How Is Streamkeeper Data Used?

This appendix was originally written in 2002 by some of Streamkeepers' Technical Advisors and data end-users, and then updated by Streamkeepers staff in 2006. As you know, Streamkeepers' primary mission is to collect credible, meaningful, and relevant data. We can look at that data and try to make some sense of it, but Streamkeepers isn't charged with designing projects or developing management strategies. End-users are the folks who use the data we collect to do instream work or make management decisions that protect and improve our natural resources. We hope these articles help illuminate the ways in which Streamkeepers' data is used by decision-makers, as well as the longer-term applications of our data. Feel free to contact Streamkeepers staff at 360-417-2281 with comments or questions.

Environmental Detective

by Valerie Streeter, former Water Quality Planner
Clallam County Environmental Health Division

Perhaps I read too many detective novels in my youth, but a favorite part of my job is when I get to be an environmental detective. When presented with a water quality problem, I put on my imaginary detective hat and pull out my imaginary magnifying glass. Like other detectives, I start by asking questions. However, when dealing with an environmental mystery, I can't find all my answers by interviewing a series of people. Since streams, lakes, rivers and bays don't communicate like humans do, I have to be sneaky about getting my information.

In the best of all possible worlds, I can go out in the field and poke around. Unfortunately I don't live in that world, so I try to fit in my detective work between meetings, grants and other bureaucratic stuff. I like to start by asking people what they see in the field, and why they think there is a problem—that is, if there are any people around to ask. Further, all that opinion is just that: opinion. I've spent hours listening to other people's musing and reasoning about why there is a fecal coliform problem in Dungeness Bay. Some of these opinions were useful, some not. These opinions can generate a few leads on possible causes of the water problems, but I have nothing substantial until I have information that is less refutable than people's opinions. Being a data geek, I've gotten in the habit of heading for the Streamkeepers' office to look at their data. Without the availability of such data, I am left with mere opinion that will not impress any policy-maker enough to take action (even if it is only to gather more data). Armed with data, I can look for patterns and signs that may provide further leads or close my case, by convincing a State or local agency to take action.

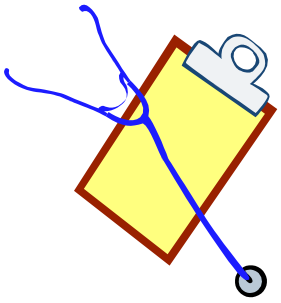
I give a hearty "THANKS!" to all the Streamkeepers volunteers, who drag all that sampling gear down ravines and brave stinging weeds to collect the quarterly monitoring data—the equivalent of fingerprinting or finding the one, long, blond hair on the black leather jacket. I couldn't make my case without you!

Baseline Data: It's "In The Blood"

by Theresa Powell, former Fish Biologist, Washington Department of Fish and Wildlife

In trying to describe the importance of baseline information, I've found an interesting parallel . . .

Streams are similar to blood. Both are part of a circulatory system, and tests can be performed on both to trace factors that could be signs of abnormal conditions. Most annual physicals include a battery of blood tests that give a wide range of information about your health status and help detect problems before you are obviously ill. In the same way, the tests conducted by Clallam County Streamkeepers provide information for assessing the health of our streams. The parameters for measuring stream health—dissolved oxygen, fecal coliform, temperature, turbidity, benthic macroinvertebrates, etc.—are all essential in diagnosing problems before they become too big to solve.

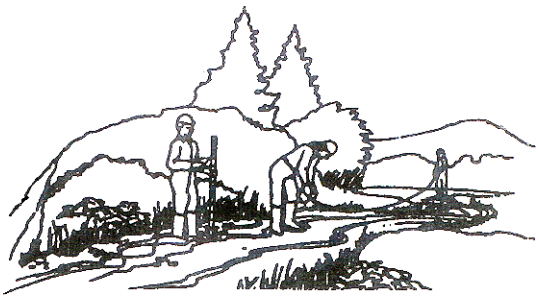


In the field of medicine, it may be just as important to establish that a condition is normal as abnormal. So to be most useful, blood tests must be conducted regularly in order to distinguish true problems from individual idiosyncrasies and normal fluctuations of blood chemistry. In this way, your doctor establishes a patient file that helps to determine what's normal for you. That file makes it much easier to tell when things are abnormal. In similar fashion, biologists and other concerned citizens need to produce a "patient file" for our local streams, and large parts of that file have been missing until Streamkeepers came along.

