

More
Cent.

Citizen Science and Management of Large Ungulates – A Primer for the Non Professional

By

Dr. Vince Crichton

slide

What is Citizen Science? It is an old practice but put into a new phrase - in plain language it is scientific work undertaken by the public often in collaboration with or under the direction of professional scientists or with a scientific institution. Modern technologies have enhanced options for citizen science – e.g. video cameras, cell phones, trail cameras, internet, observation of cyclic events in the field and just the sheer mass of interested citizens in this day and age which far out numbers staff in the Wildlife Branch – 1000s of additional pairs of eyes on the landscape. Mention coyotes killing fawns – trail cam - 19 fawns in 31 days

But, there are concerns:

- 1: some projects may not be suitable for volunteers
- 2: lack of training can introduce biases into results
- 3: falsifying data – data must be properly managed to avoid this

How best to facilitate communication between citizens, scientists and decision makers and participate in informed approaches to complex management issues.

1: utilize transparency and best science

slide - fighting elk

2: be open – no hidden agendas – frank discussions - science can be a language that fosters cooperation

3: be understanding and appreciative of other ideas

4: with disagreement, know why and understand the basis for the disagreement – only then can dialogue and mediation move things forward

5: develop management planning – think down the road not just tomorrow or next week and ensure citizens understand the technical issues – what needs to be done so we can move forward? Plan surveys for next 5 years for example recognizing that this is not cast in stone and changes may be appropriate

6: Presentations and relationships are so essential – clear and effective communication with decision makers, agency professionals and vice versa i.e. with citizens - citizens are not going away but are a voice and a resource to be reckoned with – citizens must insist on current data

7: there is a need for citizens and yes professionals to fully understand the complex approaches needed to deal with complex issues

Ungulate Management for Non Professional

Management historically focused on enforcement (cuff photo – cuff them and throw away the key) and activities such as population surveys (ask tappers how many big game on their line and then estimate from this – crude but it was done) and setting hunting seasons. But there has been significant change.. Enforcement is still an essential ingredient but management has taken on many different perspectives

today – e.g. habitat, disease, access, rights, politics, increasing demands, antis, non-consumptive uses, social structure of populations to name a few.

To have big game populations we need habitat – this is critical – habitat includes food, cover from the elements (summer and winter), birthing and rearing areas and safety from predators.

Our ungulates are primarily grazers/browsers and by that I mean graze on food resources that vary from lichens to grasses to browse on woody vegetation. Now recognize that in some cases with copious quantities of high quality foods populations can exceed what we call carrying capacity - this is a nebulous term and difficult for anyone to quantify or qualify **BUT** for general purposes it is a point at which there are so many of a species in its habitats that food availability over time limits population growth, animals are in poorer health and we see lower survival during stressful periods. **(2 slides elk in Jackson Hole and moose on the prairies)**

Our predecessors in the wildlife game recognized the population growth curve and because of this the science of wildlife management was born **(Slide showing curve)**. I will come back to this slide but from this managers can allow varying degrees of harvesting to occur during the growth phase to prevent populations from reaching K (carrying capacity) which can result in population crashes in stressful periods. If managed correctly a population theoretically could produce a harvestable surplus ad infinitum.

But the situation is much more complex – the major forces acting on these populations must be recognized and accounted for and the impacts of each vary at different points along the growth curve – think of moose in MB today.

We can harvest surplus animals to keep below carrying capacity. **BUT** there are many other issues in MB today to deal with before worrying about carrying capacity and this applies to many areas across Canada today – of course we must also recognize that habitat carrying capacity is one thing but social carrying capacity is another - e.g. NL moose.

Managing harvesting to keep populations below K and manipulate habitat to some degree to make it more productive - do we have the resources to do this or the political will?? I suggest the answer is obvious. No major ungulate habitat enhancement program has been done in MB since the 70s and 80s. Of course fire and logging help but the concern now is a down turn in the logging industry **(slide of logging)** and enhanced fire suppression **(fire slide)**.

Managers do not always have control - constraints come at the social, economic and political level.

Social constraints –these come from the anti-crowd - anti hunting, anti-trapping, animal rights, some humane societies - social influences can also come from groups that believe strongly that land should be used for the benefits of mankind and not set aside for wildlife. Think of the spotted owl controversy in the US.

