

WINTER INSPIRATION

Celebratory Success



Thanks to all Streamkeeper volunteers, their families and friends, who were able to attend the End of Year Potluck and Celebration. Delicious salmon, grilled vegetables, soup, side dishes, and desserts were devoured, a goofy skit 'A Streamkeepers Carol' endured, and the 2004 workscope approved.

However, the highlight of the evening was not any of the aforementioned bits, but the incredibly inspirational words from guest, friend, and our University of Washington consultant, Dr. Jim Karr. (See box →.)

Data Debuts

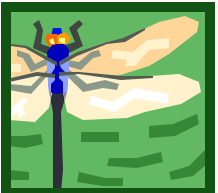


While braving the stormy, funky weather during winter monitoring, keep in mind that your efforts are not in vain. The work that you do will be showcased in the news in the next few months.

We've released our BIBI data to the press (see below), Val Streeter will be doing a press release of our fecal data, and the State of the Waters report will soon be released.

So as kits and datasheets pour in for quality control and data entry, and as the database grows, may you feel some level of satisfaction in a job well done. Now's your chance to read, rest, and recoup—that is, until spring monitoring rolls around.

PRESS RELEASE



Bugs Give Some Clallam Streams Poor Grades

Stream invertebrates show human impacts on health of local creeks

The bugs speak clearly, and what they say isn't good news for Clallam County's urbanized streams.

In the county's first extensive sampling of benthic invertebrate life – the bottom-dwelling bugs and other invertebrates that reflect the health (or biological condition) of streams – our urbanized waterways get mostly failing marks, according to a study just released by Streamkeepers of Clallam County.

By contrast, Clallam County streams in less developed areas typically earn higher grades. For example, Bear Creek on the West End had so many types of bugs that it easily earned a "healthy" rating, while Sequim's Bell Creek flunked its biology exam, with a health rating lower than any other local stream. Furthermore, virtually all creeks were healthier in their upper than their lower reaches, underscoring the connection between development and degradation. For example, Peabody Creek rated "healthy" above Park Avenue and "poor" just a mile downstream in urban Port Angeles.

The Benthic Index of Biological Integrity (BIBI) for Pacific Northwest Streams was developed by University of Washington professor James R. Karr. By measuring 10 characteristics of the invertebrate life found in

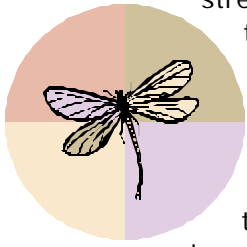
Jim Karr's Remarks



... In short, citizen groups such as Streamkeepers of Clallam County convert individuals acting alone into a mobilized civil society, a third sector of society alongside the state and the market. A vigorous civil society is an important counter-balance to government and business. By focusing on things that are "left out," they are key forces working to protect the quality of life in people's neighborhoods.

When they collect data they provide information needed to understand the consequences of human actions. They are key contributors too in stimulating use of that information to make better public policies. They serve an important function when either government or industry do not see the issue through a lens of local quality of life, or when public funds are not sufficient to provide the data essential for informed decision making. By collecting and interpreting data, they hold an important key to protecting and restoring the streams of the Pacific Northwest.

(For more see page 5.)



streams, the BIBI provides a better snapshot of overall stream health than monitoring schemes that focus solely on the purity of the water itself, "because the value of water resources to society comes from more than just distilled water flowing down concrete channels," says Karr.

Stoneflies, for example, need cool, well-oxygenated water, so a low diversity of stoneflies indicates an unhealthy stream. A much different indicator is the presence of organisms that cling to rocks to survive; a low number of these "clingers" indicates a channel transporting high sediment loads, which can pose just as big a problem as chemical pollutants.

A high BIBI score is especially important for young salmon, which primarily feed on aquatic insects and depend on the same array of environmental conditions as do the bugs. When adult salmon return to spawn, their carcasses provide the base of a food web that nourishes the next generation of salmon.

According to Karr, stream segments with BIBI ratings of "impaired" or "poor" cannot sustain viable populations of salmon without restoration and protection activities. Among these impaired streams, some may be relatively easy to restore and protect, while others may be far more difficult.

