



SAVING PLACE

**Land Stewardship
in the Age of Limits**

Dr. Bruce Fraser

Cover Photo:
The Koksilah River in Winter
by Laurie Ann Milton – LAM Images

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Foreword

Ideas for environmental reform in our province began for me in 1963 with a reading of Rachel Carson's *Silent Spring*. They progressed with ecological studies under Vladimir Krajina at the University of British Columbia and grew apace while teaching ecology at Selkirk College in the West Kootenays during the late 1960's. They were crystallized by the publication of *Limits to Growth* in 1972. Forest practices in community watersheds and viewscapes, industrial pollution of rivers, and the flooding of valleys for hydro and flood control called out for greater investments in conservative land and water management. Emergence of the Agricultural Land Reserve, the Ecological Reserves program, Land and Resource Management Planning, the Protected Areas Strategy, Old Growth Management Areas and the Forest Practices Code contributed to a process of land, water and biodiversity conservation but the age of limits has still arrived on time.

Working on Land and Resource Management Plans inaugurated by the Forest Service, Regional Land Use plans sponsored by the Commission on Resources and Environment and environmental conflicts around the province made it evident to me, however, how many entrenched vested interests occupied the land.

Always it seemed that the human footprint just kept on expanding, no matter the negotiating devices or conservation programs that were put in place, briefly flourishing, only to be replaced by others without changing the overall trajectory.

In late career, I spent six years as Chair of the Forest Practices Board. The post provided a birds-eye view of the resource management processes of the province, even though the assignment was focused primarily on forest practices on crown land. What became evident was that forestry, while major, was just one among many of the calls on natural resources, that industrial footprints frequently overlapped and that as a province we were not dealing effectively with cumulative effects.

The Board is enabled to audit forest practices, assess compliance with the law, investigate emerging issues and to respond to complaints. It is concerned about legal compliance but it is also concerned with the actual effectiveness of environmental performance by forest licensees and by government agencies with forestry and related environmental responsibilities. It performs this role meticulously, reporting only those findings that are confirmed by direct investigation. Results are extensively vetted by those investigated, by multiple staff reviews, by the Board members and lastly by the Chair.

While this formal process took place strictly within the requirements of the Board's legislated mandate, it was inevitable that I would try to reconcile the documented results with my beliefs and experience over a lifetime.

Subsequent to my time with the Board I had the opportunity to chair the Provincial Task Force on Species at Risk and to act as one of the advisors on the Auditor General's review of the province's efforts on dealing with cumulative effects in resource management. Lastly, I spent a term as the elected Area Director for Shawnigan Lake in the Cowichan Valley Regional District and have followed on as President of the Shawnigan Basin Society, an NGO dedicated to watershed planning. In these last two posts the issues of cumulative effects of the human footprint on the integrity of a community watershed just continued to reinforce the need for a fundamentally more respectful relationship between our society and its ecological foundation.

This book is about my own individual opinions. I think that the system of resource management silos and their unmanaged cumulative physical effects on our land and waters, on biodiversity and on the integrity of communities is a relic of a colonial past. It is overdue for change. We urgently need a new ethic that emphasizes the primary care of ecosystems to replace one that harnesses the exploitation of natural resources to an ever-expanding human capacity to consume and degrade.

While this leads me to an irresistible temptation to prescribe, I acknowledge to my professional colleagues that this essay is just a small pebble cast into a very large pond. I hope readers find the ripples a stimulus to a necessary debate.

Bruce Fraser, PhD
On the Koksilah River
July, 2017

Chapter One: The Stewardship of Place

In British Columbia, we still have an administrative system that can only address individual natural resources, not the complex physical, biological and social context in which they reside. All our efforts to square the circle of resource extraction and environmental security meet on specific areas of our land and waters and in our communities residing in those places. We need to pass from the era of contests of distribution to the era of stewardship of place. In effect, we need to start from home base. Home base is our lands and waters. If we take full ecosystem sustaining care of every single place we can take care of the whole.

Our British Columbia economy grew up in a time of wild exploitation of a suite of heritage resources – land, forests, fish, wildlife, minerals, water and energy, largely appropriated from indigenous peoples. Our resource management agencies grew to distribute this wealth among a host of colonial aspirants. This “pioneer” era and its sense of an unlimited cornucopia has been left behind. The era has passed for good, but our resource agencies are still in the business of allocating a perceived largesse, albeit facing, willing or not, constraints that prevent the full flight of our old profligate uses. Now we need to husband our dwindling ecological base to enable a more prudent future. We need to pass from the era of contests of distribution to the era of stewardship of place.

This is a fundamentally necessary and irreversible shift in perspective as we enter the age of limits.

In British Columbia, we still have an administrative system that can only address individual natural resources, not the complex physical and biological context in which they reside. Only as the land filled up with users did we begin to find it necessary to regulate resource uses to prevent exhaustion of each individual resource base. We remain stuck in this development phase. Each individual resource agency is burdened with the inherently conflicting roles of resource allocator, resource revenue generator and resource steward. The devil takes the hindmost!

A Ministry of Forests Lands and Natural Resource Operations is the latest in a long series of attempts to balance the conflicting roles among the fragmented agencies and to address mounting cumulative effects. The agency finds this task difficult for two main reasons, because constraint on resource development assaults the current societal goal of endless growth and because it is not responsible for the whole land. On one hand, it cannot arrest our rampant consumption and on the other can only “coordinate” the individually legislated interests of the line ministries and the many demands of the resource users to which each allocates their slices of the resource pie. That is why the Ministry is struggling to deal effectively with cumulative effects despite ground-breaking technical work at the pilot project scale.

In the past we have invented and killed off many predecessors for much the same reasons – the Environment and Land Use Secretariat, the Forest Land Use Liaison Committee, the Forest Resources Commission, Land and Resource Management Planning, Inter-agency Management Committees, the Commission on Resources and Environment, the Land Use Coordination Office and the Species at Risk Coordination Office among them – none were put in charge of land, but tasked to deal with only one sector, only one problem or to herd the resource agency cats. When they threatened to become successful they were seen to be “getting in the way of doing business” or “too prescriptive” and duly disbanded, or, like the Ministry of Environment, repeatedly re-organized and starved for its protective functions and turned into a vetting agency for development permits. This repeating process has frustrated a good many sincere and competent professionals who have tried to make these devices work. What defeats us is not the people employed in the system or even the political leaders of the system, but the limitations of the system itself. The time has come to change the design principles of our land and resource management system.

In these days as the effects of climate change are rising to the top of our land use agendas, we are rushing to invent watershed management planning processes, regulations, management regimes and stewardship sanctions as water issues become urgent – yet another feline in the

making. But watersheds will not just be about water, but about the cumulative economic and job implications of mines, gravel pits, forests, wildlife, fire, invasive species, farms, resource roads, dumping, off-roading, hunting, recreation, tourism, habitation, energy – all the human footprint elements that impact the land – all of which interact with each other.

If we are to manage the human footprint on watersheds we cannot treat water as just another resource and create another undernourished and soon-to-be- reorganized kitten with its own legislation, agency and management authority as the Water Sustainability Act intends to create. To manage watersheds and water, or mines or forests or all the others, we will need to manage the whole land. Ecological health of the land is the integrator that we need to replace the now historically obsolete model of separate resource agencies and their competing sector-specific allocation and stewardship arrangements.

We need to create an agency for modern times when the landscape is full. It needs to have the authority and professional capacity to manage the ecological health of specific land units, among them community watersheds. It needs to inventory, monitor and report on the state of natural capital assets of its land units. It needs to manage access to them to ensure that the cumulative impact of our human footprint does not degrade their capacity to provide ecological services or degrade the underlying natural capital.

Where we permit non-renewable resources to be extracted from the land units they must not leave a permanently diminished renewable natural capital in their wake. Such an agency should be appurtenant to and in partnership with the communities and First Nations embedded in the landscape units. This is necessary for reasons of ecology, economy and justice.

While acting as Chair of the British Columbia Forest Practices Board between 2003 and 2010, I was immersed in a daily diet of competing pressures of resource development and environmental security. Depletion of old growth forest, conflicts with wildlife habitat and impacts on community watersheds were the subjects of a steady flow of public complaints that required investigation by an independent public auditor. Resource roads, bridge safety, coalescing clear cuts in pine beetle territory, hanging culverts that prevent fish passage, log dumps affecting whales, cumulative effects of industrial development on guide-outfitters, encroachments of recreation on grazing range, visual impact on resort areas – a vast litany of issues continued to arise as the human footprint covered the land and our communities reeled with the impacts.

As a province, we seemed not to be able to get a grip on our collective appetites, despite landmark agreements in the Great Bear rainforest, the Haida prevailing on Haida Gwaii and the general improvement in industrial forest practices inaugurated within the brief lifespan of the Forest Practices Code and its successor the Forest and Range Practices Act.

We became smug about the fourteen percent of provincial lands set aside in parks and ecological reserves, without looking at how representative they actually are of the biodiversity of the province or how well they are connected. We have a growing list of threatened ecosystems and species and we are still eliminating heritage stands of old growth forest that can never be replaced. To save the disappearing woodland caribou, whose habitat we have appropriated, we have been reduced to shooting wolves from helicopters in a vain attempt to deal with the wrong predator.

We have allowed a generation of publicly negotiated land use plans to decay in place while the ever-growing human consumptive footprint is writ large on the moving surface of climate change, for which we are also responsible. A satellite view of the seismic grid and fracking wells in our northeast, our ubiquitous resource road network, our coalescing clearcuts in pine beetle territory, our resort developments in the mountains, is a view adorning every district office in the province and should give us pause. We have effectively disbanded the Forest Service, shrunk the Ministry of Environment into an ineffective shadow and failed to develop a way to deal with cumulative impacts. We have invented a polyglot ministry of Lands, Forests and Natural Resource Operations intended to manage land as a whole, but that does not effectively corral Environment, Mines, Energy, Agriculture, Health or Tourism, also prodigious users and regulators of land and water each responding to their own legislation.

We have marshaled a great many laws and agencies clustered around the silos of resource extraction, each intending to deliver on a revenue generating and job-creating mandate. What stewardship regulations there are have been intensively minimized through the intervention of the industrial associations clustered around each individual resource. Naturally these vested interests are overwhelmingly concerned with the cost of doing business, arguing convincingly for ease of access to their resource, limits to government oversight, reductions in “red tape”, internal resource inventory, internal monitoring, self-reporting of infractions, reliance on their own hired experts and certification by industrially based organizations. The individual nature of these fragmented efforts is the primary ingredient in our recipe for inability to address cumulative impacts.

We have created numerous coordinating agencies and programs with short life spans that have been proudly announced and then dismissed when they threatened to become effective in addressing cumulative impacts. Through all of these efforts we have searched for an integrating principle and only ended up with futile attempts to make sovereign line agencies collaborate against their entrenched individual interests. Our model appears to be upside down, with economic success held to be necessary to enable protection of our environment rather than a healthy and productive environment being necessary to enable our economic success.

Our social goals imply increased human consumption and the mantra is growth – more jobs, income and ability to pay for our welfare as a human community. The impacts were for a time invisible – limited in impact when exploitable resources were abundant and the earth could easily accommodate and recover from our resulting footprint. A much less inspiring picture has emerged as the age of limits has arrived on the land, in the seas, in the atmosphere and among the life forms we are displacing to extinction. Our growth can either overcome the earth’s biophysical capacities and crash or it can reach equilibrium and continue in balance. We are not yet doing very well in shaping our society to reach a sustaining balance.

In natural resource management, we can do better by striving for an integrating principle that works. I will argue in this book that the integrating principle that has a chance of being effective in the age of limits is the *integrity of place*. All our efforts to square the circle of resource extraction and environmental security meet on specific areas of our land and waters and in our communities and families that reside in those places. In effect, we need to start from home base. Home base is our lands and waters. If we take full ecosystem sustaining care of every single place we can take care of the whole.

I will argue that we could use the comprehensive land management model embedded in the former BC Forest Service rather than letting its best features pass into history.

We could invent a ***BC Land Service***, responsible for the ecological health of well-defined public land units. It could manage the full range of natural capital – by planning; conducting inventory and research; setting, monitoring and enforcing environmental standards; allocating resources to users; managing cumulative impacts and keeping the public apprised of the true status of their heritage. Managers of Natural Capital, properly assigned and in deep collaboration with communities and first nations, could be the new stewards of place.

I will argue that we could use the system of ***community forests*** to implement stewardship of place by putting rural communities in a strong land ownership position at the centre of a healthy and diversified local resource economy.

Ultimately, we need to turn our attention away from the essentially negative idea of *managing cumulative impacts*, as though allowing them to continue to occur is the normal state of being. Instead we need to shift to the optimistically positive idea of managing for ***cumulative stewardship***, a state of being, a consciously developed culture, that progressively brings us into ecosystematic balance with our natural world.

