

The Secret Life of Urban Rivers

We think of Calgary's rivers as "natural" environments within our rapidly growing city. The Bow and the Elbow are the cornerstones of Calgary's aesthetic, recreational and natural capital assets, and our rivers and river valleys have long had a high priority in the City's civic agenda. The value of water in a dry land has played a fundamental role in Calgary's history and continues to affect development patterns. But are Calgary's rivers really "natural" in the popular sense of the word - different from "built" or human-created environments?

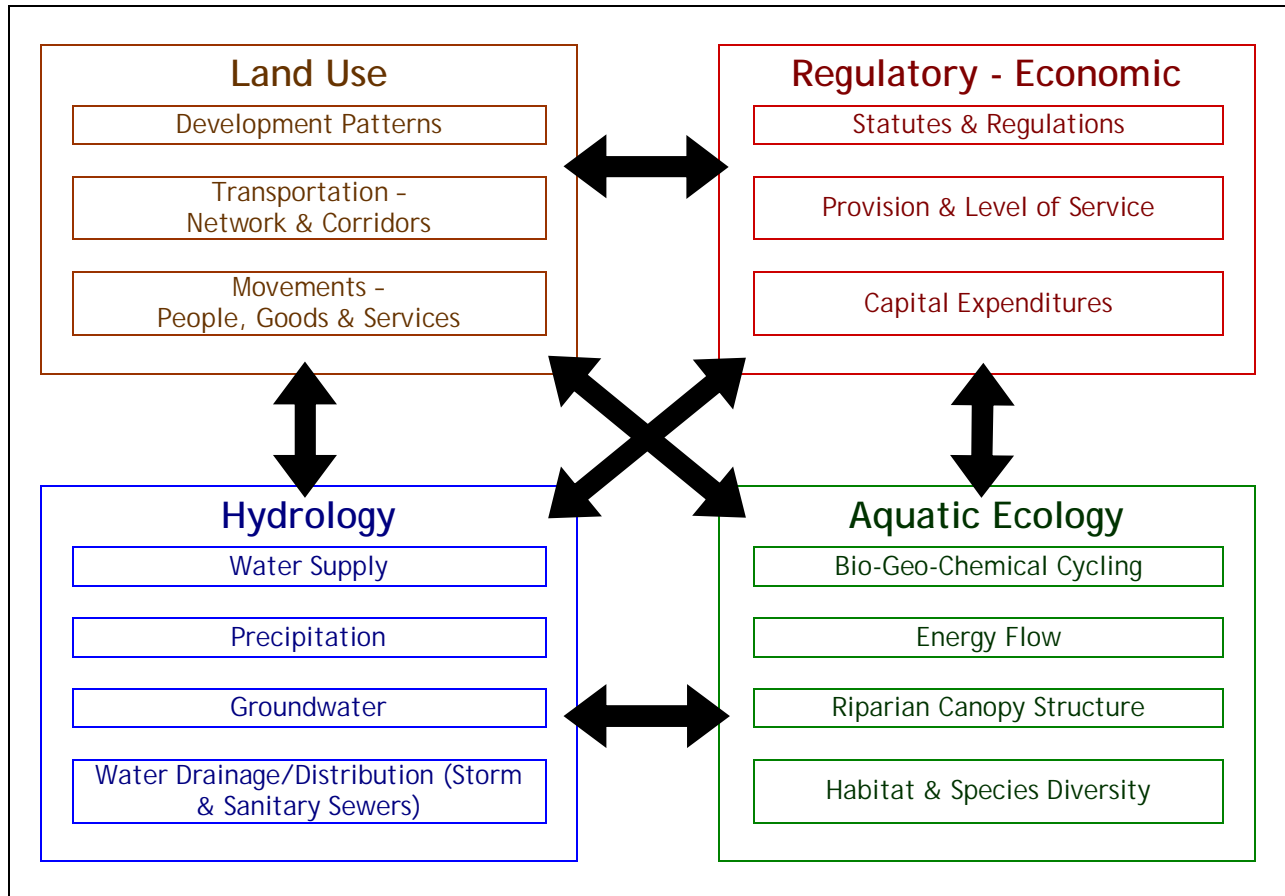
Rivers, like humans, evolve and become urban dwellers. Just as we need to understand how to live with our rivers - our rivers have been learning how to live with us! While it is certainly true that Calgary's river valleys were not created by people, like Calgary itself they have spent the last 100 years becoming more urban. Urbanizing watersheds and urban rivers everywhere go through basically the same changes and display the same characteristic patterns of form and behaviour. Rivers in a truly natural state, one not dominated by human activities, have vastly different ecologies, hydrologies and geomorphologies.

Urbanized rivers have at least twelve characteristics that distinguish them from rivers in a natural state. Many of these characteristics have significant implications for water management and civic stewardship responsibilities. For example, urban rivers generally experience increased bank-full flooding. This is related to increased urban development and large areas of impervious landscape surfaces. Urban rivers also experience reduced dry weather flows. Increased stream velocity, resulting from stormwater discharges and rapid concentration times over impervious surfaces, increases erosion and impairs the function of both aquatic habitats and riparian zones. Channel widening anywhere between two and eight times the natural or undeveloped state is common, which in turn results in a reduction of riparian habitat and vegetation. Urbanized rivers have reduced wetlands, floodplains, riparian buffers, seeps, springs and ephemeral channels, and consequently reduced biophysical diversity. Urbanized rivers often see a shift in the numbers and kinds of species that inhabit them as a result of different substrate conditions, sediment pulses, water temperatures and alterations in habitat types and nutrient cycling.

Land use directly affects river channel size, shape, water temperature and drainage area, so it is not surprising that urbanizing rivers function differently than rivers in natural landscapes. It's not easy being an urban river! To be successful requires a lot of human assistance. Urban rivers require bank stabilization; stormwater management; channel; reconfiguration and restoration; fish passages; riparian management and restoration; instream species management and habitat improvements; dam or weir removal or

retrofits; floodplain reconnection; water quality management; and land acquisition or conservation easements to enable shoreline restoration and management for aesthetic, recreational and educational activities, in order to increase community values, use, access, safety and knowledge.

Consider the chart below. Urban rivers adapt to and operate within a number of dynamic variables and human-activity / river-process interactions, which are far from “natural” (i.e., without human influence):



John Wesley Powell, an early American geographer and natural scientist once wrote of: *that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.*

If the Elbow and Bow and smaller urbanizing streams like Fish Creek and Pine Creek are to survive and succeed in our ever-growing and expanding city, then by Powell’s *simple logic*, Calgary, as a unified community, must actively manage our common watercourses - since both the rivers and people of Calgary are *inextricably linked* to each other.