream bugs** live on the stream bottom. Most are insects such as mayfly and dragonfly larvae that live part of their life in the water, but it also includes things like aquatic snails and clams.

Monitoring stream bugs tells us about the biological health of a stream. Different bugs are more or less tolerant of water pollution, and their presence or absence can tell us a lot about the quality of the water.







Habitat conditions: Development downstream of Lake Washington Boulevard led to a restoration project on Carillon Creek that reopened channel that was previously piped. The open channel and planted native vegetation have improved fish and wildlife habitat. Cutthroat trout and coho salmon have been found in the lower section of Carillon Creek.

*Challenges:* Development has significantly increased hard surfaces (pavement and buildings) in the Carillon Creek basin. This impacts the creek's water quality, aquatic habitat, and potential for flooding.

How to Help **Nitrogen** in *Carillon Creek* 

Minimize fertilizer use in your lawn and garden to reduce nitrogen



not score higher.



Poor

Habitat conditions: Most of Champagne Creek's open channel is in poor condition, but the lower and the middle sections of the creek have large, vegetated buffers. Cutthroat trout have been found in the downstream section of Champagne Creek.

**Challenges:** Most development in this basin occurred before regulations required stormwater flow control and treatment, causing Champagne Creek to have erosion problems along the creek.

#### How to Help **Phosphorus** in *Champagne Creek*

Scoop and throw away **pet waste** to reduce phosphorus runoff.

Monitoring stream bugs tells us about the biological health of a stream. Different bugs are more or less tolerant of water pollution, and their presence or absence can tell us a lot about the quality of the water.



High levels of phosphorus and nitorgen are the primary reasons this basin did not score higher.





Habitat conditions: This basin has the 2nd highest forest cover of any basin in Kirkland. This provides quality wildlife habitat and can help decrease the volume of runoff and contaminants entering Denny Creek and Lake Washington. Sockeye, cutthroat trout, juvenile coho, and sculpins have been found in the lower section and mouth of the creek.

**Challenges:** Development and urbanization of the upper section of Denny Creek has led to erosion in the stream channel.



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*Habitat conditions:* Wetlands and open space line the sides of Forbes Creek at its mouth and extend upstream. I-405 creates a barrier to fish and wildlife movement.

**Challenges:** Development has significantly increased hard surfaces in the Forbes Creek basin. This impacts the creek's water quality, aquatic habitat, and potential for flooding.

#### How to Help Phosphorus in Forbes Creek

Scoop and throw away **pet waste** to reduce phosphorus runoff.

Monitoring stream bugs tells us about the biological health of a stream. Different bugs are more or less tolerant of water pollution, and their presence or absence can tell us a lot about the quality of the water.



**2022 Water Quality** Total Nitrogen **High Concern Total Phosphorus** 82 Turbidity 82 Oxygen 86 Some or Low Concern Temperature 86 **Total Suspended Solids** 88 pН 20 40 60 80 100 Water Quality Index Score 41-80 Moderate Concerr 81-100 Low Concern 0-40 Hiah Concern



Habitat conditions: Significant green space is found in the basin due to high forest coverage and Holmes Point Overlay Zone development restrictions. Most of the lower section of Holmes Point Creek is armored and flows through several yards with lawn extending to the edge of the creek. Many fish passage barriers are present in the creek.

**Challenges:** High landslide risk and an unstable stream channel leads to erosion and sedimentation problems in the creek. This causes impacts to habitat and can also lead to flooding problems within the basin.

#### How to Help Nitrogen in Holmes Point

Minimize fertilizer use in your lawn and garden to reduce nitrogen runoff.



Plant a tree - trees help lower water temperatures.

If pressure washing, **use cold water only**. Avoid heated water and chemicals.



are the primary reasons this basin did not score higher.





*Habitat conditions:* Houghton Slope B is one of the most developed basins in Kirkland. A high percentage of the stream channel is piped due to high average slope and erosion problems within the basin.

**Challenges:** Development has led to a significant increase in hard surfaces (pavement and buildings) in the Houghton Slope B basin. This impacts the creek's water quality, aquatic habitat, and potential for flooding.



#### Learn more at www.kirklandwa.gov/stormwater



Juanita Creek is listed on the Environmental Protection Agency's (EPA) list of impaired water bodies for dissolved oxygen, temperature, and bacteria. Learn more about water quality in 2022 on the next page.



#### 2022 Water Quality

\*Based on Juanita Creek sampling site near Juanita Beach Park





**Juanita Creek** is the largest basin in Kirkland. Juanita Creek drains to Lake Washington. 1 in 3 Kirkland residents lives in the Juanita Creek watershed.