Chapter Two: The Big Picture

One day in 1973 I was working away in my office as Principal of Selkirk College. Needing something from my secretary (they still existed then) I wandered into the outer office. Out there everyone was absorbed in their administrative duties, heads down, lights blazing, typewriters clacking (they too still existed then). Picking up the papers I needed, I accidentally raised my eyes over the humming desks to the adjacent hallway and across it to the library windows. They were dark. Was no-one in the library on this normal college day? Then it dawned on me that the college was struck by CUPE and only the administrative staff was on campus. There were no students or instructors to be seen, but we administrators were carrying on anyway. Our ultimate reason for existence was absent, but that didn't stop us from our obviously important work!

So, here we are, heads down in the forestry silo, regulating and de-regulating the minutiae of forest industry practices, assessing the adequacy of cut block management in relation to the law while forestry itself is rapidly retreating from the scene: mills closing, competitors advancing, trade complexities rising, companies moving investment to the US, beetles munching, “carbon” replacing “fibre” in our technical jargon and climatic volatility accelerating faster than our adaptations.

We are exporting raw logs to be milled in other countries. We are logging green parts of the mid-term timber supply in beetle-affected areas of the interior in an attempt to ameliorate the long forecasted falldown in allowable annual cut. At the landscape scale, we are extensively fragmenting the forest environment – evident in any satellite photograph or inventory of resource roads. We are listing an increasing number of species with threatened status, we are powerless in the face of climate volatility and its consequences and we are not yet managing forests for the expected disruption to the continuity of our fresh water supply, though we see it coming.

Increments of industrial resource extraction for timber, minerals and energy are overlapping on the same landscape, leading to cumulative impacts that are neither adequately recorded nor systematically managed. We are urbanizing so rapidly that our voting citizens, now so concentrated in the lower mainland and a few interior cities, are losing touch with the environment on which our natural resource prosperity is based. We want to use land for recreational real estate rather than for primary production. We are not mindful enough of our renewable natural resource exports - the goods that can continue to earn the lion's share of real input dollars to our economy and that will be needed whether we continue to survive in the commodity market or grow our future in design-rich, intensely market-sensitive, value-added manufacturing.

Our economic model of producing bulk commodity fibre for construction and pulp, feeding a highly competitive world-scale market, is increasingly under stress. It is threatened by industrial competitors of greater size, by low returns on capital employed, by better growing conditions, by absentee finance corporation ownership, by low wage manufacturers, by protectionist efforts in customer countries, by the volatile cost of industrial scale energy, by overwhelming debt levels and ultimately by the necessity of achieving a vastly limited carbon footprint. Similar issues now face our energy industries of coal, oil and natural gas. The international trade complexities arising from a disintegrating European Union, with echoes in the United States, are creating systemic uncertainties.

At the outer extreme lies the emergence of automated construction systems based on 3D printed materials, at whole building scales, that could make traditional solid wood construction methods, materials and jobs obsolete. The resulting challenge to hewers of wood could be a massive shift in how the fibre and chemicals of trees are processed, transported and used.

Our industrial machinery is dependent on fossil fuels that are themselves one of the proximate causes of the climatic disturbances that can degrade our commercial forest. Those very fuel supplies are threatened by environmental cost of extraction, a falling return on energy invested, the potential of volatile supply sources and international conflicts.

We have begun to sell off forest land to what we are glibly calling a “higher and better use” that eliminates its value as a source of fibre and limits its contribution to carbon capture or water storage. We are shedding mills, workers and resource towns like dandruff as we automate, concentrate and invest earnings elsewhere. We are discovering in the courtroom that we don’t even legitimately own the land on which our industrial economy is based. We don’t really know if we are at the end of our tether and susceptible to collapse or in the throes of particularly vicious swings in a recurring commodity cycle from which we will emerge, perhaps smaller but trimmed for vigorous survival. We don’t know who might be left standing, a few consolidated giants, the playthings of billionaires and investment funds, or a rabble of niche-specific pygmies, the family owned and community sustaining “salt of the earth”, the lumbering but infertile dinosaurs or the fleet-footed and randy mammals.

I know that in British Columbia we have begun to address some of these larger issues. We did legislate continent-leading greenhouse gas reduction targets, even though they are presently stalled. We created an institute for climate solutions, a bioenergy strategy with a publicly funded bioenergy network, independent alternative energy schemes, plans for resilient forest regeneration, cumulative impact assessment pilots in the Ministry of Lands, Forests and Natural Resource Operations, resource road regulation, integration of industrial effort, species recovery plans,

pest and pathogen studies, beetle action coalitions, product research and innovation, community economic diversification, market research and niche specialization, protected areas, community forests, forest and range opportunity agreements with First Nations, ratified treaties, green buildings and electric smart cars. Gasp!

This is a remarkable package of activities, laws, policies, institutions and initiatives. But, are these efforts targeted collectively at the order of magnitude of the problems and are they commensurate with the speed at which the problems are proliferating and interacting? Are they well integrated and actively monitored for effectiveness?

Is there an overarching strategy behind this array of inventive responses that can continue to manage the minutiae of cutting trees while preparing us to manage the sustaining forest? Five organizing principles come immediately to mind, compression of the industrial footprint, integration of economic activity at the landscape unit level, interdisciplinary collaboration, and rapid adaptive management.

Compression

Initiatives are being established to reduce our industrial, commercial and domestic contributions to climate change. Reduction targets for greenhouse gas emissions are being set which will necessitate redesign of our industrial and electrical energy production models.

This will include innovations in industrial processes, adoption of alternative energy sources, and extensive conservation of energy and materials. In the forestry sector this is emerging as co-generation, waste biomass fuels, energy plantations, bio-refining, and district energy sharing in communities with conversion facilities. At present, these developments are dependent on already assembled biomass byproducts of major solid wood conversion facilities – a source that is shrinking in both magnitude and dispersion among communities. In the future, it may be necessary to manage the extractable biomass of our forested land for energy as well as fibre and the balance may be reversed, making fibre products the residue of forest management rather than their primary value. An energy focused future is also likely to involve extensive use of forestry as a basis for earning carbon credits, a use that may well involve maintenance of intact mature forests rather than their conversion to fibre products and burnable residue. An energy primacy might also mean more distributed conversion facilities, linked to cooperatives of smaller mills, resulting in shorter transmission requirements. A community-centered, light carbon footprint economy with energy and water priorities might look very different from the competitive industrial, world scale, commodity lumber and pulp business we now enjoy but which appears to be slipping from our grasp.

If this is the transition that could take place in some of our forests, it will take extensive debate, innovation and economic vision to implement deliberately rather than to have it arrive as a survivalist option in the aftermath of collapse.

Integration in Place

Management of our rapidly growing draw on natural capital has to reflect the actual location of that capital and the dynamics that maintain it over time. This means adapting our economic extraction of value and the scale of our interventions to ensure that the scale of development and the technologies employed are compatible with the carrying capacity of ecosystems. It means taking care of biogeochemical cycles and biodiversity, the physical environment, the biophysical processes - the moving parts of our sustaining ecosystems in real time. It also means paying attention to sustained quality of place. Our current measures of economic success rarely include an estimate of the condition of natural capital resulting from industrial development – the status of air, water, soil, species, net primary productivity of plants other than commercial crops, interspecies relationships and the dynamic flow of nutrients. We are about to find it mandatory to factor in the carbon footprint consequences of human commerce on the balance sheets of our industrial society. These issues are already the subjects of research, are emerging as fledgling policy, but not yet systematically included in our economic equations.

To make conservation of natural capital a design consequence of economic development we will need to organize ourselves around units of the human ecosystem – communities embedded in the natural surroundings on which their economic footprint is expressed. In BC, we have the forested landscape already divided into Landscape Units, largely with boundaries that respect watersheds and ecosystem types, a legacy of Vladimir Krajina’s biogeoclimatic classification and Regional Land Use Plans. Our use of these units has languished in many places in the province, but they could form the basis of socio-geographic administrative units that integrate all the demands on the landscape. Pioneering work by a FLNRO professional team in the Cariboo-Chilcotin is a prime example of the ecological specificity of landscape unit level assessment that is needed. The resulting administrative authority would have to be charged with the responsibility of keeping the resident natural capital in properly functioning condition while integrating the many overlapping industrial, commercial and public uses of the land unit. This ecological governance approach implies limits and normally horrifies the proponents of continual growth, industrial development or specific public uses that might, as a result, be curtailed. We will have to get over that if we are not to suffer the tragedy of our commons!

Interdisciplinary Collaboration

Estimating the carrying capacity of a landscape unit, addressing the plethora of existing and proposed resource uses, assessing the cumulative impacts and making decisions about limits that must be imposed is terribly complex. It cannot be done by foresters, biologists, economists, engineers, agrologists, planners, accountants or woods managers acting alone. Interests of administrative agencies and the regimes of individual economic sectors – forestry, energy, mining, ranching, tourism – responding as they must to differing market places, are rarely congruous.

This means that the integrating job at the landscape unit level will demand an unprecedented degree of collaboration among professionals across both disciplinary and employment lines. Joint boards of practice, comprehensive research programs, full cost accounting, precautionary regulation, cumulative impact management, ecosystem restoration and multiple layers of resource tenuring need to be devised, peopled, funded and maintained. Such a comprehensive effort seems unlikely to be realized without a focus on real units of the landscape, of reasonable scale, where the consequences are within the grasp of people familiar with the actual land and its functions and where the administrative arrangements facilitate direct and manageable working relationships.

Rapid Adaptive Management

In a volatile economic environment, with rapidly growing populations and rapidly changing environmental conditions, there is little leisure for resting on the laurels of current thinking. Conditions of Climate, international markets for our export products, energy costs, public viewpoints, inter-state conflicts, ecological refugee populations, pathogen and pest populations, species at risk, water distribution, among many others, are extremely volatile. That volatility is producing surprises on a daily basis.

Forecasting could not keep up with the pace of recent fluctuations in the Canadian currency, the emergence of exceptional storms or the credit collapse and stock market volatility arising from failing sub-prime mortgages in the US or slowdowns in China. Long established firms have declared bankruptcy or instituted mill or mine shutdowns causing communities to go from thriving economy to embattled town in a matter of months. Wildfires, border closures to refugees, pandemic threats, terrorism, boycott campaigns, drought, floods, demographic shifts and reactionary regulatory initiatives all interact to produce counterintuitive results in rapid succession.

In this environment, long-term strategies are needed but the longevity of their assumptions is mercilessly brief. We are forced to react to unanticipated changes that alter the usefulness of the best-laid plans. Nothing could be more vexing in a field like forestry.

In a single rotation, everything on which the social, economic or environmental value of the forest was predicated could become obsolete. Just think of a couple of rotations ago, flappers were dancing the Charleston, we were reveling in affluence just before the crash of '29 and the ensuing great depression... no second growth transition, old growth forest was endless, no pine beetles (no commercial value for pine anyway) no interface fires, no retreating glaciers, no Russian, Chinese, Indian or Brazilian competitors, no softwood lumber agreement, no nuclear Pakistan (actually, no Pakistan), no Green Party, the Northwest Passage to the Orient was myth, and America was the pre-eminent source of oil. The latest iteration of the Softwood Lumber Agreement, the volatility of the Canadian Dollar, the sub-prime mortgage manipulation adapted now to car loans, the evidence of rapid retreat of both Greenland and Antarctic ice, increased rate of loss of Amazon forests, panacea-like rise of alternative energy, 3D printing of whole buildings, to name a few of the emerging conditions are not just occurring inside a rotation, they are happening within a decade long “free to grow” period.

The future is not just opaque, it is also both “path dependent” and increasingly complex. We are already influencing it and like the flapping wings of an obscure South American insect producing the “butterfly effect”, our seemingly disconnected choices interact with a thicket of natural conditions and consequences, foreign, domestic and extraterrestrial.

We have no idea of the compounding effects of our current choices, but we had better be able to assess and respond on the same time scale that such effects occur. We need to invent fast adaptation. We need monitoring systems that rapidly integrate the intelligence arising from multiple sectors – sort of a Google Earth in four dimensions. We need to know if we can sell in the next generation some feature of what we have just made “free to grow’ in this generation - and it may not be solid wood or fuel - maybe it will be printable slurry, assuredly it will be water.

We need to be comprehensively informed, not to foster a mistaken belief that we are capable of predicting the future, but to enable us to have alternatives in mind when the surprises emerge. We need open and vigorous public debate. We need to be articulating and testing irreverent scenarios. We need to expand our base of experiments with tenure systems, industrial products, land use administration models, footprint limiting strategies and professional teamwork. We need to share information across traditional boundaries. We need to husband our aging stock of intellectual capital and engage its replacement generation. We need to make learning and rapid adaptation a central function of our businesses, agencies and professions, indeed of our society. In effect, as Baden-Powell insisted, well over a rotation ago when things moved at a so much slower pace, we need to “Be Prepared”.

Chapter Three: Natural Capital and Ecosystem Services on the Provincial Commons

The airwaves are filled with the concerns of the public, governments and industries about the significance of human caused environmental change. We have passed the threshold of realization that global climate change is real, potentially ruinous and substantially forced by human activity. The global interconnectedness that is celebrated as an economic benefit for trade has a double edge that makes us also more vulnerable to environmental problems, regardless of where they begin or end.

