Streamers

After a decade of leading the StreamKeepers in their quarterly measuring of water quality Bill Bennett announced his retirement and submitted his final report on water quality in the streams of Lake Forest Park:

Ten years ago. after a meeting during which the Environmental Quality Commission considered next steps in protecting the streams of Lake Forest Park, Sally Glerum and I looked at one another and said, "let's start monitoring water quality." So we did, and StreamKeepers was on its way with the enthusiastic support of the commission.

We have monitored water quality quarterly for a decade drawing upon the talents and commitment of more than 200 volunteers. Our measurement methods have become increasingly sophisticated.

We have learned that water quality in Lyon Creek and McAleer Creek is stable although with seasonal variation and that the streams of Lake Forest Park provide adequate habitat for cut throat trout and perhaps for sockeye salmon. We have learned that the complexity of insect life is the best indicator of good stream health. We have learned much about best practices for creating habitat for salmon and have enjoyed a little success in conveying that knowledge to citizens who live along our streams.

Lessons Learned

Water Quality is Surprisingly Good and Fully Capable of Supporting Salmon. Water quality in our streams is very good in terms of temperature, acidity, and quantity of dissolved oxygen for fish to breathe. So long as temperature is below 60, acidity is neutral, and the quantity of dissolved oxygen, produced when our streams bubble over rocks, adequate salmon can spawn happily.

Water quality is worst in the summer when water quantity is low, temperature high, and the flow is slow. Dissolved oxygen is least available where there is the least gradient--in the headwaters of Brookside Creek and where the West Branch of Lyon flows through Brugger's Bog.

As a result we could learn all we need to know about water quality by measuring quality during August any place except those two areas of reduced gradient.

Pollution is a Challenge. Pollutants, such as fecal coliform from pet waste and troubled septic systems, challenge water quality by encouraging growth of algae which reduce the oxygen available to fish. Such pollutants are monitored by the King County laboratory and reported to the Health Department when bacterial counts are unusually high. High bacterial counts usually occur during the first big storm of the fall when pet waste is washed into the streams.

Fertilizers and pesticides also pollute. Fertilizers are probably even more significant encouragers of algae growth. Pesticides, such as diazinon, damage the microbial life of our streams as well as the insect life. Moreover, pesticides may pose other challenges as yet unknown, for example we've recently learned that diazinon damages a salmon's homing instinct. Unfortunately monitoring for pesticides is extremely expensive.

Our best approach may be to pump old septic systems periodically, to prevent fertilizers from reaching the streams, and to use pesticides in only the most serious cases.

Common Sense Stream-side Practice Damages Habitat. Through unpleasant experience with floods in their small yards, neighbors who live along streams have hardened the banks to move flood water downstream as rapidly as possible. In order to gain as much usable yard as possible, owners have placed those hard banks in straight lines, eliminating curves, and bends, and meanders. In order to improve the looks of the stream and avoid slowing the water, neighbors have removed tree trunks, branches, and other woody debris that can clog the stream. And finally stream-side residents often mow their lawns right down to the water's edge--producing an attractive approach to the stream.

Each of these practices is destructive of the habitat which salmon require to thrive. The ideal stream meanders happily through a complex and ever changing landscape. Fast growing stream-side trees such as alder and cottonwood topple into the stream, redirecting the stream over and around their trunks and branches, creating a complex set of micro-habitats . Several fallen trees may build up a log-jam, creating a pond above the jam. Moreover the stream-side trees shade the stream, keeping it cool, and also provide branches for aquatic insects to climb as they move from several years of development in the streams into a month of life in the air.

The more we can keep our hands off and allow streams to develop naturally, as McAleer is allowed to do in Blue Heron Park, the better for fish. The result will be a cool stream pulsing erratically through a complex balance of riffles where the water races along, pools where water moves more slowly, as well as side-channels and back-water pools. Fallen trees and branches will create hiding places and a rich diet of insects which feed on the wood and leaves. What looks messy to us is highly desirable habitat for fish.

Fish Live in McAleer and Lyon Year Around. Our streams are inhabited by cut-throat trout. Most of these grow to adulthood at 8 - 10 inches in length and spawn in late spring and early summer. Trout, unlike salmon, may live in a stream a good many years, spawning again and again. In addition a few adult trout spend part of their lives in Puget Sound, returning as huge adults, 15 - 20 inches long.

In addition a few sockeye salmon find their way into our streams almost every year and fewer chinook salmon return to spawn. Sadly the year of the best sockeye return was also the year of the New Year's flood that destroyed the gravel bars in which the salmon had spawned.

The life cycle of salmon has become well known as these amazing creatures struggle upstream in the fall to build their nests in gravel and then die. In March juvenile salmon, two inches long and translucent, emerge from the gravel to begin life in the open stream. After living in the stream for awhile, a different length of time for each type of salmon, they swim out to sea to gorge themselves on the rich variety of foods available in salt water. A few years later, they return as adults two or three feet-long to repeat their life cycle by spawning--usually in the same stream in which they were born.

