Managing conflicts with beaver in the United States: an animal welfare perspective

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Abstract: As had happened earlier in Europe, the American beaver (*Castor canadensis*) was almost completely extirpated from its historic range because of human exploitation. Anywhere from 50 to 400 million beaver may have occurred throughout North America prior to the arrival of Europeans. Today, the population in the United States has recovered from unknown historic lows to a point where conflicts with humans have notably increased. The standard approach to resolving human-beaver conflicts has been to kill beaver and destroy their structures. From both an environmental as well as animal welfare perspective this approach is regarded as short-sighted. This paper addresses the issue of humane and environmentally responsible beaver conflict management, and identifies alternatives that control the problems beaver cause without necessitating their removal. It also addresses the benefits created by the presence of beaver in even highly urbanized ecosystems and details the strategy of one animal protection organization, the *Humane Society of the United States*, to educate the public about the beneficial role these animals can play.

Keywords: beaver, animal welfare, conflicts, Humane Society of the United States.

Introduction

As happened earlier in most of Europe, the American beaver (*Castor canadensis*) was nearly extirpated throughout its historic range to meet the commercial demands of the fur trade (Müller-Schwarze & Sun 2003). Beaver trapping reached such an extraordinary peak in 1700 that three quarters of the skins that had been collected in Montreal that year were burned in order to make the remaining portion worth exporting (Martin 1892). By 1800 the market had begun to play out and by the 1830s beaver were gone or becoming rare throughout their former range, with the fur trade moving on to other, more profitable sources (Ray 1987). The overexploitation of the beaver mirrored other environmental tragedies, such as the destruction of the passenger pigeon (*Ectopistes migratorius*) and near destruction of the bison (*Bison bison*), that accompanied the European colonization of the New World. The removal of beaver went beyond just the destruction of the animals, it destroyed the unique and timeless wetlands landscape they had created as well (Naiman et al. 1988).

The estimate of beaver numbers in North America prior to the arrival of Europeans has been set variously at somewhere between 50 to 90 million (Müller-Schwarze & Sun 2003) and 60 to 400 million (Seton 1929). While these can at best be educated guesses, it is certain that beaver were formerly numerous, and that wherever they occurred it is almost certain they impounded a majority of first through third order (and even some larger) streams (Naiman et al. 1988). Among the few who saw and wrote about early beaver landscapes was Morgan (1868). The Marquette and Ontonagon Railroad had blazed a trail through the wilderness near Lake Superior in the early 1800s to exploit the then recently discovered abundant iron deposits, and Morgan followed it into unaltered lands where beaver could still be found. He described in detail a countryside dotted with beaver impoundments, ranging from ponds of less than a quarter to those more than sixty acres in extent, held in

place by dams ranging from fifty to five hundred feet long. Beaver lodges, canals and meadows added additional elements to the beaver-influenced landscape, making unique ecological contributions of their own. On a continental scale, the activities of beaver undoubtedly influenced the ecological landscape of North America in ways we are only beginning to appreciate (Naiman et al. 1988, Hey & Philippi 1995, Müller-Schwarze & Sun 2003).

The current estimate for the beaver population of North America is set at no fewer than six million animals (Kwon 1997), although this figure is at best only an educated guess. The return of the species can be attributed to various protections afforded under game animal laws, direct efforts by state wildlife agencies to repatriate the animals, and the adaptability of beaver themselves. The former range into which beavers are now returning is almost wholly occupied by humans, and consists largely of floodplains along which there is always a struggle to maintain a foothold that natural events threaten to undermine. Inevitably, the return of the beaver has led to conflicts with humans, of which three general sorts can be said to occur: (1) beaver destroy trees that humans place value on, (2) they impound waters that can flood economically valuable land, structures or roads, and (3) they are associated, albeit to an undetermined extent, with potential threats to human health and safety. These concerns lead to the designation of "nuisance" beaver and the controversy surrounding whether killing or removal is either needed or warranted as the preferred management approach.

Statement of problem

Population control via the harvest of "surplus" beaver by licensed fur takers is advocated and promoted by all federal, state and provincial wildlife agencies in North America, and usually argued as the most sensible and economic way to deal with human-beaver conflicts (e.g. Novak 1987). For many North Americans, trapping is a time honored enterprise regarded as part of a noble tradition that has evolved from livelihood and avocation to, most recently, a public service activity helping to "control" population growth in animals that might cause economic damage to human interests. This viewpoint has been challenged by animal protection interests who oppose the trapping of wild animals for recreational purposes, take issue with the humaneness of trapping technologies, and question the presumption that indiscriminate population reduction can remediate human-wildlife conflicts.