Conserving the life support functions of global ecosystems has become one of the great issues of our time. Political leaders, public servants, industry executives, environmental campaigners and clerics are among the many voices that are clamoring for change as a result of both articulate warnings and the flood of validating scientific evidence. Ameliorating action is being called for at every level of human organization from the Leap Manifesto to the Pope's Laudato Si to the UN's Paris Agreement on Climate Change. International protocols for governments, emission targets for industries, carbon neutral fuels for transport, land reserves for wildlife conservation and fishery catch limits to conserve food supplies are among the growing array of initiatives employed with varying degrees of success.

There are many in British Columbia who are long familiar with the issues and who have created everything from innovative industries, to results-based regulatory regimes, to systems of protected areas. At the same time, as our population grows, our land and water consuming footprint is also growing. Forestry, mining, energy production, agriculture, aquaculture and commercial recreation are all expanding on a finite land and water base. These are incrementally justified, lawfully tenured and independently regulated. While we are creating a rich society, capable of great human opportunity, there are growing concerns that we are also capable, to our long-term detriment, of permanently depleting the natural capital of our ecosystems.

In British Columbia, we are challenged to take prudent care of our local environment. We need to do so both for our own welfare and for our contribution to the global effort. We need to focus on our land, water and resource management functions and how we might configure them to manage our natural capital as effectively as possible to avoid overshoot of our natural carrying capacity. Public resource agencies have major roles in the stewardship of our environmental resources because the province is managed largely as a publicly-owned common, not divided into private domains as is much of the developed world.

In 1968, Garret Hardin, in his famous essay on “The Tragedy of the Commons” suggested that our strategy for ensuring the integrity of a commons must be based on “mutual coercion, mutually agreed upon”.

In pursuing our version of mutual coercion, our province has created a multitude of management agencies, regulatory regimes and sectoral initiatives supplemented by the campaigns of many non-government organizations. In the same way that our insight into global warming has crystallized recently amid the cascade of articulate warnings and supporting evidence, our approach to management of the land and water commons must also crystallize rapidly in response to our growing footprint.

Conserving the Natural Capital of British Columbia

To make conservation of natural capital a design consequence of economic development we will need to organize ourselves around units of the human ecosystem – communities embedded in the natural surroundings on which their economic footprint is expressed.

I believe that an ever-growing number of people, quite astutely, see that the current administration of land and resources is enabling our insatiably consumptive human footprint. The result is a cumulating assault on the integrity of ecosystems with consequences that affect everyone, beginning with those at the bottom of

the socio-economic hierarchy. To stem the loss of trust in equity that this is creating, we need to engage and respect voices and concerns that are too often submerged by superior forces. Not only do we need to adhere to principles of fairness, inclusion and empathetic response, but we also need to do this at geographic scales where a full understanding of the landscape can be grasped so that baselines, thresholds and cumulative effects can actually be assessed and managed. This means, among other things, that managers of land and water need to be made resident in the areas that they administer and held accountable for the results on the ground within their charge. It also means that we need to respect the other life forms within large areas of our land and waters to the extent that we do not simply force them absolutely everywhere to serve our human demands for energy, food, materials, recreation and living space.

The systems at play in the province demand some practical suggestions for our response in the field of land and resource management. They suggest that we need to manage by ecologically defined areas, integrate the sources of industrial footprint on those areas and task our existing array of resource agencies to achieve a balance between our demands for ecosystem services and the carrying capacity of the underlying ecosystems from which they are derived. To do this means rethinking the existing division of natural resource management, organized as it is into non-articulating silos of industrial jurisdiction. This does not mean preventing development. It is

about shaping it to our long-term advantage through a system of management of our provincial commons that is based on the cumulative stewardship of place and the integration of our system of “mutual coercion”.

Natural Capital

British Columbia is sustained by an open economy, largely based on the export of products from five major natural resource industries, forestry, fisheries, agriculture, minerals and energy. Basic to the capacity of each of these industries to function over the long term is the maintenance of the ecosystems, the natural capital, that provide the resource and upon which the impacts of resource development accumulate. Sustainable resource development entails achieving a balance between development and ecosystem integrity. Maintaining the stock of natural capital enables economic activity to continue, whether through export of natural resource commodities directly or through value-adding innovation on the mix of resource products. In addition to the basic five industrial sectors, a sixth sector, water, is growing rapidly in importance. Fresh water supplies have crosscutting importance as a basic domestic need for communities, a source of forest, fishery and agricultural nutrition and as a feedstock and treatment medium for heavy industry. Water management will affect and be affected by all other resource-based industries – from pulp mills to mines, from vineyards to salmon runs.

Natural capital is the heritage of ecosystems that provide the life support system for Earth. It is the physical habitat for the diversity of species as well as the commerce among organisms and their collective interactions with earth, atmosphere and water. Organisms, interacting with elements of the physical world over millennia, have bio-formed the planet repeatedly, regulating earth's climate and chemistry to make it habitable for all life and enabling evolutionary recovery after cataclysmic change. Organisms capture the energy of the sun, create the oxygen, purify the water, cleanse the air and recycle the nutrients on which forests, grasslands, wildlife, fisheries and farms are based. All the ecosystem services on which human populations depend are ultimately the products of natural capital, a renewable resource when husbanded effectively.

In British Columbia, we have inherited a rich supply of natural capital in the form of forests, fresh water, wildlife species, fertile soils, wetlands, icefields, lakes, rivers, estuaries and shallow coastal seas. We have developed an abundant economy based on forestry, agriculture, fisheries and hydro power – our potentially renewable resources. We have increasingly supplemented this biophysical cornucopia with minerals, coal and natural gas – our certainly non-renewable resources. With all of this we have built a vibrant province and invested our population with enormous consumption power that reaches around the world to grasp the delicacies of the planet. At this stage of our development we are enjoying

an economy disproportionately and increasingly based on the extraction of fossil fuels –oil, natural gas and coal. As a province, we have articulated an objective of becoming carbon neutral by making the transformation from fossil fuel dependence to a broad array of renewable energy alternatives while at the same time striving to make our economic future dependent on the export of liquid natural gas. How do we ensure that this quixotic pursuit of a temporary economic boom based on an ultimately limited and destructive fossil resource is quickly supplanted by much stronger efforts to conserve our natural capital for the time when we will have to live within its natural carrying capacity?

Ecosystem Services

Favourable climate, food, fibre, energy, clean air, potable and irrigation water, fertile soil, waste re-cycling, pollination and natural controls on pests and pathogens are among the basic components of the earth's life support system. As these components are now recognized as having fundamental economic significance, humans, with spectacular narcissism, have come to call them "ecosystem services".

It should be widely understood that long-term sustainability of human societies is dependent on the carrying capacity of their environment. Abundant biodiversity, interacting with the physical attributes of the planet created the conditions that enable human abundance. Favourable climate, food, fibre, energy,

clean air, potable and irrigation water, fertile soil, waste re-cycling, pollination and natural controls on pests and pathogens are among the basic components of the earth's life support system. As these components are now recognized as having fundamental economic significance, humans, with spectacular narcissism, have come to call them "ecosystem services". Abundance of ecosystem services provides the surpluses necessary to foster the developed complexities of religions, governments, economies, trade, arts, sciences and warfare – the complex developments of populous human societies. They also provide the life supports needed by every other living being on the planet.

Can We Agree to Manage the Commons?

Garrett Hardin proposed that the answer to the tragedy of the commons was "mutual coercion, mutually agreed upon", essentially the agreement to be bound by limits devised by our own culture in the light of our insights about how ecosystems work and how humans tend to exploit them to extinction out of cumulative short-term rational self-interest. Our sector-based regulatory mechanisms devised by democratic legislatures are our society's current version of this mutual coercion process. The necessary evolution of regulation now points to a mutual coercion that spans the sectors, crosses the bureaucratic and industrial silos, and integrates the separate fields of human activity by looking directly at the collective outcomes on the ecosystems of the commons.

What this may take is regulation and management responsibility that is designed around ecosystems themselves rather than around the systems of allocation of benefits that now characterize our ministries of forests, mines, energy, agriculture, environment, economic development, industry and trade and so on. We need stewards of land and water, attached to place, whose mandate is to ensure that all who dip into areas of the commons for resources or for processing of their wastes are held within the measured and continuously monitored resiliency limits of the resident ecosystems and the welfare of their many non-human inhabitants.

A Sustainable Culture

Neil Evernden, in his 1985 book “The Natural Alien” characterizes the human species as an alien invader in its behaviour towards nature, bound weakly by natural limits to expansion that species tend to experience in their natural habitat. Species within a stable ecosystem tend to accumulate relationships as predator and prey, host and pathogen, symbiont or competitor, that along with their physical resilience to conditions become their natural bounds. By systematically evading the natural limits, and having no instinct to adhere to ones we might perceive, we run the risk of degrading our habitat below its capacity to sustain us. Evernden’s approach to this gap in our human make-up is that we are constrained to invent a culture that is harmonious with the planet’s finite nature.

We could react in horror about the restrictions on economic activity that such a management regime would suggest. Or, taking a positive approach, as managers of place, we could be actively seeking and supporting those entrepreneurs, developers, inventors and investors who have the inclination, talent and capacity to enhance the ability of our ecosystems to produce services while maintaining their biophysical integrity and natural capital. Now there is a design challenge for us!

Chapter Four: Initiatives at the Provincial Level

We cannot expect to influence the maintenance of natural capital at a national or global level from our vantage point in the province of British Columbia, unless we can take better care of our own piece of the planet and thereby contribute to the larger purpose.

Democratic Systems Serve Sustainability Goals

One of the areas of cultural invention that is accessible to us within Canada, and most susceptible to our own conscious design, is our system of public institutions and processes. Representative democracy at national, provincial and local levels, progressive taxation, rule of law, separation of church and state, independent courts, independent media, constitutional freedoms and human rights, universal public education, statutory professional societies, trade unions, voluntary non-government organizations and state regulation of common resources including independent investigative tribunals and extensive public participation in resource planning – these are the bulwark of our political system. Provincial elements of this Canadian democratic system are already available to us. While our institutional framework can be employed to protect the status quo of vested interests, it can also be employed to adapt our culture to the realities of a finite planetary life support system in distress.

What is Our Existing Inventory of Positive Players and Their Initiatives?

There are many public, agency and private sector responses that are in play in British Columbia that are addressing threats to ecosystem capacity. ENGO's like Ducks Unlimited, the Land Conservancy, the World Wildlife Fund, or ForestEthics focus on initiatives ranging from broad scale public policy to the conservation of specific sites or individual species. Private corporate responses include forest certification, sustainable forest management planning, adherence to corporate social responsibility protocols, and engaging the public in land and resource use planning. First Nations, while struggling to develop a viable modern economic base, insist that exploitation of natural capital should follow the respect for nature that their cultural traditions embraced. We need to assemble these valuable efforts into a coherent whole, a job that only governments, responsible for our overall public interest, can manage.

*“ForestEthics protects Endangered Forests by transforming the paper and wood industries in North America and by supporting forest communities in the development of conservation-based economies.” **ForestEthics web site***

*“Ducks Unlimited conserves, restores and manages wetlands and associated habitats for North America's waterfowl. These habitats also benefit other wildlife and people.” **Ducks Unlimited Canada website***

“The Land Conservancy achieves its conservation objectives by working in a non-confrontational business -like manner. We work with many partners, all levels of government, other agencies, businesses, community groups and individuals to ensure the broadest support for our activities. We are here for the long term. When we take properties under our care, our goal is to protect them in perpetuity.” **TLC The Land Conservancy website**

“Building on the ISO certification, Canfor has certified a number of its operations to the Canadian Standards Association (CSA) Sustainable Forest Management standard, beginning with area- based tenures and then continuing on with volume-based tenures. Canfor is very proud of this accomplishment as the standard is particularly demanding and requires public participation in developing a sustainable forest management plan for each forest management area certified. Sustainable Forest Management plans are developed for each operating area and are submitted for certification to SFM standards by independent third-party auditors. These plans must maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations.” **CANFOR Website**

One recent example that links ENGO, government agency, corporations and First Nations is the negotiated agreements in what has come to be known as the “Great Bear

Rainforest” to undertake “ecosystem based management” in the pursuit of industrial forestry. The philosophy expressed is that development should ensure a sustainable balance between the integrity of ecosystems and the welfare of human communities. The concept is widely seen as innovative but also has industry critics who see the cost escalation as a major problem. Another is the provincial effort to save threatened species through recovery plans led by the Ministry of Environment. Another is the protection afforded the agricultural land base through the Agricultural Land Reserve. Yet another is the focus of the Chief Forester on establishing ecologically resilient forest stands in the face of anticipated climate change and shifting pest, pathogen and wildfire conditions.

“The Coast Information Team approach to EBM seeks to secure a high probability of maintaining ecological integrity overall at the sub-regional scale and in landscapes and watersheds with high conservation values, while providing for human well-being by allowing focus on economic development in landscapes and watershed with greater economic values.”
Coast Information Team, EBM Planning Handbook, 2004

Do We Have the Legislation and Policies We Need?