An example is benthic macroinvertebrates (or "benthos," as we like to call them). Benthos are positioned in the middle of the food chain: they break down plant material and provide food for fish. Thus, they are important for the flow of nutrients and energy. Benthos are also good indicators of stream health due to their sensitivity to pollution. Generally, diverse and rich groups of benthos indicate high water quality. Unfortunately, many of our local streams lack consistent monitoring information on these aquatic insect communities.

Streamkeepers' monitoring of benthos yields important baseline data, which can help identify streams showing signs of stress. Some known impacts to local benthic communities include road building, logging, urban runoff, and pollutants such as pesticides and industrial chemicals. Unlike water quality monitoring which provides information only at the time of measurement, benthic sampling can provide information about past impacts that may no longer be evident. For example, an increase in "scrapers" (invertebrates that graze on algae on stones) can be an indication of past nutrient runoff such as fertilizers. Benthic macroinvertebrate information is one important component of a complete "blood count" for our streams. When combined with two dozen other parameters that Streamkeepers monitors, this data constitutes a "patient file" to track the health of our watersheds.

Thanks to Streamkeeper volunteers, at long last we have been able to establish baseline files on many of our local streams. From this information, resource managers will be able to set protection and restoration goals and improve environmental quality.



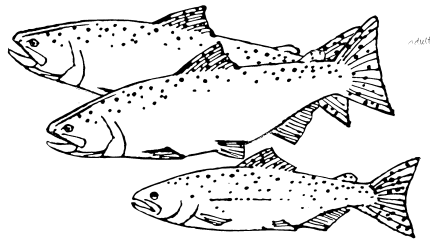
In It for the Long Haul: Trend Tracking

by Cathy Lear, Habitat Specialist, Clallam County Department of Community Development

One of the most important questions that Streamkeepers' data helps to answer is, "What happens in this system over time?" The causes of change in our streams are difficult to see at first glance. Gathering good information over the course of many years helps to paint the larger, long-term picture of conditions in the watershed.

For example, the macroinvertebrate information that Streamkeepers has gathered over the past 7 years is interesting in itself. When compared with macroinvertebrate information from earlier years (or future years), a picture can emerge: Do the same critters live there? Do they live there in the numbers they have always lived there? What has changed? Do the changes indicate improvement (i.e., water quality has improved), or do they indicate that problems exist? One year's data may not be able to tell this story, but many years' data may point to the factors that alter streams and their habitat.

[Ed. note: Some Streamkeeper volunteers have formed a Research Team, and one task this team will hopefully take on is trend analysis. Stay tuned…]



Information gathered for one year is valuable. Paired with information gathered in other years, it becomes *in*valuable in figuring out subtle, long-term trends in our watersheds.

Thanks, and keep up the good work!

State of the Waters Report Presents Streamkeepers Data

by Ann Soule, Hydrogeologist, Clallam County Environmental Health Division

In 2004 Clallam County published the first comprehensive "stream health" report for the general public, funded by a grant from the WA Dept. of Ecology. *State of the Waters of Clallam County* is a beautiful book and a smash hit! As of 2006, we've distributed all 300 copies, but the report is available on the Web at http://www.clallam.net/streamkeepers/html/state_of_the_waters.htm.

This report presents a meaningful synopsis of the health of our local watersheds, mostly utilizing Streamkeepers' data. (To "give away the ending" a bit, the bad news is that virtually all of our streams are less capable of serving their "beneficial uses" to people and critters than they used to be; the good news is that most of them are in good enough shape that those functions are recoverable with proper care.) It is intended for the general public as well as policy makers and resource managers, for use in setting priorities for future water quality work. By "crunching" the data down using simple statistical measures and maps, we've produced a highly readable, informative book that maps the way for future reports.

