



Stream Stewards

Welcome to King Conservation District's (KCD) Stream Steward program. KCD's Boise Creek water quality monitoring pilot project started in 2013, modeled after Pierce Conservation District's Stream Team stream monitoring program which began in spring of 1994. The goals of these stream steward programs are to:

- ☐ Provide public education to foster awareness of the impact of everyday activities on our streams.
- ☐ Involve citizens in observing, monitoring, and reporting stream conditions.
- ☐ Provide useful water quality data to local entities and resource agencies.

Volunteers are the key players of the Stream Steward program. Because volunteers are monitoring streams on a regular basis, they are usually the first to notice and report any changes or problems in water quality. Should volunteers notice any changes or problems please contact the King Conservation District office (425-282-1901) as soon as possible. The staff can then notify the appropriate entity.

In case of EMERGENCY please call 911!

If you have a Stream Steward-related issue you can contact KCD staff a streamsteward@kingcd.org.

Water Quality Kits

King Conservation District (KCD) provides water quality kits to Stream Stewards upon request. It is best to reserve a kit several days in advance of needing one by e-mailing streamsteward@kingcd.org. Water quality kits can be picked up, and dropped off, at the Enumclaw Waste Water Treatment Plant.

Enumclaw Waste Water Treatment Plant is located at: **451 Semanski St., Enumclaw, WA 98022** (across from Enumclaw Middle School and High School, just off SR410). Open hours are: **Monday-Friday 7:30am-4:00pm**. For weekend testing; please pick up Thursday or Friday and return the kit Monday or Tuesday.

Water Quality Kit Contents:

| | | | |
|-----------|-------------------------------|-----------|--|
| 1 | D.O. kit – Hach #OX-2P | 2 | A safety bag: gloves, goggles, wipes, first aid kit, pepper spray |
| 3 | pH kit – Hach #17-N | 4 | A supply bag: pencils, scissors, clipper, pipettes, thermometer, tongs |
| 5 | Nitrate Kit – LaMotte #3354 | 6 | Clipboard with ruler edge |
| 7 | Turbidity – LaMotte #7519 TTM | 8 | Waste bag |
| 9 | Distilled Water Bottle | 10 | Binder with instructions, data sheets, habitat assessment |
| 11 | Liquid Waste Bottle | 12 | Plastic folder with material safety data sheets |
| 13 | Kitchen timer | 14 | Calculator |
| 15 | Neon Safety Vests | | |

Monitoring Safety and Tips

Monitoring Safety

- ☐ Always work with a partner.
- ☐ Record only what you see.
- ☐ Do not put yourself in danger to gather information. Do not attempt to enter streams that are swift and above the knee in depth.
- ☐ The water is not safe to drink.
- ☐ Watch out for irritating plants (stinging nettles, blackberry), stinging insects, ticks and aggressive dogs.
- ☐ Do not walk on unstable banks; your footsteps could speed erosion.
- ☐ Be alert for spawning areas (redds) in the stream. They will look like a round or elliptical area of clean gravel about 1–3 feet long. During the fall through spring, when redds are evident, do not walk in the stream.
- ☐ Be careful of streamside vegetation; disturb it as little as possible.
- ☐ If you encounter problems accessing the site, notify KCD staff.

Monitoring Tips

- ☐ Be as consistent as possible in monitoring at the same time of day each time you go out.
- ☐ Each sample should be collected from an area in the stream where the water is well mixed – generally collect from the main current or as close to that as you can get.
- ☐ If you step into the stream to collect the sample, please collect your sample upstream of where you stepped in so that the sample is not contaminated with sediment from the stream bottom.
- ☐ Rinse sample collection containers 3 times with water to be sampled before collecting the actual sample.
- ☐ When using a dropper to add reagents to a sample, hold the dropper perpendicular to the sample container, and do not touch the container with the dropper.
- ☐ Document everything – garbage, fish & wildlife sightings, areas of erosion or any other changes to surrounding landscape and stream.
- ☐ Make sure the data sheet is properly filled out and complete.
- ☐ The Washington State water quality standards for streams can be found in the attached table. Should your results look questionable or do not fall within the given ranges, and you have time please redo the test and record both of your results.

Water Quality Monitoring Schedule

Stream Stewards monitor water quality once a month, preferably at the same time of day each time.

Every Month – 12 Times/Year

| Month | Water Quality | Habitat Assessment |
|-----------|---------------|--------------------|
| January | Yes | No |
| February | Yes | No |
| March | Yes | No |
| April | Yes | No |
| May | Yes | No |
| June | Yes | No |
| July | Yes | No |
| August | Yes | Yes* |
| September | Yes | Yes* |
| October | Yes | Yes* |
| November | Yes | No |
| December | Yes | No |

* Fill out Habitat Assessment Form/Stream Walk once each year during August, September OR October.