Provincial forest legislation includes many stewardship requirements that range from stocking standards for reforestation, to conservation of wildlife habitat, to protection of fish streams and community water sources. In other resource pursuits, there are efforts planned to coordinate resource road development, environmental requirements for energy exploration and development, rules for limiting mining impacts and restoring mine sites, impact assessment protocols for major projects and pollution control monitoring and enforcement.

In the throne speech of February 2007, the provincial government committed to an extensive attack on the sources of global climate change. Utterances in 2017 are no less ambitious. It is not as though we lack environmental awareness as a society, or as if we are not doing anything at all within our separate administrative silos, but we do still lack the means to grasp the ultimate sufficiency of all these initiatives taken together.

Mechanisms Needed to Manage Cumulative Impacts

“Cumulative effects are changes to the environment caused by the combined effect of past, present and potential future human activities. Achieving sustainable growth, and maintaining the well-being of British Columbians, requires managing the cumulative effects of development.

In this audit, we found that the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) is not adequately addressing cumulative effects in its recent natural resource use decisions, in northwestern B.C. where we looked. For FLNRO and other natural resource ministries and agencies to effectively manage cumulative effects, government needs to provide them with clear direction and the responsibility to do so.

*We’re encouraged that government has directed FLNRO to undertake much-needed work to support the management of cumulative effects. FLNRO’s Cumulative Effects Assessment Framework aims to help B.C.’s natural resource ministries and agencies make more informed decisions that are consistent with government’s objectives for the economy and the environment.” **Office of the Auditor General: Managing the Cumulative Effects of Resource Management in BC: 2015***

To be fair it is necessary to recognize two cumulative assessment pilot projects being conducted by FLNRO professional teams, one in the Cariboo-Chilcotin and the other in the Skeena Region employing a draft cumulative effects framework. Their approach is to establish base lines of ecological condition within specific landscape units, primarily biodiversity and hydrological security, but extending to high profile species of concern. What is needed is to ensure that this preliminary work finds its way into documented resource decision-making and evidence that full ecosystem integrity is being effectively maintained in each landscape unit.

At present, we have developed agency-based systems of assessing whether the activities of licensed and regulated players in a single sector are meeting the legislated requirements for environmental stewardship. What we do not yet have is a method of determining what is happening to the environment as a whole. By and large we are not monitoring the effectiveness of our chosen strategies. We need to know at least two things: are individuals with approved access to the commons performing as required and, if all such individuals are performing as required in every sector is this ultimately effective in sustaining healthy ecosystems. If the answer is yes to the former and no to the latter, we will remain in a footprint deficit that should concern us.

As a result, the language of government is beginning to include the concepts of “cumulative impact assessment” and “cumulative impact management”. Presumably this could mean that all human activities would be assessed for their individual impacts on ecosystem health and that these would be cumulated to assess the overall result in the light of measured ecosystem conditions. In this way, we might be able to determine if our collective set of practice rules is sufficient, our adherence to them adequate and if we are over-allocating and drawing down rather than maintaining our natural capital.

“Environmental Impact Assessment (EIA) has traditionally been the tool used to gauge how land use activities affect the natural and human environments. However, EIA has historically focused on addressing the impacts of individual projects in isolation of other actions, activities or events occurring on the same landscape. In the past decade, EIA has evolved to better address the cumulative nature of some types of impacts and to better recognize that a Cumulative Impacts Assessment (CEA) is a critical and integral component of an EIA. Even more recently, regulatory authorities, governments, First Nations, industry and other stakeholders have come to realize that we need to go a step beyond simply identifying and assessing cumulative impacts. If we intend to preserve things we value, then we need to manage these impacts.

*This is the concept of Cumulative Impact Management (CIM) and the premise for a regional approach to managing cumulative impacts in Northeastern BC.” **Approaching Cumulative Impact Management in Northeast British Columbia, AXYS Environmental Consulting and Salmo Consulting Inc., 2003***

Bearing the Cost of Cumulative Impact Management

Assessing cumulative impact can be seen as a constraint on active economic development and therefore dismissed as an unwelcome additional burden on the conduct of business. The specter is one of an increasing labyrinth of regulatory constraints, long development lead times and the resulting dampening of investment. The transaction costs of navigating this labyrinth could be reduced if an assessment of base line conditions were to conclude that there was ecological room for the impacts or that impacts were likely to be negligible. Approval in that case could be swift. Where the assessment determines that the impacts were too great to be absorbed it could mean that an existing use would have to be discontinued or that project revisions were needed before approval was granted. The result is that projects would have to be assessed against fully researched ecosystem capacity before approval while there was still time and design room to keep the impacts within the ecosystem’s budget of sustainable natural capital.

The province is developing an integrated land and resource registry system that has the potential of describing all the allocations of crown land resources to tenured users. Such an inventory is an essential first step. The critical gap that persists is that we do not have a mechanism for using such a comprehensive registry as an active land and resource management decision tool at a practical level and there is no authority with the full cross-silo mandate to devise and implement one.

“The Integrated Land and Resource Registry provides a single source of reliable information on 262 different legal interests on Crown Land (tenures, regulated uses, land and resource use restrictions, and reservations) that is visually represented on a map and is available to the public using a standard web browser.” **ILRR Web Site**

Chapter Five: Managing British Columbia's Forestry Footprint

There are accumulating circumstances that are making truly integrated resource management more difficult than it should be, given the signs of ecosystem stress that are now widely acknowledged. Some of these barriers and their currently envisioned antidotes are briefly summarized here as a precursor to suggesting approaches to consider for the future. This is an examination of some of the reasonably obvious hurdles that need to be overcome and not intended as a hand-wringing lament or a criticism of individuals or their agencies.

The Forest Practices Board Perspective

Arising from audits and investigations conducted by the Forest Practices Board, there is growing evidence that the land and resource management issues of the day cannot be solved by tackling the problems of individual sectors in isolation. The complex issues involved with the recovery of Mountain Caribou are a good example. Recovery of Caribou populations requires integrating the practices and results of forestry, mining, commercial tourism and public recreation with wildlife management. A provincial recovery process, initially led by the short-lived Species at Risk Coordination Office (SARCO) presented a scientific panel recommendation that suggested actions ranging from predator and prey control, to access

restrictions for recreation, to core habitat conservation. Implementing such a package would take the combined efforts of at least 6 ministries dealing with: Environment, Land Forests and Natural Resource Operations, Energy Mines, LNG, Agriculture, Tourism Sport and the Arts, Aboriginal Relations and Reconciliation to say nothing of the commercial, public and First Nation constituencies to which they normally respond. Articulation of this very complex and controversial effort is now given to the Ministry of Environment which has a coordinating and recommending brief but no effective decision making authority. When Cabinet decides what to do at the level of policy, what agency will actually have the capacity and the authority to conduct the orchestra?

Current Agency Mandates

Government ministries, bound into explicit service plans, are of necessity preoccupied with servicing their legislated mandates. It can be a burdensome charge on their limited capacity to collaborate effectively on the same time scales as other agencies— slow, complex and demanding permitting in one area and accelerated, simplified fast-tracking in others. Understandably, access to extractive resource development, mindful of industry investment, jobs and provincial revenue, is much faster than the decisions to limit those activities to conserve natural capital values. It takes a few months to allocate timber, permit energy exploration or approve a road, but several years to establish protected areas, wildlife habitat areas or old

growth management areas on the same landscape. It takes many years to develop the necessary inter-agency relationships that foster management of complex resources, such as potable community water supplies from forested watersheds, – a job that is still a work in progress in this province only just emerging in 2017 as the regulations for the Water Sustainability Act are being written.

Deploying People Effectively

Ministry staffing has been reduced in resource agencies with a consequent limitation of the energy needed to service the informal network of communications on which practical collaboration depends. As workloads have increased, the first casualty has been the time for communications among professional colleagues, not the formal committees that meet, but the integration among individuals that actually implement the work conceived by such groups. While this limitation is currently being addressed, to take a specific example, by means of a one-stop-shopping model -Front Counter BC- where a proponent can get a development proposal dealt with in an integrated manner, the service is about speeding up access to business development and does not address integrated management of the cumulative results. The agency does not process ideas from proponents of conservation of developable assets. Individual agencies are still dealing with their mandated permitting requirements without a mechanism or a responsible party adding up the total cost to natural capital.

Front Counter could contribute to truly integrated management, if the agency were to be geographically based, organizing its permit facilitating system around specific landscape units.

“FrontCounter BC is a single window service for clients of provincial natural resource ministries and agencies. At FrontCounter BC offices across the province, natural resource clients obtain all the information and authorizations they need to start or expand a business.

*Staff are highly trained members of a team, brought together to provide accurate and integrated information, customized to the needs of the natural resource client. They are specifically trained and knowledgeable in authorizations required by natural resource clients for mining, forestry, agriculture, water, land, etc. Clients can think of the staff at the counter as their direct link to B.C.'s natural resource ministries and agencies.” **Front Counter BC Website 2016***

Limitations of Delegating Stewardship of the Commons to Private Industry

Industries are quite naturally inclined to act only within their economic sectors in response to the prevailing legal regulatory requirements. It is in their interests to minimize the complexity and cost of regulation or of dealing with other players on the same landscape, even with those who enjoy an official, but overlapping

commercial tenure. The Forest Practices Board, for instance, has seen forestry activity that limits range activity where both industries have tenure on the same landscape. Similar issues are often before the Board regarding community watersheds, wildlife habitat or wilderness recreation – both public and commercial - where one use of the land conflicts with one or more of the others. Even when individual industries try to maintain operational separation they are often caught in a web of interacting regulations with the cost burdens inequitably shared as is evident in the conflicts among multiple users of resource roads. Facilitating the mutual accommodation among overlapping tenures on landscape units would be a challenging but productive task for a land-based agency charged with ultimate stewardship.

Chapter Six: Inventing a Sustainable Coordinating Agency

Coordinating agencies tend to lack the statutory authority to bring about and enforce integration or, after a time, have been eliminated as they become perceived as impediments to the business-supporting and revenue-generating work of resource ministries. There is a long winding trail of past integrating agency and multi-sectoral collaboration models including the Environment and Land Use Secretariat, The Forest Land Use Liaison Committee, the Round Table on Environment and Economy, the Forest Resources Commission, the Commission on Resources and Environment, the Land Use Coordination Office, the Ministry of Sustainable Resource Management and the Species at Risk Coordination Office – all now extinct. An objective observer could be forgiven for wondering about the lifespan of the current Ministry of Forests, Lands and Natural Resource Operations. It has never been an effective management model to have planners and integrators isolated from line decision makers, even within agencies, let alone among them. It is even less effective to have such agencies face a repetitive diet of re-organization. A land stewardship agency, tasked to bring about integration would likely have to have a presence on units of the land base, line decision-making authority and duration to be effective.

“The Environment and Land Use Committee Secretariat was established in 1973 as the staff support unit of the Environment and Land Use Committee. The Environment and Land Use Committee (ELUC) was established by the Social Credit government in 1971 under the Environment and Land Use Act (SBC 1971, c. 17). The mandate of the committee was to establish and recommend programs to increase public awareness of the environment, to ensure that environmental concerns were fully considered in the administration of land and resource development, and to make recommendations and reports to the Executive Council. It was empowered to conduct public inquiries, appoint technical committees, and hire experts, specialists and researchers. The Secretariat was established after the New Democratic government was elected in 1972 to provide recommendations and solutions to the committee by coordinating and analyzing interdepartmental studies. It was the first time in B.C.’s political history that a permanent staff served a committee of cabinet. The Secretariat was organized into three units that operated interdependently to improve and apply integrated resource planning within the regional districts of the province. The units were Resource Planning, Special Projects, and Resource Analysis. Under a new Social Credit government in 1975, the Secretariat functioned in a diminished role within the Dept. of the Environment and the renamed Ministry of the Environment in 1976. It was reorganized into two units, Resource Planning and Special Projects. The Environment and Land Use

Committee continued as an Executive Council committee but the Secretariat was disestablished in 1980.” BC Archival Union List

In a case of stunning déjà vu in 1990, Mr. Zirnhelt presented a Members bill entitled An Act to Establish an Environment and Land Use Secretariat.

