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Reckoning Hidden Costs of River Diversions

By Jason Unger and Shirley Bray

Society is losing \$2.4 billion per year because dams and water diversions from the Colorado River have drastically reduced the water flow and productivity of the river ecosystem, says Karl Flessa, a University of Arizona (UA) researcher.

By using the monetary values other researchers have applied to services provided to society by various ecosystems, Flessa compared the dollar value of ecosystem services provided by the Colorado River delta region before all the dams and water diversions to those provided by the current land-use types. The difference between the two figures is the benefit lost to society: in this case, 6 cents per 100 gallons of water diverted, or \$2.4 billion annually.

"In most years, the Colorado River no longer reaches the sea," says Flessa, a professor in the geosciences department. The decline in freshwater influx has increased the salinity of the water in the estuary and has profoundly changed the circulation in the upper Gulf of California. Upstream dams and diversion projects have also trapped and diverted much of the Colorado's sediment load.

"The day-to-day functioning of ecosystems provides benefits," said Flessa in an interview with Mari Jensen of *UA News*. "What I've done is estimate what's the value to society if you just leave the water in the river. Human populations are losing that value when the water is diverted for other purposes.

"The original ecosystem services provided are worth more than the ecosystem services we now get from the transformed landscapes," he said. Benefits that the river originally provided included natural flood control, natural wastewater treatment, and nursery areas for fish and other marine organisms.

"The price we pay for Colorado River water should include the cost of lost ecosystem services," Flessa continued. "Included in the price of water should be mitigation costs for the environmental consequences of diverting water." He added, "It's a crass, philistine thing to do, but we can put a dollar value on the impact." In evaluating the environmental impact of diverting water, Flessa emphasizes that it is a matter of the value of water to humans, not of the value of water to fish or plants.

While his analysis is limited to the environmental impacts of the changes, he argues that everyone should pay more for their water. That money could be used to help restore the river ecosystem and some of the lost ecosystem services.

"The delta is not dead," he and his colleagues wrote, "but its partial restoration depends on international collaboration in conservation science, river management, and resource utilization."

The Colorado River lesson is one that needs to be applied to the Red Deer River in Alberta well before decisions are finalized on water management. In his article in the October 2004 issue of *Wild Lands Advocate*, Heinz Unger wrote about the current management plans that are being prepared for the river and a grand scheme to divert water to Special Areas, an arid region in east-central Alberta.

The region comprises three separate Special Areas, covering 2.1 million hectares, which are administered as a single entity by the Special Areas Board. The Board is responsible for municipal services and leasing of public lands. The Board operates five community pastures, providing grazing for some 9,000 cattle annually.





The Board is evaluating the feasibility of a water supply project (SAWSP) that aims to divert water from the Red Deer River through an 88-km canal or pipeline to the headwaters of Sounding and Berry Creeks. The 384 kms of channels in these basins would distribute water for multiple uses, including domestic uses, stock watering, municipal use, irrigation, recreation, and waterfowl and wildlife conservation, particularly through wetland projects. Is this diversion the best use of water from the Red Deer River? Has anyone done a real reckoning of the cost of diverting this water?

Part of the Palliser Triangle, Special Areas was designated to promote settlement of the region starting in the early 1900s. John Palliser, who explored the prairies in the mid 1800s, documented extremely dry conditions and speculated that some areas, now dubbed the Palliser Triangle, would be “comparatively useless” for agriculture. However, a relatively wet period followed, bringing settlers to the region. The population initially increased but a huge exodus occurred during the drought of the 1930s.

Currently the South Saskatchewan Basin Water Allocation Regulation reserves water for the area sufficient to irrigate 25,000 acres of land. The number of cubic metres required would vary depending on weather conditions and is, therefore, difficult to determine. While the average flow of the Red Deer River ranges from 20 to 82 m³/year, the project proposes to divert 220,752,000 m³/year or 10 to 35 per cent of the river’s water, a huge amount of water, whose loss will undermine the ecological integrity of the Red Deer River.

The project fails to consider a number of critical elements:

(1) Instream flow needs. As discussed previously, recent meetings of the Red Deer River basin advisory committee and stewardship groups indicated that the instream water conservation objectives will be undermined in favour of SAWSP. This is contrary to the position of Alberta Environment’s Water for Life Strategy in terms of conserving the aquatic environment.

(2) Full cost accounting. The full cost of the project has not been assessed, including loss of ecosystem services. There would be limited economic return for the public commodity of river water. The amount of food production increased from the diversion would be minimal in light of need and economic return. SAWSP would be a subsidized project.

(3) Ecological integrity. Portions of the Red Deer River basin are already degraded. The further impact of the proposed project on the ecological integrity of land and water of the Red Deer River region has not been assessed.

Proponents of the Special Areas Water Supply Project (SAWSP) believe that the long-term viability of the human population in the Special Areas region is largely dependent on water supply. “The most important thing other than drought proofing our area,” says the Web site, “is opportunity for renewed hope for the future.” They believe that in addition to socio-economic benefits will be “considerable long-term environmental sustainability.” Since a naturally arid environment will sustain itself quite well if left on its own, the environment they want to sustain must be the one created by artificially high water supplies.

In his review of J. M. Arthur’s book, *The Default Country: A Lexical Cartography of Twentieth-Century Australia*, Andrew Johnson explores the understanding of “drought-proofing” in Australia. The word drought, Arthur noted, carries with it the sense of an abnormal ecological event, something outside the normal progress of seasons and rainfall. In parts of Australia, however, extended periods of low or zero rainfall might be normal.

Johnson argues that while one might take the word *drought* at face value and universally apply it such that drought is a regular, recurrent event in Australia and a less frequent event in England, in Australia





the word has a political, cultural, economic, and environmental impact. The language, he says, conditions its users to expect rainfall as a right – if not divine, then at least “natural.”

“In one sense, then,” writes Johnson, “the word suggests to Australians that the country they inhabit is defective, encourages them to take steps to ‘repair’ the land through extensive programs of irrigation, and also leads them to seek redress or compensation from governments when such programs fail.”

The key to drought-proofing is not manipulating nature but rather living and developing economies within its confines. As used by the Board, drought-proofing entails taking as much water as need to satisfy and support drought-risky practices. This ill-advised view of drought-proofing is contrary to the goals of developing sustainable communities.

Sustaining communities in Special Areas requires initiatives surrounding water conservation and altered land-use practices. We should not be looking at how we can get water to the land, undermining the environment in the process, but how we can use the land in its natural state.

For more information:

Flessa, Karl W., et al. 2001. *Since the dams: Historical ecology of the Colorado Delta*. Poster presented at United States –Mexico Colorado River Delta Symposium, International Boundary and Water Commission, Department of Interior and the Mexican Secretariat of the Environment and Natural Resources, Mexicali, Baja California, Mexico, 11-12 Sept. 2001.

Jensen, M. N. 2004. “Hidden cost of Colorado River diversions: \$2.4 billion annually.” *University of Arizona News* 10 June 2004.

Johnson, A. 2004. Review of *The Default Country: A Lexical Cartography of Twentieth-Century Australia*, by J. M. Arthur. *Colloquy* 8. www.arts.monash.edu.au/others/colloquy/current/Johnson.htm.

Special Areas Web site: www.specialareas.ab.ca.

