

To Conserve is to Bet on the Long Term

by Ralph C. Martin

The old fashioned word, conserve, is recovering its resonance. To conserve is to keep in a safe or sound state or to avoid wasteful or destructive use. Like our long-lived monarch, conservation never goes out of style.

Nevertheless, not everything should be conserved. For example, with a name derived from 'conserve,' a Canadian political party conserves a focus on an economy of oil and other fossil fuels. This is ill advised for business, social and ecological reasons. We could shift. Our ancestors didn't persist with the Stone Age until they ran out of stone.

What should be conserved? This year, Dr. Will Steffen and 17 other scientists published a paper in the highly regarded journal, *Science*, on Planetary Boundaries. The two notable planetary boundaries which interact with all other boundaries, are climate change and biosphere integrity.

Steffen and his colleagues make a strong case for maintaining a carbon dioxide level in earth's atmosphere within the boundaries of 350 parts per million (ppm) and 450 ppm, recognizing that in 2014, the global annual average concentration was 399 ppm. Others argue that 350 ppm or less is the real target, in order to conserve climatic and ecological stability.

To date, carbon dioxide concentrations have not stopped going higher. Canadians can elect a federal government in alignment with those provincial governments pragmatically organizing to arrest rising carbon dioxide emissions in Canada.

Biosphere integrity consists of 2 components. The first, genetic diversity, "provides the long-term capacity of the biosphere to persist under and adapt to abrupt and gradual abiotic change." Although conserving species and reducing the extinction rate can roughly improve genetic diversity, the scientists argue that to reduce vulnerability, it is also important to retain diversity with phylogenetic species variability, i.e. wide range of relatedness among species. Unfortunately, global data are not available.

The second component of biosphere integrity "captures the role of the biosphere in

Earth-system functioning through the value, range, distribution, and relative abundance of the functional traits of the organisms present in an ecosystem.” While searching for research funds to collect more appropriate data, “changes can now be measured in population abundance of plants and animals, as a result of human impacts at an ecosystem level.”

Steffan and his colleagues warn that if humans push across the planetary boundaries, especially those of climate change and biosphere integrity, then there is a real risk that the earth system of this relatively benign Holocene epoch will be destabilized.

Ecological data, based on independent scientific inquiry, are needed more than ever in Canada and around the world to understand the implications of not conserving genetic diversity and how climate change ramps up the risk. Our next federal government will serve the public good if they restore full federal funding for Canadian scientific initiatives such as the Experimental Lakes Area, where vital ecological data can be gathered.

The Food and Agriculture Organization of the United Nations declared 2015, the International Year of Soils. Soils host 25% of the total planetary biodiversity and sequester carbon in association with trees, forages and cover crops, thus mitigating climate change. This is the year to re-emphasize the mantra of conserving soil from being paved under and from being degraded by poor management in order to provide cheaper food. All other factors aside, food prices will rise dramatically later, if access to healthy soil is compromised now.

In the early 1980s, Julian Simon, a proponent for applying human creativity to replace resources as required, placed a bet with Paul Ehrlich. Ehrlich had consistently warned about too much demand on ecosystems as human populations grew and as consumption and waste per person increased.

Simon bet that any 10 commodities chosen by Ehrlich would fall in price over a decade and, of course, Ehrlich placed his money on the assumption that their value would increase. After 10 years, those commodities were worth about 30% less and Simon won the bet. Until his death, Simon insisted that his theory was superior, although economists calculated that he would have lost the bet in most decades of the 20th century.

Ehrlich still asserts that we are only deferring inevitable ecological dysfunction. His call is to conserve species diversity and ecosystem function by reducing pollution, reducing extraction of raw materials, protecting soil and eating adequate and healthy amounts of sustainably produced food.

Simon, a champion of human ingenuity and hard work, assumed a growing population and more consumption would stimulate more creativity and improve living standards as human systems prevailed. However, the prescient theologian, Thomas Berry, said “the earth project is primary and the human project is derivative.” A dash of humility and respectful knowledge of our place on this unique blue globe in space, points toward conserving and allowing self-regulating earth systems to function and adapt.

Ralph C. Martin, Ph.D., P.Ag. is the Loblaw Chair, Sustainable Food Production and Professor, Ontario Agricultural College, University of Guelph. Comments welcome at rcmartin@uoguelph.ca