Module # 1 – Component # 1

Human - Wildlife Conflict Resolution

Introduction

An **animal or bird becomes a problem animal** when:

- it competes at an unacceptable level for human food resources
- becomes a nuisance or
- is a danger to human life

All animals form a vital part of the mechanics of a stable environment. In a natural, "left alone" situation they interact with one another, **holding each other in balance**. This natural aspect is important to bear in mind whenever control of problem animals is contemplated as the removal of one species often precipitates other species becoming problematic.

In Zimbabwe before the Parks and Wild Life Act was amended in 1975 certain species of animal were **considered vermin** wherever they occurred. This unfortunate term was often misconstrued to mean that these species were considered total misfits even within designated protected areas! It wasn't long ago that even **conservationists believed that they were acting in the interest of game conservation** when removing these animals and a bounty was raised for their destruction. Vermin species included **wild dog**, **hyaena**, **jackal** and **baboon**, plus several species of **birds** of prey that were shot on sight irrespective of whether they were doing damage or not.

Wild dog was thought to be totally destructive to wildlife because of their apparent brutal hunting methods, which, in fact, are efficient and selective. They only kill what they require, leaving nothing to waste. They seldom remain in one area for more than a few months, moving in large home ranges rarely returning to one place within the same year.

Leopard's usually only kill livestock when calves are padlocked close to their lairs and not indiscriminately, as is sometimes imagined. Their role in keeping down **baboon** and **bush pig** populations is often overlooked when considering crop damage.

The Conflict

Animals live in **predictable patterns** that differ according to species, occupying different niches in the environment. A thorough knowledge of the animal that has become a problem as well as its environment is vital to reduce conflict with agriculture. Animal populations have built-in mechanisms within their social behaviour, be it animal to animal relationship or animal to environment, which help to maintain their numbers at reasonable levels.

In a stable situation with minimum interference the **population dynamics** of each of the species, that is the increase or decrease, is controlled over successive years. A balanced situation usually comprises several species living together, all interacting with each other, **preventing too great a build up** of one another. For example, as soon as antelope increase a corresponding increase in predators occurs to bring their numbers down. The population of the predator is then itself limited as its food source diminishes.

This scenario has been evident on the shores of Lake Kariba in Zimbabwe where the area of *panicum* grass species grown as a result of periodic flooding of the lake shore provides a direct influence on **buffalo population levels** which in turn determines the **population of lion** feeding upon them. Recently the water level, instead of rising and lowering each season, rose steadily over the next few seasons, flooding the grass and denying food to the buffalo that then died off in large numbers. Initially the lion responded but then also declined in response to the decrease of the buffalo population.

The more the various species interact, the more stable is the ecosystem. A knowledge of these interacting forces is necessary **to keep the environment as stable** as possible when **reducing conflict** between a problem species and agriculture. The upsetting of this delicate balance often takes place inadvertently, for example where large tracts of land are opened up for agriculture reducing the diverse, complex situation to a few species which are less able to stabilise the populations of interacting organisms remaining. This happens whether a virgin tract of land is opened to an agricultural crop or too many livestock are introduced to a paddock!!

Removing virgin forest in the Eastern Highlands of Zimbabwe for exotic timber such as pine, wattle and gum are an example of this. **Baboons** inhabiting the area before, occupied a diverse habitat of differing plant and food types interacting with them. Suddenly this is replaced with a form of **monoculture** where all the surrounding trees are now exactly the same with consequent drop in diversity of habitat and food resource. Would not nature then try and reverse this trend? In natural circumstances baboons damage certain trees under certain conditions of growth as they forage around. As they move around so the vegetation they occupy also changes and so the opportunity to damage is temporary lost until they return. Is it not possible because in their new environment there is no change, the opportunity remains close to hand and the habit, once started for what ever reason, is then perpetuated?

Suddenly **damage levels become unacceptable** and baboons are eradicated on a large scale to stop the problem. Little thought is given to the fact that it is the trees that are exotic to the region not the baboon. To date over **6,000 baboon** have been controlled and still the problem remains. Control has effectively reduced the problem but will have to continue at the same level indefinitely to keep it in check. Evidence is mounting that it may be that it is the bachelor males that may be responsible and if so, with directed management, the problem could be reversed. Urgent research is necessary to test the hypotheses developed but the effected companies are unwilling to commit funds and remain unconvinced of its importance!

In another development, probably the most serious problem in the **United States** of America and the **United Kingdom** and elsewhere in the world are various **species of rodent**. In Sub Saharan Africa rodents have not yet provided a major threat, probably because there are **sufficient natural buffer zones harbouring raptors and other predators**. Should these be removed the rodent problem may increase significantly. Commercial agriculture, in its quest for expansion seems to remain largely unaware of this.

