Building successful conservation partnerships: private lands, shrinking budgets and the case of the Vancouver Island marmot

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ABSTRACT -- Vancouver Island marmots are critically endangered. Fewer than 150 animals remain, with most (90%) confined to a small (150 km²) area. Marmots disappeared from large portions of their historical range recently. Numbers declined by 60% in the last decade. Causes are multiple and complex. Results from Russia and western Europe suggest that recovery is feasible, but the project faces financial as well as biological extinction. *M. vancouverensis* provides an opportunity to build a successful conservation partnership between industry, government, academia and non-government organizations.

INTRODUCTION

Vancouver Island marmots (*Marmota vancouverensis*) rank among the world's most critically endangered mammals (Groombridge and Mace 1994). Prior to 1970 almost nothing was known about the distribution, abundance or ecology of this animal (Heard 1977). Since then *M. vancouverensis* has been the focus of extensive population surveys (Bryant and Janz 1996), behavior research (Heard 1977), habitat and diet studies (Milko 1984, Martell and Milko 1986) and intensive mark-recapture work, genetic analysis and radio-telemetry (Bryant 1990, 1996).

Growing concern over population status led to the establishment of a formal Recovery Team in 1988 under the auspices of RENEW (Recovery of Nationally Endangered Wildlife). A preliminary recovery plan was prepared in 1990, the official Plan was published in 1994 (Janz et al. 1994) and an updated plan is in preparation (Janz et al. in prep).

Ecological processes and human history have conspired to sandwich *M. vancouverensis* between the proverbial rock and hard place. The species faces harsh fiscal and institutional realities in addition to biological ones. In this paper I suggest that Canada's most endangered mammal presents a unique opportunity to build a successful conservation partnership between industry, government and non-government agencies, to secure the continued survival of *M. vancouverensis*, and to showcase this experience to the world.

BIOLOGICAL ISSUES

In most respects *M. vancouverensis* is a typical alpine-dwelling marmot (Figure 1). It is relatively long-lived and highly social but breeds infrequently (Bryant 1996). Vancouver Island marmot ecology is characterized by a classical "metapopulation" structure

Figure 1
Juvenile Vancouver Island marmot. M. vancouverensis *is one of only 5 mammal species that live exclusively within Canada, but the only one listed as endangered. Photo by author.*

(Bryant and Janz 1996). Metapopulations are sub-divided populations in which the constituent sub-populations occupy discrete habitat patches in an otherwise inhospitable landscape. Individual colonies suffer extinctions so that at any time some patches are unoccupied. Dispersal is the crucial "glue" that allows recolonization of unoccupied habitat patches or "rescue" of colonies that are doing poorly. Changes in the landscape matrix can alter dispersal and influence metapopulation survival (McCullough 1996).

The current Vancouver Island marmot population is small and localized. Marmots are principally restricted to a small geographic region south of Alberni Inlet. They disappeared from approximately 2/3rds of their historical range in recent decades (Figure 2).

Causes of marmot disappearances from habitats north of Alberni Inlet are unknown. Weather, predators, disease, hunting by humans and altered dispersal patterns are all possibilities. Similar extinctions from unknown causes have occurred in Alpine marmots (*M.*