Scientists recommend a "triage" approach to managing our watersheds, based on degree of impairment. As Clallam County Planning Biologist Pat Crain explains: "Healthy streams should be protected from degradation, as it is generally far cheaper to protect than to restore them. 'Compromised' streams can often be restored with relatively straightforward interventions. Unfortunately, streams in 'impaired' and 'poor' condition are usually affected by a broad variety of complex, interrelated factors. In these cases, restoration can be a substantial undertaking." Current local restoration efforts focus on many of the streams rated as "compromised," including Jimmycomelately, Johnson, Siebert, Ennis, Valley, and Salt Creeks.

The BIBI study was conducted by Streamkeepers of Clallam County, a county agency that trains volunteers to monitor the health of area streams. The findings will be part of the *State of the Waters of Clallam County* report, a comprehensive look at the health of the county's waterways that is scheduled for release later this month. (See *Biomonitoring Results Chart* on page 7.)

FOCUS ON MONITORING

Photos & Photo Logs

When entering information on the photo log, it is essential to note the roll number, date, site number, photo number, and sampler initials. The photo description is only helpful if we know what data to connect it to! Thanks to photo editor Bob Dunlap and database guru Walt Johnson, most of our photos are now available through our database at the click of a button—check it out!



Beware of pH Meters Wearing "Bootles"



When you next come in to pick up a kit, your pH probe may be wearing a boot—stuck inside a little pill bottle with pH4 buffer rather than its calibration chamber. If so, get one of us (in person or by phone) to help you take it out of this "bootle" and get it back into its calibration chamber. It's all part of trying to take the best care of equipment; we may get twice as much life out of the probes that way.

EVENTS & CLASSES

The Science of Watersheds 2004 Annual Review of Research, Friday, February 6, 8am-6pm
Hosted by the UW Center for Water and Watershed Studies, a source of comprehensive aquatic information to maintain and enhance the earth's watersheds. Derek Booth, Director, has offered scholarships to any Streamkeepers who'd like to attend. To register go visit <http://depts.washington.edu/cwws> or call 206-543-6920. And contact Hannah if you'd like to carpool.



KINGS Salmon Stewardship Institute (KSSI), February 16-20



This project is a coordinated effort between Long Live the Kings and YMCA Camp Orkila on Orcas Island, for students aged 14+ with interest and aptitude to study the current science and strategies for enhancing wild salmon, while understanding the salmon's important role in maintaining healthy ecosystems and watersheds that we share with them. For more information contact Tim Carpenter, at (360) 376-2678 ext. 142 or email: orangecats@orcasonline.com
Streamkeepers of Clallam County, 223 E. 4th St., Port Angeles, WA 98362, streamkeepers@co.clallam.wa.us 360-417-2281



Native Plant Sale, Saturday, March 6, 9am-12noon **Order now!**

Check out the website <http://clallam.scc.wa.gov/plantsale.htm> then pick-up plants at Lazy J Tree Farm, 225 Gehrke Rd, just off Old Olympic Hwy. Any remaining plants will be sold. If you are willing to help the day of the sale 8am-12noon or help organize & fill orders, Feb. 28 from 8am-12noon, call 452-1912 ext. 109.

10th Regional Wetlands and Water Resources Meeting, March 9-11



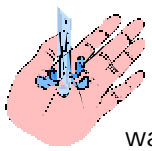
This meeting titled: New Protection Challenges for Unprotected Waterbodies, will be held at Hyatt Regency Crown Ctr, Kansas City, Missouri. For more registration & agenda information see the following website: <http://www.ctic.purdue.edu/EPARegion7WetlandsMeeting/Region7.html>.

Coastal Training Program Technical Training Classes, Spring

Classes will be announced in early spring. To receive email announcements for these classes, please visit the Coastal Training Program Website <http://www.CoastalTraining-WA.org> and enter your email address or contact Cathy Angell, Coastal Training Program Coordinator, at 360-428-1558.