Where do we Strike a Balance?

It is accepted that agriculture, even with the best intention of the farmer, does upset the natural ecology and there will be times when the level of depredation upon crops and livestock becomes unacceptable, requiring action. Unfortunately agriculture and forestry must expand to provide food and a greater economy for the increasing world populations. The complete eradication of the animal pest, though, is seldom sustainable or effective and should be discouraged as much as possible.

One of the golden rules in problem animal control is to never seek to entirely remove the pest species from an area but rather concentrate on removing specific culprits.

Invertebrate pests in crops such as cotton provide excellent examples of nature's attempt to combat the problem. **Cotton**, a species introduced to the area, is quickly predated upon by exotic bugs that have no natural predators to regulate their numbers. Consequently, **insecticides are introduced** in an effort to rectify the problem. Without these insecticides the viable production of the crop would not be possible, but in the long term the use of these pesticides does not solve the problem. Recent research in crop protection **favours biological control** rather than chemical control. In biological control predators specific to the resident pest are introduced to balance out the situation, their populations in turn being balanced by the resulting decline of the targeted pest.

In other words rather *cooperate with nature* and employ principles already in place to combat the problem rather than attempting to eliminate the offending species.

An example would be enforcing stringent crop management procedures of removing and destroying all residue cotton plants still existing after the growing season to prevent build up and carry over of the pest into the next season. If chemicals are necessary, the type and method of application selected should be target specific, affecting only the culprit. In **citrus**, biological control has been introduced to control outbreaks of citrus scale in the larger citrus estates using **predating wasps**. Occasionally when a major re-infestation occurs chemicals are required to get back on top without destroying the wasps. This practice is not foreign to most farmers, regarding the control of insects however when dealing with animals this fact is too often overlooked!

The same situation is also true in livestock farming with veterinarians now seriously **questioning the chemical control of ticks**. Research is currently underway looking to enhancing natural resistance bred into animals rather than resorting to chemical control.

Consequences of Control

It is important then, when undertaking any agricultural venture, to consider its impact on the environment on indigenous flora and fauna found there and determine what conflicts could occur in order to determine the best possible course of action when these problems arise. It may be beneficial; for example, to leave vlei or hill areas surrounding agricultural land alone to harbour birds and insects, which in turn can predate upon pests.

Advances in our understanding of the problem and new techniques available to us are producing better and more efficient methods of problem animal control than in the past. These methods are becoming **more target specific** minimising impact upon the environment.

Careful monitoring of control measures implemented is essential to record trends indicating changes in the status of the problem and to prevent over control. Completely removing baboons from an area where there are **resident leopards**, for example, will be likely to result in increased depredation of livestock. In addition by removing a whole troop simply results in its replacement as most species occupy home ranges with some also being territorial.

Experience in the Eastern Districts of Zimbabwe has indicated in many instances replacement of these troops has resulted in the next troop causing even more damage than their predecessors. Recent toxic control of baboon in the exotic plantations along the Eastern Districts of Zimbabwe removed some 6000 baboon (carcasses found and disposed) resulting in a dramatic drop in baboon depredation and perceived numbers for 18 months. But thereafter, damage seemed to **escalate to levels higher** than had previously been recorded.

Investigation of the problem at a workshop to specifically discuss the problem with stakeholders indicated a poor understanding of the factors involved. The numbers of baboon troops and the size of the individual troops were generally unknown. Their distribution, movement and reasons for causing damage were assumed, rather than being based on hard evidence. The immediate solution to this without further research is to remove even more baboons in a large blitz operation over the next two years to reduce the overall population throughout the region until; presumably, their numbers are reduced to insignificance. This will prove to be both costly and a major disaster to the environment when a much cheaper solution could be possible simply by conducting basic research to establish precisely what is transpiring.

These facts establish a second principle that any decision to remove a portion of the population must be based on a thorough understanding of the dynamics of that population and the reason for depredation fully understood to provide any meaningful long term solution to the problem.

These reasons may not be apparent when control is first initiated but through adaptive management **must** be researched to continually update management strategy to provide effective long term control of the problem. To ignore this will always result in more expense, poor results and even possible permanent damage to the environment. (**See Module # 5 Component # 1 - baboon behaviour**).

Poor land management may also be responsible for problem animal activity, for example through excessive irrigation, causing damp areas in poorly drained land, which encourage bush pig build-up as they provide excellent conditions for rooting during the dry season.

Bush pig root only in moist soil so during the dry season they are hard pressed for food to a point of starvation. In dry years this natural phenomenon provides a natural means of controlling of their numbers. A further example would be overgrazing in the high veld of the country that may encourage an increase of pioneer species of grass and trees, favourite breeding sites for **quelea**. At present quelea are forced to move great distances to the more arid low-lying regions of the country, providing a control influence.

