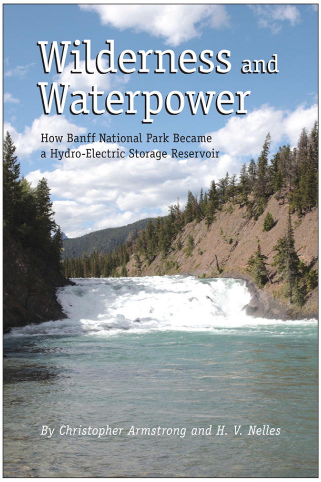

WILDERNESS AND WATERPOWER: HOW BANFF NATIONAL PARK BECAME A HYDROELECTRIC STORAGE RESERVOIR

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CHAPTER 12

Conclusion

With great effort and ingenuity – not to mention expense – Calgary Power had managed to make the Bow River a much more efficient producer of hydroelectricity by the 1960s. At that point, driven by the unbottled genie of Alberta's oil-fuelled economic growth, the company turned from the province's rivers to its coalfields for a source of primary energy to meet the demand for electricity. In this new dispensation, the Bow's role reverted to that of spot power producer to meet peak demand and backup in the event of emergencies within the core thermal system.

Dammed and plumbed to hold back water until it was needed by the generators, the Bow had been redesigned during the first half of the twentieth century to surrender more power than nature had originally intended. It was subsequently eclipsed as a source of electricity. It remains, by way of conclusion, to ask what this hydroelectric engineering meant for the river and the national park. And, now that waterpower has shrunk to relative insignificance, what has kept all of those dams, diversion works, and reservoirs in place?

The history of the electrification of Edmonton and Calgary presents contrasting experiences of system development. Both actually began in a similar fashion, supplying civic, commercial, residential, and industrial needs from centrally located thermal electric stations. Edmonton continued down that path, generating electricity from locally available coal and gas and distributing it to the city and, with surplus capacity, to the surrounding region. Power lines radiated out to the region from the city of Edmonton. Calgary's municipal utility, by contrast, gave up generating its own power in the 1920s, preferring instead to perform retail distribution of wholesale power purchased from the Calgary Power hydroelectric system. Edmonton paid a price for its electrical autarchy in power rates significantly higher than those prevailing throughout the period in Calgary.

Geography explains part of the divergence. Edmonton, located astride the large North Saskatchewan River, nevertheless lacked convenient waterpower of the necessary scale, situated as it was further east from the foothills and the mountains on the open prairie. The nearest industrial-scale waterpowers lay hundreds of kilometres to the west, high up in the mountains. In that context, owning and operating a municipal plant in the city made sense. Calgary, however, had what appeared to be industrial-strength waterpower close at hand, although as we have seen, that appearance proved illusory. Nevertheless, as the power company succeeded in re-engineering the river, producing electricity at prices lower than the city could generate at its thermal station, the city retreated to urban distribution functions. Meanwhile, Calgary Power's system grew around the city as a regional grid, with the city as the core demand source.

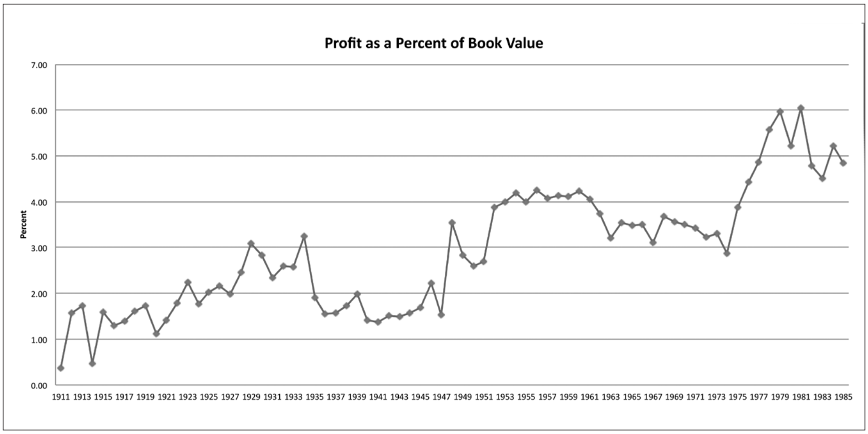
Alberta thus developed with two dominant electric utilities employing different energy sources and based upon different business models. These two systems would remain geographically isolated until the 1950s, when system growth and provincial utilities regulation brought the two utilities into physical and institutional contact. As Calgary Power moved its generating capacity north to the coalfields closer to Edmonton, co-operative upstream hydroelectric development of expensive waterpower sites on the tributaries of the North Saskatchewan River became financially possible, and provincial regulation smoothed the way to intersystem grid management.

In theory, at any point before the mid 1950s, Calgary Power could have given up on hydroelectricity and opted for thermal electric production. Alberta had lots of coal begging for markets; that's why the coal operators joined the parks advocates in opposing the Spray Lakes development in the 1920s. The technology was available and, when adapted at scale, produced reasonably priced electricity. The publicly owned Edmonton electric utility took this thermal power route from the outset. Later, oil and gas presented power-generating possibilities. But Calgary Power could not bring itself to take that step until it ran out of river to plumb.