Streamkeepers will present at "Working Together for Clean Water,"



2004 National Monitoring Conference – May 16-20, Chattanooga, TN

The National Water Quality Monitoring Council promotes partnerships to foster collaboration, advance the science, and improve management within all elements of the water monitoring community, as well as to heighten public awareness, public involvement, and stewardship of our water resources. They are hosting the scientific conference in Chattanooga, TN! This is **the** group of water-monitoring professionals, and they have invited lil' ole **us** to speak about the Physical Habitat Index that we're currently developing. It's quite an honor!

Like to come along? You'd probably have to pay your way this year, but we could probably cover your lodging—check out their website at, <http://www.tetrattech-ffx.com/NWQMC/schedule.cfm>.



National River Rally 2004, May 21-25, Wintergreen Resort, Charlottesville, VA

This important event brings together hundreds of river and watershed organizations from throughout the nation for professional and personal development, education, organizing and celebration. Nine of us went to the 2003 rally and learned lots; this year Streamkeepers staff won't be going, but you're welcome to go on your own! Volunteers are invited and encouraged to attend. Information on scholarships, group discounts, and program will be available soon at www.rivernetwork.org.



2nd National Conference on Coastal and Estuarine Habitat Restoration, September 12-15

Restore America's Estuaries is thrilled to announce that this conference will be held at the Washington State Convention & Trade Center and the Grand Hyatt in Seattle! Visit the website <http://www.estuaries.org/2ndnationalconference.php> or call 703-524-0248.

ODDS & ENDS

Two of our most important aquatic-insect neighbor-families: Mayflies & Stoneflies

From "Art of Angling," by Dave Whitlock – *Trout*, Autumn 2003

Aquatic insects have both an underwater, gilled form and an air breathing form in their life cycle. It's estimated that the 10 orders of aquatic insects contain approximately 8,000 species. [As of 2002, Streamkeepers had found about 200.]

Of the six major groups, there are three categories that have similar characteristics in their life cycles. These categories are: mayflies and stoneflies; caddisflies and midges; and dragonflies and damselflies.

Let's begin with the first category, mayflies and stoneflies. There are many physical similarities and some distinctive differences that make these two groups easy to identify and distinguish from other major aquatic insects. First, both have a simple life cycle form of egg, nymph, and adult.