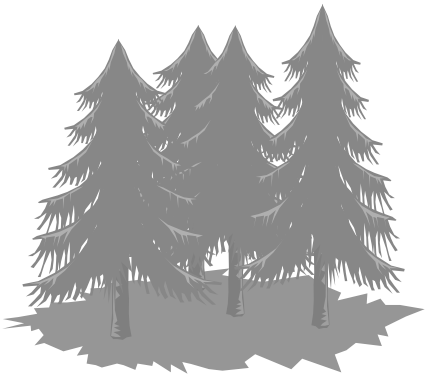
Watershed Planning on the Peninsula: Streamkeepers' Vital Role

by Jeff Bohman, former Watershed Planning Coordinator for WRIAs 19 & 20
[updated by Streamkeepers staff in 2006]

WRIAs are State-designated Water Resource Inventory Areas. Clallam County includes part of WRIA 17 (Sequim Bay area), all of WRIAs 18 (Dungeness-Elwha area) and 19 (Straits tributariess west to Cape Flattery), and part of WRIA 20 (Pacific Ocean tributaries south to Quileute River system).

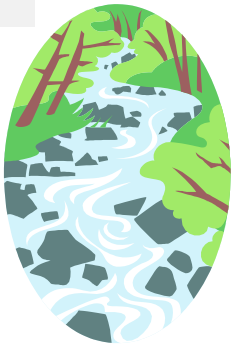
In 1999, the state legislature passed the Watershed Planning Act, which gives local governments, businesses, and citizens an opportunity to collaborate on plans for the management of watersheds in their area. In our area, collaborative groups formed for each of our WRIAs (the part of WRIA 17 in Clallam County being lumped in with WRIA 18). These groups each chose to address all of the major issues facing our watersheds: water quality, water quantity, habitat, and how much water had to be left in the streams for fish and other creatures.

As of 2006, WRIA 18/17 has already adopted its plan (see http://www.clallam.net/environment/html/wria_18_watershed_plan.htm) and is getting ready to implement it. As of 2008, WRIAs 19 & 20 are still finalizing their plans and hope to adopt them by the end of the year. These are comprehensive plans for managing the water resources in our area.



In all cases, Streamkeepers have helped supply needed data for development of these watershed plans, and the plans themselves call for continued monitoring in order to revise management directives over time, as conditions change. Each of the plans specifically mentions Streamkeepers and its vital role in providing the data needed to keep the plans current.

Streamkeepers and the Jamestown S'Klallam Tribe: A Long, Flowing Relationship



by Lyn Muench, former Natural Resources Planner, Jamestown S'Klallam Tribe

The Tribe has been an enthusiastic supporter of Streamkeepers from the very first days of your predecessor "Eight Streams Project" in 1996. We are grateful to you for a number of reasons; here are some of the most important:

First, you are our early warning system. If you find a potential problem, we'll be able to follow up on it and hopefully prevent major damage to resources. For example, your irrigation ditch monitoring team discovered some pollution sources into Matriotti Creek which we didn't know about before; this data helped us explain some water quality issues which had confused us, and helped us clean up not only Matriotti, but also the Dungeness River and Dungeness Bay, which Matriotti flows into.

Second, you provide invaluable baseline data to us, so that seven generations from now, we'll be able to compare and help steer our course. Your macroinvertebrate data alone, we are confident, is going to prove invaluable one day. Keep that in mind when you're picking bugs off rocks in the cold and wet!

