



## Ecosystem services and human well-being: Lessons from the Coquitlam watershed and beyond

By Craig Orr, Watershed Watch Salmon Society

Healthy watersheds provide key ecosystem services such as clean water, flood control, climate regulation, abundant fish and wildlife, and more. These ecosystem services also provide humans with important cultural, spiritual and health benefits that contribute to a healthy community (Chapin, Kofinas and Folke 2009).

Watershed Watch believes it's in our collective best interest to promote watershed health by reminding people of the many and shared benefits that healthy ecosystems contribute to human well-being, especially given that humans continue to degrade watersheds at an alarming rate. Here I describe some efforts under way to assess

the status of and threats to key ecosystem services, and related measures of human well-being, in the Coquitlam watershed, and briefly touch on some recent research into links between healthy watersheds and healthy humans.

### THE COQUITLAM RIVER WATERSHED

The Coquitlam watershed encompasses the communities of Coquitlam and Port Coquitlam, just east of the City of Vancouver. Like many watersheds in the Lower Mainland and elsewhere, the Coquitlam is heavily urbanized. The watershed boasts the oldest hydroelectric dam in BC, hosts numerous industrial developments and provides a

significant portion of the drinking water for the ever-increasing population of Greater Vancouver.

Despite such pressures, the Coquitlam watershed is also still a place of many natural features, including several species of salmon. (The word Coquitlam is derived from the Coast Salish language and means "red fish up the river," which refers to the red sockeye that once teemed up the Coquitlam River in thousands.) While the iconic sockeye have been decimated by the dam, urbanization and demands on water, many other species are rebounding. Indeed, the Coquitlam River was recently

FIGURE 1



removed from the Outdoor Recreation Council's top ten list of endangered rivers in BC, thanks in large part to the efforts of its numerous salmon stewards.

**COQUITLAM RIVER WATERSHED ROUNDTABLE**

Stewardship efforts in the watershed were given an important boost by the formation of the Coquitlam River Watershed Roundtable in 2011, itself spawned by work begun in 2007 under the umbrella of the Coquitlam River Watershed Strategy.

Like many such efforts, this one started when local residents gathered to express concerns and share information on the health of the watershed. Between 2008 and 2009, these citizens, assisted by city staff, organized public meetings and workshops to develop a common vision, mission and guiding principles for the watershed. Further meetings resulted in a governance framework, and the eventual formalization of the roundtable the primary mission of which was to "facilitate collaborative resolution of urban growth and natural resource use pressures consistent with agreed community objectives and values."

The heavy lifting, though, was yet to come. Guided by the principles of resilience-based ecosystem stewardship, the Roundtable Core Committee – which includes city staff, educators, local salmon stewards, the Department of Fisheries and Oceans, the Kwikwetlem First Nation, a local arts group, and a representative from the gravel mine operators along the river – recognized the value of developing a watershed plan that characterized existing conditions and potential pressures, and identified strategies needed to ensure the future health of the watershed.

But how to proceed? Especially on a limited budget? The roundtable eventually landed on a process popular in the US known as the Open Standards for the Practice of Conservation, which follows a five-step adaptive management cycle that integrates both ecological and human well-being concepts into conservation planning. After obtaining financial support from organizations such as the Seattle-based Bullitt Foundation, Metro Vancouver and BC's Real Estate Foundation, the roundtable hired a consultant specializing in Open Standards planning to develop this first-in-Canada plan.

**IDENTIFYING WHAT WE CARE ABOUT**

Guided by the Roundtable's vision for a healthy watershed, the Watershed Plan Task Group convened public meetings in November 2012 to identify key ecological and human wellbeing components that would make a healthy watershed. Participants identified what they cared about most and thought are critical, distilled into list of ten ecological and human well-being components (Figure 1).

**IDENTIFYING THE PRESSURES ON, AND STRATEGIES FOR, THINGS WE CARE ABOUT**

The roundtable then identified 15 pressures on ecological and human well-being components. Following a "pressures rating" exercise to assess the scope, severity and irreversibility for each of the pressures, four pressures were ranked very high or high for key watershed components: hazardous spills, stormwater, invasive species, and development. The Watershed Plan Task Group drafted seven conceptual models to describe their understanding of how these key pressures affect key components, and summarized the contributing factors and existing strategies or opportunities and activities that could effect change.

As an example, stormwater pressure was defined as impacts associated with the introduction of exotic or excess material into hydrologic systems due to surface water loading and runoff from the built environment. The built environment includes commercial, residential, and industrial lands and transportation facilities and corridors. Stresses to the watershed include introduction of toxins, degraded water quality, altered hydrological dynamics, altered nutrient levels, reduced human health, and impaired species/habitat condition.