MR. ZIRNHELT: “The purpose of this bill is to create a secretariat whose main function will be to provide support to the cabinet with respect to resolving the conflicts over the use of a diminishing land and resource base. In recent years, this conflict has been heightened by previous patterns of waste and over extraction in B.C.’s resource industry and by the increasing pace of urban development. This bill is necessary in that the province currently lacks a comprehensive and well-coordinated approach to the issue of environment and land use conflict. The establishment of a secretariat will greatly assist the resolution of these conflicts and will ensure that environment and land use decisions are given serious treatment at the highest level of government” (An Act To Establish An Environment and Land Use Secretariat: Hansard of BC, July 24, 1990

Organizing Our Land Based Agencies Appropriately

Land and resource management boundaries overlap with one another or have been consolidated for administrative cost reduction purposes, leaving a pattern of misaligned, single purpose jurisdictions on the landscape. FLNRO, Environment, Health, Oil and Gas, Economic Development and regional district geographic jurisdictions, for instance, are not the same, yet their interests often overlap or interact. Land base activity integration is addressed in part through regional interagency management committees (the integrator of longest standing), but the functional boundaries administered by the parties around the table do not always match and the committees do not have decision-making authority above that of a line ministry. In the context of Mountain Pine Beetle activity coordination, for instance, the mandate of IAMC's has been characterized in the following way: *“Inter-Agency Management Committees support regional level coordination of provincial government-led projects and activities. This would include information sharing between agencies to raise awareness amongst ministries (at the regional level) on mountain pine beetle related projects that are underway or activities planned for the near future, and to find efficiencies between projects being led by different agencies. The functioning of the committee in no way impinges on the ability of member ministries to exercise their mandates and authorities. IAMC members do not generally serve as advocates for any*

industry, but instead are interested in effective, coordinated management of Crown land and resources". It would appear that no-one directly connected with the land base is provided with the authority to enforce coordination or the rationalization among mandates that might well be required to manage overlapping tenures or a burgeoning footprint. IAMC's are being tasked with developing service plans that enhance their integration work, but that will be difficult to realize without providing a regional leadership authority with a decision-making function, one that is not lost in a thicket of distant committees.

"The successful implementation of government's strategic directions and priorities for resource management requires a collaborative and coordinated approach within a cross-ministry structure. This collaboration and coordination is occurring at the political level through the Cabinet Committee on Natural Resources and the Economy (CCNRE) and at the executive level through the Deputy Ministers' Committee on Natural Resources and the Economy (DMCNRE), the ILMB Board of Directors and Assistant Deputy Ministers' Committee on Integrated Land Management (ADMCILM)."
Provincial Terms of Reference for Inter-Agency Management Committees, March 2006

Does Our Current Forestry Legislation Deal with Cumulative Impact?

In the forestry sector the current Forest and Range Practices Act makes mention of cumulative impacts, but this is about equitable distribution of prescribed stewardship responsibilities among a group of licensees, not about their cumulative impacts on the environment. FRPA Division 2.1 Miscellaneous: Section 19 deals with “Cumulative effects of multiple forest stewardship plans”

Section 19. For the purposes of section 9 (proportional objectives) of the Act, the minister may establish targets referred to in that section, if, where there are likely to be multiple forest stewardship plans within an area,

- a) one or more agreement holders may be unduly constrained in the specifying of results or strategies in the holder’s plan unless targets are established under section 9 of the Act,*
- b) the agreement holders within the area are unable to reach an agreement that would remove the constraints referred to in paragraph (a)*
- c) an agreement holder subject to a constraint referred to in paragraph (a) requests the minister to act under section 9 of the Act, and*
- d) the minister is satisfied that a fair and effective order can be made under this section*

Section 9 reads: “In prescribed circumstances, the minister may establish targets, in specified proportions between or among holders of forest stewardship plans, for sharing the responsibility to obtain results consistent with objectives set by government”.

In Section 21(c) of FRPA, dealing with review and comment responsibilities, the Act requires that a person “must provide a person whose rights may be affected by the plan with an opportunity to review the plan in a manner that is commensurate with the nature and extent to which the person’s rights may be affected – and, in Section (d) requires that the person must also “make reasonable efforts to meet with First Nation groups affected by the plan to discuss the plan”. While this may provide an avenue for discussion of overlapping tenures and potentially accommodating the needs of other resource users, it does not direct forest licensees, in collaboration with the other users, to consider their combined impacts on the natural capital base of the area. This issue is exacerbated by the provision that allows forest companies to express their harvesting intentions in the form of generic Forest Stewardship Plans that lack the specific land detail that would be essential for any serious approach to cumulative impact management.

Agencies at a Regional Scale

Authorities at the regional or basin scale tend to be information producing in nature rather than decision making as is the case with the Fraser Basin Council or the Canadian Columbia River Forum. Local governments have limited authority to influence their surrounding crown land as is the case with approval of independent power projects or the authority/liability issues involved in interface fire protection on crown land beyond their legal borders. Health regions with responsibility for potable water supply do not match the forest, environment or local government jurisdictions that have a material role to play. Harmonization of administrative boundaries appears to be one of the prerequisites for effective landscape unit management.

“The FBC has been entrusted over the years with a number of major studies in the Fraser Basin and with recommending strategies for government, agencies, business and community groups. One such project is integrated flood risk management – to give local governments the information and tools they need for flood prevention, mitigation and recovery along the Fraser. Other strategies developed by the FBC, in partnership with others, include a plan to combat invasive plants and a plan to manage agricultural organic waste in the Basin.”

Each year the FBC provides education on diverse topics – such as approaches to watershed management stewardship and air quality.” **Fraser Basin Council Annual Report: 2005-2006**

“The Basin’s water resources have played a critical role in supporting the growth and development of human habitation in the region. Human use of water has expanded to include hydropower production, industry, agriculture, domestic water supplies, waste assimilation, transportation and recreation. These uses have placed greater demand on the finite water resources and have resulted in water use conflicts. Regulation of the Columbia River and its tributaries has become commonplace, while the complexity of the system is increased by the number of national, provincial, First Nations and state jurisdictions co-managing the system.” **Canadian Columbia River Forum, Background Paper, 2006**

Losing Touch with the Land

Frequent reorganization of agencies coupled with accelerated retirements among the baby boom generation has weakened corporate memory and disrupted succession, an inescapable result of concurrent aging population and downsizing of government. As agencies are consolidated the tendency is to re-assign the people to roles that remove them from continuous association with colleagues and geography that would enable them to make

accurate and timely assessments of cumulative impact.

“The Ministry of Environment was established in 1975, under its first name Dept. of Environment, by an order in council (OIC 3838/75). The original functions of the Dept. of Environment were transferred from the Dept. of Lands, Forests and Water Resources, whose functions had been split between the Ministry of Environment and Ministry of Forests. The department was responsible for the management and protection of land, air and water resources including Crown lands (except for matters under the jurisdiction of the Dept. of Forests), water rights and pollution control. The department was divided into three branches: land and water management, environmental and engineering services, and environmental protection. Later in 1976, the Dept. of Environment was renamed the Ministry of the Environment (OIC: 3199/76). In 1978, a major government reorganization transferred functions relating to lands and parks from the Ministry of the Environment to the newly established Ministry of Lands, Parks and Housing. At the same time, the functions of marine resources, fish and wildlife were transferred from the disestablished Ministry of Recreation and Conservation. Environmental health engineering was transferred from the reorganized Ministry of Health and emergency programming from the reorganized Ministry of Provincial Secretary and Travel Industry. The reorganized Ministry of the Environment was divided into four branches: Land and Water Management, Environmental and Engineering

Services, Environmental Protection, and Environment and Land Use Secretariat. In 1979 the name was revised as the Ministry of Environment, removing “the” (OIC 3018/78, see also RSBC 1979, c. 271). In 1986, the parks function from the Ministry of Lands, Parks and Housing, was merged with the Ministry of Environment. As a result of this addition to its functions, the Ministry of Environment became known as the Ministry of Environment and Parks (OIC 1495/86). In 1988, the park function was removed and transferred to the newly established Ministry of Parks. As a result, the Ministry of Environment and Parks was renamed the Ministry of Environment. In 1991, the Ministry of Environment was disestablished. Its functions were then merged with the functions of the Ministry of Lands and Parks to create a new ministry called the Ministry of Environment, Lands and Parks.” **BC Archival Union List**

Many resource tenures do not provide incentives to look after the sustainability of operating on the same land base in perpetuity, because the target resource is non-renewable or because the tenure is temporary, or as the case in forestry, the tenure is volume rather than area based. It is unlikely that an industrial corporation, with a fiscal responsibility to shareholders, would be able to justify investing in the future value of a natural resource, beyond the legal minimum, if there is no prospect that any portion of the benefits will return to them. Nor is it likely to be able to raise development capital easily in such circumstances.

In this case, stewardship, regeneration or reclamation efforts are a cost of doing business, a cost to be minimized in the face of the usual cycles of resource industry pressures.

Doing Enough Research

Funding for research and development is increasingly administered by sources with a diminished funding capacity and non-continuous objectives so that the criteria of fundable research changes too rapidly to support long term studies, as has happened, for instance, with the demise of Forest Renewal BC or the shrinkage of the MOFR Research Division or the three-year funding cycle of the Forest Investment Account's Forest Science Program. Long term studies are needed to conduct the kind of monitoring that is required to assess cumulative impact or the sustainability of natural capital. Limited funding and short cycles of application and award are not conducive to gaining an understanding of the march of climate change and its many consequences for the value of natural capital assets. Long term tracking of the implications of climate change for natural resource management will require extended research on a network of benchmark areas and model forests, an enterprise that requires continuity of support and dedication of researchers over a lifetime.

A Mechanism Competent to Assess Footprint

No government authority is charged with or provided with the capacity to look at the cumulative impact of the total human footprint on all or individual units of the land base. Similarly, none is charged with promoting the potential of economic synergies among industries working on the same land base. There is no mechanism to seek optimum solutions that balance the uses, benefits, costs and impacts on systematically defined units of the provincial landscape. Public land use planning, as has occurred in Sustainable Resource Management Plans and Land and Resource Management Plans, now mostly stale dated, went part way but the plans tended to be thematically general and few had consistent follow-up mechanisms to ensure that implementation took place at a practical level or that the consequences would be assessed and revisions made in a timely fashion. The Cariboo-Chilcotin Land Use Plan may be the only exception, where the device of well-defined landscape units is being employed by FLNRO's cumulative effects pilot project.

It was not always clear how the publicly negotiated land use plans were to interact with the legislation administered by the individual resource agencies beyond the Land Use Objectives Regulation under the Forest and Range Practices Act and Regulations now administered by FLNRO. Landscape unit planning and defined forest area management even in the single field of forestry have both

been started, only to end up partially implemented or abandoned within a period of five to ten years. Land use plans are strung out over a continuum ranging from approved as policy only, to legally mandated, to rendered in formal objectives set by government with consequential mandatory response requirements.

The Government Actions Regulation within the Forest and Range Practices Act and the Land Use Objectives Regulation within the Land Act are in effect for the pursuit of forestry, but equivalents in other natural resource sectors that tie sector-based practices to comprehensive land use plans still remain to be developed. The regionally established “Beetle Action Coalitions”, representing communities affected by the Mountain Pine Beetle infestations, held promise for fostering integration of natural resource development activity at a regional level and could have benefited from having their territories ecologically as well as socio-geographically defined.

‘To develop a coalition that will be effective with government regarding the Mountain Pine Beetle epidemic and the future of our communities. To ensure that our communities are economically stable, that there are jobs in all sectors, and support the entrepreneurial spirit that is fundamental to the Cariboo-Chilcotin lifestyle’. The Cariboo-Chilcotin Beetle Action Coalition (CCBAC) believes it is essential to bring together natural resource managers and economic development expertise

*to minimize the potential economic impacts of the beetle epidemic, and to make the best of the ensuing opportunities. **CCBAC Mission Statement***

This mix of capacities and limitations in our current system is leaving us vulnerable to unmeasured degradation of each of the separate values that our resource development industries are pursuing in their own limited interest. Our response to complexity on the land base on one hand is to invent fast track approval mechanisms and one-stop-shopping for industrial and commercial development while on the other hand weakening inter-agency referral mechanisms or the prior approval of detailed resource use plans from which the cumulative implications might be anticipated before they occur. We appear to be eliminating the mechanisms of integration when we need to be strengthening them.

Symptoms of this fragmentation include the proliferation of resource roads with many approving and regulating agencies and many competing users resulting, for example, in an inability to control the spread of invasive plants. They include the continuing proliferation of species-specific recovery plans visited on the same landscape, designed by recovery teams with single species mandates, as is the case for Marbled Murrelets and Northern Goshawks where an arbitrary timber impact budget must be shared between two species.

There is a growing number of such recovery teams in operation, the cumulative implications of which are unknown, with the result that most are perilously slow in coming to any useful conclusion.

Then, there are the complexities of forest health management in the face of fuel loading from past fire suppression practices, fuel accumulating stands of increasingly vulnerable timber and the justifiable concerns of interface communities. They include the conflicts between resource extraction and wilderness tourism as well as among recreation interests themselves and between towns diversifying their rural economies in response to the Mt. Pine Beetle impacts on mid-term timber supply. They are bound to include conflicts over ground and surface water – domestic, irrigation, fishery and recreational - in the face of a warming climate as now being experienced by Okanagan Valley Irrigation Districts, Okanagan Nation Salmon Recovery planners, and purveyors of community water supplies in the Cowichan and Shawnigan Lake basins on Vancouver Island.