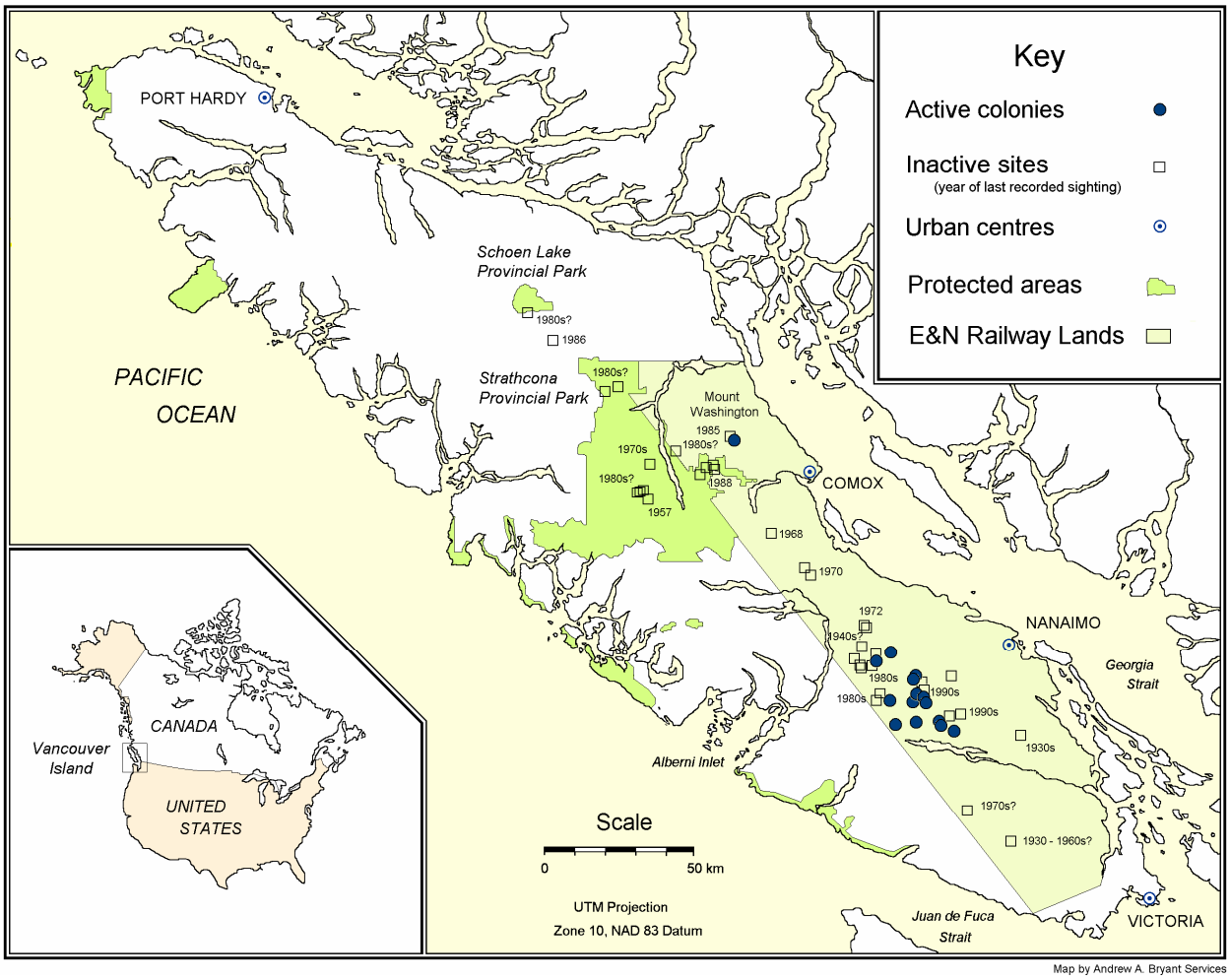

Figure 2

Historical and current distribution of Vancouver Island marmots. Extinction dates are approximate and based on sighting reports, burrow conditions and specimen data. Approximately 85% of the current population is found in a small geographic (150 km²) area on private forest lands owned by MacMillan Bloedel Limited and TimberWest Forests, with the remainder on or near Mount Washington. Land tenure in this region has an interesting if somewhat convoluted history. These lands were part of the Esquimalt and Nanaimo Railway Land Grant Act of 1883 that were subsequently acquired by private interests.

marmota) in parts of western Europe (Preleauthner et al. 1995).

South of Alberni Inlet, marmot numbers declined from about 350 individuals during the 1980s to about 150 in 1997. This metapopulation also experienced profound structural changes as a direct result of forest harvesting (Figure 3).

Regenerating clearcuts in montane sites above 700 metres in elevation resemble natural marmot sub-alpine meadow habitats for at least 10 to 20 years after harvest (Bryant 1996). This resemblance allowed marmots to colonize some clearcuts (first record in 1981, with at least 10 additional colonizations from 1982 to 1992). Population increases were impressive in a few cases. For example, one site on Butler Peak was logged during the late 1970s, colonized in 1982, and contained at least 28 adults by 1989.

Unfortunately the resulting population expansion was temporary and limited in geographic scope (Bryant and Janz 1996). Only a small proportion of available clearcuts were eventually colonized. The Butler Peak colony described above contained only 2 adults in 1997, and several other clearcut colonies suffered extinction in recent years. Ten years of accumulated data suggest that forestry produces relatively low-quality habitat in which marmot survival is reduced (Bryant 1996). The reasons for this are multiple and complex but it appears that clearcuts function as “sinks” (Pulliam 1988) that attract dispersers but provide sub-optimal conditions for survival (Bryant 1996).

