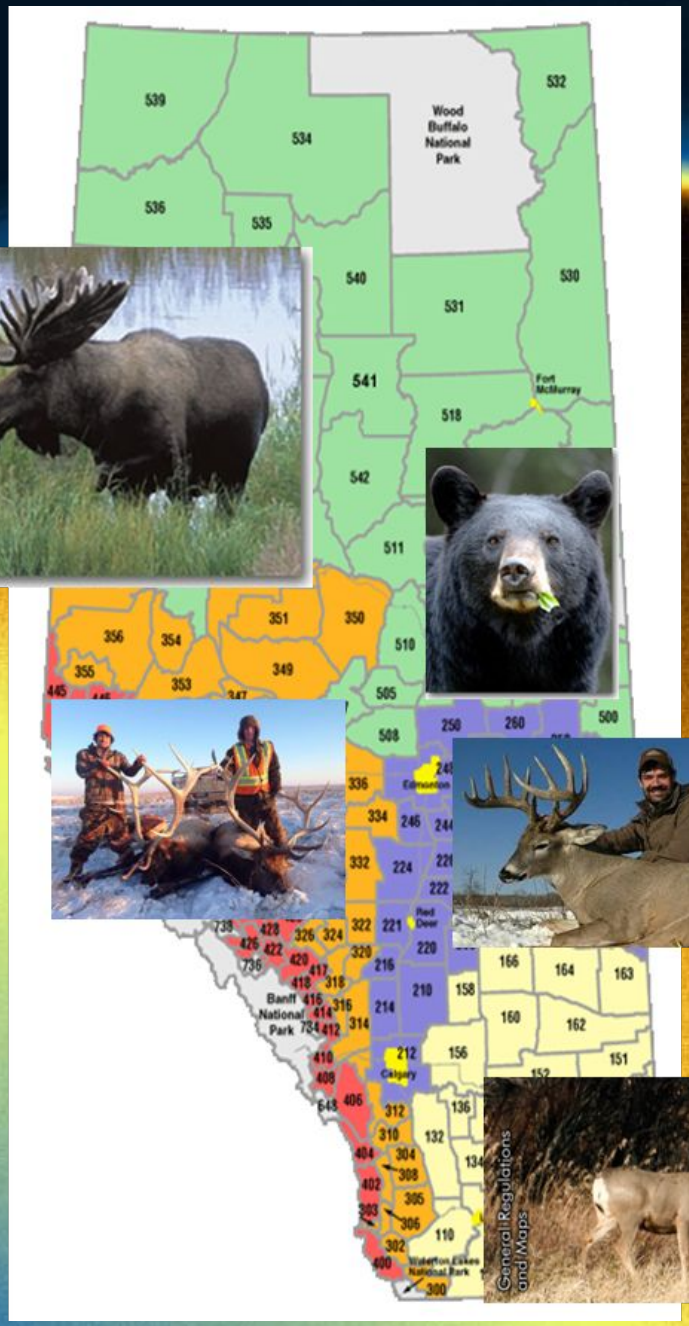


"TRUST ME, I'M A BIOLOGIST": HOW ALBERTA WILDLIFE MANAGERS USE SCIENCE TO MAKE DECISIONS

Scientific methods guiding effective wildlife conservation efforts

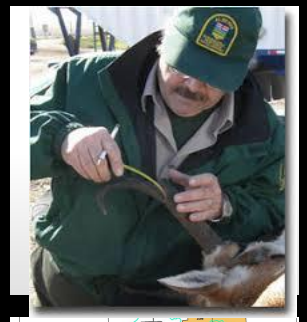
Matt Besko, ACTWS AGM and Conference

February 28, 2026

FOUNDATIONS OF SCIENCE-INFORMED WILDLIFE MANAGEMENT

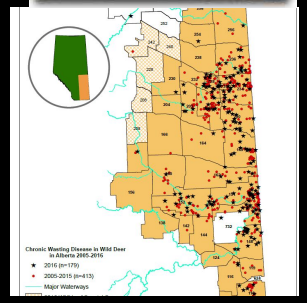
Q. "WHAT WAS YOUR FAVOURITE SUBJECT IN SCHOOL?"
A. "SCIENCE – ESPECIALLY THE OLD TESTAMENT"
-KENNETH FROM "THIRTY ROCK"

CORE PRINCIPLES OF SCIENCE IN WILDLIFE DECISION-MAKING



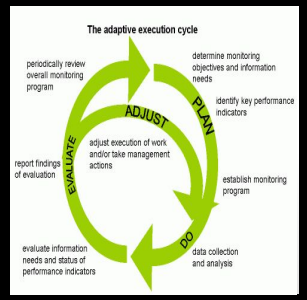
Science as a Decision TOOL

Science informs wildlife management by providing data on population dynamics and ecological relationships, guiding informed decisions. In essence, it is the pursuit of truth. It describes and predicts the effects of processes and decisions using experimental design, describes dependencies, measures functional relationships between variables, identifies causal and probable events using statistical summaries.