Nothing absolutely constrained the company. No iron shackles bound it to the river. Rather, the company managers' own imagination limited their reasoning to the hydroelectric option. Technological momentum or path dependence – this phenomenon has been called both – put blinkers on management thinking.[1] This reflex was partly a justification of past decisions that had set the company on the hydroelectric path, but it was also due to professional bias. The managers were all hydroelectric engineers, true believers in the superior cleanliness and efficiency of hydroelectricity. It was partly, too, an economic quest, a search for electricity at the lowest possible operating cost. And it was a conventional modernist way of thinking about costs being restricted to certain kinds of things, a type of accounting that excluded aesthetic, scenic, and environmental considerations from the cost calculation. Convenience figured in the equation as well: it was always easier, faster, and possibly cheaper, right up until the end, to continue machining the river than it was rethinking the whole process and investing in an entirely different way of doing things. Calgary Power became a captive of an early technological choice. A perverse rationality drove it, in the face of opposition and viable alternatives, to continue to invest in redesigning and machining a mountain river. A very Canadian obsession with hydroelectricity possessed the management of Calgary Power for three generations. Ultimately, the force behind the redesign of a river and a national park emanated from the grooved thinking of a power corporation.

Corporate strategy may also have played a part in this Bow River fixation: occupying territory and thus denying important assets to competitors took priority. However, there are limits to this line of thought. After the early elimination of a rival bidder on Kananaskis Falls, the provincial government itself remained the most likely competitor for waterpower resources and for the electric utility business. That made for a very delicate dance between the government and the company, who were at once potential competitors, controller of the resource and supplicant, regulator and regulated, and allies in negotiations with the federal government. The power company had to finesse its way forward in a situation where the province might at any time enter its business as a rival and takeover threat, or where the provincial government might back the company as its policy instrument of choice.

In the playing out of this drama, nothing appears to have been inevitable or predetermined. The Province of Alberta explored the possibility of creating a provincial electric system in the 1920s, just as it had earlier created a provincial telephone system. The Hydro-Electric Power Commission of Ontario had famously – or notoriously – paved the way. But then the Great Depression, followed by a world war, crushed any thoughts of state expansion for a generation by drying up revenues, freezing provincial credit, and seizing taxation room (especially, during the war, by the federal government). After the war, "provincialization" of the electric industry once again loomed as a real possibility. A more traditional conservative provincial government might well have gone forward with such a project. Manitoba and Saskatchewan had already gone this route, as had Nova Scotia, New Brunswick, and Quebec. Besides, an out-of-province, eastern-controlled public utility seemed particularly vulnerable to Alberta's populist politics. But the Social Credit government of Ernest Manning was not a conventional conservative government. Its ideological obsession with communism and the Cold War raised ideological barriers against this kind of statism even though public ownership of electricity had strong support in Social Credit's strong populist constituencies and within Calgary and Edmonton – both of which had municipal-owned systems. But the timing of things mattered. Who could have predicted that the province would take a self-denying ordinance in this critical period? A conservative government like that of W.A.C. Bennett in British Columbia, or a more consciously province-building progressive conservative government like that of Peter Lougheed in Alberta in the 1970s, might have followed a different course. But Calgary Power survived in the postwar era by virtue of Premier Manning's Cold War ideological abhorrence of state enterprise. As a result, an investor-owned, private utility flourished in Alberta, a lone holdout against the pattern of provincial hydro companies



Graph 12.1. Long-term profitability of Calgary Power TransAlta Utilities, 1911–1985. Source: Compiled from data obtained from Calgary Power and TransAlta Annual Reports.

that characterized postwar Canada. Political events far from Alberta had a profound influence upon the structure of its electricity industry.

The private versus public ownership debate complicated power issues in Alberta, but it did not have much influence on whether the waterpower resources of the upper Bow would be developed. The resolution of this debate would determine who would be in charge of development. After protracted negotiations interrupted and influenced by extraneous events – the Depression, World War II, and the Cold War – Calgary Power was able, with provincial backing, to complete its program of Bow River remediation to maximize its hydroelectric output.

The combination of an ability to produce more power more efficiently and to sell more power at lower prices made for a much more profitable company. Graph 12.1 attempts to capture the gradually improving profitability of the Calgary Power Company over time. The measure – reported net surplus as a proportion of book value of assets – is not the best measure, but it is the only one at our disposal for an extended period. Nor should the specific figures be given too much weight: the longer term trends are more significant. Accounting legerdemain and very lax financial regulation gave management the ability to manipulate financials to some extent. Nonetheless, the trend lines show that over time, management was gradually able to improve the financial performance of the company up to the late 1920s. The Great Depression and World War II had a deep impact on profitability, but in the postwar era, on the strength of a much more efficient hydroelectric generating system, rapid growth in southern Alberta followed by extremely low-cost thermal electric production at mine-mouth plants raised the company to new and sustained levels of profitability in the 6 per cent range. It took time, an enormous investment, and almost half a century of struggle to stabilize the fortunes of Calgary Power.

