

Prairie-fed Rivers: Appreciating Local Waters

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Two young fish meet an older fish swimming the opposite way. As they pass the older fish remarks “Morning boys, how’s the water?” After a time one of the younger fish turns to his companion and asks, “What’s water?” An equally perplexing question could be “What’s a prairie river?” The point of the parable, whether it’s water or prairie rivers is often the most obvious, important realities are the hardest to see and to talk about. A reality for many living in Alberta and across the Prairie Provinces is their water comes from a local, prairie-fed source.

Prairie rivers could be considered as the Rodney Dangerfield’s of flowing waters. It’s hard to say what a prairie river is- it’s easier to start with what it isn’t. Many of our rivers have headwaters in the mountains and eventually flow through the prairie, but technically these are not prairie rivers. Where a prairie-fed system starts isn’t always obvious. They don’t start from melting glaciers or extensive snowfields. They don’t tumble down steep gradients with a sense of inflated grandeur. They rarely get much respect.

The first thing might be is the term “headwaters” sounds too grand for river beginnings that are subtle, modest and largely local. The mighty Rosebud River starts from a puddle and unless you follow the channel upstream you might overlook its headwaters. From a small, muskeg lake the Medicine River starts its path to the Red Deer River. In the middle of the Town of High River, perhaps from beneath the basement of the Baptist Church, rises the start of the Little Bow River. Holy water! Sometimes the start of these rivers is in view of the shining mountains, covered with snow, but is beyond the grasp and influence of those water towers.

It takes a broader, more discerning look to discover the origins of prairie rivers. The origins of these systems are cloaked with disguise, employ stealth and are hiding in plain sight. When you see field runoff from snowmelt or rainfall it represents river beginnings. Ephemeral wetlands store runoff temporarily; it is attenuated in permanent wetlands with more storage capacity over a longer span of time. All of that water flows, seeps and creeps into thousands of kilometers of small streams, mostly unnamed, unrecognized and unheralded for their role in forming the watershed and transferring water to the named prairie rivers.

And so, for prairie rivers all of the watershed is headwaters. In particular, headwaters mean wetlands. Wetlands might not have the grandeur of mountains, the age of glaciers but cumulatively they have the absorptive quality, the storage capacity and the effect of a landscape-scaled sponge. How aware we are of them, how much we understand their function, how we treat them and how many remain functional is a metric, a measuring stick of the health of prairie rivers.

Prairie rivers talk with the land as they wind their leisurely way through it. We might recognize the language in the sinuous letters that are carved in their valleys. At some point or another, prairie rivers flash us a “V” in a victory sign, or a “U”. Dependent on your point of view, or your view point, the meanders are in the form of either an “S” or “Z”. Some like the Battle River are a bit more loquacious with “M”, or “W” and “J”. A very talkative river, the Vermillion, shows us “Q”, “L”, “P” and “T”. You have to work with the river a bit to discern these. You might have to excuse the penmanship.

Maybe it’s just our presumption that the script is in English. Maybe it’s in Arabic or perhaps Sanskrit. It is, after all, river language, not ours and the messages they form are obscure. Patience is required to understand the virtues of these rivers. What can we discern from prairie rivers?

Prairie rivers don’t rush anywhere quickly; the water seems confused, in no particular hurry to reach the mouth. From the source of the Battle River to the Saskatchewan border, as the crow flies, is 280 kilometers; it takes the Battle River 678 plodding kilometers to make the trip. The gradient from beginning to end, the drop from source to mouth seems insignificant. The Battle River drops less than 0.5 meters of elevation for every kilometer of distance. This, and other prairie systems, are not white water rivers.

The variability in flow is breathtaking. For the Battle River the volume of water delivered annually can range from a low of 50,000 to a high of 1,280,000 cubic meters, meaning the wettest year had 25 times more water than the driest. On a dice roll we can have flood or drought. It means we shouldn’t be complacent about these systems- they can roar, especially if the wetland sponge has gone missing. A minor obstacle, like an ice dam, coupled with the low gradient can send these rivers into places we thought we owned. These nondescript prairie rivers can still periodically dictate what is theirs, crossing roads and fields, invading towns and homes and giving new meaning to the thought that flood is the other “f” word.

To what degree are droughts, low flow events, or too much water, floods, part of the range of natural variability, or a function of our additive changes to the landscape? From a few isolated pools of water in an otherwise dry river channel to a very wet hayfield it might seem Mother Nature has a perverse sense of humor. Admittedly, it is hard to grasp the cumulative effects of our roughly 100 years of development and of landscape change. But, the signs are evident and the tools are available to both measure change and predict the future based on current trends. What is equally evident is the variability in our world is increasing and we can expect, should anticipate at times, a combination of too much of a good thing and then too little of an essential element in our lives.