By it's very definition, it cannot make decisions in of itself

Science will not decide what is "right", "Moral", or what "Should be" done in Wildlife Decision Making. It is therefore objective, unbiased and does not assign human values to species, systems or landscapes. Science "isn't fair or "unfair", nor does it pass judgement on decisions as "good or bad".



Science, can however, help Decision Makers to Manage Adaptively within tolerable levels of risk

Wildlife management is flexible, respecting legal frameworks and the reality of societal needs, be they ecological, economic or social. It lives within the world that decisions must be made even in the absence of robust baseline dat sets.

ETHICAL GUIDANCE FROM ALDO LEOPOLD AND THE ROLE OF SCIENCE

Presentation title

As Biologists, we gravitate towards Leopold's Land Ethic

"Actions are right when they preserve the integrity, stability, and beauty of ecological communities." But as great as Aldo was and remains, his intent was interpreted too narrowly.

Uncertainty in Ecosystem Management makes us nervous

Ecosystem complexity means managers rely on resilience-focused decisions amid inevitable uncertainty and trade-offs. We tend to advise using precautionary principles which may lead to either inaction or actions that occur regardless of a decision. We were taught that ecological landscapes, species and their function are paramount, and their integrity is the Objective Function in management. However, the landscape and the people who live in it have other interests which may be factored into analyses and advice.

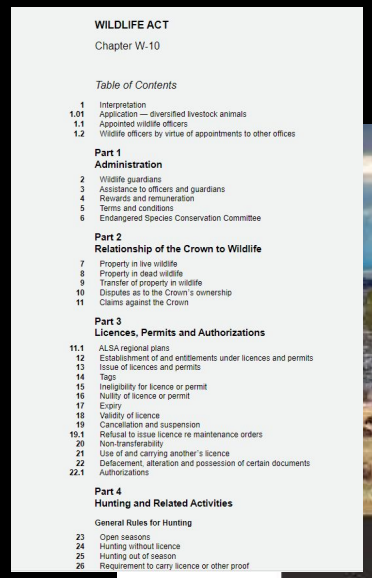
Science must be used objectively, because like Spiderman, the great power of science must be used with great responsibility as a Stewardship Tool

Science supports stewardship but must not be ideologically or politically driven or become weaponized for benefit outside of the public trust; Government Biologists are bound to integrate science with cultural values, legal duties, and human experiences for balanced management advice. Other jurisdicitions may be influenced by different schools of thought such that the decisions affecting wildlife are inconsistent, but the Government of Alberta manages using standards and protocols based on legislation and policy to remove this bias. Some of the public are utility focused, while others are more "existence value" focused. In Alberta, we are focused on a variety of objectives, and it is important for biologists to know what these are prior to advising a decision maker.

Ethical, balanced and Inclusive Management

Combining ethical reasoning with science ensures decisions honor ethics, humane use of our wildlife resources, as well as the cultural, economic, utilitarian and social values that society places upon our environment.

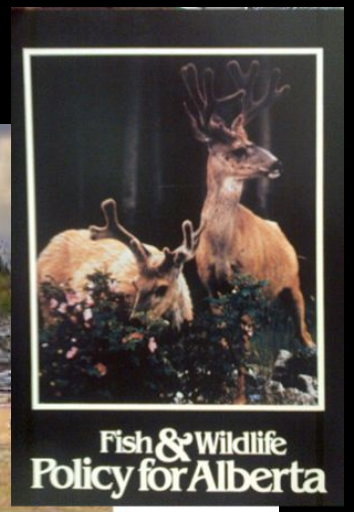
WHAT IS OUR MANDATED RESPONSIBILITY?