Upon completion in the late 1950s, Calgary Power's river management system consisted of the following:

- Three diversions: the Upper Ghost into Lake Minnewanka, the Spray River into the Bow at Canmore, and Smith-Dorrien Creek into the Spray Lakes
- Eight storage reservoirs: Lake Minnewanka, two at Spray Lakes, two at Kananaskis Lakes, Barrier Lake, Ghost Lake, and Bearspaw Lake
- Eleven hydroelectric generating stations: Cascade (36 mw), Rundle (50 mw), Spray (103 mw), Three Sisters (3 mw), Pocaterra (15 mw), Interlakes (5 mw), Barrier (13 mw), Kananaskis (19 mw), Horseshoe (14 mw), Ghost (51 mw), and Bearspaw (17 mw)[2]

Together, these facilities, rated at 326 megawatts (mw), made possible the generation of 837 gigawatt hours of electricity annually. After these facilities were in place, no significant waterpower sites remained undeveloped on the upper river. Two possible locations below Calgary would be costly to develop and would destroy the most popular trout-fishing reaches.[3] For all intents and purposes, the Bow was tapped out as a power source by the mid-1950s.

The Bow had become, in the words of environmental historian Richard White, an "organic machine."[4] Not only had its power been captured for use, but the river itself had been re-engineered to make more power and more reliable power. Nature and technology had become so intertwined as to be inseparable. The Bow remained a natural phenomenon, beloved by tourists and residents alike, much visited, used, and photographed, but it was "second nature" reworked by human ingenuity to serve human needs.

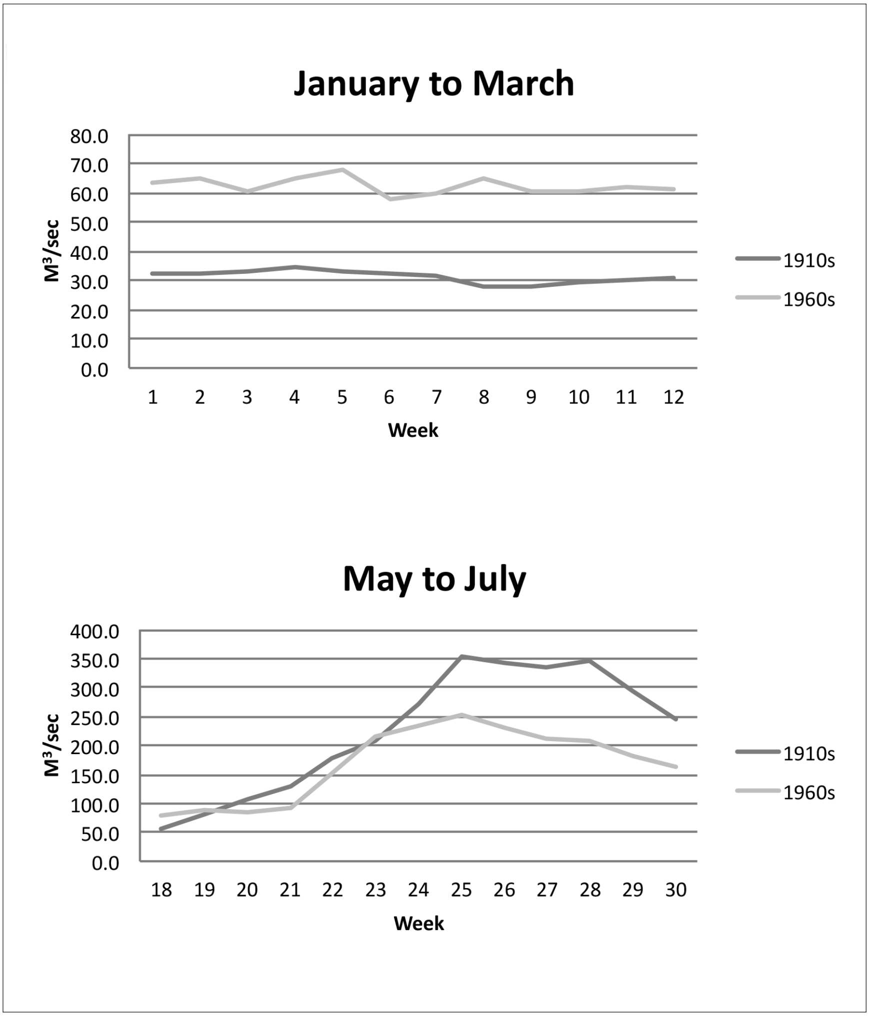
Over the course of half a century, through the addition of upper watershed storage reservoirs, the flow of the river had been significantly altered. Early summer peak flows had been shaved by storing water upstream for release in the fall and winter, which effectively doubled the "natural" streamflow during those periods.