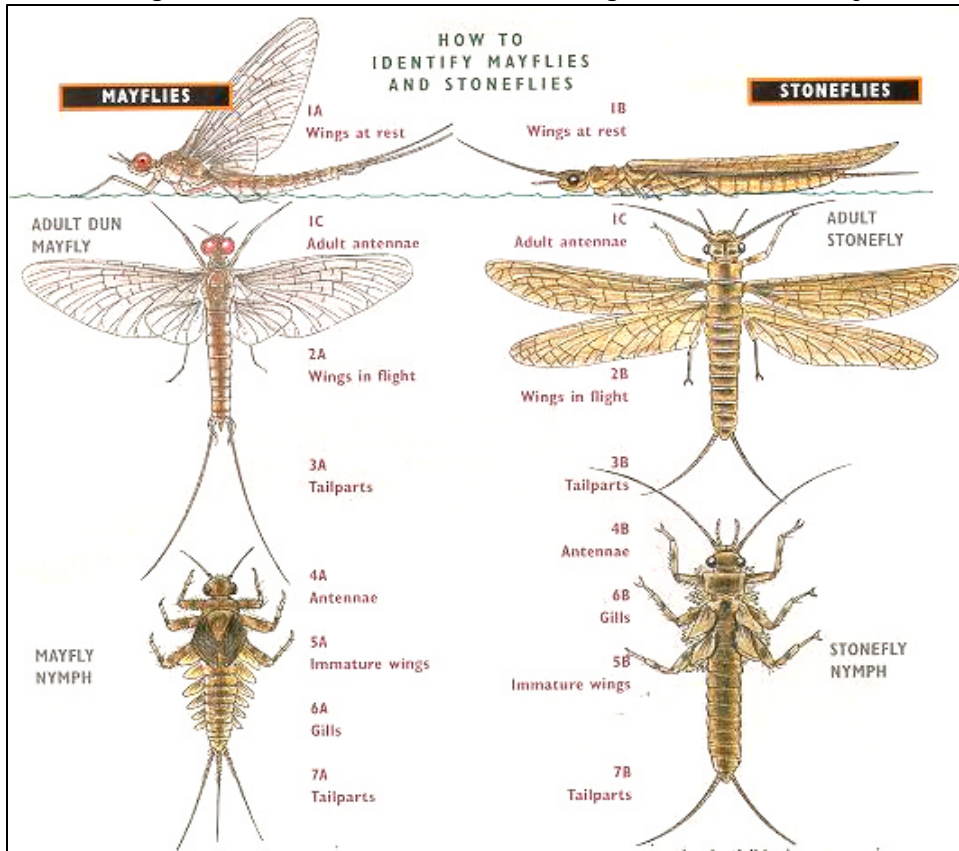
Mayflies: Order Of Ephemeroptera

Mayflies are primitive, harmless, fragile, and graceful. The adult's slender, tapered body has two pairs of sail-shaped wings that are held straight up and together at rest, making it look like a miniature sailboat on the water. The two or three long, curving tail parts enhance the mayfly's classic look.



The mayfly nymphal form, though less spectacular, is attractive to fish – they eagerly feed on them all year-round. Depending on the species, these immature forms survive in still or flowing water by swimming, crawling, or clinging to bottom structures or by burrowing into the streambed. Their three tails, lack of easily visible antenna, and gills on the upper sides of their abdomen segments identify mayfly nymphs. Most species of mayfly nymphs live several months to a year or more underwater and then swim to the surface to emerge into duns. A few transform before or during their rise to the surface.

The nymph, on its way to the surface or at the surface, splits its skin and emerges into the air-breathing, read-for-flight adult dun. This first adult stage characteristically rests on the water's surface as its new wings



unfold and become rigid for flight. The insect then flutters and launches into flight up toward the nearest shoreline to find seclusion to rest. Later the skin will split again and transform the matte-finished dun into the more colorful, shiny adult spinner. A few species of the smallest mayflies do this transformation as they fly away from the water right after emerging, but most wait until darkness or the next day to complete their adult form.

In either case, the insects form a mating swarm, dancing up and down together, usually over the water. Within minutes to an hour after mating, the females descend and lay their eggs on or below the water. A few species even swim to the bottom and lay their eggs on the sides of or beneath rocks. Both males and females die soon afterward.

Stoneflies: Order Of Plecoptera

Stoneflies are predominately found in coarse stone or rubble in moderate to fast-flowing areas of streams. Stoneflies have an inefficient breathing system and must have relatively swift, highly oxygenated water flowing over their gills at all times. They have a simple life cycle of egg, nymph, and adult. However, many stonefly species take longer to mature in their nymph form. The larger species can take several minutes to split their skin and become fully formed adults, so they must crawl out of the water onto stream structures to go through this transformation. The adults then fly or crawl to streamside cover, especially willows and leafy bushes, where they gather and mate. Then the females crawl or fly back to the stream to deposit their eggs in the water along the shoreline or on the water surface...depending on the species. Adults may live a few days to several weeks.



Its roach-like shape, two distinctive and stiff antennae, two stiff tails, and a lack of gills on its segmented abdomen easily identify the stonefly nymph. Some stonefly nymphs absorb oxygen through their skins and/or by crude gill filaments between their legs and lower part of their thorax. Most also have two pairs of immature wings on the second and third thoracic segments. Most anglers will quickly identify a nymph as a stonefly if it has two tails and two distinct antennae.

The adults have two pairs of large wings that fold down flat over the top of their bodies when at rest. In flight their wings appear large and clumsy. The long, stiff antennae and two tails are also a unique physical point of identification of the adult. ♪

LAST WORD**Synopsis of Jim Karr's Address from Streamkeepers Gathering, December 2003**

Citizen volunteers, like Streamkeepers of Clallam County, are part of a long history of grassroots initiatives that contribute immeasurably to the well-being of neighborhood communities, both human and nonhuman.