QA/QC Replicate Sample Schedule for Stream Stewards

Field replicate samples for dissolved oxygen, pH, and nitrates will be collected and tested twice a year. Stream Stewards select which two months they do replicate samples.

Dissolved oxygen replicates should not vary over a range of more than 2.0 mg/l. pH replicates should not vary more than 0.4 pH units.

Washington State Water Quality Criteria in Fresh Water

The following uses are designated for protection in fresh surface waters of the state.

Use designations for water bodies are listed in WAC 173-201A-600 and 173-201A-602.

| Aquatic Life Uses | Description |
|---|--|
| Char spawning and rearing. | The key identifying characteristics of this use are spawning or early juvenile rearing by native char (bull trout and Dolly Varden), or use by other aquatic species similarly dependent on such cold water. Other common characteristic aquatic life uses for waters in this category include summer foraging and migration of native char; and spawning, rearing, and migration by other salmonid species. |
| Core summer salmonid habitat. | The key identifying characteristics of this use are summer (June 15–September 15) salmonid spawning or emergence, or adult holding; use as important summer rearing habitat by one or more salmonids; or foraging by adult and subadult native char. Other common characteristic aquatic life uses for waters in this category include spawning outside of the summer season, rearing, and migration by salmonids. |
| Salmonid spawning, rearing, and migration. | The key identifying characteristic of this use is salmon or trout spawning and emergence that only occurs outside of the summer season (September 16–June 14). Other common characteristic aquatic life uses for waters in this category include rearing and migration by salmonids. |
| Salmonid rearing and migration only. | The key identifying characteristic of this use is use only for rearing or migration by salmonids (not used for spawning). |
| Non-anadromous interior redband trout. | For the protection of waters where the only trout species is a non-anadromous form of self-reproducing interior redband trout (<i>O. mykiss</i>), and other associated aquatic life. |
| Indigenous warm water species. | For the protection of waters where the dominant species under natural conditions would be temperature tolerant indigenous nonsalmonid species. Examples include dace, redbside shiner, chiselmouth, sucker, and northern pikeminnow. |

Water Contact Recreation Bacteria Criteria in Fresh Water

| Category | Bacteria Indicator |
|---|---|
| Extraordinary Primary Contact Recreation | Fecal coliform organism levels must not exceed a geometric mean value of 50 colonies/100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL. |
| Primary Contact Recreation | Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies/100 mL. |
| Secondary Contact Recreation | Fecal coliform organism levels must not exceed a geometric mean value of 200 colonies/100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 400 colonies/100 mL. |

Washington State Water Quality Criteria in Fresh Water

| Temperature Highest 7-DADMax | Dissolved Oxygen Lowest 1-Day Minimum | Turbidity NTUs | Total Dissolved Gas % Saturation | pH pH Units |
|---|--|--|--|--|
| Char Spawning and Rearing* | | | | |
| 12°C (53.6°F) | 9.5 mg/L | Turbidity shall not exceed: <ul style="list-style-type: none"> 5 NTU over background when the background is 50 NTU or less; or A 10% increase in turbidity when the background turbidity is more than 50 NTU. | Total dissolved gas shall not exceed 110% of saturation at any point of sample collection. | pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units. |
| Core Summer Salmonid Habitat* | | | | |
| 16°C (60.8°F) | 9.5 mg/L | Same as above. | Same as above. | Same as above. |
| Salmonid Spawning, Rearing, and Migration* | | | | |
| 17.5°C (63.5°F) | 8.0 mg/L | Same as above. | Same as above. | pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units. |
| Salmonid Rearing and Migration Only | | | | |
| 17.5°C (63.5°F) | 6.5 mg/L | Turbidity shall not exceed: <ul style="list-style-type: none"> 10 NTU over background when the background is 50 NTU or less; or A 20% increase in turbidity when the background turbidity is more than 50 NTU. | Same as above. | Same as above. |
| Non-anadromous Interior Redband Trout | | | | |
| 18°C (64.4°F) | 8.0 mg/L | Turbidity shall not exceed: <ul style="list-style-type: none"> 5 NTU over background when the background is 50 NTU or less; or A 10% increase in turbidity when the background turbidity is more than 50 NTU. | Same as above. | Same as above. |
| Indigenous Warm Water Species | | | | |
| 20°C (68°F) | 6.5 mg/L | Turbidity shall not exceed: <ul style="list-style-type: none"> 10 NTU over background when the background is 50 NTU or less; or A 20% increase in turbidity when the background turbidity is more than 50 NTU. | Same as above | Same as above. |

*** Note:** Some streams have a more stringent temperature criterion that is applied seasonally to further protect salmonid spawning and egg incubation. See below. WA DOE has identified waterbodies, or portions thereof, which require special protection for spawning and incubation in WA DOE publication 06-10-038 (also available on WA DOE's web site at <http://www.ecy.wa.gov>). This publication indicates where and when the following criteria are to be applied to protect the reproduction of native char, salmon, and trout:

- Maximum 7-DADMax temperatures of 9°C (48.2°F) at the initiation of spawning and at fry emergence for char; and
- Maximum 7-DADMax temperatures of 13°C (55.4°F) at the initiation of spawning for salmon and at fry emergence for salmon and trout

The two criteria above are protective of incubation as long as human actions do not significantly disrupt the normal patterns of fall cooling and spring warming that provide significantly colder temperatures over the majority of the incubation period.