At the end of May 2014, the modelling and assessments were advanced enough such that the roundtable sought public input on ways to relieve the pressures on key components. For stormwater, outreach/education and policy suggestions were the most frequent types of strategies for both the task group and roundtable participants. Outreach and education activities focused on residential and development practices that reduce run-off and pollution. Policy ideas related primarily to stormwater management plans and development practices. Program suggestions focused on incentives for voluntary stormwater-reduction practices, such as rain barrels, rain gardens and permeable surfacing. Capital investments were suggested for stormwater management infrastructure, along with improved enforcement of existing and/or improved regulations.

The Action Plan for this and other pressures will be used to record goals and measures to determine success. It will include development of specific strategies the roundtable can implement as feasible and practical to further their goal for improved health of the watershed.

### ECOSYSTEM STEWARDSHIP AND WELL-BEING

The issue of human well-being or “happiness” receives considerable attention in annual UN reports ranking countries by happiness. Though well-being, or quality of life, is strongly influenced by health and economics, it is also tightly linked to other key factors. As researchers such as Chapin, Kofinas, and others note, well-being also depends on “the acquisition of basic material needs including ecosystem services, as well as other social factors such as freedom of choice, equity, strong social relations, and pursuit of livelihoods” (Chapin, Kofinas and Folke 2009).

Once basic needs are met, “people have greater flexibility to think creatively about options for ecosystem stewardship to meet the needs for future generations in a rapidly changing world.” It is in this context that the Coquitlam Roundtable operates. And, importantly, in that of the human tendency to “seek greater levels of consumption... even though this leads to no measurable increase in happiness.”

### COMMUNITY BENEFITS

Members of the roundtable have risen to the challenges and attempted to assess what important cultural, social and even spiritual benefits watershed residents derive from ecosystem services. This has been done through workshops, polls and “watershed cafés” – sometimes with mixed results.

The efforts of the Roundtable have been helped considerably by recent research into watershed planning and ecosystem stewardship. One potentially fascinating application is described in Wallace Nichols’ book, *Blue Mind: The surprising science that shows how being near, in, on, or under water can make you happier, healthier, more connected, and better at what you do*, in which he summarizes science that shows how proximity to water can diminish anxiety, amply creativity, increase success, and improve our overall health and well-being. Our brains and well-being are literally hard-wired to water – and thus, to needed improvements in watershed protection and planning.

Perhaps even more exciting is the recent medical research, largely from Japan, on “nature therapy and preventive medicine,” known as “shinkinroku.” These researchers provide a compelling argument that we shouldn’t forget that our physiological functions are still adapted to nature. They show through a set of physiological experiments that time spent in nature can produce measurable health benefits, including lower blood pressure, lower heart rates, improved immune systems, elevated levels of cancer killing proteins, and lower cancer rates.

Given the importance of health to well-being, the measurable health benefits linked to green space will hopefully prove to be powerful arguments to planners and politicians to protect and restore key ecosystem services and to minimize the nature-human disconnect too common in today’s society.

### CELEBRATING WORLD RIVERS DAY

The yoga, education and environmental communities came together on World Rivers Day, September 28, on the Coquitlam watershed to raise awareness of the connections between

watershed health and human well-being. The yoga practitioners recognized that many of the well-being benefits they sought through yoga (such as reduced stress and improved immune systems) were also provided from healthy ecosystems and nature therapy. The spectacle of a large gathering of “unusual suspects” advocating for healthy watersheds and humans drew considerable attention to the event and issues, and hopefully enhances understanding and action around watershed protection and planning.

As humans continue to put more and more pressure on our ecosystems, it will become increasingly important to understand and promote these links, and the value of healthy watersheds to community and human well-being. As the roundtable and medical and social researchers are showing, our chances of achieving success ultimately depend on us acknowledging the shared and multiple benefits of healthy watersheds, and working collectively to get there. 💧

### ABOUT THE AUTHOR

Craig Orr holds a B.Sc. in biology with chemistry and conservation minors, an M.Sc. (Acadia University) in Wildlife Ecology, and a Ph.D. (Simon Fraser University) in Behavioural Ecology. Craig is a conservationist and the current Executive Director of Watershed Watch, which was founded in 1998.

### SOURCES

- Lee, J., Q. Li, L. Tyrväinen, Y. Tsunetsugu, B. Park, T. Kagawa and Y. Miyazaki. 2012. Nature therapy and preventive medicine. In Jay Maddock (eds.), *Public Health – Social and Behavioral Health*.  
*Principles of Ecosystem Stewardship: Resilience-based Natural Resource Management in a Changing World*. F.S. Chapin, G.P. Kofinas and C. Folke (eds). 2009. Springer Science and Business Media.  
Coquitlam River Watershed Roundtable Strategy Assessment, August 2014  
[www.coquitlamriverwatershed.ca/](http://www.coquitlamriverwatershed.ca/)  
[www.orcbc.ca/pro\\_endangered](http://www.orcbc.ca/pro_endangered)  
[www.cmp-openstandards.org](http://www.cmp-openstandards.org)