More than a century ago the Audubon Society became a powerful force due to concern about the decline in egrets and other birds caused by overhunting. Since then citizens have been key players in the protection of migratory waterfowl, marine mammals, and old growth forest as well as the clean up of Love Canal and other toxic sites throughout the nation. Streamkeeper and river protection groups are one of the fastest growing citizen initiatives. They are an important complement to government agencies unable to carry the load because of limited budgets.

Citizen groups are not trapped by narrow perspective such as training in an academic discipline or the mandate of an agency mission or legal construct. Rather, they are motivated by a desire to improve the quality of life experienced by themselves or by their children and grandchildren.

Citizen volunteers also rise above the special interests that drive many to downplay the importance of environmental protection. Too many modern decisions are made under the guise of capitalism with its two primary goals: create wealth for capitalists and avoid paying the costs of that growth in wealth. The "dirty little secret" of capitalism is that those costs are paid by the society at large while the profits go to the smaller group of capitalists. Declining environmental quality is often a consequence of unconstrained capitalism. Of course, citizen volunteers in this situation are perhaps the most important special interest

because they are working to protect the quality of life in their home neighborhood.

Citizen volunteers educate themselves and motivate their neighbors to collect data to document patterns and trends. Because they develop a new understanding of those trends, they are energized spokespersons helping to inform political leaders and the larger community about regional trends in environmental quality.

In short, citizen groups such as Streamkeepers of Clallam County convert individuals acting alone into a mobilized civil society, a third sector of society alongside the state and the market. A vigorous civil society is an important counter-balance to government and business. By focusing on things that are "left out," they are key forces working to protect the quality of life in people's neighborhoods.

When they collect data they provide information needed to understand the consequences of human actions. They are key contributors too in stimulating use of that information to make better public policies. By collecting and interpreting data, they hold an important key to protecting and restoring the streams of the Pacific Northwest.



**Streamkeepers Nominates James R. Karr for the
2004 American Fisheries Society Conservation Award**



...We take great pleasure in nominating Jim Karr for your award. He has made a huge difference in both our understanding of our work and our impact on watershed monitoring and management on the North Olympic Peninsula of Washington State. And the implications of his work go far beyond our state, region, or country.

We are amazed by the scope of Dr. Karr's activities, not simply in the scientific realm (which has run the gamut from tropical birds to fish to insects to the idea of measuring ecological health), but in his insistence that we, the people, use the results of scientific effort for our own well-being. As he explains it, "A lot of good public money has been spent enabling me to perform my research. I feel I owe it to society not only to share my findings, but also to assure that the information is actually used. Otherwise the money's been wasted."

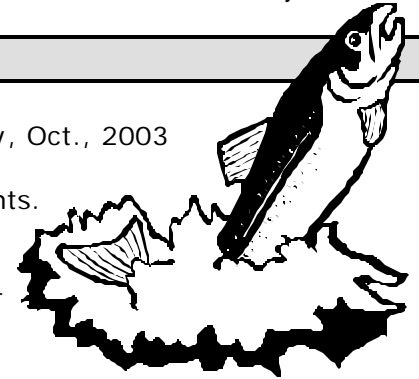
Dr. Karr sticks his neck out because of his personal ethics: respect for the natural systems that have taken thousands upon thousands of years to develop, and fear for the consequences of degrading those systems. His actions show him to be not only a premier scientist, but also an exemplary member of the human race and a boon to life on this planet.

(Excerpts of Streamkeepers Nomination Letter)

GOOD READING**Where have all the salmon gone? A Brief History**

From King of fish: The thousand year run of salmon, by David R. Montgomery, Oct., 2003

Salmon are resilient, robust animals that can rapidly colonize new environments. They are not like a sensitive bird that can only nest in a special type of tree that occurs in a particular type of forest in a couple places on Earth. Even so, we are managing to drive them to the verge of extinction across much of their range.



Salmon are not in trouble because people didn't know about the impacts of human actions on salmon runs. The King of Fish is not in trouble because people didn't care about salmon. Laws to protect salmon have been on the books for over a century in the Pacific Northwest, and attempts to save salmon date back hundreds of years to England. Efforts to save the Columbia River salmon began well before the first dam spanned the river. The biggest problem for salmon lies elsewhere – in the way we make decisions and in the mismatched time scales over which societal processes operate, as well as the slow accumulation of little changes into large impacts that over time can radically alter natural systems. Under human influences the landscape gradually evolved right out from under salmon.

