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POLICY CONSIDERATIONS FOR CONTRACEPTION IN WILDLIFE MANAGEMENT

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ABSTRACT: Managing wildlife populations by manipulating their birth rates is a promising technology. However, the use of contraceptive technologies will involve the development of new wildlife management policies. We designed and implemented a survey that was intended to gather information on the range of perspectives of concerned publics on contraceptive use in wildlife management. There appears to be considerable confusion and mistrust regarding the application and appropriateness of this new technology. We recommend that promoters of contraception use in wildlife management be careful to explain what this new technology can and cannot do in order to avoid the pitfalls associated with trying to deliver false promises.

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Historically, natural resource professionals have worked under the assumption that their primary responsibility is to the resource (Wagner 1989). Kennedy (1985a: 121) stated that foresters traditionally believed that they were "managing and protecting resource things (i.e., objects such as trees and game animals), rather than managing these resources as objects of changing social values." Wagner (1994:282) believed this perspective was changing, given the natural resource professionals' "emerging realization that our goals are social goals." Professionals manage natural resources to satisfy social values (Hendee 1974, Kennedy 1985a, Wagner 1989). It is therefore reasonable to conclude that wildlife management does not exist to further the interests of wildlife but instead exists to fulfill the human values applied to that wildlife.

Natural resource management proceeds from policies or statements of how an organization will operate to satisfy social needs. F. H. Wagner (personal communication) defined a process through which policy is formulated and implemented in natural resource management (Figure 1). The first step involves assessing human values that pertain to a particular issue to determine which perspectives will be most important to developing a policy on that issue. This first step tends to be fraught with conflict as any of a variety of groups will attempt to impress upon the wildlife professional the importance of their values on the issue. The second step of the process involves consolidating the values assessed and weighing them against each other in order to develop a set of management goals. In order to achieve these goals, strategic plans must be developed. These plans may be codified into law as policies. The last step of the process is management of the resource. The practical aspects of management are dependent upon the various interpretations of policy by different natural resource professionals. At this point, the lack of scientific input in this model is obvious and appropriate. This omission is due to the fact that human values, not science, drive policy formulation and implementation (Decker et al. 1991). Nonetheless, science does play a role in the policy formation process at every step. Science is used to assess the validity of all the social components in the process (Schmidt 1992). Science is, therefore, important, but it does not drive the policy.

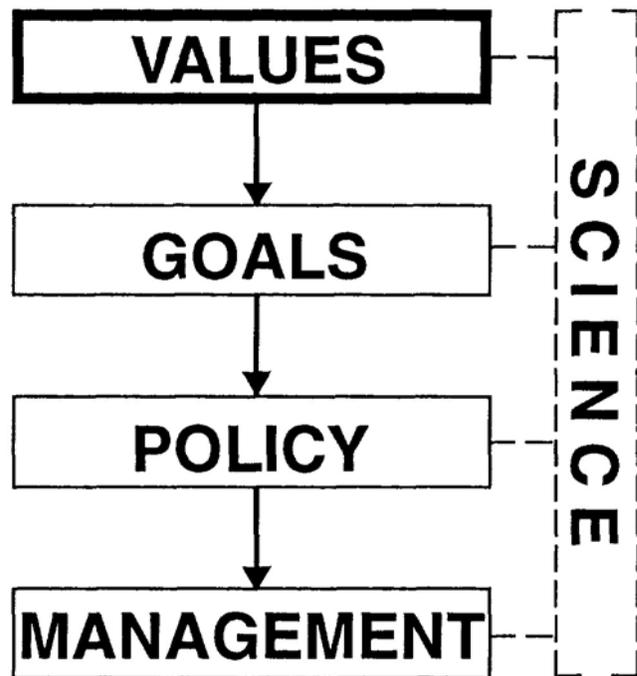


Figure 1. A process through which wildlife policy is formulated and implemented in natural resource management. Values drive the process, and science serves to assess the validity of all components in the process. See text for details.

The focus of this paper is on the creation and implementation of policy pertaining to contraception as a tool in wildlife management. The logical question that follows is why should anybody use contraception in wildlife management? In addition, if it is determined that contraception is a sensible tool for use in wildlife management, what factors will affect the creation of policy that establishes guidelines for use of this technology?

Contraceptive technologies are used to control population growth by reducing birthrates in selected populations. As with any other wildlife management tool,

viable contraception techniques can be used in an attempt to minimize the negative impacts of wildlife on other resources. Negative impacts do not simply include "damage" to human property or persons, but to any aspect of the environment which humans value and wish to protect. Potentially useful applications of wildlife contraception include limiting the population growth of elk (*Cervus elaphus*) in national and state parks to minimize damage to those ecosystems, limiting the population growth of predators that feed on threatened and endangered species or domestic livestock, limiting the population growth of Norway rats (*Rattus norvegicus*) that coexist with and affect humans everywhere, limiting the population growth of bird species that inhabit and cause damage at airports, or limiting the population growth of white-tailed deer (*Odocoileus virginianus*) in urban environments. In each case, population control is used to benefit humans, not the wildlife itself. Clearly, human perceptions guide all aspects of decision-making within wildlife management.

