

## WATER QUALITY INDICATORS FOR VALLEY CREEK

This report card format is intended to give an overview of the health and status of Valley Creek, based primarily on information collected by volunteer monitors working with WSU Cooperative Extension and Clallam County Department of Community Development, with information from other sources in italics. Volunteers monitored six reaches in the lower three miles of Valley Creek, including the Mill Creek tributary (see previous part of this report for locations), using protocols identified in the 8 Streams Quality Assurance and Monitoring Plan (1997), approved by the Washington State Department of Ecology. Data here has been averaged for all monitored reaches over the eight quarterly monitoring sessions between July 1997 and April 1999. (Raw data from individual monitoring sessions is available as a separate document, "8 Streams Project Stream Monitoring Data, Summer 1997-Spring 1999," available from the Streamkeepers office.) For certain parameters, a score is assigned in accordance with values suggested by the Global Rivers Environmental Education Network (Mitchell and Stapp 1996, *Field Manual for Water Quality Monitoring*), using a four-point poor-to-excellent scale. (These values are described in the "Water Quality Rating Criteria" section preceding the individual stream reports.)

### I. MEASURES OF PHYSICAL INTEGRITY

| PARAMETER                    | STANDARD FOR A HEALTHY STREAM<br><i>(Sources: Streamkeeper's Field Guide, Field Manual For Water Quality Monitoring, Stream Scene, Washington Administrative Code, &amp; Joel Freudenthal, Clallam County Planning Biologist)</i> | VALLEY CREEK<br><i>(Information in italics was compiled from non-volunteer sources identified in Part VI below.)</i>   |
|------------------------------|---|--|
| Instream habitat             | Abundant woody and organic debris, shade, gravel bars, cover, riffles, pools. Natural meanders, not channelized.  | <i>Lacks organic debris and shade in lower corridor. Lower 2,000 feet in culvert. 2000 above culvert is channelized through residential development. Reaches above are meandering with considerable woody debris, excellent shade, pools and riffles.</i><br>SCORE 3 (GOOD)  |
| Stream bank vegetation       | Abundant vegetation (preferably native), root wads, logs  | <i>Limited logs and root wads; invasive plants taking over lower 1/2 mile-purple loosestrife, blackberry and Japanese knotweed. Above residential zone is abundant native vegetation, a few root wads and many logs.</i><br>SCORE 3 (GOOD)   |
| Canopy                       | Many layers and levels, abundant canopy cover (trees shading the stream) with conifers present  | <i>Lacks trees in residential area. Abundant coniferous and deciduous canopy over all areas above residential zone.</i><br>SCORE 3 (GOOD)  |
| Stream banks                 | Mostly stable, as indicated by a diverse mix of mature riparian vegetation. Absence of runoff gulleys & devegetated or collapsing banks   | <i>Mostly armored in channelized 2000 ft residential zone. Areas above are mostly vegetation protected and stable.</i><br>SCORE 3- (FAIR TO GOOD)  |
| Stream bottom (substrate)    | In moderate-gradient reaches, a high percentage of gravel (= rock sizes between 0.1 and 2 inches) and cobble (= rock sizes between 2 and 10 inches); little mud or silt   | <i>Limited spawning gravels through residential zone. Upper reaches have maintained approx. 10 % gravel and 70 % cobble, free of silt and mud.</i>   |
| Stream flow                  | Adequate summer flow and no human-caused fish blockages   | <i>High flow events downcut channel and erode streambanks. Winter flow reach 10 CFS, spring 1.5 CFS and summer 1 CFS.</i>  |
| Human alterations to channel | Few objects or structures other than detention ponds. Absence of culverts, channelizing, rip-rap, other protection  | <i>A single long culvert at the mouth; Commercial development in floodplain over culverted stream; 2000 foot channelized, rip-rapped, buffer limited residential zone; Garbage and itinerant camps have been partially removed. Upper reaches include a short culvert under Highway 101 but few other alterations.</i> |

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**II. MEASURES OF BIOLOGICAL INTEGRITY**