The clash of differing viewpoints often takes shape within a vacuum of needed information concerning the wildlife population at issue. It may also lead to political action outside the usual ambit of wildlife management policy-making and debates that rage in the press, not the scientific journals. One current illustration of this involves beaver management in the state of Massachusetts. There, a 1996 ballot initiative took place in which the Humane Society of the United States (HSUS), the Massachusetts Society of the Prevention of Cruelty to Animals (MSPCA), and the Massachusetts Audubon Society joined in support of a proposition to ban body gripping traps (leg hold traps had been banned some years earlier). More than 60% of the public voted for this ban, with an urban majority playing a clear role in the vote's passage. The state wildlife agency vigorously opposed the trap ban and argued that the beaver population would grow exponentially without trapping control (Talbot 1998). Figures published by the state demonstrated how beaver populations could grow from two individuals to more than 600 over a decade (Jackson & Decker 1993), but failed to explain that such increases were modeled on populations into which no mortality was ever introduced. With the debate centered in the press almost exclusively on the issue of population, animal interests led by the MSPCA sought to change focus to the actual issue of controlling beaver damage. They began to work directly with local communities to facilitate installation of flow devices, such as beaver

deceivers, that prevented damage and left beaver colonies intact (Lisle 2001). This was in an effort to shift the focus away from what they felt were alarmist population projections to one in which the public understood that there were solutions to conflicts with beaver that did not involve killing and removing the animals.

The record of population changes reported by the state of Massachusetts do show growth, although the estimated increase from 18,000 in 1995 to nearly 60,000 in 2000 (Talbot 1998, Higgins 2000) seems based entirely on general approximations. No peer-reviewed estimate of population status and trends has emerged from the maelstrom of contention over beaver populations in Massachusetts, and even if it had it would not address the issue of conflicts unless it could differentiate between beaver occupancy of sites where no problems exist as opposed to sites where they do. The oft-made claim that denying the take of beaver with body-gripping traps during the recreational trapping season has allowed exponential growth to occur is, as well, argued more in principle than in fact. The one inescapable fact that does seem to emerge from the long period of debate is that far more effort and energy have been devoted to the defense of ideological ground than the physical ground on which conflicts have been occurring. Missing from the debate has been the simple explication of why all parties should be concerned about the control of beaver populations.

Beyond the debate

Concern for the welfare of beaver should be accepted as a central component of contemporary management practices because beaver are sentient beings deserving of moral consideration. At least three issues can be identified from an animal protection perspective as crucial to a discussion of this concern.

Are methods of control humane? By current standards many of the means commonly used to control "problem" beaver cause unnecessary suffering and are inhumane. While "humaneness" may mean different things to different people, there is increasing recognition in both professional and lay circles that suffering and distress can be empirically defined and measured (e.g. Mench 1993). Standards for humane death (euthanasia) as defined by organizations such as the American Veterinary Medical Association (AVMA) are one example. By criteria acknowledged by the veterinary community, then, practices such as drowning and bludgeoning have been recognized as inhumane (Ludders et al. 1999, AVMA 2001). Kill traps, deemed acceptable for "small, free-ranging mammals" (AVMA 2001), are not endorsed for animals as large as beaver, and reviews of test data on them support the general conclusion that they cannot ensure a humane death for beaver (IAFWA 1997). Gunshot, under certain conditions, and permitted injected agents are among the few techniques that could be called humane in killing beaver, if used carefully and correctly. Inhumane killing practices employed in beaver management should be discontinued, or banned.

Is control necessary? While animal welfare and protection interests traditionally have focused on the individual animal, the need to look at populations (and even ecological communities) and the ethical concerns surrounding their management are increasingly being recognized (Eggleston et al. 2003). A typical current argument for population control is that human-altered landscapes have created such provident habitat for some wildlife species that populations must be culled or reduced in order to mitigate the problems they cause for humans, for the environment, and even for themselves (Rutberg 1997, Kenyon et al. 1999). The *prima facie* assumption that a linear relationship exists between the abundance of an animal species and the economic and other damage it causes has been challenged and found lacking (Hone 1996), even though at face value this notion has an apparent logic. It would now be a good time to begin to examine other "apparent logics" in wildlife management, such as the widely held belief that only regulated trapping by fur harvesters will control beaver populations (e.g. Langlois 1994).

Today, most "control" of problem-causing beaver is almost certainly accomplished by lethal means, but no accurate estimate of the extent of this can be given since few states keep records or track the taking of nuisance beaver. The U.S. Department of Agriculture's Wildlife Services, the only federal wildlife damage control agency, reported killing 29,312 beaver in 34 different states in 2001, the only centrally reported figures available for the taking of "nuisance" beaver. The numbers taken ranged from 1 to 5,410 animals, with a mean of 862 and a standard deviation of 1,511 (USDA 2002). Such variability suggests that either beaver problems are varying enormously from state to state or that beaver control programmes are not being administered in anything approaching a well-grounded and systematic set of operational practices. Even where body counts are published, nothing seems to be known of the consequences of management actions, how much nonlethal control has been attempted, or the timing or extent of recurrence of problems at sites where control occurred. In short, no agency or group seems able to unify biological and ecological information with administrative information to produce a consistent and meaningful overview of beaver management.