Contraception is designed to allow managers to decrease natality rather than increase mortality within a population. In this sense, contraception may be considered acceptable to people concerned with humaneness issues. For example, contraceptive technology seemed an exciting prospect in the 1960s when research in this field indicated that chemosterilization might be a more humane management tool than traditional techniques (Davis 1961).

Recently, there has been a resurgence in interest in contraception technology. The perceived humaneness of contraception may explain this resurgence to a certain extent. Nonlethal techniques are generally perceived to be more humane than more traditional lethal ones. Historically, lethal control techniques were not questioned as the methods of choice in population management. In the past few decades this situation has changed. Animal activists have called for an analysis of other methods in wildlife management. At first this was not taken seriously by wildlife managers. Yet over time, pressure from animal welfare and rights groups has resulted in a great deal of research that has emphasized nonlethal control techniques. For example, in predator management, new techniques have proliferated, including livestock guarding dogs and other animals, electronic guards and other visual and acoustic repellents, and soft-catch traps. Additionally, the media is introducing more and more people to the idea of contraception for limiting population growth in wildlife species, as well as to the realities of lethal techniques.

This resurgence in interest may also be due to recent successes in research dealing with many forms of contraception. Major breakthroughs are occurring in immunological and surgical forms of contraception. Examples include success with porcine zona pellucida (PZP) vaccines in reducing birth rates in wild horses (*Equus callabas*) (Kirkpatrick et al. 1994) and white-tailed deer (Turner et al. 1994) populations, as well as hormonal implants in reducing birthrates in striped skunks (*Mephitis mephitis*) (Bickle et al. 1991) and rabbits (*Oryctolagus cuniculus*) (Phillips et al. 1987).

Interest in an issue does not in and of itself lead to policy pertaining to that issue. In order for a

contraceptive procedure to be considered a viable tool, several criteria must be met, primarily effectiveness, safety, and economic feasibility. These criteria can be presented in the format of questions. Questions include: Is the contraceptive agent species-specific? Does the contraceptive agent allow treated individuals to maintain health and normal behaviors? Is it safe, in terms of health and behavior, for other animals, including humans, to hunt or scavenge the treated individual? Is the contraceptive process reversible? Is its effectiveness long-term? Are there any reliable delivery systems? Most importantly, does the technique actually allow the manager to minimize population growth within a species at a particular site? And finally, is the tool economically sound? A more complete list of pertinent questions can be found in Table 1. If most questions can be answered appropriately, the contraceptive strategy in question may be useful in the practical sense.

The factors that preclude the viability of a management strategy may assist in development of a policy. Again, it is important to remember that policy development is not driven by science, but by human values. Public acceptance of the technology is critical. Traditionally, wildlife professionals have enjoyed the support of the various publics that were directly affected by their actions (Wagner 1991). In the past few decades, a number of other interested publics have begun to voice opinions that are in opposition to traditional management techniques. These groups may oppose management for various reasons, including concern over humaneness or the desire to preserve species that are of low value to traditional wildlife programs (neotropical migratory birds, for example). The original response of wildlife managers to such publics was that the demands of these people were unreasonable because they were driven by emotional and irrational arguments only and they did not consider scientific ones (Decker et al. 1991, Brunson 1992, Schmidt 1992). The emotional nature of such arguments, as well as a belief that the environmental movement was a passing fad that could be ignored until it collapsed, allowed professional wildlife managers to disregard the concerns of these publics.

We believe that it is no longer appropriate to cling to the belief that the environmental movement was just a fad. There is significant evidence that indicates that the environmental movement is a true social movement (Mitchell 1989, Dunlap and Mertig 1991). This means that the vocal publics who question traditional management techniques will not be quieted in the near future. In fact, these groups will continue to be a constant force in policy formation on wildlife management issues. The assessment that these groups are "emotional" is no longer relevant, nor is it an appropriate reason for conflict avoidance.

In order to gauge the opinions of various publics and professionals, we designed and implemented a survey which was undertaken in late 1993. The survey was sent to representatives of 134 organizations that we believed would have interest in contraceptive technologies. A list of the types of groups we contacted and a summary of the results of the survey can be found in Table 2. Through this medium, we attempted to gather information on the range of perspectives of concerned publics on

Table 1. A partial list of questions that need to be addressed before wildlife contraception can be considered a legitimate wildlife management strategy.