We ourselves are concentrating on several of "your" streams:

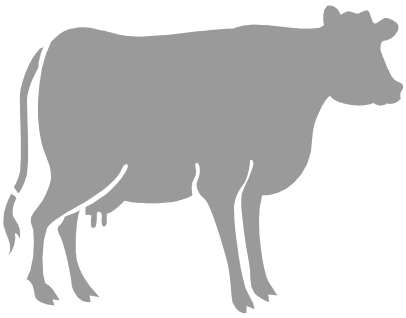
- Jimmycomelately, where a major creek and estuary project has been completed;
- The streams that run into Sequim and Dungeness Bays, where persistent fecal coliform problems have closed shellfishing areas and resulted in federally-mandated cleanup plans

But we are interested in all the streams in Clallam County. Our fishers fish throughout the area, and our primary job is to make sure there are fish for them to catch. We also have a general concern with protecting and restoring habitat – and monitoring plays an important role in those pursuits.
And believe it or not, your work actually helps provide money for natural resources programs, for both the Tribe and others. On a grant application, there is nothing like saying, "Monitoring will be done by citizen volunteers," to lure a potential donor. This has worked especially well in our Jimmycomelately project, and on the Dungeness, we were able to provide some grant funding back to Streamkeepers!

Keep up the good work – you ***are*** appreciated.

Streamkeeper Data Helps Plan a Multimillion $$ Restoration Project

by Joe Holtrop, Manager, Clallam Conservation District



Thanks to the dedicated work of Streamkeepers volunteers, the Conservation District was able to make responsible decisions about how limited funds for irrigation ditch enclosure should be spent. Streamkeepers volunteers collected two years' worth of water quality data on 20 irrigation ditches in the Dungeness Valley.

These data, along with data collected by the Washington Department of Ecology and the Jamestown S'Klallam Tribe, have been essential for project ranking and decision making. Without this information, we would have been guessing at where the problem ditches were. And, since our goal with these projects is to clean up the water flowing to Dungeness and Sequim Bays, we want to invest our funds for maximum impact. Continued monitoring will allow us to measure the effectiveness of these projects.

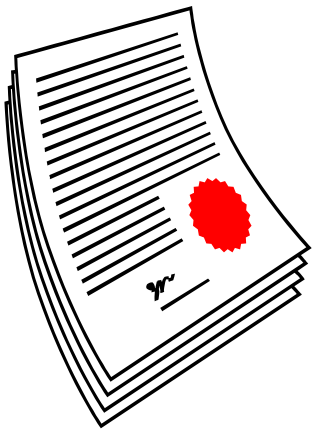
Access to reliable data is essential for responsible decision making. Any time you wonder whether Streamkeepers' work makes a difference, rest assured that the water quality sampling work done for this project has made all the difference in the world.

303(d)? What's in It for Me?
-- a guide to the alphabet soup of pollution law

by Lyn Muench (speaking strictly for herself!)

QAPP! TMDL! 303(d)! Does all this vegetable soup get you down? If so, don't worry: while some of us have to be bureaucrats, other lucky ones like Streamkeepers get to put on boots and work outdoors! But the data you collect all gets put back into the soup, which we hope helps to "heal what ails us."

Here is a short version of what the regulations are all about. In 1972, The United States Congress passed the Clean Water Act, which sets national standards for all surface waters. The Environmental Protection Agency (EPA) was established to implement the Act. EPA has delegated the implementation to most States - in ours, the Department of Ecology. The State can use the EPA standards or adopt their own, which must then be approved by EPA. Once standards are set, Ecology must make two reports: one to Congress on the state of the state's waters [the 305(b) report], and one to EPA every two years on which bodies of water are "impaired" [the 303(d) report]. (The numbers refer to the sections of the Clean Water Act which require the reports.)