To come to grips with this, at least conceptually, we should stop looking at prairie rivers as linear features, passing through and by us. One of the marvels of early Wisconsin, so goes early logger stories, was the Round River, a river that flowed into itself, and thus sped around and around in a never-ending circuit. Paul Bunyan, a logger of mythical proportions and of myth, discovered it and the Bunyan tale is of how he floated logs down its waters that were somehow magically connected in a never ending circle. It’s not

really magic and only partially metaphor to suggest prairie rivers (really all rivers) are like the Round River.

As part of natural cycles and rhythms we float past our starting point endlessly, reversing the thought that we are simply either upstream or downstream residents. We are in and part of a loop. A reflection on the mighty truths of the world might help start to make this connection:

- What goes around, comes around
- Everything is connected
- Everything is additive
- Diversity equals stability
- We are in the loop

If you don't buy into this yet, the roughly 10,000 years of bison occupancy of prairie watersheds represents a past cycle, one of annual migration and of movement of energy with the landscape. This was a significant and driving cultural, ecological and economic influence for native peoples. Early ranching, filling a void left by the extirpation of the bison, continued that cycle, albeit on somewhat different scales and conditions.

We are still subject to natural cycles of drought and it only takes a few days of heavy rains to remind us of lost wetlands, the past ghosts from our development history. What we may not perceive is these wetlands are part of the hydrologic cycle, the biggest loop in being residents of a Round River. Do we alter these cycles; influence the loop of which we are a part? Yes! Wetlands are part of a long term water supply safety net. Removing the storage capacity through drainage, cultivation or infilling inevitably bites us somewhere, sometime in the future.

We engage in the cycle of agriculture, from early pioneering efforts to today's large scale endeavor. It is the same cycle though, of planting, praying and harvesting. In the process, because the landscape fails to conform to our perceived needs (and the size of our equipment) we interrupt the Round River, severing the loop by cutting off meander bends, simplifying the system through channelization and drainage but not realizing that in such complexity is value.

The interruptions in the loop increase with our additive footprint. It could be the linear features of the oil and gas industry. It includes the transportation network that we use extensively but pay little attention to, except for speed limit signs and potholes. In very similar ways, these features interrupt, block, divert or unintentionally speed up flow, changing the cycle of water delivery in terms of timing and quantity.

In ways additive, complex and synergistic we've changed the water quality dynamics of prairie rivers. That includes our wastes, and the assimilative capacity of receiving waters. To that load we have added the outputs of intensive forms of agriculture as well as the products from broad, extensive agriculture. It leads some people to complain about "pasteurized" water, water running across pastures, especially in spring runoff periods. Much of it comes either as sediment, a product of increased erosion, or the materials that

bond to sediment. These changes, a consequence of the footprint of our land use decisions and activities, haven't been met with appropriate natural filters and buffers to deal with the increased tide of sediment, nutrients and other chemical additives.

What are some of the measuring sticks to help us assess the health, function and integrity of prairie watersheds? We can turn to wild things- fish and wildlife- to help us. The presence, abundance, distribution and variety of wild species are clues and tell us much about landscape and aquatic health.

Prairie rivers and their valleys are corridors, conduits and connectors for fish and wildlife. Here are found the critical habitats without which many of these species would not survive. There are the big things, like deer that make their year round homes in these habitats and use these river features as travel lanes. Others like the yellow warbler make a cyclic migration of about 8000 km every year from Central and South America to nest in prairie and parkland watersheds or further north in the boreal forest. That migration is a marvel for a bird that perhaps weighs about as much as two quarters, about 8 grams. To accomplish that requires fuel and the fuel is the insect life in these river and riparian corridors. Intact and healthy prairie rivers and wetlands are the 7-11s, the fast food emporiums of the migratory bird world.

Prairie valleys may have been ice carved initially, but since those glacial melt waters disappeared another agent has aided in the maintenance of them. Beavers have been busy storing water for about 10 millennia. They are a keystone species upon which many others rely, remarkably sometimes us. Without a healthy beaver population many stream channels would be dry most of the year. The flow of prairie rivers depends, in part, on the stored water in beaver dams whose collective contribution of storage is undervalued.

In the mosaic that was the prairie and parkland other wild species profited from the mixture of grassland and shrubland. The sharptail grouse was one species. It is often worthwhile looking back to see the cornucopia of wildlife that existed- it helps us understand the changes to the landscape. In 1941 four hunters near Lac Ste Anne, in a week, shot and canned 300 sealers of grouse. At seven grouse per sealer on average, that is a total of 2100 grouse. It is doubtful whether now one could see that many grouse in a life time.