“Okanagan Basin Fisheries Ecosystem Planning

The [Central Okanagan Basin Technical Working Group] COBTWG and BC Ministry of Sustainable Resource Management are embarking on a new long term fisheries planning process for the Okanagan and the Similkameen. 2003 and 2004 will be spent setting the stage for "Watershed-based Fish Sustainability Planning" (WFSP). WFSP is a

process developed by DFO and provincial agencies to be fish focused and to identify and address watershed priorities by developing comprehensive watershed plans. Although the focus is on fisheries, the process does address the need to include water in planning and obtain support from non-fish interests. This year will be spent: compiling relevant reports; assessing the state of the basin for fisheries; developing an implementation plan for WFSP; and starting community consultations.”
Okanagan Nation Alliance: Fisheries, 2003

It would seem that we have enough challenges to go around! How do we begin to weld the laudable and well-meaning individual initiatives that are being undertaken in each of these areas of difficulty into a coherent program. We want an economy that is both vibrant and sustainable. We have chosen to compete as commodity exporters in a globally networked economy but we also have to conserve the natural capital on which our economic continuity depends. This is the challenge that our perception of global environmental change places squarely in our laps.

Chapter Seven: What Are We Asking of Our Natural Capital Resources?

We are on the verge of a transformation in forestry as we face the effects of extreme competition in the international commodity fibre market, the Mountain Pine Beetle infestation and potential successors in the interior and the declining timber value of mid and north coastal forests. A portion of our forests may become valuable as sources of bioenergy, alternative transport fuels and bio-refinery products at an industrial scale. With these developments, we can expect new demands on the natural capital of forest ecosystems – at once a potentially valuable contribution to the reduction of greenhouse gases, a new community sustaining industry, an attractor of forestry investment in the province and a source of increased industrial footprint on the landscape.

What Do We Tell the World?

In each of our major resource exporting industries there is a need to assure the general public and the international marketplace that our renewable resources are being managed on a sustainable basis. Increasingly we will also be challenged to demonstrate that we are taking practical actions that contribute to global climate stability. While government has approached the need for stewardship of resources through sectorally based regulatory regimes, in the very near future it will also require objective

confirmation of the combined effectiveness of its regulatory regimes on the conservation of the natural capital of ecosystems. The growing demand for stewardship of natural capital has given rise to a complex array of sector-based ministries, industry associations, professional bodies, public advocacy groups, academic research teams, market-based certifying bodies and public auditors, all paying attention to differing aspects of the quality of resource management practices. This intensity of management, while complicated, has been created to maintain our competitive position in the international marketplace, the legal right of access to the provincial resource base and social license to conduct business using the publicly owned resources of the commons.

What Have We Got Going Already?

Intentions of the public, supported by technical assistance from resource agencies, are being materialized in our efforts to produce comprehensive land use plans. Those plans, when complete and approved by government, are being rendered into legal objectives for resource values through the Land Act and the Forest and Range Practices Act (FRPA). Activities then authorized under FRPA are subsequently monitored by the agencies for compliance with the legislation, regulations and objectives. The Integrated Land Management Bureau (ILMB), whose functions are now subsumed within the Ministry of Lands Forests and Natural Resource Operations, is the agency responsible for the government sponsored public

planning processes and manages a land and resource data warehouse. First Nations are creating their own land use plans that express their intentions for their traditional territories. Front Counter BC is the established clearing-house for development proposals. The planners, the facilitators, the plans, the agencies, the legislation and the agency monitors represent components of a sustainable ecosystem management system that await to be effectively integrated by a focus on units of the land itself.

“The Hupacasath stated during a Treaty Main Table session on May 1, 1998; “We as a First Nation in our territory, know the balance of all life cycles, how they affect one another, and how to keep harmony and balance. We know how the environment used to be and we can recover and restore our territory’s natural resources to what they once were. Our interest in the natural resources is not driven by economics, but by resource sustainability for all people of the lands. To be First Nations is to be part of the land, water, air and to respect it. We will give back to mother earth the respect and sanctity she rightfully deserves. We will make our lands, waters and air inviolable. We will spiritually cleanse the lands that have already been violated. We will take back our place as the rightful caretakers of our territory and far exceed the provincial and federal standards, for they are lax and inefficient.”

Healthy Environment Vision: This means that there must be healthy populations of all the animals, birds, fish, plants and the eco-systems

*that these species depend on for their survival and health including: Protecting water and riparian zones that are important for fish and wildlife; Protecting areas identified by the Hupacasath as “Protected Areas”; Ensuring all fish and wildlife and their habitat are protected from industrial development and urban growth; Enhancing and reclaiming forests, lakes, rivers and creeks that have been damaged by development and reclaiming fish and wildlife habitat” **Hupacasath Land Use Plan***

Assessment of the sustainability of resource development practices in agriculture, mining, fisheries and water management are addressed by responsible government agencies through regulatory regimes with compliance and enforcement monitoring. This is supplemented by the Forest and Range Evaluation Program (FREP). The Ministry of Environment supplements its internal monitoring procedures with a series of “State of the Environment” reports. First Nations are gaining direct access to land and resource management through both interim measures and treaty settlements. In addition to these formal arrangements, such bodies as the Fraser Basin Council or the Columbia Basin Trust provide insights about the state of regions of the province and draw in a host of engaged participants from First Nations, to interest groups, to industries, to local government.

“British Columbia’s Forest and Range Evaluation Program (FREP) is led by the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO) in partnership with the Ministry of Environment (MOE). The Forest and Range Practices Act and Regulations provide for a results-based, forest and range management framework in British Columbia that includes professional reliance as a foundational principal. Under the results-based model, government evaluates compliance with the law (C&E) and evaluates the effectiveness of forest and range practices in achieving management objectives, including sustainable resource management.

For the purposes of FREP, sustainable resource management means:

*Managing forest resources to meet present needs without compromising the needs of future generations, providing stewardship of forest and rangelands based on an ethic of respect for the land, conserving the resource values identified under FRPA and its regulations, namely: biodiversity, cultural heritage, soil, water, fish, forage and associated plant communities, timber, recreation, resource features, visual quality, and wildlife. **FREP Website 2016***

Independent public assurance auditing is only currently provided under the auspices of the Forest and Range Practices Act that allows for auditing of both industry licensees and the appropriateness of enforcement activities of government agencies with duties under the act.

Independent publicly reported auditing of the technical performance of both industry and government is rare. The Forest Practices Board is unique in the world in this respect and is part of the internationally acknowledged leadership edge that British Columbia maintains in the management of forest practices.

“The Forest Practices Board is British Columbia’s independent forestry watchdog. On behalf of the public, it monitors and oversees forest and range practices on public land, as well as government’s enforcement of the Forest and Range Practices Act.

One of the main ways the Board gathers information is through its random, field-based audits. Audits, either limited/full scope, thematic or enforcement, can examine any aspect or combination of aspects of forest practices. The results of these audits are then published in a report to the public. Therefore, audits examine and provide assurance on whether forest practices are achieving government's objectives. The Board focuses on whether forest practices have achieved the desired results on the ground so it is ideally positioned to support BC’s results-based Forest and Range Practices Act.”
FPB Website

Integrating Our Activities Effectively

The combination of Land Use Plans, Front Counter applications, State of the Forest reports, State of the Environment reports, FREP evaluations, internal agency audits, independent Board Audits, industrial certification schemes, Auditor General audits and regional or basin assessments represent a significant package of public preference, resource development intention and impact information that could benefit from being integrated. If one of our existing regionally distributed agencies were to become a unitary land authority it would be the logical receiver of the information in its function of managing resource development within the carrying capacity of our land and water ecosystems. It is a unitary land authority, tied to the land base, tasked with managing the health of ecosystems, which is the missing integrator of our existing complex of agencies. Without such a mechanism, cumulative impact assessment and cumulative impact management will elude us in a haze of statistical summaries unrelated to units of place. Without such an integrator, we risk drowning in a sea of overlapping resource agency jurisdictions, overlapping tenures to the land and resources, overlapping regulatory regimes and overlapping land use plans.

Integrate by Managing Natural Capital Instead of Individual Silo Interests

If we proceed to resource tenure reform, as is being widely discussed in forestry, let it be founded on an objective to ensure that forested ecosystems are managed on an eco-geographic basis. Let's not make the fundamental error of tenuring single industrial uses on an area basis. The goal should be to ensure sustainable management of the land and water base to maintain the productivity of our capital stock of ecosystems so that they continue to provide the services that all of us require, regardless of the nature of our industrial interest. If we manage natural capital on an area basis, then tenures for the sector-based use of a value that can be derived from that capital can be administered in a manner mindful of cumulative stewardship. Let us allocate the interest on natural capital, but not the capital itself. If we provide area-based tenures for each single industrial use, we merely lock into place the silos of our human footprint that are already so difficult to integrate by traditional means.

It is time to design a land and resource management system for British Columbia that is based on the cumulative stewardship of ecologically and socio-geographically defined units of land and water. This could be launched progressively by revising the tasks given to the people and institutions we already possess. Regardless of the reception to the models proposed here, a vigorous debate on our approach to cumulative stewardship is essential.

We can make a more closely integrated use of our rich supply of existing agencies and initiatives, if we will.

Chapter Eight: Cumulative Stewardship

What can we use as the unit of integration that would begin to develop an organizational environment based on cumulative stewardship? In the last analysis would that not be the land itself? The land and waterscapes of the province are the ultimate source of resource-based wealth. It is the land and water that must be the object of cumulative stewardship, not the fragmented prevailing commercial uses to which these are put by the ever-changing economies of our society and their competing agencies.

The issue of increasing effects on land and water ecosystems of the full complex of human interventions is becoming more urgent as evidence of environmental deterioration accumulates. Discussion of cumulative impacts is taking place in British Columbia, but it is still largely focused on limiting resource extraction, emphasizing the conflict between economic growth and development constraints. We are missing the evolutionary boat by placing stewardship initiatives in the negative, as costly constraints on necessary or desirable economic activity. Instead of framing the discussion around “cumulative impact assessment” or “cumulative impact management”, essentially the manufacture of constraints, we could frame our approach in more positive terms.

We could instead speak of our economic approach to the natural capital of our ecosystems as **“cumulative stewardship”**.

Cumulative stewardship of natural capital would mean that our economy would be designed positively around sustainability, with every human intervention on the land and water contributing to both our current economic needs and those of the future.

An Approach to Cumulative Stewardship at the Landscape Unit Level

“Landscape units are areas of land and water for long-term planning of resource management activities with an initial priority for biodiversity conservation. They are important in creating objectives and strategies for landscape-level biodiversity and for managing other forest resources.” **Landscape Unit Planning Guide 1999**

Recommendation: That the ABCFP encourage the Province to ensure that landscapes that will be subject to a significant level of industrial development, regardless of the business sector(s) involved, have a single guiding, government approved plan for forest stewardship within which all industries will operate. Such plans would be consistent with existing land and resource management plans, but would apply to a much smaller area. They would specify clear objectives, responsibilities, monitoring and reporting standards, and provision for adaptation to changing circumstances at a level sufficient to guide operational activities. Wherever possible, these plans should be in place before forestry, oil and gas or other tenures are awarded or replaced.

(Task Force Report: Forest Stewardship in Areas with Forestry and Oil and Gas Development in Northeast BC – The Forest Professional's Perspective. ABCFP December 27, 2006 Final Draft

What could we do with our existing resource management organization to provide our part in the growing global demand for conserving the integrity of our sustaining ecosystems. Are there ways of tasking our resource management agencies to meet the challenge of cumulative stewardship without tying ourselves up in a hopelessly labyrinthine bureaucracy or endless series of disruptive reorganizations?

