The challenge of interdisciplinary environmental studies:
fond remarks to colleagues at the School of the Environment, University of Toronto

Douglas Macdonald
April 15, 2017

I first started thinking about the message I am delivering here last fall, when it occurred to me I might be asked to say a few words about my retirement at a School event sometime this spring. Back then, I planned to spend the first few years of my retirement very much involved with the School, working out of my office, helping out where I could, teaching a course and writing my book on Canadian energy and climate federalism. As you know, events have not turned out that way. However, I still want to offer these thoughts, on paper if not in person.

In summary, this is the basic message I have been thinking about since last fall: the rationale for interdisciplinary environmental studies is straightforward, but the doing of it, in either teaching or research, is not at all easy. However, there is one thing which can help those of us working in an interdisciplinary unit like the School as we face those challenges. We need to remember that no matter how widely varying our fields of expertise, we do have one thing in common - our love of nature and our profound belief more must be done to protect it. So many people in the School have their particular means of getting in touch with nature and acting on their environmental values: to mention just a few - David Powell, off to the cottage with his partner every possible weekend; Kate Neville, spending summers with her partner in a cabin in the Yukon; so many riding bikes to work; John and his efforts to improve environmental performance of the university; Karen and her annual August trip to view the Perseids meteor shower; Stephen's writings in the Toronto Star, to say nothing of the summer times he and Hilary spend at their northern "ecological research station"; Kim and her students with all their Arctic connections.

Of course, I have my own particular path: the cottage in King Township (which, given its rustic nature, my wife Lorraine claims is more accurately described as a "cabin"; a word I am quite comfortable with) I have been going to all of my life. I first saw the property when I was six years old. A few years later my parents built the cottage which is still there, after many repairs over the years, operating with kerosene lamps rather than electricity and an out-house rather than running water and indoor toilets. As a child, young man and then with the family of my first marriage I spent much time there, always in the presence of other people, family and friends. As the social creatures we are, I was always focussed on the other humans. I was very aware of the natural setting, but it was always background for the human. For the past fifteen years or so, however, I have been going there mostly by myself. My lovely wife, Lorraine Wai Chun Cheng, grew up in Hong Kong. She is a city girl and very much wants a shower to wash her hair each morning, to say nothing of an indoor toilet. I have found that being there by yourself changes everything in terms of your awareness of nature. Since you are not focussed on other humans, your attention inevitably shifts to the nonhuman, the other species with whom you share the property. I spend my time in the cabin, reading and looking out at the lake, and outdoors, cutting wood, mowing lawns, cutting back brush on the paths, digging out the beaver

dam, but mostly just wandering over the property, binoculars in hand. There is always something to see.

To help you follow the anecdotes given below I need to give you some basic geographical information. My property is 38 acres of land, a lot of it swampy and a large part of it planted with spruce as part of the reforestation efforts of the late 1940s. It is on a small kettle-lake (Thompson Lake, although not always so named on maps) scooped out by the glaciers and fed by underground springs rather than a stream flowing in. The land is very much part of the Oak Ridges moraine, with hills around the lake and on the western side of the property, and with low-lying areas and wetlands on other parts. It is a bit west of Highway 27, half-way between the King Road and Highway Nine. The cabin is on the south side of the lake, looking approximately north. Directly in front of the cabin is a wooden walkway through the marsh which circles the lake. The walkway leads to a small dock. Although no streams flow into the lake, there is an outlet stream, which only flows in spring time when the lake level is high. It flows from a small bay in the lake, a few hundred yards west of the cabin. South-west of the cabin is a hill which, unlike the others, is not covered in trees and allows a view the surrounding countryside - ideal for star-gazing and bird-watching. The walkway and dock, the outlet stream at its mouth and the hill are the three main venues discussed.

Please allow me to indulge fond memories as I tell you about some of the most memorable things I have seen, heard and felt on that property.

Death is part of life

This message was brought home to me in a few seconds of insight about ten years ago. I had seen an Osprey flying across the lake with a fish in its talons. (I had not seen the actual catch which is done by the Osprey lifting it wings directly above its head and dropping down, talons extended, to take the fish under water - see below). Running to the dock, I was able to spot it in the binoculars as it settled on a branch of a dead elm tree on the other side of the lake, pinning the fish to the branch and leaning down to rip off chunks with its beak - eating the still living fish. I watched, aghast and fascinated and then suddenly was flooded with a view of the whole scenario from the perspective of the fish. At one moment, swimming underwater, secure in its own element and then, in the next, in a completely different element, being carried through the air, and then the gruesome end. At other times, I have been out on a winter morning and seen the red blood and fur of a rabbit scattered across the white snow, presumably killed the night before by a coyote. Early last April I was at the eastern side of the cottage on a still chilly spring day. A large moth came flying out from under the eaves and I was just starting to wonder if it had spent the winter there, when - wham! A Phoebe swooped over the roof of the cottage, caught the moth in its beak, landed in a tree and devoured it on the spot, all in the space of a few seconds. I thought about what a tragedy it was for the moth, to have survived the whole winter, come out on one of the first days warm enough to fly and then, suddenly, its life is taken away from it before it can enjoy even a few minutes of life after hibernation.