It is not possible, given the state of the data, to compare streamflow before hydroelectric storage with streamflow after the system became operational. First, as noted earlier, detailed streamflow data were not collected before 1911. Reliable and comparable data exist only from 1912 onward. But by that time, the first Lake Minnewanka dam had already gone into service, slightly modifying streamflow patterns. Thus, our comparison shows not before and after, but rather minimal streamflow regulation against full management. It is quite likely that the differences between unregulated and regulated regimes would have been even greater had we been able to obtain recorded levels of unimpeded river flow, but we must make do with a best approximation. Second, the river never flows in exactly the same quantity or with the same pattern of variability, thus skewing year-to-year comparisons. The graphs presented in this chapter, therefore, should be thought of as suggestive and illustrative rather than definitive. They are also more of a statistical artefact than a precise representation of an observed phenomenon. Averages often mask large differences within the period, and they certainly do so in mountain river measurement.

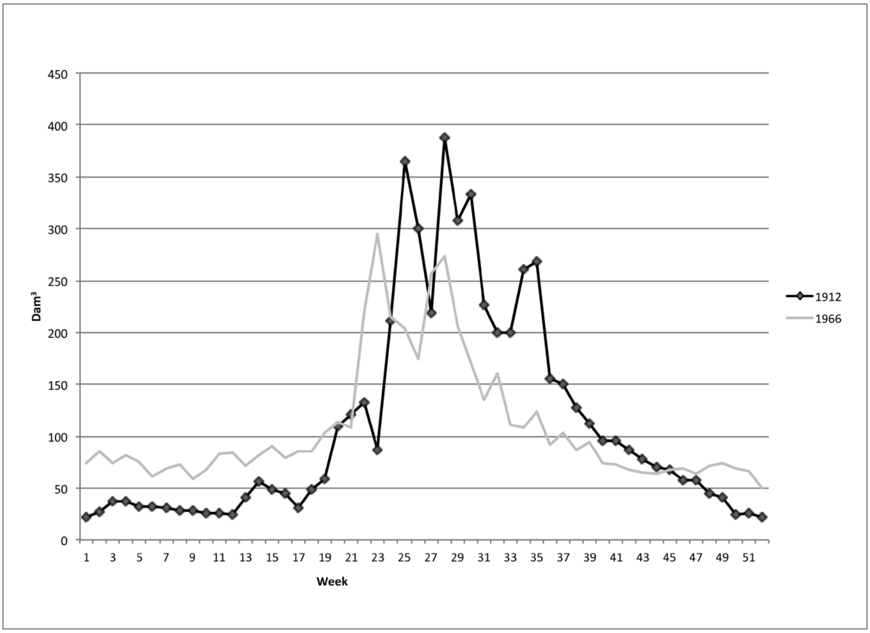
The graphs are based upon average actual weekly mean flow records in cubic metres per second (m^3/s) for the Bow River at Calgary.[5] The numbers are averages of a series of means. To compare two periods, we have averaged these means in two series, the 1910s (1912–20) and the 1960s (1960–69). To compare the flow at different times of the year, we have selected two periods: April to July (weeks 18 to 30) to capture peak flow trends and January to March (weeks 1 to 12) to register low flow performance. During these two periods, the total flow of the river was comparable but not identical, an average of 3,409,022 dam^3 (1 dam^3 = 1,000 cubic metres) in the 1910s and 3,116,798 dam^3 in the 1960s. It should be borne in mind, therefore, that the total average flow during the earlier period slightly exceeded that of the later period. Nevertheless, the changes in streamflow are quite clear.

Graphs 12.2a and 12.2b show that in the 1910s, streamflow after week 23 substantially exceeded streamflow recorded during the 1960s. Early peak flows were higher, or, alternatively, the 1960s summer peaks were much lower than before. In the interim, and especially after the 1940s, the missing water (the area between the two lines on the graph) was retained upstream in the company's reservoirs to be released as needed. The graph covering the first three months of the year, shows the effects of releasing stored water in the winter months during periods of traditionally low flow. Storage effectively doubled the "natural" flow of the river in the 1960s. The next graph (12.3) compares two years of almost identical quantities of streamflow, 1912 and 1966. Here, the shaving of the peak and the doubling of winter streamflow can also be seen in the much lower curve in summer for the 1960s and the much higher winter flows on the tails of the curve on either side of the peak. On the left side of the chart, 1960s flow levels were approximately twice those of 1912 until week 19. Then the 1912 flow peaked at much higher levels and stayed higher until week 45, when storage releases in 1966 resumed.

Storage smoothed out the variation, but not completely. In its streamflow profile, the Bow remained a mountain river, but one of moderated extremes. Graphs 12.4a and 12.4b profile streamflow during two periods: 1912 to 1942 with minimal storage capability and 1960 to 1990 when the storage system was fully operational. In outline, both are quite similar profiles of a mountain river with highly seasonal variations in streamflow. A close comparison of the scale of the vertical axis on the graphs measuring flow in cubic metres per second reveals, however, that the maximum (over 1,000), median (900), and minimum (600) levels of the peaks were much