A Cumulative Stewardship System

Could the innovative tasking of our many land and resource management fragments lead to cumulative stewardship of defined areas of our provincial landscape if we integrated them by a suite of initiatives, based on a regionally decentralized and unitary authority dedicated to sustainability as their first responsibility? Some characteristics of such an approach are suggested here, not as a blueprint, but as a stimulus to discussion

Integrate Resource Management Within the Land Base

Foster integration within the land and water unit level rather than across the current administrative units of the resource allocation level through area-based management, not just

for forestry, not by individual resource sectors, but for the whole ecosystem base

Base Land and Water Management Units on Ecosystem and Socio-geographic Integrity

Designate biophysical units with socio-geographic integrity, embedding communities in a landscape in which concern for sustainable stewardship is a fundamental part of their ethic, their formal responsibility and their sustaining economy

Create a Unitary Authority under a Natural Capital Act

Provide for a unitary authority, under the guidance of a “natural capital act”, organized to manage each unit or groups of units, tasked with assessment of the natural capital resource values within and conducting and maintaining an inventory of potential for use of their productive surplus

Provide the authority with the power to manage the total human footprint of the area so that it is consistent within the assessed carrying capacity for all interventions as they accumulate

Harmonize boundaries of the resource allocation agencies to fit the unit pattern

Localize Our Existing Land Use Plans and Regulations

Translate the outcomes of the publicly negotiated and First Nation land use plans and existing resource sustainability regulations into the requirements and guidelines relevant to each unit

Deploy People to Place

Assign a core of field staff from existing agencies to the unitary authority, integrating their broad-based experience and giving it the capacity to track and understand the cumulative footprint and to gain intimate knowledge of the details of all resource values and their status

Build incentives for field staff to attach themselves over a career with the land and water units in which they become resident – to become lifelong experts in the stewardship of place

Allocate Resources within Carrying Capacity

Tenure access to renewable resources on the basis of interest generated from the natural capital – their renewable productivity - of the units of land and water, not the natural capital itself

Tenure non-renewable uses of values within the units on the basis of no-net-loss of ecosystem capacity

Make all industrial process loops internally closed or compensatory to the integrity of the ecosystems of the unit

Ensure that all targets for resource extraction are based on the measured and continuously monitored carrying capacity of the relevant units

Harness and Re-Task Existing Monitoring Agencies

Harness the monitoring agencies we currently have to the unitary authority, to focus on the land units and to adopt responsibility for the full natural resource complex: examples include transforming FREP into a Natural Resource Evaluation Program, The Forest Practices Board into a Natural Resource Practices Board, and combining the Integrated Land and Resource Registry with Front Counter BC into a Development Pressure Estimator for the land and water units

Make the existing interagency management committees consistent with unit boundaries and advisory to the unitary authority

Engage Communities and Public Groups

Engage local governments, First Nations governments and the non-government land and water use monitoring organizations and attach them to specific units

Chapter Nine: Repatriate a Familiar Land Management Model

During the mature days of the BC Forest Service, either based on Forest Rangers or the later move to more corporately styled District Managers, a thorough system of area management took place. The Forest Service planned, maintained inventory, managed silviculture, conducted research, allocated timber volumes, conducted appraisals, defined sales values, approved roads, set environmental standards, assured compliance and enforcement, managed wildland recreation, fought fires, maintained a training school for managers and reported on the state of the forest. It had a well-organized management footprint across the province and was comprehensively responsible for the public interest in public forests. This integrated and distributed system began to decay with the decline in provincial revenues from forestry and was effectively surrendered with the rise of the political philosophy of limited government and privatization. The main limitation of the forest service model was that it was organized around a single resource and could not deal with the cumulative effects on its forested land base arising from the host of other users of the land. It also could not be sustained financially based on the earnings of a single resource, particularly in the face of the province's hunger for revenue leading to the progressive depletion of the most valuable old growth forests.

While nostalgia for the past is insufficient reason for resurrecting an old bureaucracy, we need to recall a good many of its strengths. We threw the stewardship baby out with the public-sector bathwater.

Management of the provincial land base actually requires a forest service type model to be effective, but it must manage the whole land, not just a single resource. A unitary BC Land Service could be created with the best features of the Forest Service while avoiding some of its limitations.

- Based on well-defined areas, landscape units already created by the Forest Service and Regional Land Use Plans, for which the agency carries the primary responsibility, rather than the current model of responsibility divided by resource sector and partially coordinated by FLNRO
- Staffing dedicated to defined areas, rather than to single resource functions
- Capacity to conduct and maintain a public resource inventory, rather than delegation to private interests
- Capacity to conduct research, rather than delegation or abandonment of the function
- Mandated to plan for and manage the full spectrum of natural capital assets, rather than being obligated to defend a single set of interests against competition

- Mandated to address balance among users of the complex of values that are present in the land units, rather than treating alternative users as damaging to a single primary interest
- Mandated to set integrated rules of environmental engagement for the land units, rather than continue with disarticulated sets of standards by industrial sector
- Ability to conduct compliance monitoring and enforcement backed up by public independent audit, rather than self-reporting delegation to industrial users
- Ability to address all natural disturbances in the defined areas, rather than only dealing with fire
- Responsible for addressing cumulative effects by landscape unit, rather than attempting to force reluctant tenure holders of disparate resources to coordinate across incompatible legislated mandates
- Capacity to engage public and first nation interests on the landscape units or groups of them, rather than generic engagement that avoids the specifics of location
- Capacity to train its managers in the detailed practices of stewardship of place, rather than expecting generic continuing professional education programs to be enough by themselves
- Capacity to provide ecosystem-based extension services to owners of private

land, rather than leaving them to their own devices in a patchwork of weakly monitored regulations

Chapter Ten: Communities in the Forest

We have to make the transition from treating workers and their communities as industrial inputs to treating them as desired outcomes. The current British Columbia arrangements for establishing, funding and governing community forests provides a base from which to develop a truly visionary system, unique in the world.

Community Forests: Experiment in the Face of Change

Climate change and cumulative forest practices are acting on the legacy of the province to alter the ecological relationships on which we have based our forest economy. This has been brought home to us forcefully through the Mountain Pine Beetle epidemic and large scale interface fires of our recent experience. Widely reported science indicates that the future will bring more altered climate, more ecological disturbances, more fire, and more pests leading to accelerating changes across our landscapes. These changes will affect how ecological zones are expressed geographically, what tree species will persist to commercial rotation age, the status of water supplies and the quality of the environment for agriculture or recreation. While this ecological shakedown is occurring, we as a province are facing a rapidly shifting economic environment in which the products of our existing forest industry face competitors from Russia, South America, the European Union and

China. It is a very complex world and it is changing rapidly.

The forest industry of British Columbia has developed to become a highly efficient producer of fibre commodities, largely for pulp and paper and structural wood for construction. Our major export success in the past and the drive to remain competitive in global markets is leading to larger economies of scale, automation, concentration of ownership and targeting of large scale consumers such as the US housing market, the Japanese housing market and the emerging super-consuming populations of China, India and Southeast Asia. The pulp industry is experiencing major threats to viability in competition, particularly with South America, even as they are briefly sustained by cheap beetle killed fibre. Accompanying this process, the historical requirement for industry to locate distributed conversion facilities in communities in the nearby supplying forest has been removed. This consolidation process, seen to be necessary in the large-scale operations of major commodity exporting companies, is decreasing the direct economic tie between many rural communities and their surrounding forest resource base.

Community forests run counter to this large-scale trend. Community Forest Pilot Agreements have increased in number as a counterbalancing part of the province's Forest Revitalization Plan. The forest allocations have generally been in close proximity to the communities, inside local viewscapes,

watersheds, recreation areas or grazing lands. In the early stages of community forest development, the rationale included providing for diversified economic activity along with understanding and local ownership of the forestry enterprise. The early rules for management of community forests stressed the recovery of timber values. To meet these rules, community forest managers had to meet timber cut targets, which in many cases could only be accomplished economically by making traditional supply arrangements with local industry mills and established logging firms. In some cases, meeting cut expectations would prove to be difficult, while also meeting more diverse community ideas about the benefits that should be coming from a community forest. The debate tended to focus on the economic viability of the timber supply allocated, with many proving to be too small to pay for the stewardship and management obligations expected from a timber company.

Lately the harvesting imperative has softened to allow for an expanded set of forest uses, but we are a long way from treating the community forest as a forest, rather than a fibre supply.

What benefits could we derive from a forest that surrounds a rural community? The easy list is long and diverse enough:

- microclimate control
- visual amenity
- stable water supply
- commercial fibre supply

- specialty fibre for intensive value-added uses
- community pasture
- wildlife habitat
- biodiversity or old growth reserves
- recreation, both commercial and public
 - trails, resorts, swimming areas, beaches, camping areas, fishing, hunting, birdwatching...
- non-timber forest products
- traditional uses of plants for foods and medicines
- culturally important sites
- health recovery facilities
- cottage country

What about extending this list to new patterns of land and resource use?

- Ecological restoration of ecosystems damaged by beetles, wind, fire or other disturbances or need more attention following salvage operations
- Tailoring to provide for safer residential interface conditions
- Silviculture experiments to test for the viability of non-traditional reforestation in the face of impending climate change
- Ecological education and research plots for educational and research institutions
- Agroforestry trials leading to local marketing of products and increase in local self sufficiency of food supply
- Small scale biofuel trials
- Wind power or micro-hydro locations

- Therapeutic health or correctional facilities, retreat centres
- Social experiments with sustainable governance of common resources appurtenant to a community

If we were to treat community forests in the widest possible frame, how could we expect to make them economically viable. Let's consider an entirely different model from the allocation of a small, constrained timber supply that was designed to resemble a traditional forest industry tenure.

Land Grant Forests for Communities

The Land Grant System of Senator Justin Smith Morrill 1862

The Morrill Acts of 1862 and 1890 in the US provided grants, in the form of federal lands, and later funds, to each state for the establishment and maintenance of a public institution to fulfill a major social development mission: "to teach agriculture, military tactics and the mechanic arts as well as classical studies so the members of the working classes could obtain a liberal, practical education". The acts provided 30,000 acres for each state representative and senator. Originally vetoed by President Buchanan in 1859 on the grounds of limiting federal interference in education, the act was passed for a second time by Congress and was signed into law by President Abraham Lincoln on July 2, 1862.

A permanent funding allocation continues for the land grant colleges under the Nelson Amendment to the second Morrill Act. The land grant system included provision for establishing and funding agricultural experiment stations through a program created by the Hatch Act of 1887. The Smith-Lever Act of 1914 created a Cooperative Extension Service associated with each US Land Grant institution, providing ongoing funds for the extension service. The US Department of Agriculture administers the Smith-Lever funding, cooperating with State governments (which also provide funding for extension programs) to support the entire extension system.

In October 1994, the land grant model was extended to 29 tribal colleges through endowments totaling \$23 Million and the institutions were incorporated into the extension system network with commensurate funding.

The land grant model enabled development of a national network of colleges, many of which have matured into universities, providing both for democratization of educational opportunity and intimate engagement of learning institutions with the practical economies of their home regions.

What might a parallel model, based on land grant community forests, look like?

For each rural, forest resource-based community of the province, including those primarily held by First Nations, provide an allocation of forested land and a financial endowment

enabling the establishment of a “Community Forest” with the purpose of providing for economic diversification, land and resource stewardship, interface fire management and public education, leading to a permanent and sustained relationship between the people of the community and their surrounding forested commons.

Make the development of a community forest system in the province the joint responsibility of the relevant land, resource and educational ministries, providing for a lead agency through which accountability to the legislature would be ensured. Set standards for the ownership and governance of a community forest on which formal management duties and relationships with citizens would be based.

Establish eligibility criteria to define the appropriateness of land grants based on organizational integrity, economic necessity, land assembly potential and community enthusiasm for the enterprise. Base the land content of the grant on forested areas with multiple resource potential, not solely on the basis of commercially valuable timber supply or any other single value.

Link each community forest with a community college or university with a view to establishing education and research programs that teach both diploma and degree students and members of the community at large about the ecosystems of the forest and the means of their sustainable use and ultimate conservation.

Further link the community forests and the responsible colleges with a regional or provincial university, government, model forest and industrial forest research programs designed to provide the scientific underpinning of sustainable forest management and the socio-economic models necessary to manage the human dimension.

Provide funding and organization to support a provincial association of community forests, as sponsors of an extension service designed to foster the continuing development of community forests and to share and apply the research information arising from the experience of all members.

Provide endowment and annual funding to support the work of the community forests and make the rules of engagement flexible enough to allow financial benefits derived from the community forests to be re-invested as well as to provide a share of proceeds to the crown. Provide that the basic land entitlement shall not be sold, but may be tenured in a variety of ways to enable development of revenue streams supportive of the fundamental purposes of the community forest.

Adapting the Model

Could we consider creating “land grant communities” in which the community forest becomes a permanent asset of the rural community rather than a time-limited discretionary timber tenure?

This would make them like the sustaining land grants to colleges in the US or the endowment lands for the University of British Columbia.

Guidelines could be established to set the stage for land grant forests. They could be owned by the elected local government. They could not be sold off nor public access be restricted except for safety or limited functional reasons. Tenures for operations within the forest could be devised by the communities. They would be governed by a broad community process and report their deliberations, decisions, operations and accounts to the citizens. They could incorporate a wide variety of land and resource uses, providing that those uses were sustainable, susceptible to audit and did not degrade the fundamental ecosystem integrity of the land and water.

Rural communities could be invited to prepare proposals for land grant areas, expressing the comprehensive vision for the area that would launch the community's initial uses of the grant. Grants would be legislated, expandable and only rescinded under exceptional circumstances.

Development of the community land grant could be funded from many sources, some traditional and some innovative:

- sale of forest products derived from the area
- Share of resource revenues derived from the region
- rental or tenuring of sustainable commercial uses compatible with the aims of the community forest

- sponsored restoration projects, research trials or educational uses
- grants in aid to local government for economic diversification, interface management or other such initiatives that support the development and renovation of community infrastructure
- local taxation for specific ventures of broad public interest
- carbon credits, biodiversity credits or other such instruments recently arising in the financial marketplace
- energy recovery
- water treatment savings
- contracts for management of recreation sites, parks and ecological reserves

The current British Columbia arrangements for establishing, funding and governing community forests provides a base from which to develop a truly visionary system, unique in the world.

Chapter Eleven: Re-Localization of the Rural Economy

In effect, this means re-localizing our world. It means putting the integrity of place and continuity of resident people at the centre of our agenda rather than the continuity of a particular resource sector in its traditional form. It means putting rural communities, not on subsidized life support, but on the track to a robust self-sufficiency so that we have a resilient local and regional economy as our home base even as we participate in the larger global marketplace for our export earnings. It means keeping people on the land and in communities deeply attached to that land. For British Columbia, how we do this is one of the most significant societal design challenges of the twenty first century!