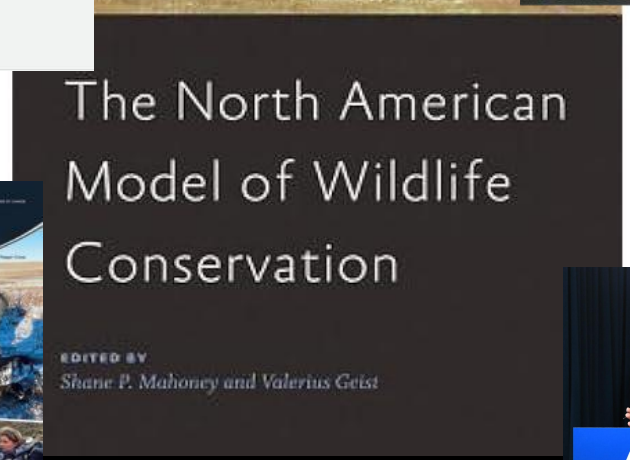


WILDLIFE ACT

Chapter W-10

Table of Contents





As Statutory Decision makers and Advisors to those who are, our ultimate responsibility is to manage wildlife in the PUBLIC TRUST.

We are responsible to the citizens and residents of Alberta. We manage wildlife sustainably to ensure that populations of species and their habitats are managed by objective, recognizing all values that Albertans place upon our environment and the benefits they receive from maintaining wildlife on our lands.

How?

We manage for sustainable use by objective. We use science as the foundational pillar upon which we evaluate status, trend, risks and relationships of wildlife species to other variables of interest. Science itself is not the objective, but the tool used to achieve the objective.

We make recommendations based on what we know, and what we don't know, and balance the information with other factors which may influence decisions

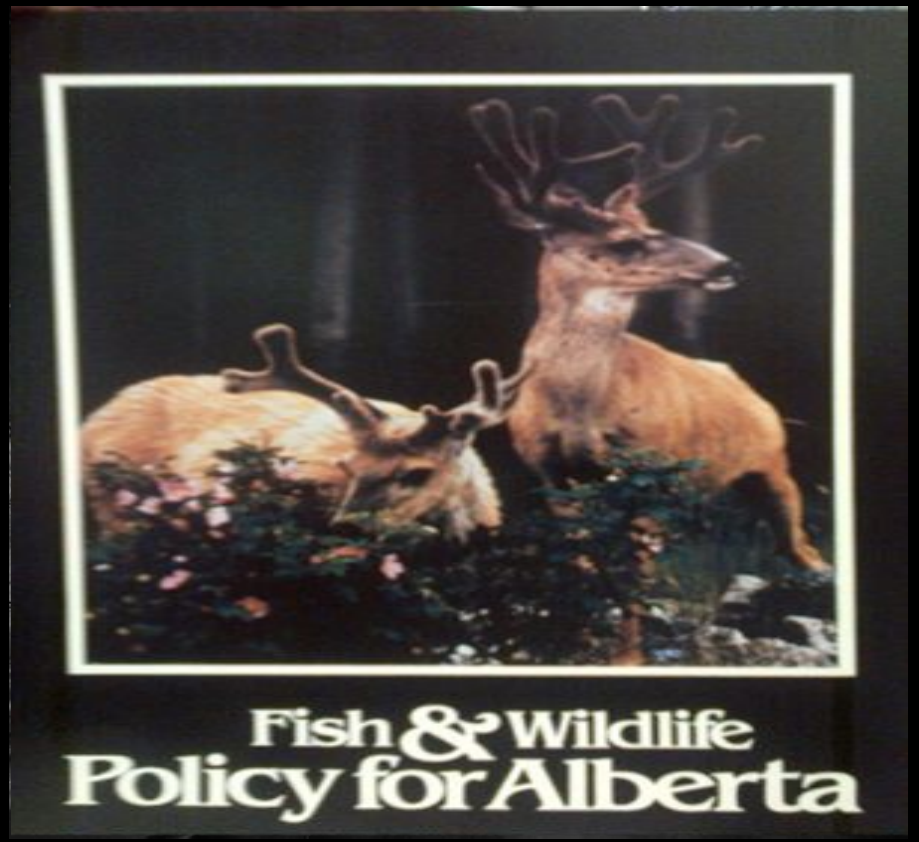
Science supports stewardship but societal values, ethics, economic interests or cultural integration of values helps balance these decisions.