The other side of the coin, however, is the fecundity of life. Winter is the time of stillness and cold, with dead grasses and plants poking through the snow, no leaves on the trees and few signs of any form of life. Six months later, by late June and July, life is bursting out everywhere.

The weather is hot and the whole place has a lush, jungle-like feel, with different grasses, which literally did not exist a few months ago, now towering over your head. All kinds of plants, insects, birds, fish, squirrels and so many other creatures are by then growing, reproducing, producing the next generation which will then later partake in the great cycle of birth, life and death which has been going on in that exact spot since the disappearance of the glaciers, over ten thousand years ago. This feeling of being completely surrounded (inundated) by life is strongest at the edge of the water. Sitting on the dock, just a few inches above the water, one is surrounded by shrubs and small trees, bulrushes, grasses, the green leaves of water-lilies lying on the water, closely packed and extending out ten or fifteen feet with their yellow or white flowers standing above them, purple pickerel-weed, growing in the water, insects on the water (water-striders and jitter-bugs) and in the air, especially many kinds of dragon flies blue, green and red, large and small, often fish in the lake just a few feet away, plus an occasional view of a turtle, (painted but sometimes also a big old snapper) poking its head above the water. Out on the lake in the evening, fish are rising to feed, creating circles all over the calm water, while swallows are swooping and swirling, also feeding on insects, providing their contribution to the vibrant sense of life, death and beauty.

Natural rhythms

All my life there has been no shortage of clocks and watches at the cottage. For the past twenty years or so, there has also been a solar-powered radio which provides CBC or Radio-Canada news on the hour. However, the fact there is no electric light available works to pull you out of the world of human-created time and into that of nature. Since the cottage faces roughly north, in summer the sun rises on the right-hand side, in the north-east, shining through the trees until mid-morning by which time it has risen far enough above the pines out back that it can shine directly down on the cottage. By then, however, it is too high in the sky to be able to shine *into* the windows on the south side. The cottage has a bank of windows on the north side, looking out on to the porch and the lake, but only has five relatively small windows on the other three sides. It is always a bit dark inside. During the day the sun is cycling into the west and then by evening is starting to descend in the north-west, shining through the pines and casting beautiful shadows on the front lawn. Around the time of the summer solstice, the sun sets on the other side of the lake, almost directly in line with the walkway leading to the dock. For perhaps the last half hour or so, this allows it shine directly into the cottage through the windows on the north side. Everything is illuminated and made beautiful inside, with pale sunlight washing the amber-coloured, knotty-pine walls contrasted with the black of the wood stove and piping. There is more light in the cottage for that short time than there has been all day.

In winter, that same process of light coming directly into the cottage for a few moments is reversed. At the time of the winter solstice, the sun is low in the southern sky and so, unlike summer, able to shine directly into the southern windows. This time it is not a setting sunlight and so instead of bathing the interior with a soft glow it provides bright, direct, happy light, illuminating the two southern rooms. It then moves on to set, very early and not over the lake at all, but instead behind the hills, in the south-west. Kerosene lamps are lit and all curtains pulled well before time to start preparing dinner.

These different times of the sun shining directly into the cabin, from the north-west at end of day in summer and from the south at mid-day in winter, mark both the twenty-four hour cycle of the earth's rotation on its axis and the 365-day cycle of the earth circling the sun.

In addition, of course, there are all the other usual indicators of seasonal change. The month of April marks the end of winter, providing a blessed period of relatively warm weather combined with absence of mosquitoes and other biting insects. That has all changed by mid-May; for the next few months they are a dominant presence. March and April are also the time of high water levels and the annual contest with the beavers over water flow in the outlet stream; also the time for the annual return of the Great-Blue Herons, nesting in the dead trees in the little bit of old-growth forest south of the laneway (too swampy ever to have been cleared and planted); the return of many other birds, and passage through of a large number of ducks, heading further north. By early fall, mosquitoes are gone, water levels are down, evenings are becoming crisp and for the first time in months I light a small fire in the wood-stove. Starting then and extending into the winter is the time for cutting, hauling, splitting and stacking firewood, ideally standing dead maple, which is then burnt on winter visits. On those winter evenings, the cottage is a haven of warmth and soft light from the wood stove fire and lamps, while wind and snow howl in the darkness outside.

Beauty not created by humans

I am sure we all have our list of the flashes of beauty given to us by nature at an unexpected moment: the early morning sun, reflecting off dewy spider-webs on a green lawn; the distant whoo-whoo-whoo of an owl, far away in the woods on a summer night; an owl, perhaps the same one, seen flying by in daylight the next day, body thick like a moth and flight so completely silent; thick, heavy snow drifting down so soft and silent in grey, overcast light; that same world the next day, in sunshine, with the white snow tinted by blues and purples in the shadows of the trees; Orion, seen coming up in the east for the first time on a late October evening. Like all of us, I have many more such moments of distilled wonder and joy, but there are three memories of beauty glimpsed up at the cottage in recent years I want to share with you.