As the cost of transport energy becomes more volatile there is an increasing potential for the global marketplace to provide more room for local and regional economies to reverse the trend toward large scale as the source of competitiveness. It may turn out that the “economies of scale” that will work for us in the future are smaller, more community and employment friendly, more specialized and more mindful of sustainability. In the short run this is evident in the calls for tenure reform and the separation of milling from growing, the success of community forests with active log yards, and the economic diversification strategies of the beetle action coalitions. Future resilience of our forest industry may be better

served by a host of small and medium enterprises than a few, massively vulnerable giants.

There are major tidal forces that are affecting our forest industry and that have significant implications for the future viability of rural communities – economic, ecological and organizational.

Economic challenge to the Forest Industry

Our forest industry is challenged by the social, economic and political volatility of our major trading partners, restricted capital availability, volatility in the Canadian dollar, increased international fibre competition, high development and production costs, lack of infrastructure re-investment due to a chronically limited return on capital employed, looming timber supply shortages, flight of expertise with the decline of employment and decline in forestry education enrolment for the future.

This is a concurrence of negative conditions that all are trying to survive, battered down, hoping for the anticipated turn in a recurring cycle but also mindful that it may be protracted or permanent. These conditions, while severe, may well be buffered by a growing international demand for sustainably managed wood products, or an aggressive marketing effort in Asia, but no-one is expecting these recovery changes to be swift.

The growth of smaller tenure opportunities could step into parts of this breach, but only with a much-expanded base of allocation, a strategy to derive energy at local scales, tenure conditions that recognize a much-expanded range of forest products, and new mechanisms for assembling and marketing the smaller volumes of products emerging from them.

For large corporations, the downturn is resulting in contraction of employment, tightening of all cost elements, consolidation of ownerships to reach internationally competitive scale, rationalization of mills and the search for alternatives to the overwhelming reliance on the American market, notably in China. For forest dependent communities, a side effect of successful survival of the larger corporations through these measures is retention of a smaller number of major forest companies, established in fewer communities and with smaller numbers of employees both internal and contracted.

Government response to the problems faced by large scale industry has been to remove impediments to the consolidation process through removal of the requirement to maintain mills in communities near where the timber is located, allowing intercompany transfers of assets, allowing removal of private lands from Tree Farm Licenses and their conversion to non-forest uses, allowing raw log exports, by reducing regulatory costs, by encouraging a market in energy products and by stepping in to ameliorate the impacts on employees and communities from the losses of employment and

tax base. In addition to the measures designed to assist industries with immediate survival and competitiveness issues, government has also established an aggressive marketing campaign to encourage the use of wood in Asian housing and in both multi-story housing and commercial buildings in Canada. It has also promoted development of a biomass fuel and bio-refining industry to employ the current pine beetle waste and to provide additional forest product potential for the future.

At the same time, government has also greatly expanded the allocation of timber resources to First Nations and communities through forest and range opportunity agreements and community forest allocations. The overall allocations remain small in volume and economic impact, but hold potential for small and medium enterprise development with a recovering solid wood products market and innovation in smaller scale value-added products intended for domestic consumption.

For all scales of industry, the potential markets for carbon management, biodiversity management and water management along with other non-timber or ecosystem based products and services of intact natural forests represent future opportunity. For these to be realized beyond the current round of theoretical studies of non-market values, we will need to create market mechanisms that provide tradable credits for some values and direct sales markets for others. Carbon and biodiversity trading have already begun. Water may not be far behind.

Diversification of the uses of naturally intact forest may well be a critically important economic prospect for smaller tenures and the communities in which they are located.

The Growing Consequences of Climate Change

Climate change also holds the potential for reversing the trend toward globalization of commerce. Big industry, participating in a global marketplace has been made possible because the costs of industrial scale and large shipping distances have been enormously subsidized by inexpensive fossil fuels. The era of such cheap energy, however, is rapidly departing. It is not necessary to have this happen through extreme resource depletion, although that is the ultimate prospect, it is enough that it will happen because of competing energy demands from emerging economies and the fact that we cannot continue to put greenhouse gases into the atmosphere or chemicals in the ocean without extremely negative effects on the earth's climate and the earth's biota. It can also occur due to limits on the financial credit needed to invest in future supplies when fossil energy prices are highly volatile.

Climate change in British Columbia, through the release of a growing list of pests and pathogens from effective winter temperature controls, will continue to reduce the traditional timber supplies, as it has done spectacularly with the

mountain pine beetle. It will also affect forest growth through the changes in snow and rainfall patterns and their associated growing conditions throughout the province that are projected within the next fifty years. For large forest industries, this will likely mean further consolidation and the likelihood that energy and biochemical production will supplement fibre production as a forest product. For small forest industries derived from First Nation and community scale tenures this will mean that a much more diverse base of forest values will have to be drawn upon to make a commercial success.

Outside of forestry the potential for agricultural limitations in our major international supply regions, such as Mexico and California, arising from climate change induced drought, is going to make us more dependent on our own agricultural capability. Land in the agricultural land reserve will escalate in importance, supply lines will shorten, market garden and local consumption farming will rebuild and the low elevation land of the province will have to be managed for food self-sufficiency as well as for our historical fibre based forestry, extensive habitation and non-food industrial, water storage or transportation uses.

Chapter Twelve: Managing Our Human Footprint

It is now widely acknowledged that our current 7 or projected 9 billion people cannot possibly continue to consume the earth's resources at ever increasing rates without degrading the earth's productivity. This is particularly true of North America, Europe and the swiftly growing Asian nations where the scale of development has already resulted in major effects on the global climate.

We have an overall footprint problem that will eventually be reversed, either by the brutal intervention of nature or by a drastic voluntary change in our human societies. Neither will be easy or pleasant, but the latter should be within our capability and much preferred. While British Columbia holds one of the more favored geographic positions on the earth for the consequences of climate change, we are not immune to those consequences within the province and certainly not from those arising from elsewhere. This could mean losses of remote food supply, demands for export of our fresh water, the need to harbor ecological refugees or having our resources purchased and depleted by stronger nations and their corporations under binding trade agreements. Our current system of resource management is much too fragmented to respond to such significant challenges. Our governance model is stuck in a pioneer era where public management of resources was all about allocating an apparent cornucopia among competing interests and

deriving tax revenue from the ensuing sectoral developments. Our energy, forestry, agriculture, tourism and mineral industries continue to fragment the landscape without sufficient assessment or control of the cumulative impacts on the ultimate productivity of the supporting ecosystems. The decline of wild fisheries, the growing list of endangered plant and animal species and rising conflicts among overlapping tenures on the same land base are symptoms of this fixation on a “past-its-due date” model of resource management. We will have to evolve a resource management system that is based on ecosystems in place, with managers attached to the land rather than the silos of commercial interest. Managers attached to the land are managers also attached to rural communities.

We will have to be very careful in the closing days of our fossil fuel civilization that we have conserved ecosystem capacity on our provincial landscape for the future when local self-sufficiency is demanded of us by circumstances. We cannot afford the classic error of treating our rural environment only as a depopulated supply region to a few concentrated cities.

We must also guard against the ugly historic response of “clearances” which removed rural populations from the land to allow exploitation of the last vestiges of a natural resource legacy and concentration of ownership in fewer hands. Historic European clearances found the North American continent as a safety valve that could absorb the people displaced, with that in turn only made possible by the clearances of

aboriginal populations. But the only frontier left to us now is crowded cities that are themselves struggling with the energy and environmental cost of their cumulative footprints. There is no “away”, there is only “here”.

What this means is that there will be a premium on toughening the fibre of our rural communities throughout the province. We need to create more conservative land use by communities, more self-sufficiency in food supply, more locally generated energy, more careful husbanding of water supplies, more tending of our internal inter-community marketplace, more careful assessment of our ecological assets, more market collaboration among smaller enterprises and more regional collaboration among communities to address things as diverse as wildfire safety, efficient transport, amenity sharing, import replacement, educational development, marketing of visitor experiences, and the renewal of low elevation agricultural land. We need to seek a new balance that creates more jobs that perform local stewardship functions and fewer that extract and remove the land’s wealth without investing in its future.

Forestry, above most other land uses, can provide the ecological and economic base that will enable rural communities to rise to these multiple challenges. With ingenuity, we can multiply the marketable values that can be derived from a forested land base. I can see a future in which rural communities are stewards of a defined forestland area granted to them in perpetuity.

In it they are successfully managing to sustain the productivity and diversity of the incorporated ecosystems. They make tax revenue and create a broad range of jobs from a balanced portfolio of certified, and where appropriate organic, agro-forestry products, water management, air-shed management, bio-fuels, local scale electricity generation, carbon sequestration credits, biodiversity credits, bio-medical resources, silviculture and ecosystem restoration contracting, wilderness and cultural tourism. This is a vision of a vibrant rural community and job rich future.

For the larger forestry firms, that will still be operating at a global scale, the future involves some of the same products, but the land base from which they will be derived will be smaller, more intensively managed and likely area-based on tree farms where accelerated growth of trees may be separated from the management of conversion mills. The fibre, chemical, electrical energy and fuel operations that diversify the larger firms will likely be concentrated in ownership, highly technologically efficient and extremely cost conscious. They will have to work, however, within a landscape that contains the First Nation and community land holdings and product operations that are specifically designed to sustain rural communities at a more intimate scale.

In effect, this means re-localizing a significant portion of our world. It means putting the integrity of place and continuity of resident people at the centre of our agenda rather than the continuity of a particular resource sector industry in its traditional form. It means putting rural communities, not on subsidized life support, but on the track to a robust self-sufficiency so that we have a resilient local and regional economy as our home base even as we participate in the larger global marketplace for our export earnings. It means keeping people on the land and in communities deeply attached to that land. For British Columbia, how we do this is one of the most significant societal design challenges of the twenty-first century!



Dr. Bruce Fraser

Bruce's perspectives on the province were formed by a career that combined forestry and education. At age eleven he decided to become a forester, at age 22 he decided to become a teacher and the two interests have oscillated over a lifetime.

His formal education included a first year in a one room "little red schoolhouse" in Oyster Bay, south of Campbell River, time in elementary schools in Nanaimo, Vernon and West Vancouver, proceeded through high school and college in Victoria, and concluded with studies in forestry and ecology at UBC. On graduation, he proceeded to the Biology Department of Selkirk College in Castlegar eventually taking on the role of College Principal. From the West

Kootenays he went to the Ministry of Education as Executive Director of College Programs. He was seconded to the Ministry of Forests to launch their public engagement program and then moved on to the Presidency of Malaspina College in Nanaimo. The tours in post-secondary education and college presidency were very broad in scope because the disciplines involved in community colleges ranged from biology to mining, from nursing to aviation, from music to poetry and from computing to aquaculture. Issues faced by colleges during his tenure included dealing with student employment in recessionary times, community economic development and international education.

After the college life, Bruce worked with a consulting firm on international development in education and environment in Southern Africa, the Caribbean, Southeast Asia, China, Jordan and Pakistan. At the same time, his assignments included extensive work in BC on land use planning and community economic development in First Nation and non-native communities. When he “retired” from six years at the Forest Practices Board he spent three years as an elected regional director for Shawnigan Lake in the Cowichan Valley Regional District. He is currently President of the Shawnigan Basin Society, an NGO working on stewardship planning for the lake and its forested watershed.

Bruce lives with his wife Sarah on a small farmstead on the banks of the Koksilah River south of Duncan BC, in indentured service to goats, chickens, dogs and an imperious cat.

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The Stewardship Series

There are four books in the Stewardship Series

Book One: Saving Place- Land Stewardship in the Age of Limits

Explores ideas on how to make a colonial era model of land and resource management in British Columbia respond to the limits to growth of the human footprint on the ecosystems of the province.

Book Two: Saving Water- Stewardship of the Shawnigan Community Watershed

Explores how ecological governance and intensive ecosystem based planning could address the detailed human footprint issues present in a specific watershed while fitting into the real world of local government democracy.

Book Three: Saving Space- Conserving Ecosystems at Risk

Explores how the province of British Columbia could address the growing problem of declining biodiversity as wild places diminish in extent and have grown increasingly fragmented by industrial land use.

Book Four: Saving Futures- Peering into the Crystal Ball

Presents some serious and some frivolous gazes into the environmental future of the province.

***“Saving Place* is an essay on environmental stewardship in British Columbia. I believe that our society needs to abandon the failing resource management systems created in a colonial era. They were designed to distribute a cornucopia of unearned natural wealth. The resulting governance model produced a host of disarticulated government agency and industrial silos that cannot deal effectively with the cumulative effects of our ever-expanding human footprint. The ecological consequences on land, on water, on biodiversity and on climate are escalating. It is time for us to redesign our systems of land governance for the *age of limits*. We need to couple people and their communities to the ecosystems that sustain them. We need to become dedicated stewards of place.”**

Bruce Fraser, 2017