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To Know Nature And To Keep It Worth Knowing

Vancouver Island Marmot
Villains, heroes and sidehill gougers

It's October already. Mountain meadows are frosty in the morning and Vancouver Island marmots are fast asleep. Again I face the hopeless task of trying to distill a complex story into a few paragraphs.

The basic facts are clear enough. Vancouver Island marmots (*Marmota vancouverensis*) rank among the world's most critically endangered mammals. There are fewer than 100 animals left, which means that if this were some kind of morbid "most endangered" contest, Vancouver Island marmots would win hands down over Black Rhinos or Mountain Gorillas or Giant Pandas. As the name suggests, *M. vancouverensis* lives only on Vancouver Island and is related to other marmots just as Black bears are related to Grizzlies.

There are 14 recognizable marmots in the world, of which four species live in Canada (Hoary marmots, Yellow-bellied marmots, Woodchucks and Vancouver Island marmots). Most marmots live in mountainous regions, which accounts for the translation of the Latin word *Marmota* as "mountain mouse".

Vancouver Island Marmot. Photo by A. Bryant

In some ways Vancouver Island marmots are pretty typical. Like all alpine-dwelling marmots they live in burrows, eat grasses and flowers, hibernate, live a long time (~8 years is not uncommon) and reproduce infrequently (females achieve sexual maturity at age 3 or 4, and thereafter produce litters of 3-5 pups every two years). But in some respects they're pretty unusual. Natural habitat conditions on Vancouver Island are very different from those on the B.C. mainland or elsewhere; good patches of habitat tend to be much smaller and more widely scattered. This is the fundamental reason why *M. vancouverensis* is rare. But natural habitat restriction has done more than make it rare. It has shaped its behaviour and ecology. That's why I like to describe Vancouver Island marmots as "typical marmots...only more so".

Because they live in such small colonies the risk of local extinction from natural processes (bad weather, predation or bad luck) is exaggerated. Marmots have responded by developing behavioral characteristics that permitted survival in a patchwork quilt of small habitats over the past several thousand years. Specifically, the process of dispersal (i.e., marmots that leave home in search of a new one) allows marmots to re-colonize sites where extinction occurred, or "rescue" colonies that aren't doing well.

Dispersal is therefore the "glue" that maintains the overall population, and in so doing it forced marmots to become rather nice animals! Vancouver Island marmots rarely fight, juveniles from different families play together, and sometimes they even "camp out overnight" with the neighbours. Scientists from overseas have often commented at how approachable Vancouver Island marmots are compared to other species. I don't think it's surprising. I think it's the predictable result of an evolutionary history that regularly forced resident marmots to accept strangers into their midst.

Learning these things has made me a very fortunate person. In many ways I consider marmots to be a good role model for human beings, so it is only half-jokingly that I tell people that I wish to be reincarnated as a Vancouver Island marmot. In fact after 11 years of field-work I confess that watching their antics still makes me laugh. When I see them. And there's the rub.

Populations have declined precipitously. Surveys suggest that we've lost 60% of the world population in 10 years and that this species has disappeared from about two thirds of its historical range in the past few decades. The paradox of the story is that marmots colonized a few habitats created by clearcut logging of forests above 700 metres elevation during the 1980s and early 1990s. In some cases they increased dramatically in these new habitats. For example 2 animals observed at "Butler Peak west roads" resulted in at least 28 adults living there by 1989. Superficially it makes sense. Vancouver Island marmots don't like forests and have pretty basic food, visibility and soil requirements.

What's more curious is that they didn't keep expanding. There's no shortage of high elevation clearcuts on Vancouver Island. What happened to the invasion?

A decade of science suggests that forestry produces relatively low-quality habitat in which marmot survival is reduced. The reasons for this are multiple but it appears that clearcuts function as "sinks" that attract dispersers but provide sub-optimal conditions. By providing new alternative habitats, forestry changed natural dispersal patterns and probably reduced the rate at which animals were able to colonize distant habitats. The most important effect was therefore to concentrate the population and exacerbate the "eggs in a small basket" problem, increasing the risk of mortality from disease, predation and bad weather. I think that is exactly what happened. And it explains why most of the colonies that I visited over the course of my career as "the marmot guy" are now extinct.

So who's the villain? In my experience I find that many people prefer easy definitions for environmental problems. Evil company chops down old-growth forest and we lose the spotted owl. Developer dredges coral reef and we lose the triggerfish. El Nino causes declining coho returns and those darn wolves are responsible for declining deer numbers. And when all else fails, blame The Government (society seems to endow this entity with the extraordinary ability to have known better). A decade with marmots has taught me that things are seldom that simple. Don't get me wrong. We can safely discount some factors in the decline of Vancouver Island marmots. For example, despite what others have written there is no evidence that things like ski-hills, people walking their dogs or urbanization has had *any* effect. Given where marmots live, these processes are as mythical as Sidehill Gougers. (That improbable beast has one set of legs shorter than the other, supposedly to facilitate easier movement on steep hillsides. It is destined to forever wander around the tops of mountains, with "clockwise" gougers seeking "counterclockwise" mates and vice versa).

The reality is that most natural habitats have probably not changed very much over the past few centuries. So are the logging companies to blame? Well, somewhat. Is it the nasty cougars who eat marmots? Well, partly. Is it disease? Well, sometimes. But the easy answer is that there is no easy answer, and I believe that a complex interplay of factors is at the root of the current dire population status of *M. vancouverensis*.

If I can't easily identify the villains should I at least name the heroes? Well yes, that would be much easier for me, although the extent and composition of my list might come as a surprise to some. There's the naturalist who diligently recorded every observation she ever made, and who trusted me enough to loan me her slide collection for cross-referencing to her original field notebooks. There's the manager in a major forest company who challenged me to adopt a businesslike attitude towards species conservation (how much will it cost? what good is funding *half* of a species recovery project?) There's the financial officer who bent the rules to make sure that I had money to put gas in my truck when there was no money available. And there are young kids, folk bands, reporters, scientists, lovers, managers and hunters who also qualify in my book as "heroes". They're heroes precisely because they stepped outside the boundaries of the expected and into the realm of the possible.

After 11 years of study, science tells me that there is no reason why humans cannot reverse the processes of decline and restore Vancouver Island marmot populations to their former abundance and distribution. Having seen successful captive-breeding and reintroduction of other marmots firsthand, I came home from Russia and France utterly convinced of this possibility for *M. vancouverensis*. Sometimes I read the newspapers and can't help but think that searching for villains or heroes will not help marmots, particularly since the white hats seem to regularly exchange with the black. So in this case I must defer to my marmot mentors. Welcome strangers into your midst. And then get on with the specifics of ensuring survival.

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