Would alternatives provide greater benefits? The environmental benefits that might result from beaver presence and activity are fairly well known, if not fully appreciated. Substantial lists of ecological "services" ranging from water storage to increased resistance to ecosystem perturbation (Naiman et al. 1988, Hammerson 1994, Kwon 1997) testify to the potential role beaver and the wetlands they create and maintain might play in promoting ecosystem health. Further, some researchers now argue that were beaver allowed to reclaim all or even just some of the floodplains that delineate their usable habitat, they might do so to the general benefit of humans. Hey & Philippi (1995) have analyzed flood events in the Upper Mississippi River Basin with an eye toward the role beaver impoundments might have played in the past in mitigating flood events. Their analysis shows in principle that the effect could have been significant. Estimating the original storage capacity of beaver ponds at 11% of the watershed and wetlands at 10%, they calculate that the 26 million acres of wetlands lost since colonization could have easily accommodated the 111 million acre-feet of water that passed through St. Louis in 1993, creating many millions of dollars in damage.

Donald Hey (personal comunication) has also estimated the potential for retiring agricultural land from production, the same lands that were drained in the 1800s, and allowing them to serve as mitigation "banks", principally to capture, store and process nitrogen generated by agricultural activities. The potential benefits could be considerable, given the staggering environmental problems facing the Mississippi River drainage that arise from agriculture (Turner & Rabalais 2003). It is obvious for advantages such as this to even be considered, a broad, multidisciplinary, multi-jurisdictional systems management concept has to be put into play. Attempting to do so within the context of traditional beaver management policies would be unwieldy at best, and perhaps impossible.

Discussion

A combined humane and environmental perspective represents the most realistic and practical basis from which to approach the future of beaver management. Education should play a significant role in such an approach. Since 1997, the HSUS, working with various partners, has sponsored a national programme of educational workshops that emphasize the integration of information on beaver biology and ecology with the contemporary and practical aspects of nonlethal ways to solve human-beaver conflicts. A total of eight workshops in seven different states have begun, albeit slowly, the process of promoting better public awareness about alternatives. The HSUS can not, and should not, be the only group organizing such events.

The key to future human-beaver interactions

will not reside in the advocates who call for change without attempting to understand what that change would mean nor the traditional interests that resist change without admitting that it is already upon them. The future of beaver management will lie in new perspectives generated from a better understanding of these animals, their populations, their communities, and the ecosystems of which they are a key part. Animal welfare interests cannot expect or demand that every human-beaver conflict be resolved by nonlethal means, only that they be resolved humanely. They might expect, or demand, that the full benefit of having beaver present at any individual site be weighed before control is authorized; that the time it might take for a site to be reoccupied given weight in management recommendations to avoid recurring cycles of control; and that the most contemporary and effective means of nonlethal conflict resolution be employed before lethal control is authorized. On their side of the debate, animal interests should be more open to discussing the "ecocentric" aspects of management (Eggleston et al. 2003) and aware of the complex interplay between species, their ecological associates, and what could be called their welfare state. On the opposing side, almost exactly the same could be said, adding as well that it is important for traditional wildlife managers to acknowledge the importance of giving beaver moral consideration for and of themselves.

Conclusions

A considerable agenda remains to be addressed on the possible future of beaver management, especially as this relates to our urban and suburban environments. We must have a better understanding of the relationship between population management and resolution of human-beaver conflicts in order to devise optimal strategies. We must devise ways to keep humans out of flood plains to maximize the environmental benefits of these ecologically critical areas. We must approach beaver as an issue involving environmental management as much as one of animal management. To do so can lead to environments that benefit humans as well as beaver, and the myriad of other living things that comprise their community associates.

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Samenvatting

Het oplossen van problemen met bevers in de Verenigde Staten: gezien vanuit het oogpunt van dierenwelzijn

Zoals eerder al gebeurde in Europa, was ook de Amerikaanse bever (*Castor canadensis*) bijna geheel uitgeroeid in het gebied waar deze soort in historische tijden voorkwam. Vóór de komst van de kolonisten uit Europa leefde er een groot aantal bevers in Noord-Amerika, ergens tussen de 50 en 400 miljoen individuen. De beverpopulatie in de Verenigde Staten heeft zich na een historisch dieptepunt - de precieze aantallen zijn onbekend - hersteld tot een niveau waarbij de conflicten met mensen aanzienlijk zijn toegenomen. De standaardaanpak voor het oplossen van deze conflicten was en is nog steeds het doden van bevers en het vernietigen van hun bouwsels. Bezien vanuit het oogpunt van het milieu en dierenwelzijn is dit een kortzichtige benadering. Dit artikel gaat in op de mogelijkheden voor een milieuvriendelijk beverbeheer waarbij ook rekening gehouden wordt met het welzijn van bevers. Alternatieve methoden voor het oplossen van problemen bij het beheer van bevers worden voorgesteld; alternatieven die niet noodzakelijkerwijs neerkomen op het verwijderen van bevers. Ook worden de voordelen aangegeven van de aanwezigheid van bevers, zelfs in ecosystemen die sterk zijn verstedelijkt. Het artikel beschrijft de strategie die één van de organisaties voor de bescherming van dieren, de *Humane Society of the United States*, hanteert om het grote publiek op de hoogte te brengen van de nuttige rol die bevers in ecosystemen kunnen spelen.

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