How many salmon should return? Salmon comprise a valuable part of the diet of a wonderful array of predators, including us. A good return is one or two percent of those whose parents started them on their way in our streams.

What prevents more salmon from returning? No one can answer with authority. Certainly commercial fishing and man-made obstructions, such as the Ballard locks, play an important role. In Lake Forest Park, it seems to be the case that our cold, clear waters support fish and could support many more. The limiting factor preventing a return to the old days when our streams were jammed with salmon seems to be absence of complex habitat to provide food and shelter for juvenile salmon.

The importance of complexity is hard to overstate. Each kind of salmon prefers a particular type of habitat. Cut-throat trout prefer the conditions they find in our streams, clear fast moving water as found in the mountain stream where cut-throat evolved. Sockeye salmon may be our best bet as a species to be encouraged since they spawn in middle sized streams and then spend a year in a lake, such as Lake Washington, before going out to sea. Coho salmon prefer smaller streams and may swim incredible distances up-stream to find ideal habitat and then spend a year living in the side-channels of those streams. Since side-channels have long since been removed, our streams are not suitable for rearing young Coho. Chinook prefer larger streams than ours, although several have been seen spawning, especially in the wildest, most complex part of McAleer, the canyon between 185th and 196th. Neither chum nor pinks visit the streams that feed into Lake Washington.

Would stocking our streams with salmon increase their rate of return? Probably not--especially of absence of habitat is the limiting factor. Moreover several little known but very active stocking programs are in operation. Each year as many as 200,000 salmon are released into the waters that flow through Lake Forest Park, some directly into McAleer, others into Lake Ballinger and still others into Halls Creek above Lake Ballinger. In addition several schools have salmon incubation programs from which salmon are released into McAleer.

The most active incubation project in Lake Forest park is maintained by Jim Rzegocki whose blue plastic drum on Perkins Way nurtures 70,000 - 80,000 coho each year. In March the juveniles emerge from the drum and swim out into the main channel.

Other animals enjoy our streams. The most active stream residents are insects. One of the best measures of water quality is the complexity of insect life in the streams. The most important insects are the mayflies, stoneflies, and caddis flies which spend several years in our streams before emerging as winged adults. These are important indicators of stream health because they do not tolerate pollution and they comprise a rich part of the diet of all of a stream's residents. A dance of insects over a stream is a happy sign of the stream's good health.

Other residents include our bird friends who feast on fish, such as the Great Blue Heron and Kingfisher, and our mammalian cousins, especially the family of River Otters who used to live in Lyon and Lake Washington but haven't been seen recently.

Dogs enjoy splashing in our streams--but they ought to be restrained. Their waste is destructive. They scare off the natural predators we ought to encourage such as herons and otters. And they disturb the nests of ducks who share the stream.

Children also enjoy splashing in our streams and form a special case. The educational value of finding out how water works and how fish may be caught must be weighed against the damage children may cause. A youngster who learns to love playing in a stream is likely to grow into an adult committed to good stream-side stewardship. So our best bet is to notice the places fish spawn--at the upstream edge of a gravel-bar just below a pool--and encourage children to avoid those areas and have fun everywhere else.

Thanks for Your Help

StreamKeepers have been blessed with support from city, county, and state officials as well as a happy community of volunteers. Each of these deserves a hearty thank you. Mayors Roger Loschen and David Hutchins have been invariably supportive as have representatives of the city council, county council, and state legislature. City staff have been essential, especially Frank Zenk, Susan Stine, Ty Peterson, and Ruthe Moe. Chairpersons of the Environmental Quality Commission were always helpful including Jim Wahlstrom, Debbie Terwilliger, Roger Olstad, Julian Anderson, Dave Peterson, Janice Page, and now Lisa Kerr.

Volunteers who were always eager to pitch in included Eric Alef, Carolyn Armanini, Mamie Blolender, Jan Binks, Brian Bodenbach, Christy and Derek Brown, Ginger Casillas, Maggie Colvin, Frank Corr, Carol Dahl, Hilde and Evie Engen, Ken Exelby, Jack Fullerton, Doug Hennick, Ginny Isler, Dorothy Jenkins, Terrie Klinger, Paul Korsmo, Jim Mattila, Jim Mead, Martin Nelson, Lianne Newman, Tom Olson, Ray Oslin, Mark and Ty Pethe, the Phillipses (Mark, Sarah, Stephen, and Amy), Charles and Diane Pickrel, Malena Pontious, Toni Potter, Bill Proctor, Bill Rogers, Richelle Rose, Bob Simmons, Karen Tarr, Kay Welborn, Bob Winter, Ashley Young.

To all of the named StreamKeepers and to many unnamed ones as well, a profound Thank You. We've done well together.

Equipment and Technique

Four test kits for measuring water quality are available to anyone who wishes to continue measuring water quality, along with a protocol for their use. A list of contact people is available as well--especially Jonathan Frodge at the King County Laboratory--and all of the StreamKeepers.