By providing new alternative habitats in which to settle, forestry changed natural dispersal patterns and probably reduced the rate at which animals were able to colonize distant habitats. The most important forestry effect was therefore to concentrate the population and excacerbate the “eggs in a small basket” problem,

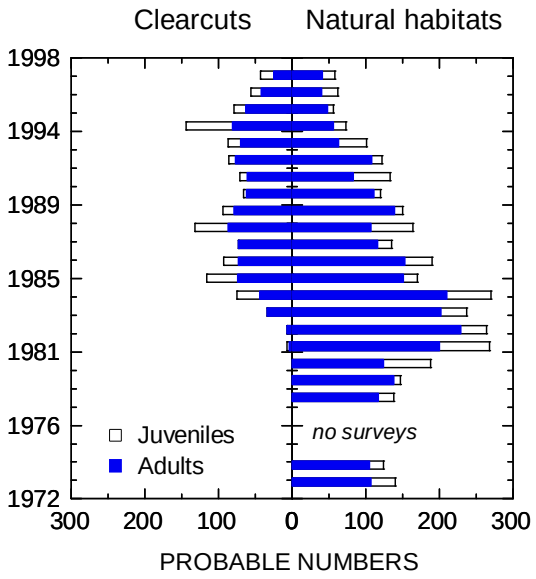

Figure 3

Marmot population trends in natural and clearcut habitats. Population estimates are from Bryant et al. (in prep). The current population probably contains fewer than 150 animals and 25 breeding females. A substantial fraction of the world's M. vancouverensis *live in clearcut habitats that will become unsuitable as forest regeneration occurs.*

increasing the risk of mortality from random environmental events such as disease, predation and bad weather.

PRIVATE LANDS

Vancouver Island marmots present a somewhat unusual management issue by virtue of their curious predilection to occur almost exclusively on privately-owned lands. Two forestry companies (MacMillan Bloedel Ltd. and TimberWest Forests) own lands containing 85% of the current world population of this species. Another 10% or so inhabits property held by the Mount Washington Ski Corporation.

LEGAL ISSUES

Legal responsibility for Vancouver Island marmots rests squarely with the B.C. provincial government under the Wildlife Act (1980) and regulations (Munro et al. 1985). No marmots or potential reintroduction habitats occur on federal lands. Proposed federal endangered species legislation will probably have little relevance for *M. vancouverensis*. The species appears on the "red data list" maintained by the International Union for the Conservation of Nature (Groombridge and Mace 1994) and (rather oddly) is listed under the U.S. Endangered Species Act (Federal Register, 23 Jan. 1984).

Two small marmot habitats are legally protected under the Ecological Reserves Act (Haley Lake Ecological Reserve; 127 ha) and the Wildlife Act (Green Mountain Wildlife Management Area, 260 ha); these sites contain <10% of the known population. Most potential marmot reintroduction habitats are protected within Strathcona Provincial Park.

SHRINKING BUDGETS

Expenditures on *M. vancouverensis* were minimal prior to 1980. Population surveys during the 1980s probably cost less than $40,000 annually. Research beginning in 1987 cost $20-90,000 annually, and renewed surveys beginning in 1992 cost $75-100,000/year. Since the Recovery Team was formed in 1988 well over $1 million has been spent on research, monitoring and management although "in kind" contributions are difficult to estimate with precision. Donations were obtained from many agencies but costs of recovery efforts to date have been principally borne by the B.C. provincial government (Table 1).

Table 1: Financial supporters of the Vancouver Island marmot recovery project, 1988-1997. These data include "cash" donations only but note that additional "in kind" contributions by the B.C. government (at least $260,000) and forest companies (at least $100,000) were substantial.