Huge salmon runs initially provided an abundant food source that sustained subsistence economies in Europe, the Northeast, and the Pacific Northwest. In all three areas, native people relied on salmon fisheries they protected through cultural practices that restrained overexploitation. As long as local human populations depended on local salmon there was a built-in ecological safeguard. People who overfished, or otherwise degraded their fishery, cut off their own life support.

The transformation of the salmon's habitat into farms, towns, and cities amplified the detrimental effects of overfishing through reducing the capacity of rivers to support salmon. Clearing of logs and logjams, as well as channel straightening, diking, and damming for flood control degraded salmon habitat in river after river. Already stressed salmon populations crashed as forests were cut and dams blocked rivers and streams. In many areas, pollution from industrial and urban wastes polished off most, if not all, remaining salmon. Finally, urbanization converted some channels into inhospitable concrete-lined ditches.

Instead of rebuilding spawning runs, hatcheries propped up shrinking populations by pumping out smolts ill equipped to survive in the wild. In the end, reliance on hatcheries replaced wild salmon with hatchery fish, and delayed but did not reverse the ongoing decline in salmon abundance.

Many writers over the past century and a half have remarked that salmon and civilization appear to be mutually exclusive – that the development of the landscape for the use of modern societies must inevitably banish salmon to shrinking refuges uninhabited by people. I reject this argument. Although past experience certainly endorses this view, it is based on the faulty premise that we lack the ability to adapt our behavior to

 **Shakespeare on Geomorphology** 

The current that with gentle murmur glides,
Thou know'st, being stopp'd, impatiently doth rage:
But when his fair course is not hindered,
He makes sweet music with the enamell'd stones,
Giving a gentle kiss to every sedge,
He overtaketh in his pilgrimage;
And so by many winding nooks he strays,
With willing sport, to the wild ocean.

-Shakespeare, Two Gentleman of Verona

accommodate salmon. Salmon and civilization can co-exist, if we so choose. I hope that this book brings some long term perspective to current debates over how to accommodate salmon in the changing landscape of the Pacific Northwest, where the next several decades will be pivotal in determining whether salmon survive in significant numbers. It simply would be tragic to lose wild salmon in the Pacific Northwest because we failed to learn the lessons of Scotland, England and the Northeast. Moreover, those lessons tell us as much (or more) about our societies and ourselves as they do about salmon. 🐟



Biomonitoring Results Based on the BIBI (Benthic Index of Biological Integrity)

The table below represents information from one of the twenty-odd parameters that Streamkeepers monitors: benthic macroinvertebrates, otherwise known as “stream bugs.” Once a year, we dig up stream bugs at selected monitoring sites and have them professionally identified. Then we perform a set of statistics on the kinds and numbers of bugs we find, according to metrics developed at the University of Washington. The results yield a good picture of the overall biological health of the streams. For further information, see www.clallam.net/streamkeepers, or call us at 360-417-2281.

Biological Condition (“Health”) of Local Streams					
Area	Stream segment	Health rating per BIBI results[†]			
		Healthy	Compromised	Impaired	Poor
Sequim	Jimmycomelately (JCL) upper*	✓			
	JCL lower*		✓		
	Johnson lower*		✓		
	Bell				✓
	Cassalery				✓
	Siebert upper*	✓			
	Siebert lower*		✓		
	Bagley upper*		✓		
	Bagley lower*			✓	
Port Angeles	Morse		✓		
	Lees upper*		✓		
	Lees lower*			✓	
	Ennis		✓		
	Peabody upper*	✓			
	Peabody lower*				✓
	Valley upper*	✓			
	Valley lower*		✓		
West End	Salt		✓		
	Bear (Sol Duc trib)	✓			
	Lake Creek upper*	✓			
	Lake Creek lower*				✓

[†]Summary of results from 1999-2002, according to the Benthic Index of Biological Integrity (BIBI)
*Lower refers to lower-elevation, developed zones; upper refers to zones above most development.