Recognize our audience and client base: Emotions are real and Moose don't vote

We frequently criticize decisions that are influenced by emotion with the assumption that emotion negatively affects cognition and reason. Human beings are emotional creatures and have evolved as such for a variety of important reasons. It is therefore important to recognize emotion as a variable which will affect public opinion, trust and ultimately, decisions.

HUNTING AND FISHING
Alberta

BASIC PRINCIPLES OF WILDLIFE MANAGEMENT IN ALBERTA



Wildlife is managed for Albertans

We can, and frequently say, that wildlife is managed for its intrinsic value, but ultimately that philosophical rationale becomes wholly dependent upon how natural systems function. Human beings function as other species do, and we use wildlife and value it for a number of reasons which are not mutually exclusive of each other. Our policies and legislation, therefore, reflect our mandate of managing wildlife for sustainable use, diversity, natural process and representation on our landscapes for all Albertans.

Wildlife in Alberta is owned by the Crown, and Citizens may possess, collect, hunt and transfer wildlife by regulation as a licensed privilege. Whereas recognized indigenous peoples as governed by Section 35 of the Constitution Act of Canada are rights holders

Indigenous peoples are rights holders and may exercise those rights to hunt and possess wildlife for traditional use, subsistence and cultural practices for themselves and their communities.

We manage using legislation and Policy, and Internationally recognized humane standards

Alberta manages and allocates wildlife under the authority of the Wildlife Act and Regulations, as well as associated legislation such as the Federal Migratory Bird Act, the Species and Risk Act and others.

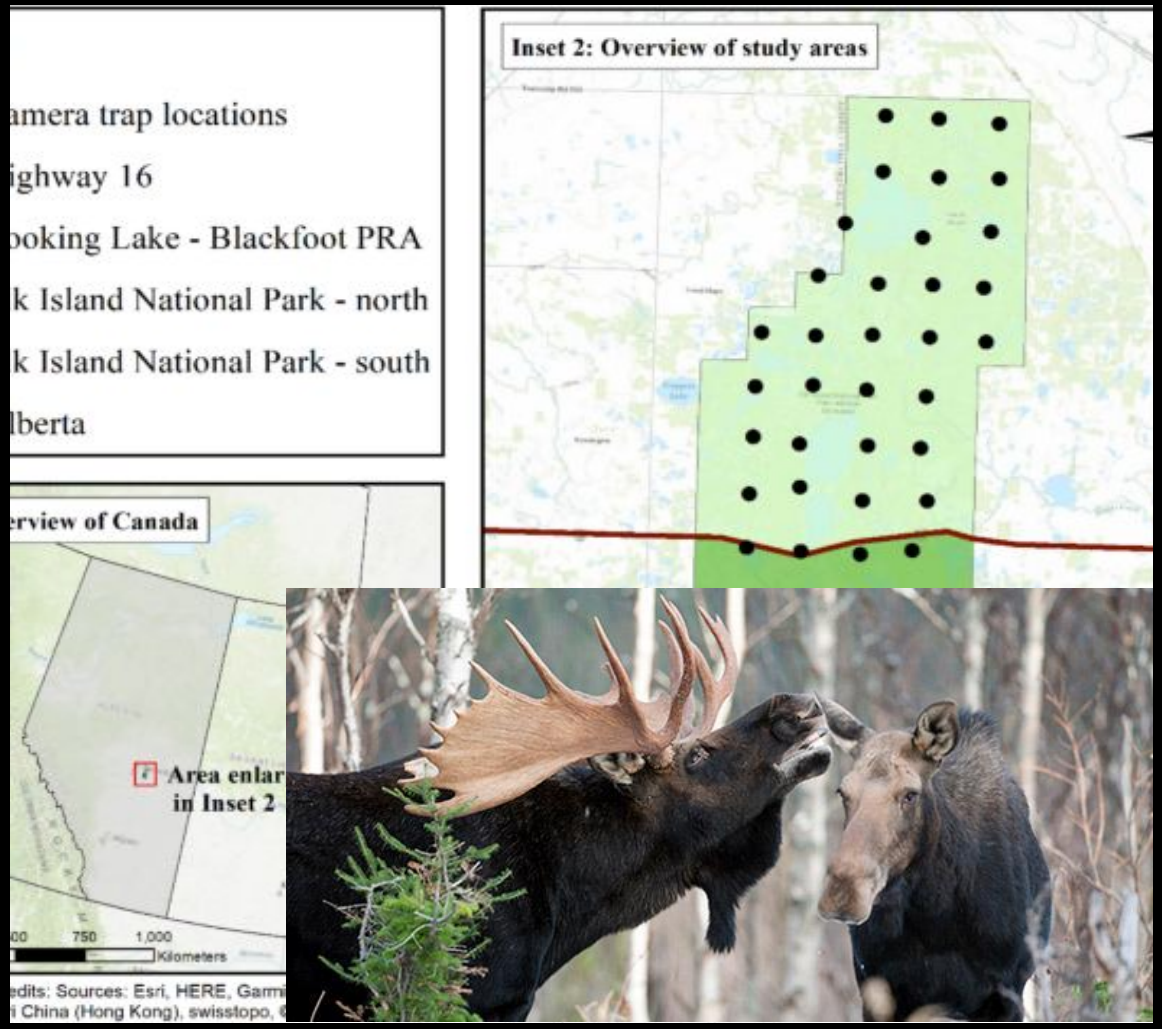
We manage using Science as a foundational tool