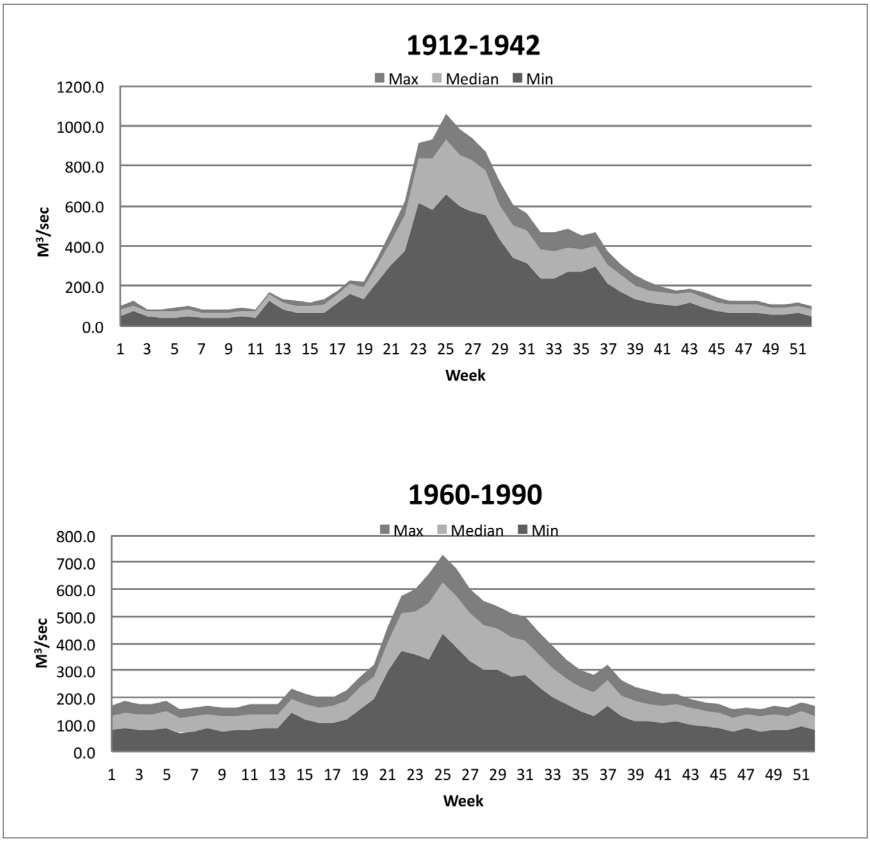
Graphs 12.2a and 12.2b. A comparison of the winter and summer flow of the Bow River at Calgary before upstream storage (1910s) and with storage in full operation (1960s). Source: Environment Alberta, South Saskatchewan River Basin Historical Natural Flows, 1912–1995, CD-ROM version 2.02.



Graph 12.3. Bow River weekly flow at Calgary in two years of comparable volume before storage (1912) and after 1966. Source: Environment Alberta, South Saskatchewan River Basin Historical Natural Flows, 1912–1995, CD-ROM version 2.02.

higher in the earlier period than later – 700, 600, and 400, respectively. In contrast, maximum, median, and minimum flows were much higher (between 100 and 200) later in the twentieth century than in the earlier period (all under 100). The curve had been flattened somewhat: the peaks had been lowered and the tails raised.

Calgary's growing demand for electricity, combined with capital and hydroelectric technology following the logic of path dependence, created a "second nature" on the Bow River. In the sense best described by William Cronon in the case of Chicago, commodity flows into and out of the city altered the landscape, shaping a new ecology that, over time, came to be thought of as a natural landscape.[6] This phenomenon was not limited to the river. The ranches, farms, irrigated fields, and feedlots, and the coal mines, drilling rigs, pump jacks, and pipelines of the energy economy



Graphs 12.4a and 12.4b. Maximum, mean, and minimum flows of the Bow River at Calgary under relatively small-scale (1912–1942) and extensive (1960-90) storage regimes. Source: Environment Alberta, South Saskatchewan River Basin Historical Natural Flows, 1912–1995, CD-ROM version 2.02.

also represented nature transformed by capital, technology, labour, and public policy into commodity flows directed through the city of Calgary. Here, we see how the metabolism of a growing city operating within a hydroelectric technological regime changed the nature of a river – and a national park. We will return to this point in a moment.

First, however, we must explore some of the broader implications of second nature on the Bow River. The river had been changed, but that was nothing new: the river changed itself all the time. Its flow varied; it meandered in its bed, each year cutting away banks and piling up new banks and bars. What was different was the role of humans in driving change. On the one hand, summer floods gradually diminished, until they became a distant memory.[7] On the other hand, for a period, the increased winter flow produced brief but alarming mid-winter floods during the 1940s and 1950s, until the provincial government ordered the power company to build the Bearspaw dam to minimize the possibility of winter ice jam recurrence under artificially elevated flow levels. The moderated river carried less debris, worked less vigorously against its banks, and stayed more regularly in its bed. On the stabilized banks, vegetation thickened. In time, beavers colonized new reaches of the river that now provided abundant shrubbery for food, even in Calgary. The less extreme river became more verdant.