Prairie rivers and streams at one time produced a phenomenal harvest of sport fish- walleye, pike and goldeye. Rivers are a reflection of their watersheds. What we do (and have done) on the land becomes reflected in water quality and quantity. Both have declined. The test for sustainable land use should be- "do the fish like it?" Whatever we do in the watershed it inevitably runs by and through a fish. Sport species abundance has plummeted in prairie rivers and in some reaches they are gone. The alarming issue is even resilient species like suckers are affected.

Big plans look down from an elevated perch and, given the scale of prairie watersheds, it's appropriate to do so. But, if we want to solve problems that confront prairie rivers our view might need to decrease in elevation. Many of the solutions, the fixes, the changes

have to happen at the level of the farm gate. That's where many organizations, like Cows and Fish, spend their time. Whether the solution involves wider buffers, or building a buffer, this happens at ground level. It doesn't mean activity, land use, has to stop, but land management surely needs to become more enlightened and more caring for our prairie Round Rivers. It will mean extending that reach into the watershed where there are wetlands that contribute substantially to prairie Round Rivers.

There are already examples of exemplary stewardship to draw strength, solutions and stories from, as motivators. Some of it, most of it, isn't rocket science. Some strategic fencing protects critical riparian areas. Water developments that conserve water, protect the source and allow for increased herd health are significant steps forward. Grassed waterways and wetland retention ameliorate water quality issues. Stewardship changes aren't big, but when applied routinely and consistently enough by many people the effect can be larger than one might think. The whole becomes greater than the sum of the parts.

What if we don't act? The answer isn't in the stars, or on the front page; it's in your right rear view mirror which points out: "objects in mirror are closer than they appear". We have reengineered the landscape through which prairie rivers flow. We have asked more of these systems than they can provide. It shouldn't be surprising the response is a loss of ecosystem integrity, diminished ecological services and increased risk for our future.

We need to develop a new view, an enhanced appreciation and a greater sense of responsibility, at all levels, for prairie rivers and their watersheds. The challenges for prairie watersheds are large but not unsolvable. Solutions revolve around these elements:

- Respect
- Awareness
- Education
- Stewardship
- Policy

If you think about it, a characteristically unique thing about prairie rivers is that nearly every linear foot of stream is managed by a prairie person. Headwater streams and rivers tumble down steep gradients, starting from melting glaciers and extensive snowfields, the landscapes are inaccessible, topographically rugged, and are mostly unfarmable; as such, we manage them as parks and other protected places.

But, prairie streams like Crowfoot Creek, like Iron Creek, the Battle River and dozens of others meander and twist from beginning to end through a variety of lands that are mostly privately owned or controlled. It isn't organizations, agencies or government managing these lands, the riparian fringes and the wetlands. It is the prairie person that manages these rivers, quite often from top to bottom, upstream to downstream, headwaters to confluence and who have the most influence on these systems.

Potentially, prairie rivers can have many friends, but the process of building that friendship, through awareness and education, leading to respect, can be challenging. The

role of resource professionals is first to interact and engage with those who have the greatest influence on prairie rivers.

Cows and Fish has been doing that for over two decades; listening, collecting stories from prairie people, particularly ranchers and farmers who manage the lands which often encompass rivers and streams and, sharing these stories with others. First comes a conversation, followed by understanding and then a pathway is possible towards the science and management of these critically important rivers, streams, riparian areas and wetlands.

The stories of prairie people and their association with the land are key to understanding these friends and stewards of prairie rivers. Farmers and ranchers are natural story tellers, with a treasure trove of experiences and learnings. An anticipated quick chat can morph into a lengthy visit. The outcome is an in-depth understanding of the history of the creek over many decades, from the stories landowners relate.

Like so many other Canadians, stories from rural Albertans tend to involve the weather – droughts, floods, too hot, too dry, too wet – but once you get past that warm up, their stories weave together family, history, nature and landscapes, the ties that bind those who work on and around the land together. Stories weave together a tapestry, much like our creeks and rivers form the yarn that stitches together Alberta. Stories awake a sense of place, of belonging, of trust and partnership with the land.

These stories help resource professionals to travel with the storyteller down a path toward engaging a community of people. With awareness and insights develops a community that can begin working together on a watershed scale. At the core of this is stewardship, something Cows and Fish has worked to support for over 20 years. Stewardship is the act of knowing about, caring for and maintaining the land; it's keeping the pieces of the landscape intact and functioning both now and for the future.

As Aldo Leopold wrote: “We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.” Prairie rivers are a key part of our landscapes, our lives and our likelihoods. Being more aware of them, managing them with care and attention and ensuring a stewardship ethic persists is a follow-up to Leopold's wisdom and advice.

For more information regarding the content of this article and the Cows and Fish program visit www.cowsandfish.org.

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