B.C. Ministry of Environment	$ 278,000
Forest Renewal B.C.	225,000
B.C. Habitat Conservation Trust Fund	156,000
World Wildlife Fund (Canada)	68,000
Corporate donors excluding forest companies	38,000
Public donations	33,100
Universities	24,000
Other non-government agencies	18,400
Forest companies	10,000
Federal government agencies	3,500
Total cash expenditures	$ **854,000**

Summary financial data conceal some important trends, including recent (1994-97) support of population surveys by Forest Renewal B.C., increased importance of public donations through the "adopt-a-marmot" campaign, and recent (1996-97) "in kind" sponsorship of recovery planning efforts by MacMillan Bloedel Limited. Dollar values also do not reflect the crucial importance of small academic and non-government funds during the early years of recovery efforts. Nor do they portray the diminishing ability of government agencies to fund recovery efforts from existing "wildlife management" budgets.

Any objective financial assessment would suggest that the marmot Recovery Team has done pretty well over the years. A million dollars is not to be sneezed at. Indeed, few wildlife research projects in Canada have enjoyed such stable funding levels, such thorough population surveys, or such ambitious research efforts

spanning more than a decade. Unfortunately, science indicates that continued survival of Vancouver Island marmots would not be guaranteed even if historical government funding levels could be maintained.

THE TASK AT HAND

Most wildlife recovery projects are characterized by a "research" phase followed by an "implementation" phase (Caughley and Gunn 1996). *M. vancouverensis* is not exceptional in this regard. A decade of science is behind us, and we know clearly that recovery can only occur with implementation of captive-breeding and reintroduction programs combined with additional research and monitoring work (Janz et al. in prep). Transplant methods have been developed (Bryant and Schwantje in prep.) but current populations are just too small to support additional reintroductions. Experience from Russia and western Europe (Ramousse et al. 1992, Dimitriev et al. 1992) provides strong hope that recovery of Vancouver Island marmots is ecologically feasible (Janz et al. in prep).

The good news is that many potential reintroduction habitats exist in currently protected areas. Recovery will not require additional parks and therefore does not constitute a "jobs versus marmots" issue. Forestry effects on marmots are largely a "done deal" and conversely marmots will probably have little or no impact on forestry activities in the future. The less palatable news is that recovery will require construction of a marmot captive-breeding facility and expenditures on the order of $3.5 million within the first five years. The truly frightening news is that current government wildlife budgets are in no way congruent with the job.

PARTNERSHIP OR EXTINCTION?

The idea of establishing conservation "partnerships" between government agencies and other groups to assist endangered species is not new. "Operation Burrowing Owl" in the prairie provinces and "Carolinian Canada" in Ontario are two well-known examples, as is Canada Life Assurance Company's extraordinary commitment to its corporate mascot (the American White Pelican *Pelacanus erythrorynchus* became the first species to be "downlisted" from the Canadian endangered list).

Corporate involvement in Vancouver Island marmots is not new either. Past contributions included donation of lands for the Haley Lake protected area, helicopter support, construction of marmot "condominiums" in the course of logging road deactivation, and participation in Recovery Plan development. Less tangible but no less important contributions were made by "field-level" staff who facilitated access to private lands and diligently reported marmot sightings.

What *is* different about the Vancouver Island marmot story is the paradoxical nature of it all.

M. vancouverensis exhibited rather uncouth behavior by becoming extinct in protected areas such as Strathcona Provincial Park, the flagship of B.C.'s otherwise magnificent parks system. That marmots disappeared probably had nothing to do with forestry, and yet these animals have shown additional temerity by inhabiting private lands where recent forest harvesting has increased the risk of extinction.

M. vancouverensis appears on more "endangered" lists than any other Canadian organism but this has not prevented the loss of 60% of the population in the last decade. Recovery work to date depended on a style of management that stressed cooperation rather than antagonism. A quite extraordinary collection of people from government, industry, academia and conservation organizations have brought us to where we are today: knowing how to fix the problem. I think it's time to recoup our million dollar scientific investment and show the world that inter-agency wildlife management actually *works*.

Recovery of Vancouver Island marmots is feasible but I caution that it will not be easy and will realistically take 15 or 20 years. If we rely on government resources alone it won't happen. Period. Rather, we will simply have the most thoroughly-documented extinction in the history of North America and the shameful national memory of losing an endemic treasure. In the end there remains no legal reason or historical precedent to help me argue the case for increased forest company funding of marmot recovery. But since conservation biologists tend to be optimistic dreamers by nature, perhaps the most appropriate conclusion is to offer some words borrowed from another:

Some see things as they are and ask "why?" I ask you to imagine things that never were and ask "why not?"

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