Objective, predictive, and based in data-driven analyses

We manage via public consultation

The Minister has established Advisory Councils for fisheries and wildlife, regularly meets with stakeholders, and frequently uses targeted consultation with entities such as the ACTWS.

HOW SCIENCE IS APPLIED IN ALBERTA



Data Integration for Wildlife Monitoring

Alberta integrates aerial surveys, harvest data, collaring, and habitat assessments to monitor and allocate wildlife populations effectively.

Integrated Population Modelling (e.g SpeedGoat, Alces etc.)

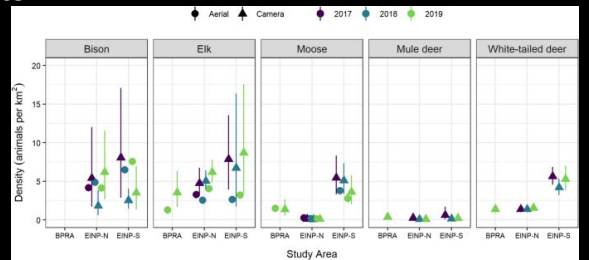
Models clarify interactions between species like wolves, moose, deer, and caribou under environmental pressures.

Applied Research and Adaptive Management Practices

Alberta works with researchers at Universities and Institutes to help develop experimental designs used to answer key questions in Wildlife Management. Scientific evaluation and adaptive management allow continuous learning and adjustment to improve wildlife stewardship.

Balancing Science and Social Factors

Science is used to help inform Management decisions considering ecological data alongside social issues, Indigenous needs, local access, and economic constraints.



DECISION-MAKING:
3 APPROACHES USING SPECIES SPECIFIC EXAMPLES

ELK MANAGEMENT: STANDARD INCORPORATION OF SCIENCE INTO A DECISION

Scientific Basis for Management

Aerial Ungulate surveys in addition to observational citizen-informed data have showed an increasing density and distribution of elk in CFB Suffield resulting in depredation and damage to standing adjacent commercial crops and infrastructure. Populations grew from 75 to over 8000 in 10-12 years/

Data Collection Methods

Managers used aerial surveys, hunter harvest returns, stakeholder observations and complaints , pop-dyn models and habitat assessments to estimate elk abundance and recruitment accurately.

Balancing Social and Economic Factors

Managers consulted with the Military, landowners and hunters and presented the survey and damage data, and proposed to reduce the density of elk in order to reduce then stabilize population growth, while using intercept feeding and fencing to deal with existing conflicts. Management decisions consider hunter preferences, economic reliance, and public expectations alongside biological science.

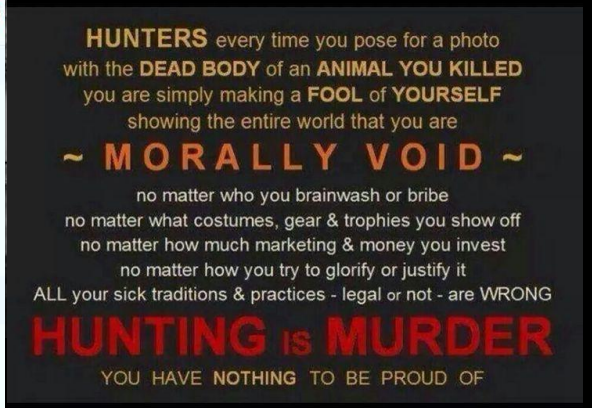
Applied Wildlife Management

The quota for elk was increased significantly, and several hunting seasons were coordinated with the Military, and the population of elk has been reduced to a target of 2500. Depredation complaints are virtually nil.