| PARAMETER   | STANDARD FOR A HEALTHY STREAM   | VALLEY CREEK  |
|---|---|---|
| Benthic macro-invertebrates<br><br>(Underwater invertebrates visible to the naked eye, such as insects, worms, spiders, mollusks, etc.) | High number of macroinvertebrates of different types (taxa); variety of mayfly (taxonomic order Ephemeroptera), caddisfly (Trichoptera), and especially stonefly (Plecoptera) species. Collectively, these three crucial orders of underwater insects are known as EPT.<br><br>If sampling has been done in accordance with the 10-metric genus-level Benthic Index of Biological Integrity (B-IBI; see "Water Quality Rating Criteria" for a description), scores are as follows:<br>46-50=Excellent; 38-44=Good; 28-36=Fair; 18-26=Poor; 10-16=Very Poor. | <b>5/98:</b> <i>Reach 2:</i> 8 individuals, 5 taxa: 4E (3 taxa), 1P, 3T (1 taxon). <i>Reach 3:</i> 5 individuals, 5 taxa, including 2E (2 taxa), 1P, 1T. <i>Reach 4:</i> 7 individuals, 6 taxa, including 2E (2 taxa), 1P, 1T.<br><br><b>10/98:</b> <i>Reach 6</i> only. ~175 individuals from <21 taxa, including ~90E (5-8 taxa), ~25P (4-7 taxa), 18T (4-8 taxa) |
| Fish  | Historical species still present in healthy numbers   | <i>Resident trout; potential for salmonids (3 redds reported in 1998).</i> Resident cutthroat observed in significant numbers. Few if any salmon or steelhead left.<br>SCORE 1 (POOR)   |
| Wildlife  | Diversity of species, habitat corridor  | <i>Habitat corridor constrained by roads and development in lower reaches.</i> Upper reaches exhibit wide variety of native birds, small and larger mammals<br>SCORE 3 (GOOD)   |

**III. MEASURES OF CHEMICAL INTEGRITY**

(Unless otherwise noted, standards are taken from Washington Administrative Code 173-201A, standards for Class AA waters. Scores are assigned for most parameters, using a four-point poor-to-excellent scale given by Mitchell and Stapp (see "Water Quality Rating Criteria" section preceding individual stream reports), and comparing the values in that scale to the high, low, and median values for the parameter over all quarterly samplings for all reaches.

| PARAMETER                    | STANDARD FOR A HEALTHY STREAM  | VALLEY CREEK   |
|------------------------------|--|--|
|                              |  | <i>Highs, lows, and medians are for quarterly samplings between 7/97 &amp; 4/99--not to be confused with absolute highs, lows, or medians.</i>                       |
| Dissolved oxygen (DO)        | >9.5 mg/L; >90% DO saturation (Mitchell and Stapp, 1996)   | High: Concentration 11.8 mg/L; Saturation 103%<br>Low: Concentration 4.0 mg/L; Saturation 80%<br>Median : Concentration 10.3 mg/L; Saturation 90%<br>SCORE: 3 (GOOD) |
| pH                           | 6.5 - 8.5  | High: 7.8 Low: 7.0 Median: 7.5 Geo Mean: 7.5<br>SCORE: 3-4 (GOOD TO EXCELLENT)   |
| Temperature                  | <16°C  | High: 15.3 C Low: 5.0 C Median: 10.0 C   |
| Nitrates                     | No government standard established for surface waters; Mitchell and Stapp suggest a scoring scale—see "Water Quality Rating Criteria" section for details.     | High: 1.54 mg/L Low: 0.00 mg/L Median: 0.0 mg/L<br>SCORE: 4 (EXCELLENT)  |
| Phosphorous                  | None established; federal drinking water quality standard is <0.1 microgram/L  | <i>Unknown</i>   |
| Turbidity                    | Varies greatly under natural conditions. Nature Mapping Project sets standard of <5 NTU for Class AA waters. Impairments of fish health documented at >25 NTU. | 0.96 - 1.65<br>SCORE: 4 (EXCELLENT)  |
| Fecal coliform concentration | <50 colonies per 100 mL  | 10 – 26 colonies per 100 mL<br>SCORE: 4 (EXCELLENT)  |
| Conductivity                 | Streamkeeper's Field Guide (Murdoch and Cheo, 1996) sets standard of 150-500 micromhos/cm  | <i>Abnormal readings 6 - 800; salty due to low culvert.</i>  |

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#### **IV. PROBLEMS NOTED BY NATURAL RESOURCE PROFESSIONALS**

- Fish passage blocked at Marine Drive with culvert; impaired passage at Hwy. 101.
- Channelized from mouth to end of Valley St.
- Eight fish passage barriers identified by Clallam Conservation District from mouth to 500 meters upstream, 1995.
- Urbanization and development in upper watershed creating stormwater management and runoff problems.

#### **V. RECENT PROJECTS**

- Restoration of the estuary and established of Estuary Park, 1997 and ongoing.
- Eagle scout projects to remove garbage and invasive plants, 1997-98.

#### **VI. PROFESSIONAL DATA SOURCES**

- Water quality monitoring for Port Angeles watershed plan by Clallam County Dept. of Community Development, 1993-95.
- Stream Team volunteer monitoring through the Eight Streams Project with sites at upper end of culvert, end of Valley St., Hwy. 101, about 1/4 mile upstream of Hwy. 101 and on Mill Creek tributary at Laurel St., 1997 to present.