Biological

- Is it species-specific?
- Is it safe for the animal?
- What are the impacts on non-target species if they consume the contraceptive agent or carrier?
- Are other species dependent on the species to receive the contraceptive?
- How will animal behavior be altered?
- Will it reduce the negative impacts (damage) of the animal or population?
- Is the method reversible?
- Will the breeding season change in length?
- How often is a dose required?
- Can the contraceptive be targeted to certain individuals in the population?
- Will natality be changed or will there be an increase of mortality of young?
- Will it impact pregnant females?
- Is genetic diversity going to change?
- What are the physiological consequences of the contraceptive device?

Professional

- Is the method cost-effective or are traditional methods such as hunting and relocation more efficient?
- Who is going to pay for this method?
- What economies will be impacted?
- Are local economies dependent on the species for a portion of their economic livelihood?
- Will state fish and wildlife agencies have their funding impacted?
- Will more jobs be created? Will jobs be lost?
- Who is going to administer the contraceptive?
- Are the state fish and wildlife agencies going to accept this new technology?
- Will people have to have game animals checked to see if the agent is present in the carcass?
- Who will control what types of devices or chemicals can be used?
- How will non-resident or exotic species be handled?
- What do you do if the treated animal moves away from the area in which it was supposed to live?
- Will the objectives of the program be met?
- What will keep new animals from colonizing the area?
- Who is going to be allowed to use the contraceptive?

Public

- Is the method humane?
 - Who is going to decide whether the population needs this treatment?
 - Will use of a contraception strategy interfere with recreational experiences?
 - What happens if we decide that contraception was not the best idea?
 - Will the long-term objective be met?
 - Is there a chance that population numbers may increase?
 - Are the animals going to get people sick if touched or eaten?
 - Will it effect pets or livestock?
 - What makes this method better than conventional methods?
 - Who can we trust to administer the agent correctly?
-

Table 2. Summary of survey results sent to 134 regional and national groups in the U.S. These groups were asked whether they had a policy relating to contraception and wildlife management.

Number of groups contacted: 134
 Overall response rate: 59%
 Groups that did have a policy on wildlife contraception: 9 %
 Groups that did not have a policy on wildlife contraception: 91 %

Types of Groups	Number Contacted	Response Rate	Policy	No Policy
State Wildlife Agencies	50	86%	9%	81%
Scientific Associations	6	67%	0	100%
Management Associations	8	38%	0	100%
Wildlife Damage Organizations	8	25%	0	100%
Hunting and Trapping Groups	8	63%	20%	80%
Environmental Groups	8	50%	39%	61%
Animal Activist Groups	46	39%	39%	61%

contraception use in wildlife management. These perspectives will be illustrated by quotes selected from among the surveys that were returned.

To return to the issue of facilitating public acceptance of contraception technologies, the first step is to convince the public that contraception is a viable tool in wildlife management. To represent the public perspectives we looked at animal activist organizations, environmental organizations, hunting and trapping organizations, and organizations specifically concerned about wildlife damage. None of the groups contacted were convinced that contraception is viable at present. Several stated that contraception may offer a humane alternative to lethal control of wildlife. But several also agreed with the statement that "although we recognize that contraception may be an effective tool for controlling wildlife ... there is a gross lack of knowledge as to the effects on wildlife populations." Thus, regardless of a group's moral stance on contraception, none felt that it was feasible at this time.

If contraception is shown to be a useful technology, three main types of public response may be expected. The responses can be characterized by the following statements: contraception is more humane than other technologies, contraception threatens traditional recreational activities, and contraception is only useful if managers are responsible. Some groups called "for the least intrusive management activities that base reduction decisions on sound biological principles that protect diverse communities." Several groups supported "the use of contraception and oppose hunting and trapping ... (because) they don't work and only serve to benefit hunters/trappers and state game commissions." In contrast to the above views, we also saw such diametrically opposed perspectives as "animal populations

can be controlled by hunting and trapping ... only people who do not want to 'kill' animals are the problem." In addition, some groups were "concerned that hunting and fishing will be relegated to the "other control methods" category." One individual stated that "the use of contraception as a wildlife management tool deprives millions of men and women of a traditional and socially acceptable form of recreation." Some groups were concerned that managers would not use contraceptive tools responsibly: "I have little faith in present managers who seem intent on providing hunters and trappers with more targets." And lastly, some groups just did not approve of wildlife management at all: "I regard using contraception methods as akin to using perfume to disguise the fact that one has not showered."