The first was a couple of years ago. I was sitting quietly with my back to the outlet stream, enjoying the sunshine. Suddenly behind me I heard a sound as though somebody had tossed a twenty-pound stone into the water, an unmistakable loud splash. I spun around just in time to see an Osprey seemingly flying up out of the water, bottom part of the body still submerged, strong wings beating, water pouring off, while it rose straight up into the sky. (This time, with no fish suspended in its claws.) That vision of such a strong, graceful bird rising straight up out of water has always stayed with me.

The second was also a few years ago, this time in a summer afternoon, up on the hill, watching Turkey Vultures soaring in the blue sky some distance away. I caught one in the round disc of the binocular view and stayed with it as it as it drifted leisurely toward the hill, never flapping a wing but moving in steady arcs as its small red head turned, continually scanning the ground below. It came almost directly over me, very close and very large in the seven-magnification field of view, looking directly down at me, and then - suddenly it was framed against the white semi-orb of a day-time moon which I had not previously known was in the sky.

It took my breath away - the blue of the sky, the circle of the binocular view, within that, the half-circle of the moon, and the huge motionless bird with its enormous wing span, individual wing feathers so clearly delineated against the daytime moon. Everything had come together in that one, unexpected, moment of beauty.

My third memory comes from a week in early April spent at the cottage, taking a break from writing during my last sabbatical. I had chosen that time for a holiday back in January, thinking it would be warm, mosquito-free and a time to spend outdoors. There were certainly no mosquitoes, but that was because it was still winter weather, with ice still on the lake, snow on the ground and cold rain alternating with freezing rain and snow. Actually, for a holiday it was just fine. I spent the days going for walks, fully bundled up, but with most of the time spent in the warmth of the cabin, adding another log to the fire as needed, reading, relaxing, enjoying the feeling of peace. The moment I wish to recount came as I was sitting by the table sipping tea, looking out at the frozen lake, seen through the fringe of trees. Two coyotes entered the scene from the left, walking one behind the other, slipping so gracefully through the trees as they followed the curve of the lakeshore. The day was overcast and grey, with a wet snow falling. The ground was a dull white and the trees without leaves were also a dark grey. There was no colour in the picture, except for one thing. Because they had been walking in the snowfall, each of the coyotes had a line of snow on its back, white against the wet, dark brown fur, running from just behind the head down to the tail. I cannot say why, but that line of snow each coyote carried unknowingly on its back transformed the scene completely, giving it a breath of the wild and the exotic and a stab of beauty which came from that wildness, beauty which could only have come from the nonhuman world.

.....

I first clearly heard the need for an interdisciplinary approach to our subject expressed by Rodney White as he, Ingrid and I, directors of our respective units, were working with our colleagues in 2004 to develop the plan for the Centre, later transformed to the School. He explained it in clear and convincing terms. Environmental studies exists because in the second half of the past century it had become clear that humans had to act to reduce the damage they were inflicting on the environment and on themselves. To act on any given problem required expertise from the full span of disciplines; various sciences, engineering technologies, law, politics, markets and business, sociology, ethics and so on. The external world looked to the university to provide this needed expertise in a coherent fashion. Each of the disciplines moved to incorporate study of environment into its field of study. But at the same time, universities began to create interdisciplinary units such as the Faculty of Environmental Studies at York and not long after the original Institute of Environmental Studies at U of T. These interdisciplinary units exist today in almost all universities because the subject matter is *itself* inherently interdisciplinary.

The rationale is clear, but in my experience the practice is much less so. We are all so limited - by our cognitive abilities, time available to acquire understanding of different subjects and theoretical approaches - and the temptation to work exclusively with our fellows in one field, all sharing the same basic assumptions and speaking the same language, is so strong. Stephen

speaks of ways in which co-teaching our introductory courses with colleagues like Miriam and Karen in the sciences and me and others in the social sciences has opened his eyes to new ways of understanding. I agree, and I have learnt a lot from teaching with science colleagues like Ann Zimmerman, Karen and Becky Raboy and philosophers like Stephen, Simon and Mark Hathaway. But I must admit that almost all my collaborative research has been done with other policy analysts, mostly located in political science departments. The closest I have come to an interdisciplinary approach is perhaps the work I have done in the last few years with Laura Eastham, a quantitative physical anthropologist, working to integrate her insights into the nature of evolution with mine into the nature of power and the state.

Rodney's rationale is so compelling that we must continue to develop the School as a home for interdisciplinary connections. But we cannot pretend it is easy. As we face those challenges, I urge you to remember the one great thing we have in common, reaching across our disciplinary divides; our fascination with, and love of, the natural world, of those things which were not created by humans.