1. **WILDLIFE CONTROL**
	1. **Introduction**

A control operation is similar to a sustained-yield exercise but is conceptually more complex. The objective must be defined precisely, not in terms of the number of pest animals removed but according to the benefit derived there from. Methods include mortality control, fertility control, and various indirect manipulations.

* 1. **Definitions**

Control” has three meanings in wildlife research and management. The first two deal with manipulating animal numbers, the third with experimentation. “Control” is used first in the sense of a management action designed to restore an errant system to its previously stable state by reducing animal numbers. We speak of controlling an outbreak of mice in a grain store or wheat-growing district. The action is temporary.

The second use of “control” has to do with moving a system away from its stable state to another that is more desirable. The animals are reduced in density and the new density enforced by continuous control operations.

“Control” is used in a third sense within the idiom of experimental design. At length, an experimental control is the absence of an experimental treatment. That meaning of the word is usually obvious from the context except when the experiment tests the efficacy of a control program (i.e. “control” in one or other of the first two senses). The control operation is then the treatment and the control is the absence of control.

The obvious ambiguity in the previous sentence can easily lead to misunderstandings. For example, in an experiment testing the effect on riverside vegetation of controlling (reducing, i.e. second meaning) hippopotami, they were shot (controlled) periodically in one stretch of river. The vegetation along the bank was compared with that of another stretch of river where the animals were protected (the control stretch, i.e. the third meaning). However, a change of hunting staff led inevitably to the control (protected) stretch being controlled (hunted) one sunny Sunday morning. We have seen similar mistakes (discovered at the last minute) in the testing of rabbit control methods. There is no sure remedy, but the chance of a disaster can be reduced somewhat by always linking “experimental” to “control” when discussing experimental design.

**9.3. Effects of control**

If the density of a population is lowered by control measures, the standing crop of renewable resources (e.g. grass needed by a herbivore) will increase because of the lowered use. Non-renewable resources such as nesting holes will be easier for an individual to find. Hence control, like harvesting, increases the resources available to the survivors of the operation. Their fecundity, and their survival in the face of other mortality agents, is thereby enhanced. For example, an increase in survival of juvenile rabbits compensated for an experimentally reduced reproduction of females. The reduced density, therefore, generates a potential increase that will become manifest if the control or harvesting is terminated.

The enhanced demographic vigor following reduction in density is a desirable outcome of a harvesting operation, and in fact the success of the harvesting is determined by such an effect, but it acts against the success of a control operation. The further density is reduced the more the population seeks to increase. Thus control, in the sense of enforcing a permanently lowered density, is simply a sustained-yield operation that seldom utilizes the harvest. It is an attempt to drive a negative feedback loop in the opposite direction. In other words, density -dependent effects compensate for the imposed mortality of the control operation.

* 1. **Objectives of control**

More than the other two areas of wildlife management (conservation and sustained yield harvesting), control is often flawed by a lack of appropriate and clearly stated objectives.

Control, in contrast to conservation and sustained-yield harvesting, is not itself an objective. It is simply a management action. Its use must be legitimized by a technical objective such as increasing the density of a food plant of a particular species, say, from one per hectare to three per hectare. The control operations would be aimed at a herbivore for which that plant was a preferred food. The success of the operation would be measured by the density of plants, not by the density of the herbivore or by the number of herbivores killed.

Control campaigns in many countries share a common characteristic. Very often the original reason for the management action is forgotten and the control itself (lowering density) becomes the objective. The means become the end. A good example is provided by the history of deer control in New Zealand. It is one of the largest and longest running control operations against vertebrates in any country.

**Table 9.1**. Lists the sequence of official justifications for government-funded control of deer

 from 1920 onwards.



Whereas the stated justification for the control operations changed with time, those changes had virtually no effect upon the management action. There were certainly changes in control techniques but, with the exception of the change of 1967, these were evolutionary adjustments in the management action itself. They were not driven by changes in policy. The means themselves were the end.

Control operations must have clear objectives framed in terms of damage mitigation. Their success must be measured by how closely those objectives are met, not by the number of animals killed. The operations must be evaluated carefully to ensure that their benefit exceeds their cost. And their success or failure must be capable of independent verification.

There are three circumstances in which control may be an inappropriate management action: (i) where the cost exceeds the benefit; (ii) where the “pest” is not in fact the cause of the perceived problem; and (iii) where the control has an unacceptable effect upon non-target species. These are best investigated experimentally before a control program is instituted.

* 1. **Methods of control**

Control methods can be divided into those aimed at directly increasing mortality, those aimed at directly reducing fertility, and those that act indirectly to manipulate mortality, fertility, or both. The success of an operation is not gauged by the reduction in the density of the target species but by the reduction in the deleterious effects of the target species. In all cases the prime responsibility of the wildlife manager is to determine whether the control adequately reduces deleterious effects and whether its benefit exceeds its cost. The most common wildlife controlling methods are the following.

* **Control by manipulating mortality** - control by increasing mortality may be direct, as in poisoning, trapping, or shooting, or it may be indirect as in biological control through pathogens
* **Control by manipulating fertility** - the use of contraceptive techniques for population control
* **Control by indirect methods include** - exclusion, sonic deterrents and habitat and food manipulation.