Habitat conditions: Juanita Creek is one of the most confined creeks due to residential development along its banks. Vegetation along the creek is primarily landscaping, grass, shrubs, and invasive species. Juanita Creek has a variety of fish and wildlife. Small numbers of cutthroat trout, coho, sockeye, chinook and kokanee salmon have been observed. Beavers are at work throughout the creek and its tributaries. Ducks and other waterfowl are present in the creek.

**Challenges:** Development has led to a significant increase in hard surfaces (pavement and buildings) in the Juanita Creek basin. This impacts the creek's water quality, aquatic habitat, and potential for flooding. Urbanization of this basin and loss of native vegetation have caused erosion and instability of the stream bank.









Habitat conditions: The stream channels in this basin have been straightened, ditched, or piped through the lower reaches prior to entering Lake Washington. This has resulted in no viable habitat for fish to enter from Lake Washington.

**Challenges:** The Moss Bay/Everest Creek basin is the most developed basin in Kirkland, with the highest level of coverage by hard surfaces (pavement and buildings). This impacts the creek's water quality, aquatic habitat, and potential for flooding.

> How to Help **Nitrogen** in *Moss Bay/Everest Creek*

Minimize fertilizer use in your lawn and garden to reduce nitrogen



High levels of phosphorus and nitorgen are the primary reasons this basin did not score higher.





Habitat conditions: Multiple smaller wetlands are scattered across the basin with a larger, high-quality wetland along the Juanita Bay shoreline. Salmon have been identified in the open channels in the Juanita Bay wetlands up to 98th Avenue NE. The salmon have not been able to migrate further upstream due to fish barriers and lack of habitat.

**Challenges:** Much of the South Juanita Slope basin was developed before regulations required stormwater flow control and water quality treatment. This can impact stream health and potential for flooding.

#### How to Help **Nitrogen** and **Phosphorus** in *S. Juanita Slope*

Scoop and throw away **pet waste** to reduce phosphorus runoff.

Minimize fertilizer use in your lawn and garden to reduce nitrogen runoff.



A high level of nitorgen is the primary reason this basin did not score higher.





**Cochran Springs Creek** and **Yarrow Creek** are in this basin and drain to Yarrow Bay in Lake Washington.

Habitat conditions: A near-continuous greenbelt connects Yarrow Creek with Cochran Springs Creek. This allows wildlife to move freely between a variety of upland stream and woodland habitat. A large wetland complex at the mouth of Yarrow Creek filters contaminants, stores flood waters during storm events, and is home to many fish and wildlife species. Coho salmon and cutthroat trout have been found in Yarrow Creek.

**Challenges:** Development has led to a significant increase in pavement and buildings in the Yarrow Creek basin. This impacts the creeks' water quality, aquatic habitat, and potential for flooding.

#### How to Help **Nitrogen** in *Yarrow Creek*

Minimize fertilizer use in your lawn and garden to reduce nitrogen runoff.

## Thanks for helping protect our waterways!



#### **Yard Care and Maintenance**

Minimize use of fertilizers and chemicals in your yard. Follow directions on label and never use more than suggested.

Do not sweep, blow, or dump yard debris into streets, sidewalks, ditches or drains. Dispose of yard waste in yard waste bins.

Did you know? More than 35 different pesticides have been detected in our local creeks. Adding just a 3-inch layer of mulch in your garden can prevent weeds as effectively as yard chemicals.



#### **Pressure Washing**

Use a broom to sweep up dirt and debris. Divert wash water to a landscaped area where wash water can soak into the ground. If you can't divert wash water, use <u>only cold water with no soap</u> <u>or chemicals</u>.

Don't allow soap, chemicals, or dirt into street or storm drain.



#### **Roof Cleaning**

Use a broom, stiff brush, or leaf blower to remove moss. If you must use chemical cleaners, disconnect roof downspouts so chemicals do not flow into the stormwater drainage system.

Direct wash water to adjacent lawn and landscape to soak into the ground.



#### **Car Washing**

Use a commercial car wash or wash your car on a lawn or gravel area. Keep soap (even biodegradable soap) and dirty water out of streets and storm drains.

Did you know? The average driveway car wash wastes more than **120 gallons of water.** The average commercial car wash uses 60% less water and keeps soap and chemicals out of our streams.



#### **Paint and Chemical Disposal**

Never dump chemicals, paint, or rinse water in your yard or down storm drains. Always rinse paint brushes and rollers in a sink, never outside.

Visit **hazwastehelp.org** for info on safe disposal of household chemicals or **paintcare.org/WA** for FREE paint disposal.

# If you see soap, oil, or other pollution in your neighborhood storm drains or creeks, call our 24/7 Spill Hotline:

# 425-587-3900

Alternative language formats of this publication are available upon request. For more information contact (425) 587-3831 or **titleVlcoordinator@kirklandwa.gov.** 

Learn more at kirklandwa.gov/stormwater

City of Kirkland Public Works Storm & Surface Water Division