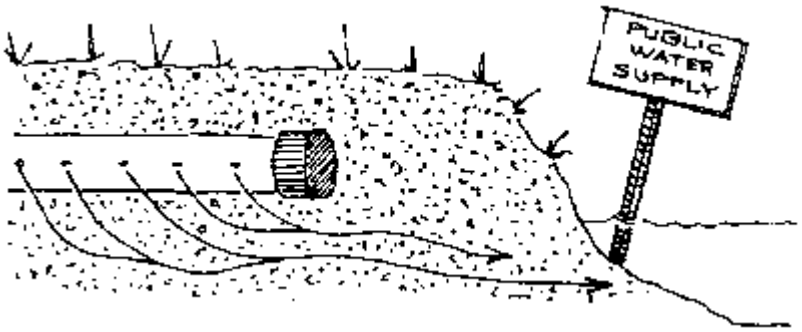


So what's in a 303(d) report? A list of all the surface water bodies that do NOT meet the State's standards. Which means someone had to take some water samples to determine the health of the water body. Ecology used to accept data from almost anyone as the basis for putting a stream on the list. A few years ago they realized that some protocols needed to be set, both for how many samples are required to prove that a stream is in trouble, and for what methodology is needed to collect the samples. Hence the QAPP was born! Formerly called a QAQC (Quality Assurance Quality Control) and now called a Quality Assurance Project Plan (QAPP), this is a plan to ensure that all samples are collected, handled, and analyzed properly. Streamkeepers staff went to a lot of trouble to write a QAPP for their volunteers' monitoring, so the data you collect can be officially used by the State to put problem streams on the 303(d) list.

So what's the point of getting on this famous list? Because you can't get help from Ecology to fix a problem unless it's on the list. Once on the list, the water body is eligible for … tada … TMDL ! That stands for Total Maximum Daily Load (which makes no more sense than its acronym, does it?). This is a process whereby the State, working along with local entities, figures out what's causing the impairment to the water body and how to clean it up to be able to meet the State standards.

The TMDL process has worked pretty well back East on rivers with heavy industries dumping chemical pollution into the water—you get all these industries to treat their effluent before dumping, and water quality is improved. Here in Clallam County, it's not quite so simple to find and address the causes of impairment, because it's not a matter of a few big industries dumping pollutants out of big pipes. Instead, it's a lot of little things that add up, such as timber harvest, road construction, urbanization, and agricultural practices. So Washington State has a tough challenge to deal with in getting its streams in conformance with the Clean Water Act.

But in spite of TMDLs' drawbacks, Ecology is doing lots of them—because of a lawsuit. Environmental groups sued the State for failure to make progress on cleaning up polluted waters, and the out-of-court settlement dictated that a certain number of TMDLs would be done every year. So to get Ecology's help, or even funding, you need to be a priority, namely, a TMDL. And you can't get a TMDL until you are on the 303(d) list. And you can't get on the 303(d) list without DATA.



That's where Streamkeepers comes in! On the 2004 version of the State's 303(d) list, Streamkeepers data figured prominently: out of about 50 Clallam County water bodies on the 303(d) list, one-third are based on Streamkeepers' data. And 20 additional sites were listed as "impaired and requiring further study to identify specific pollutants," based on Streamkeepers' macroinvertebrate data *[see Theresa Powell's article above]*. This was the first time that ANYONE successfully submitted biologically-based data for Washington State's 303(d) list; so Streamkeepers has set a precedent for others to follow!

State/Local Partnership: Streamkeepers' Data and TMDLs

By Maggie Bell-McKinnon, Biologist, Environmental Assessment Program, WA Department of Ecology

As Lyn Muench has pointed out in the article above, the WA Dept. of Ecology is required by the Clean Water Act to report on impaired water bodies [the 303(d) list], conduct studies detailing the type and amount of pollution affecting those waters [the infamous TMDL or Total Maximum Daily Load], and then work with other entities having jurisdiction, responsibility, and interest in those waters to design and implement plans ["Detailed Implementation Plans" or "DIPs"] to get them back into compliance with state standards. In Clallam County, a TMDL and DIP have been completed and are being implemented for the lower Dungeness watershed and Dungeness Bay, partly thanks to Streamkeepers data. You can view that cleanup plan at Ecology's website: http://www.ecy.wa.gov/biblio/0410059.html.

As Lyn's article points out, that leaves about another 50 Clallam County water bodies in need of TMDLs! Under the court order mentioned by Lyn, Ecology has until 2013 to develop TMDL studies for 643 polluted waterbodies here in Washington. Most of these waterbodies are affected by more than one pollutant. In order to carry out this mandate and clean up our waters, the State will need maximum participation on the part of local partners. Streamkeepers can serve as one of those partners.

For more information on the Department of Ecology's Water Quality Assessments (303[d] list) & Water Quality Improvement Projects (TMDLs), see:
http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html