Certainly, people living by the river noticed the changes. They responded by changing their attitudes toward the newly well-behaved river and reconceptualizing land use along its banks. Public hearings in the 1950s looking into winter flooding and a participatory democracy insurgency in the early 1970s against floodplain clearance demonstrated how closely people in Calgary observed changes in "their" river, disregarded flood risks in the new flow regime, and valued its new attributes. The banks of the Bow as it flowed through Calgary – once the home of lumber yards, auto shops, and junkyards – became the location for manicured parks, trails, and condominium and commercial complexes. Trees, flourishing in the floodplain, became an urban forest worthy of preservation on an otherwise treeless prairie. The river gradually became the focus of outdoor recreation and a centre of civic pride.[8] Second nature became the new normal. As the river became domesticated, no longer running rogue in summer and winter, people, without thinking about it too much, came to prefer the new river to the old, or rather, what existed in their experience compared to some imagined earlier state.

Although hydroelectric development of the Bow reshaped not only the boundaries of Banff National Park but also the park's internal ecology, it must be noted that aesthetic considerations trumped development

– even among hydroelectric engineers – at what was considered one of the most scenic spots in the park, Bow Falls. Engineers excluded this potential hydroelectric site from development calculations right from the very beginning. "Highest use" thinking reserved it for other human revenue-producing pleasures. Bow Falls would remain untouched by electricity developers, though not completely untouched: for fifty years it would live an underground existence as the sewerage outfall for the town of Banff.

Parks do not exist in isolation but in a broader politics in which different "rights" compete in the formation of public policy. The particular fate of Banff National Park with respect to hydroelectric storage and generation hinged upon the intricate interplay of federal and provincial politics over a fairly long period of time. The power company, driven by its own technological and capitalist imperatives, eventually achieved its objectives, but not according to its own timetable or under its own steam. It could only do so with the powerful support of provincial and municipal officials who themselves made choices about how electricity would be developed and distributed.

Similarly, historians who write of "the state" as if it were a singular, coherent, purposeful entity will be cautioned by this story, noting how internally divided the "state structure" actually is on something as straightforward as hydroelectric development of a western Canadian river. The internal pluralism of the state – not just the separate federal, provincial, and municipal orders of government, but also the diversity within those orders – needs to be taken into account. The conflicts within the state were as intense as those between interest groups. Officials from Parks, Waterpower, Fisheries, Indian Affairs, and Munitions and Supply contended with one another with an intensity and tenacity comparable to that of the Alpine Club and the Canadian National Parks Association with Calgary Power. The state was not of one mind; its internal divisions had to be brokered. Readers may be inured to stories of overriding capitalist power or the iron rule of bureaucracies, but in this particular story, elected politicians do the decisive deciding. Whatever happened to Banff National Park happened because complex political forces came into alignment. It is broadly a democratic story, however much nature and parks purism were compromised.

As the ideology of parks hardened, Banff, as we have seen, necessarily shrank in size to exclude development sites. Nonetheless, hydroelectric development changed nature within Banff as well. The "Doctrine of Usefulness" accommodated an initial storage project at Lake Minnewanka, which Parks Branch officials opportunistically used to build their own hydroelectric generating system to serve the park. But once the camel's nose had crept into the metaphorical tent, the camel itself – larger, more effective storage – was not far behind. This force could be, and would be, resisted during both the Roaring Twenties and the Dirty Thirties, but it could not hold out against a world war.

Storage and electricity generation within the park and on its eastern border had implications for the environment of the park itself. Storage at Lake Minnewanka after 1912, but especially after 1942, created a much different kind of lake than the old Devil's Lake. It was a much larger, deeper, more integrated body as the retained water pushed back into the mountains and up former canyons. The annual six- to ten-metre raising and lowering of water levels lent a bathtub ring effect, first where the forest had been stripped and then in the form of a 294-hectare dead zone of alternately exposed and sunken earth. But the raised water levels also improved boating and sustained a popular service industry. On the debit side, however, important fish spawning zones were drowned in deep water, and the artificial raising and lowering of water levels also interfered with fish reproduction. Of course, the fish themselves were partly products of human intervention, an introduced species having been stocked in the lake from the park's own fish hatchery.

The needs of war planted a hydroelectric station in one of the most visible sites within the park, right beside the highway, and a large power canal cut a geometric line through the park angling from the lake to penstocks leading down to the generators. Did this diminish the "park experience" for the millions of postwar visitors? That is an impossible question to answer, particularly as mass automotive-based tourism overwhelmed the park. The new tourists had quite different aesthetic sensibilities from those of the trail riders, mountain climbers, and spa goers of an earlier era. Were the visitors to the tour boats and campgrounds of Lake Minnewanka offended by the berm and head gates and power canal of the storage reservoir? Did the generating station on the highway just past the hoodoos jar the mood of autotourists threading their way into the mountains at Banff? For some perhaps. But for most, these intrusions were rendered invisible by the more obvious splendours. The equipment creating Lake Minnewanka did not normally crowd its way into the photographs of the mountain scenery reflected in the water. It is more likely that, in time, visitors came to live with the incongruities – and these were not the only ones on offer. Time turned earlier intrusions into romantic relics: the site of Bankhead, for example, had to be imagined from the ghostly concrete remnants of the mine.