Many wildlife professionals believe that gaining public support for new technologies is the most difficult task in the policy development process. Indeed, this aspect of the process tends to be fraught with conflict. Attempts to convince wildlife professionals to adopt new perspectives may be just as difficult for several reasons. First, the professionals must be convinced that contraception is a viable tool in wildlife management. Second, they must be shown ample evidence of public concern over this issue to prompt an investigation into public opinions. Even if public opinion strongly favors utilization of contraceptives, an acceptance of the technology on some personal level is essential because, in general, it is extremely difficult to create a change within agencies (Scott and Hart 1979). In this case, acceptance means accepting contraception as a legitimate tool in wildlife management, whether one supports use of the technology or not. Creating change in agencies is difficult because many individuals are attracted to a given agency because they hold many values in common with

the agency mission (Kennedy 1985b). That is, they wish to work in an environment with people who share the same values. On the other hand, there are people who choose to work within an agency with the intention of acting as catalysts for change, contributing to the movement away from traditional behaviors and attitudes. Regardless of an individual's purpose when joining an agency, individuals are compelled in many ways to accept and perpetuate the well-established agency mission, especially if individuals wish to keep their jobs (Scott and Hart 1979). This acceptance occurs as the individual is indoctrinated into the culture of the agency (Brunson 1992). This indoctrination is strengthened because differences in opinion are frequently quieted or even punished, and certainly discouraged, within that culture (Scott and Hart 1979).

Our survey also included representatives of scientific and management associations and representatives of fish and wildlife agencies in all states in the U.S.; in other words, the professionals. The responses to our survey indicated that many professionals were quite convinced that hunting under almost all circumstances was the appropriate form of wildlife management, for example, "hunting and trapping are the best and most effective ways to control wildlife populations." Many felt that their responsibility was to the consumptive user: "it is our policy to provide the public access to the wildlife resource and opportunity to take wildlife." Clearly, wildlife professionals felt that traditional techniques were the best techniques available for wildlife management: "contraception may be the largest threat to wildlife management, and ultimately all wildlife species, ever devised." Some seemed concerned that "the animal welfare community spreads the word that the 'magic bullet' has arrived and hunting is no longer necessary." Along the same lines, some were concerned "that the public perceived non-lethal to mean non-harmful" where contraception is concerned. Conversely, a few supported "research into contraception as a specialized technique for wildlife which cannot be controlled by traditional, proven wildlife techniques."

One can see that the perspective that traditional, lethal techniques are vital to wildlife management is well-established and that there is limited interest in techniques that conflict with this perspective. Thus, institutional change may well be slow in coming. If we return to Wagner's model (Figure 1), it is clear that this discussion focused on one component of that model: values. Again, this is because values drive the policy formation process in natural resource management.

Let us suppose that we are able to meet the criteria for policy development, and a policy is formulated that directs the use of contraceptive tools in wildlife management. The issue of conflicting values still will not be laid to rest. Dissention over use of this technology will always exist. We predict that a minimum of three types of results will be expected from contraceptive use. These expected results could be defined as promises. These promises can be represented by the following statements: 1) contraception is a humane management technology; 2) contraception reduces the negative impacts caused by wildlife; and 3) contraception limits

population growth. False promises occur when such expectations are not produced in reality.

Contraception may or may not be perceived as a humane management tool because the procedures involved with treating an animal may cause that animal a great deal of stress. For example, a surgical procedure involves capturing an animal, tranquilizing it, performing surgery either in the field or the laboratory, and observation of the animal to ensure that it is recovering appropriately. Obviously, after such an arduous procedure, the animal may suffer large amounts of stress. The suffering endured by an individual animal may be perceived by some to be inappropriate. If contraception is to be used, it must be used in a manner that minimizes individual suffering.

Similarly, contraception is expected to reduce the negative impacts caused by wildlife. But negative impacts tend to be caused by individual animals rather than populations at large (Schmidt 1992). Thus, reducing population sizes may or may not minimize negative impacts (damage). For example, a sterile raccoon (*Procyon lotor*) may still get in the garbage, a sterile elk could compete for forage with livestock, a sterile cougar (*Felis concolor*) may kill livestock, a sterile Canada goose (*Branta canadensis*) can still defecate on a golf course, and a sterile white-tailed deer sometimes will collide with a car.

Lastly, there is the expectation that contraception will limit population growth. Current models demonstrate that sterilization of large proportions of a population is often required to produce population reduction in some species. Thus a contraceptive technique may or may not limit population growth.

In closing, we cannot predict whether contraception will meet the promises we assign to it, or if this technology will offer us only false promises. Through our speculation, we cannot predict every possible response to contraception use in wildlife management, but we believe this examination of values pertaining to contraception is a useful starting point for policy considerations of contraception use in wildlife management. At the very minimum, we believe that public and professional attitudes toward contraceptive agents and contraceptive strategies should be monitored closely and regularly. In addition, to avoid the consequences of delivering false promises, promoters of contraception use in wildlife management should be careful to explain what this technology can and cannot do.

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