REACTIONARY DECISION MAKING – NO SCIENCE

A case study of a decision in wildlife management that was made without the benefit of science.

- In 2016, Josh Bowmar, a US hunter from Ohio and a former US Olympic Javelin thrower, killed a black bear over bait using a spear with a camera attached to it
- The video showed the bear struck with a spear followed by Bowmar jumping up and down celebrating the kill. The footage sparked backlash, including criticism from animal welfare groups
- The incident was investigated by Enforcement Staff and deemed legal as per the Wildlife Act and regulations
- Within a week, the Alberta Government called the practice "archaic" and "Unacceptable" and banned spear hunting.
- Now, if we examine the incident using fact-based interpolation and formal logic, we may conclude the following:
  - The bear was harvested in a manner consistent to modern archery hunting and following a post-mortem examination, it was found that both lungs were severely lacerated not unlike using a modern broadhead-tipped arrow in bowhunting. It is entirely likely that the animal died via pneumothorax within 30-60 seconds of being hit by the spear. Given the short range, expertise of the spear hunter, accuracy of the throw and the wound evaluation post-mortem, we would reasonably conclude that the animal was harvested well-within the parameters set by legislation and humane hunting standards.
  - However, public opinion, reactions and the utter shock expressed by many Albertans resulted in a flood of complaints to Government resulting in the banning of spear hunting



ALTERNATE PREY DYNAMICS: WOLVES, MOOSE, AND CARIBOU- SCIENCE CONSIDERED AND BALANCED WITH OTHER FACTORS

Predator-Prey Feedback Loop

Endangered populations of Woodland Caribou in west central and NW Alberta were at critical risk of extirpation unless proximate limiting factors were addressed, namely, wolf-caused caribou mortality. Aerial shooting was used to remove wolves, which helped caribou, but increased moose, which in turn supports more wolves, creating a challenging feedback loop for incidental predation risk. This was demonstrated by Serrouya et al, 2017, 2019, 2023 etc.

Alternate Prey Management

Managing moose populations helps control wolf density, aiming to reduce predation on vulnerable caribou herds.

These hypotheses were evaluated with a before-after control-impact (BACI) design that included response metrics such as population trends and vital rates of caribou, moose, and wolves. Moose hunting quotas were increased and the moose populations declined. Wolves were removed and caribou survival increased.

Indigenous Harvesting Rights

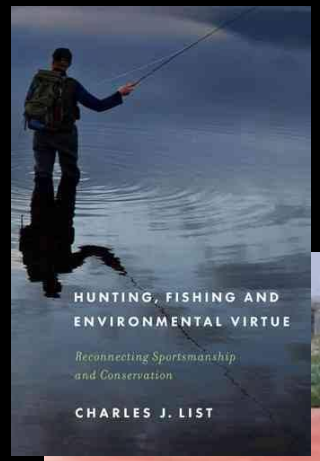
Indigenous communities harvest moose under protected rights, impacting how managers adjust licensed harvests, and in the context of caribou management, a wicked problem emerged. Indigenous hunters expressed concerns regarding food security, access to those foods and claimed that they were unable to sustainably harvest moose to feed their communities.

Economic, social, cultural and Ecological Balance

This problem involves complexity between industry, recovery of species at risk, and maintaining moose on the landscape for indigenous and resident hunting needs. It has the potential for a very serious legal process for adjudication and would set precedent for case law. At this time, it is decided that moose allocations are not to be increased in light of a potentially significant legal challenge and ruling until alternative tools are evaluated and more data can be collected.

TAKE-AWAYS AND SUMMARY

TAKE-AWAYS AND SUMMARY



Alberta is a highly complex and diverse landscape with many competing interests for natural resources

Albertans are passionate about wildlife, wildlife use and sustainability of our natural resources

Legislation and Policy Provide us with the Framework to Make Wildlife Management Decisions using the Public Trust Doctrine

We rely on science as a tool to provide us with baseline information, assess relationships between variables of interest, predict outcomes based on an input, and generate an assessment of risk for decision options; we do not rely on science as a stand-alone decision making entity in of itself

We use consultation with Albertans, focused stakeholders, business interests and Indigenous Knowledge Integrated into our decision processes

Balancing Ecology, Economy and Community interests to make decisions