The Spray development, though removed from the park, nevertheless had important consequences for the park. Water levels were raised sixty-one metres, drowning forty-four hundred acres of subalpine terrain and creating a fifteen-mile lake. The lake filled up, as we have seen, when the natural outflow into the Spray River was dammed up to divert water through a tunnel through a mountain toward a much higher fall through an intricate series of interconnected generating stations. The Spray River, as a result, virtually dried up during some months of the year and, for the benefit of the golfers and tourists at Banff Springs Hotel, carried just enough water in high season to be scenic. This regulation of the river was, of course, fatal to the fish in the stream. The Spray River was once the main focus of fishing within the park, but the sport fishery on the river became a victim of Bow River hydroelectric development downstream. To the extent that fishing continued as a pastime for visitors, its focus shifted from the rivers to the lakes of the park, which were, of course, stocked with vigorously fighting introduced species much beloved by anglers.

The Kananaskis Lakes and the Spray Lakes experienced the same increase in surface area and the same annual cycle of fill up and draw down as Lake Minnewanka. The fish faced the same reproductive difficulties in their changed environment. But the constantly restocked introduced species did survive in sufficient numbers as to satisfy anglers. These larger lakes that resulted from hydroelectric development, fully filled in the summer months and newly accessible with logging roads and provincial parks, created new recreational opportunities for canoeists, kayakers, and campers. Boaters and sailors, too, colonized the ponds behind the dams, and whitewater enthusiasts capitalized on the surging increased flows below the dams when the turbines sprang to life.

Several recent studies have surveyed the environmental impact of hydroelectric storage and development in Banff National Park and on the Bow generally.[9] Dams on the mainstem and in the mountains have prevented the migration of fish populations. Flooding and dewatering of the reservoirs has interfered with the spring and fall spawning of certain fish species and favoured the reproduction of species preferring deeper water. Fluctuations in lake levels has changed the structure of aquatic communities and altered food sources for some species. The Cascade and Spray Rivers have virtually vanished as a result of damming. The flow of the Cascade has been almost entirely redirected through the power station, and the lowest sections of the river have disappeared completely. The Spray River, too, has been dramatically altered, as we have seen, although minimal flows have been maintained in summer for golfers and tourists. The original 14 m^3/s flow has been reduced to an annual average of 3 m^3/s. This regulation eliminated the annual spring floods, changed the stream channel, and permitted vegetation to encroach on the bed. It also decimated populations of cutthroat trout, Dolly Varden trout, rainbow trout, and mountain whitefish. The overall net effect of altered streamflows within the park for hydroelectric storage has been to reduce species diversity and biomass.

Downstream on the Bow, the dams and their periodic on/off operation have had an impact upon aquatic and terrestrial ecosystems as well. Daily water-level fluctuations complicate the reproductive activities of some species of fish. Slack water created by the dams affects native species requiring fast-running cold water. River management has, to some degree, contributed to the stabilization of riverbanks and a concomitant thickening of streamside vegetation. This, in turn, has diminished the habitat for some species and improved it for others – in particular, beavers and muskrats. Overall, however, it is difficult to measure whether the ecological impact of the modification of the river for hydroelectric production has had a greater or lesser effect than introduced fish species and nutrient loading as a result of sewage effluent. In many places, native species have been virtually extirpated by introduced sport fish, one of which, the rainbow trout, has flourished in the nutrient-rich reaches below Calgary.

Undeniably, the nature of Banff National Park changed in response to hydroelectric development of the Bow River. It is important to note, however, that this was a relative rather than an absolute change. The new dispensation simply represented a different mix of the human and the natural world. Banff before hydroelectric storage was not an Eden before the Fall.

The city, with its growing appetite for energy, continued to act on nature far beyond its own city limits, but the nature being incorporated was coal, and the consequences of its metabolism were felt by the atmosphere and climate. But that is another story. With the growth in electricity demand being satisfied by other energy sources within the province, and with the capitalist imperative thus relaxed, what kept these elaborate engineering works on the Bow River in existence? They required costly maintenance. Why not tear them down, let the river revert to its wild state?[10] Some people argued for such an outcome. But surprisingly, long after these hydroelectric works had outlived their functional usefulness, an unusual coalition of interests formed to keep the dams in place. Indeed, when proposed, the idea of removing the dams – as has been done in dozens of rivers in the United States – would be dismissed out of hand as "socially unacceptable."[11]

From an industry point of view, the Bow plants existed primarily to be turned on and off to meet peaks in demand. Other uses – recreation, sanitation, irrigation – might be accommodated from time to time, but conflicts between optimization of operations within the TransAlta distribution system received the highest priority, as its brief to the Alberta Water Resources Commission hearings in the 1980s contended that it should. However, as the Bow River contribution to the grid declined to virtual insignificance, it became harder and harder to defend such a position.

For half a century, TransAlta – née Calgary Power – had enjoyed the run of the river. The electricity company designed and operated it to suit itself – though not without persistent opposition, as we have seen. However, as the company withdrew from the river as its primary energy source after the 1960s, the power of other users over river management grew. Over the last thirty years, TransAlta has lost control of the river and even of its own works. Put another way, it has had to learn to share management of the river and its facilities with a broader coalition of interests. While, for the most part, they have all agreed upon maintaining the river as a managed resource, they have differed on management principles.