Problem Animal Control

Problem Animal Control, (P**.A.C**) world wide is a controversial subject and there is considerable debate regarding the removal of problem species, particularly in the more developed countries where possible **ramifications to the ecology** have been realised.

Consequently respective Governments have set up agencies specifically to monitor and **curb excessive destruction** of problem animals. This is particularly evident in the U.S.A., where each method has to be scrutinised and accepted by both the Federal Government and individual States before it can be implemented. A **permit** is then issued carrying details of exactly how the method will be implemented or product used the precautions to be adhered to, etc. In addition, individual permits must also be obtained for each operation undertaken with full returns submitted to the respective authorities immediately after each operation.

Where possible, **repellents** or other **aversion agents** are preferred rather than the destruction of the culprit. Long-term research, often taking many years before general acceptance can be considered, is also carried out to **determine secondary hazards** and other possible side effects. In the U.S.A the Denver Wildlife Research Centre in Colorado employs in the region of eighty scientists on a number of projects to keep abreast of control needs. In Canada authorities are reluctant to permit the destruction of animals and **only agree where damage is unusually severe or where human lives are at stake**. Numerous assessors are employed to examine each case reported and where damage has taken place the owner is paid compensation rather than having the culprit removed.

The situation in sub-Saharan Africa is not as strict and **farmers in the main are permitted to control problem animals with little restriction**. Strict control is only exercised on certain animals **designated as protected**, i.e. **cheetah** and **python**, for which permits may be issued for the removal of the specific animal causing a problem. The **use of toxicants** is coming under greater scrutiny and is now governed by the Department of Veterinary Services and the Wildlife Authority for the respective countries. The use of toxicants still provides the major means of control in Zimbabwe and large-scale operations are undertaken under the direct supervision of the Department of National Parks and Wild Life Management Authority.

Control measures are tightening up so agencies and farmers need to be diligent **controlling only those specific animals causing damage** rather than the species in general. Each report of damage should be thoroughly investigated and only when the problem is identified action to affect control carried out. Apart from the control of large dangerous species, the Department expects individual landowners to be responsible for control, unless, of course, they are unable to or do not have the necessary equipment.

The Authority on its part though must assume responsibility to **undertake research** into the whole problem of problem animals in order to improve upon knowledge of the animal and techniques of control for them. The information then must be disseminated to assist farmers resolving the problem themselves.

The assumption that control invokes only lethal methods to achieve this end without thought to possible side effects is no longer acceptable. The trend is to follow the western world where farmers are more aware of the total picture and expect some loss. Farmers in Africa must budget for a percentage of loss to problem animals and accept a certain level to prevent over-control.

Course Objectives

The object of this Course is to introduce respective farmers, wildlife managers, conservationists, ecologists, wildlife-enthusiasts, field guides and designated control agencies to **acceptable methods of control** and provide ideas as to how the problem can best be alleviated.

New management concepts are discussed and details of each method and its use are given, with illustrations where possible, for easy reference.

The methods of control are divided into:

- non-lethal and/or aversion agents (repelling or protection)
- capture, where appropriate, and finally
- lethal control

Each approach is discussed before the respective methods are presented in detail (with the exception of the lethal methodology, where the ***Why*** and ***What*** questions are addressed, but the ***How*** is not detailed.

The Course then concentrates on each of the **major problem species**, briefly giving description and distribution information before looking specifically at the behavioural patterns through which control can best be affected. The approach to the problem, therefore, should initially be one of alleviating the problem without control followed by non-lethal aversion or capture and finally, if all else fails the removal of the culprit from the system.

The Course is specifically referenced so that respective farmers can study the species concerned and the methods best suited for its control.

The Course Synopsis

Module # 1 – Introduction to Human - Wildlife Conflicts

Component # 1 – Human – Wildlife Conflict Resolution

Module # 2 – Non – Lethal Methodology

Component # 1 – Physical & Chemical Deterrents

Module # 3 – Capture & Translocation

Component # 1 – Physical Capture
Component # 2 – Hippo Traps
Component # 3 – Crocodile Traps
Component # 4 – Chemical Capture
Component # 5 – Mass Capture of Redbilled Quelea

Module # 4 – Lethal Methodology

Component # 1 – Attractants & Conventional Hunting
Component # 2 – Leg Traps, Set Guns & Poisoning

Module # 5 – Non-Mass Capture Techniques

Component # 1 – Behaviour of Problem Herbivores
Component # 2 – Behaviour of Problem Carnivores
Component # 3 – Behaviour of Problem Primates