Economic constraints - such forces are often inseparable from social forces (a good example in MB is boreal woodland caribou). Funds are needed to maintain management programs and, often big chunks are seen as opportune places to cut especially as one gets into the 3rd quarter of the fiscal year – surveys are not done until sometime toward the end of the calendar year but when the bean counters see \$225.0 not spent in early Dec they see this as place to pull back – many times we have had to go to the

~ 3 ~

wall and fight to keep these funds. Last year post hunting season the hunter questionnaire program was cut – how can one manage without harvest data – we have 3 hunter groups here in Mb - licensed, 1st nations and Metis – we could at least get data from one but for 2013/14 nothing was collected. And, from 2002 to 2005 all surveys dollars cut – not one govt. cent for surveys but I believe in one case the MWF paid for an elk survey somewhere in the southwest - so, for that period we were going by guess and by golly – gee whiz – what should we do!!!

Social and economic forces become more important as human populations increase and as demand for things such as increased access to remote communities come to the fore.

Political forces – these are the sum total of social and economic forces – political forces can be most upsetting with politically appointed bureaucrats making decisions and I have often said if the minister knew all of the options he would have gone a different route – reference Sunday hunting here. *heavily* *12 hr after census*

One good thing about MB is we are situated so organizations such as the MWF have ready access to the minister or Dept. staff – this is in stark contrast to what we see in our neighbouring province to the east – the bureaucracy is mind boggling and I saw this again this past November when the Ministry invited me to Thunder Bay to participate in a moose focus group - too many square pegs in round holes.

Once wildlife programs have been approved there are objectives to be followed to achieve pre-set goals.

Some of these might be:

- 1: to set up refuges – no harvesting whatsoever
- 2: to maintain areas for non-consumptive use or a combination
- 3: to manage for predators
- 4: to develop a big game monitoring program set for 5 years but flexible
- 4: to manage for or recognize the significance of some parasites/diseases and their impact and adjust harvesting
- 5: to develop educational programs
- 6: to develop systems to gather scientific data

All of the above must be based on the premise that the first priority is resource conservation - nothing else.

Prior to any management programs being initiated the status of our ungulate populations must be established. This is the core of wildlife management and managers must use 3 general approaches to determine population status

- 1: habitat evaluation
- 2: population demographics (e.g. ratios, trends, population size, social structure, sex and age composition, rate of change, mortalities rates)

- 4 -

3: biological data that can be gathered as indicators – e.g. reproductive data from moose and elk harvested around RMNP - can be gathered relatively cheaply and by doing it now we have past data which I gathered for comparative purposes.

These topics could be a person's life time work or more likely the applications of one of these to a single species could constitute a career. But back to citizen science, these I suggest are even more doable today via the citizen science approach.

Two factors often prevent successful management - the first is lack of funds – this can be partially compensated for by rigorous prioritization that ensures the most important data are collected first. The second is the lack of creativity by biologists – there is a need for innovative approaches and with the new technologies available today this can be compensated for by these technologies and citizen involvement. There is a need to ensure that technology and funding are what limit management success and not lack of creativity – just because something does not work in the southern US for example should not be proof that it will not work here.

At this point I want to reference some slides – 4 slides – theoretical population structure; real world data; recruitment/mortality slide; population structure and real world

(back to growth slide)

Initially population growth is slow as there is a shortage of individual which are widely dispersed.

As numbers increase we see 3 changes: **Exponential growth** – a rapid increase in population size/growth as natality exceeds mortality – remember now that productivity is the number of new born in the last spring that make it to one year of age and enter the adult population – not just calves/fawns born. (Lots of food, shelter, water and limited environmental stressors such as disease and predation).

Transitional Phase - competition increases and availability of resources becomes limited. Natality falls and mortality starts to increase leading to slower population growth.

Plateau Phase – mortality= natality and population size becomes constant – population has reached K which we call carrying capacity of the environment. Limited resources, predation, diseases all contribute to keeping population size in balance. Population at this size and at this point may and likely will not be static but rather oscillate around K and remains relatively even – no net growth – but you can see very quickly what will happen if mortality suddenly greatly exceeds natality – just as we saw a rapid increase there will be a similar decrease.

Now let's talk briefly about density dependent and density independent factors

Density Dependent

(Factors affected by population density)

Predation/disease /parasites

Shelter and water

Food resources

Density Independent

(Factors unrelated to population density)

Climate and weather

Natural disasters

Light/daylight hours

Recommendation