Adapted from Water Quality Standards for Surface Waters of the State of Washington; Chapter 173-201A WAC; Amended May 9, 2011
<https://fortress.wa.gov/ecy/publications/publications/0610091.pdf>

| Site ID | Latitude | Longitude | Creek Name | Site Description |
|---------|-----------|-------------|-----------------|---|
| BC-01 | 47.174801 | -122.019870 | Boise | Lower Boise Creek Natural Area on Mud Mountain Road near confluence with White River (downstream of King County bridge #3055A and USGS Gauge Station # 12099600 https://waterdata.usgs.gov/nwis/uv?site_no=12099600) |
| BC-02 | 47.185717 | -122.005382 | Boise | Upstream side of King County bridge #3198 on northeast side at 252nd Ave SE |
| BC-03 | 47.186611 | -122.005659 | Boise | Culvert near SR410 on southwest side of 252nd Ave SE |
| BC-08 | 47.190324 | -121.984093 | Boise | Upstream from King County bridge #3052 on 268th Ave SE in Middle Boise Creek Natural Area |
| BC-09 | 47.188421 | -121.973616 | Boise | Private residence on 276th Ave SE near upstream of King County bridge #3051 |
| BC-11 | 47.193664 | -121.996923 | Boise | In Mountain Meadows Manufactured Home Community's park area below culvert outflow between trailer parks. Park at Foothills Trail trailhead parking and walk to trail access by park office on Noble Fir Ct. |
| BC-12 | 47.193745 | -121.996931 | Boise | Ditch paralleling SR 410 above confluence with Site #11. Use same access at BC-11 above. |
| BC-14 | 47.193173 | -121.984394 | Boise | Northwest side of Blake St ditch/culvert. |
| BC-15 | 47.193139 | -121.979160 | Boise | NW side of Watson St ditch/culvert south of Mt. Peak Village |
| BC-19 | 47.177777 | -121.963265 | Beaver | East side of 284th Ave SE, north of SE 472nd St near Adopt-A-Road sign |
| BC-20 | 47.189375 | -121.931855 | Boise | Just off SR 410 below spillway coming from Weyerhaeuser property. |
| BC-21 | 47.185611 | -121.963830 | Boise | Private residence downstream of King County Bridge #3049 on 284th Ave SE |
| BC-22 | 47.184966 | -121.966054 | Beaver | Private residence downstream of bridge and upstream on confluence with Boise Creek |
| NC-01 | 47.282378 | -122.066682 | Newaukum | Newaukum Creek Natural Area at end of SE 358th St upstream of confluence with Green River |
| NC-03 | 47.240990 | -122.038596 | Newaukum | Private residence on 228th Wy SE (upstream of King County bridge #3188) |
| NC-04 | 47.230070 | -122.032260 | Newaukum | Private residence on north side of SE 424th St (downstream of King County bridge #3063) |
| NC-06 | 47.216309 | -122.028894 | Newaukum | SE of King County bridge #3066 on 236th Ave SE on City of Enumclaw property |
| NC-07 | 47.211799 | -122.019144 | Newaukum | In Mahler Park (downstream of King County bridge #3068) |
| NC-08 | 47.213782 | -122.011002 | Newaukum | Downstream of King County bridge #3069 on 248th Ave SE and also McHugh culvert outflow |
| NC-10 | 47.228395 | -121.976628 | Newaukum | Northeast corner of King County Bridge #3043 on SE 416th St |
| NC-15 | 47.235743 | -121.952988 | N Fork Newaukum | Southwest side of culvert on 292nd Ave SE |
| WC-02 | 47.221091 | -121.972036 | Watercress | Northwest corner of King County bridge #3201 Watercress Creek on SE 424th St along Foothills Trail |
| PFC-03 | 47.222760 | -122.064380 | Pussyfoot | Private residence on 208th Ave SE |
| PFC-04 | 47.237112 | -122.079477 | Pussyfoot | Private residence |
| WR-01 | 47.184721 | -122.026829 | Ditch | Private residence on SE 468th Way - Residential and agricultural area roadside ditch |

