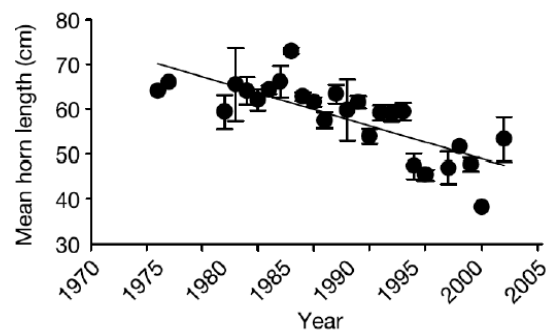


Rapid evolution and harvest sustainability.

The livelihood of many Canadians depends directly or indirectly on the harvesting of wild populations. Research conducted with NSERC Discovery Grant funding has shown that evolutionary change in these populations can have important consequences for the value and sustainability of these harvests. Examples include bighorn sheep on Ram Mountain in Alberta and Atlantic cod off the east coast of Canada. The bighorn sheep population is studied by David Coltman (Univ. of Alberta) and Marco Festa-Bianchet (Univ. de Sherbrooke). This population is managed for trophy hunting, such that only the largest individuals can be harvested each year. The investigators showed that this selective harvesting caused the evolution of smaller horn size in the population, which reduces the value of the resource to hunters. The Atlantic cod situation is studied by several Canadian scientists including Jeff Hutchings (Dalhousie Univ.). Atlantic cod are famous for their precipitous collapse in the 1980s, which led to the loss of livelihood for many Atlantic fisherman and individuals with fishing-related businesses. The researchers have shown that the collapse in cod stocks was coincident with an evolutionary decrease in growth rate, age-at-maturity, and size-at-maturity of the cod. These life history changes may have contributed to the collapse and may now be hampering population recovery. In short, the work on bighorn sheep and Atlantic cod has revealed the need to consider potential evolutionary changes in management plans, and has thereby tied the basic science done through NSERC Discovery Grants into the lives of Canadians and the resources of Canada.



A bighorn sheep with a relatively small horn size (photo: Andrew Hendry) and changes in horn size through time in the Ram Mountain bighorn sheep population (from Coltman et al. 2003 – *Nature* 426: 655–658).