Through several rounds of analysis, public consultation, and reporting, it became apparent that the river would in future be managed to serve a number of needs, not just hydroelectric production. Through the South Saskatchewan River Basin Study and the Alberta Water Resources Commission hearings of the 1980s, the Bow River Water Quality Council State of the River reports and the Banff–Bow Valley Task Force consultations of the 1990s, and the Alberta Water for Life legislation and the creation of the South Saskatchewan Water Basin Council during the last decade, the principle of co-management of the river to meet a broader range of social and environmental objectives has gradually been established. The electric company, in the operation of its dams and reservoirs, must comply with government regulation intended to serve the sometimes conflicting objectives of a broad constellation of interests: Native peoples, irrigators, duck hunters, fishers, ecologists, water experts, canoeists, boaters, recreationists, environmentalists, business groups, labour unions, tourist promoters, park authorities, and municipal councils, to mention only the organized interests. Through consultation processes, it became clear that irrigators wanted the storage reservoirs to release water in late summer when they most needed it rather than in the winter. Boaters and recreational users wanted water levels behind the dams to be maintained at steadier levels. Fishers insisted that river levels be managed to promote fish-spawning activities. Fisheries biologists and environmental scientists, studying the impact of human interference on the ecology of the river, sought measures to restore natural habitat. The higher needs to be served that have emerged from these consultations are maintaining safe and secure domestic water supplies, meeting inflow stream needs for aquatic ecosystems, mimicking natural streamflow behaviour to restore terrestrial and aquatic ecologies, and providing adequate water supplies to irrigation districts to meet the minimum flow requirements of the Master Agreement between Alberta and Saskatchewan. Water storage and release by the power company must now be managed to take these requirements into consideration.

TransAlta, too, had its own reasons for keeping its Bow River system in working order, even if it had to share management of it. After the Kyoto Protocol was adopted in December 1997, TransAlta, whose electricity came from coal-fired generators, needed "green" offsets to compensate for the heavy atmospheric carbon emissions from its coal-fired thermal generating stations. Hydroelectric capacity, having been deemed to be "green," served a strategic purpose in the calculus of carbon credits. The existence of this legacy hydroelectric system to some degree made up for greenhouse gas emissions from those thermal generators. The new value of the Bow to the company derived from what its waterpower permitted elsewhere. The same was true of the wind farms sprouting under TransAlta sponsorship in the southern Alberta foothills and as far away from Calgary as rural Ontario.

The reign of the power company over the river had effectively ended by the beginning of the twenty-first century. Its works in the river would remain, but they would be operated to serve priorities other than maximum hydroelectric output. Some environmental purists would campaign for a return of the river to a "wild" state, but a new coalition of interests enshrined in public policy ensured that for quite different reasons, it would remain an organic machine.

Time matters in the telling of stories. Different timeframes afford opportunities for quite different narrative arcs. Imagine what this story would have looked like had it ended in 1929, or 1949. Similarly, the transition to coal-fired energy production looked different in the 1970s than it does in an era of carbon emissions–induced climate change. And, of course, time has not stood still, nor has Alberta's appetite for electricity diminished. So the story continues to unfold.

This is not a moral tale. We have not told this story to cheer on corporate capitalism, to discourage environmental protest – or vice versa. We have written this account to demonstrate how historically contingent public policy outcomes can be in a democratic society. The players do not always have equal access to power, to be sure, but in this case, corporate power on its own was not enough. The power of the respective players, too, is influenced by context and circumstances – rising or falling electricity demand, war or depression, economic growth, and the salience of aesthetic and environmental concerns. Calgary Power achieved its objectives on the Bow River, but it was a surprisingly long and convoluted struggle ruled by path dependence. While, to a degree, the company's hydraulic needs were a surrogate for the demands of southern Alberta electricity consumers, there were other means of producing that primary power. And those residents, too, were the people with the greatest direct interest in the management of Banff National Park, being its largest users. The development of waterpower on the Bow and the implications for a wilderness national park involved complex tradeoffs, managed by the politics of a federal system, in shifting economic and ideological circumstances over more than half a century. At each stage, the forces engaged with uncertain outcomes.

Nor, in taking the humans-in-nature approach, do we seek to justify every form of alteration to parks and natural systems. Quite the contrary. This is not an apologia for what happened to the Bow and Banff National Park; rather, we want to understand the social and political processes of human-induced environmental change. Nor is it our intention to license with this narrative any modification of rivers or national parks to suit human needs. Principles are worth fighting for, usually against other principles. But we do not believe that there is some absolute principle whose rigorous application should everywhere and always prevail. We do not believe that there is some prelapsarian nature to return to. Rather, these are matters for debate, contestation, and resolution in their time as interests and ideals compete. The tension built into the original legislation for Rocky Mountains National Park promoting "use and enjoyment," on the one hand, and the injunction of the 1930s Parks Act to pass on parks "unimpaired for the enjoyment of future generations," on the other, opens space for a politics of parks rather than a theology of parks – a politics in which choices are publicly debated and democratically decided. With this story, we affirm that the game is always worth playing and that outcomes are never predetermined.