

DEER MANAGEMENT ISSUES

BAITING / SUPPLEMENTAL FEEDING

A. DISEASE

1. In Michigan, where bovine Tuberculosis (TB) exists in wild deer and elk, scientists believe that the maintenance of bovine TB in white-tailed deer is directly related to supplemental feeding/baiting and the increased focal densities these practices create (Schmitt et al. 1977). The unnatural circumstances of supplemental feeding promote inhalation of bovine TB bacteria or consumption of feed contaminated with the bacteria from animals coughing and exhaling (Schmitt et al. 1997).

2. Although it is difficult to attribute the spread of disease to deer density alone, some disease problems occur more commonly in areas of high density (Eve 1981), such as might occur with baiting.

3. The evidence that deer baiting causes the spread of diseases is well documented (McCaffery 2000, Mich. DNR 1999).

4. Large quantities of grain, or the sudden ingestion of feed high in carbohydrates without acclimation results in acidic conditions in a deer's rumen (stomach). This kills the bacteria necessary for digestion and causes bloating, diarrhea, enteritis, and in extreme cases death. The visible affects on deer include lameness, arthritis, and a decrease in appetite (Lyons 2000). This condition reportedly occurs yearly in Michigan (Mich. DNR 1999). During a severe winter in Saskatchewan 30% of the deer found dead near cattle feedlots were diagnosed with lactic acidosis (Wobster and Runge 1975). Deer have been found dead and suffering due to this condition in Wisconsin, but the widespread affect is not known (Langenberg 2001).

5. Tuberculosis, a bacterial disease of the respiratory system, can be injurious to deer, cattle and humans (Hyde 1998, Schmitt et al. 1997).

6. Aflatoxin are extremely toxic chemicals produced by two molds, *Aspergillus flavus* and *Aspergillus parasiticus*, which are widely associated with moldy corn. Aflatoxins can lower deer reproduction and cause mortality of wild turkey, quail, songbirds and mourning doves (Davis 1996).

7. Despite supplemental feeding, wildlife populations may exhibit poor physical condition and experience malnutrition if their numbers grow to exceed the amount of nourishment provided by the supplemental food. As examples, white-tailed deer on Long Island in Lake Winnepesaukee, New Hampshire, and on Monhegan Island, Maine, were in much poorer condition than mainland deer, even though both island deer populations were supplementally fed by residents (Lavigne and Dumont 1996, Weber 1997). Supplemental feeding does not prevent malnourishment - it just increases the population size at which malnourishment occurs (Pekin and Tarr 1997).

8. Perhaps the best cumulation of arguments against supplemental feeding was most recently produced by the Wildlife Management Institute (Williamson 2000). In this easily readable and well-referenced brochure, Scott Williamson, formerly a biologist in Texas, states, "When and where such feeding is done, it is undertaken only, if not expressly-for the interest of people, because fed animals almost invariably will not benefit and will very likely be harmed by the practice."

9. The provision of food to wildlife has been implicated widely as a causative factor that increases the occurrence of infectious disease. Animals are attracted to artificial sources of feed in higher density than normally occurs under natural conditions (Thorne and Herriges 1992, Williams et al. 1993, Fischer et al. 1997). As animal density increases, competition for food also increases resulting in more frequent contact among individuals (Baker and Hobbs 1985, Schmitt et al. 1997). Contact can be direct through physical contact, or indirect as occurs when two animals share the same portion of food. If one or more animals are harboring an infectious organism or prion, its transmission to uninfected individuals is facilitated by the increased frequency of contact among animals

congregating at the feeding site (Miller et al. 1998, Michigan Bovine TB Eradication Project 2002). It is also suggested stress from crowding reduces immunocompetence in some animals, increasing the likelihood of disease (Smith and Roffe 1994, Smith 2001). Disease can affect individual animals, populations, or communities. Depending on the nature of the disease and the feeding location, disease can be transmitted within or between species (Schmitt et al. 1997, Smith 2001), between wildlife and domestic animals (Thorne and Herriges 1992), or even between wildlife and humans (Rupprecht et al. 1995). Non-infectious disease also can occur when wild species are fed foods incompatible with their digestive function (Wobster and Runge 1975), foods of poor nutritional quality (Ohio Wildlife Center 2000), or spoiled foods that have become toxic (Perkins 1991, Davis 1996, Breed 2002).

10. High concentrations of deer around feeding and baiting sites facilitate disease transmission through increased animal-to-animal contact and possibly through contamination of feed (Palmer et al. 2001, Schmitt et al. 2002).

11. In Fort Collins, Colorado, artificial feeding by private citizens is believed to have contributed to the infection of 49 free-ranging cervids with chronic wasting disease (Spraker et al. 1997). Experimental and circumstantial evidence suggests infected animals probably transmit the disease through animal-to-animal contact, and through contamination of food or water sources with body fluids (saliva, urine) and feces (Williams and Young 1980, Miller et al. 1998) Further, conditions of high animal density or confinement can create conditions where transmission of CWD occurs at a faster rate than under natural conditions (Miller et al. 2000).

12. White-tailed deer receiving artificial feed in Maine have suffered from outbreaks of demodectic mange caused by the spread of mites while at feeding stations (Maine Department of Inland Fisheries and Wildlife 2002, see www.state.me.us/ifw/hunt/deerfeed.htm).

13. Winter feeding of white-tailed deer can lead to starvation of some individuals if the feeding delays the migration of deer to their winter yards, or if artificial feeding is terminated abruptly (Ozoga and Verme 1982).

14. Recent epidemiological research suggests that baiting and feeding of deer enabled the TB outbreak in Michigan to persist and spread and that declines in TB prevalence were associated with a ban on baiting and feeding (O'Brien et al 2002).

B. HABITAT

1. Lewis (1990) suggests that although improved physical condition and reproductive success are generally perceived as beneficial effects of artificial feeding, they may prove detrimental in the long term. This is because, as physical condition and reproductive success improve, population growth will eventually exceed the carrying capacity of the range.

2. Over many years, the composition of a community can change markedly - plant and animal diversity is reduced, and plant abundance declines (Casey and Hein, 1983; DeCalesta, 1994). The ability of a habitat to support animal life, its carrying capacity, is diminished (Doenier et al., 1997; Williamson, 2000).

3. Casey and Hein (1983) studied the effects of 27 years of artificial feeding of ungulates on the community structure of an eastern deciduous forest. Populations of white-tailed deer, elk and mouflon sheep (*Ovis musimon*) were maintained at higher densities in feeding areas than in neighboring areas where artificial feeding did not occur. Further, the amount of understory was decreased, little ground cover remained, trees were larger, and there were an increased number of dead trees in feeding areas.

4. Doenier et al. (1997) studied the browse pressure exerted by deer around artificial feeding sites. The effects of over-browsing, such as loss of plant species and increases in less desirable plant species, were seen within a one mile radius of feeding sites.

5. Weeds contained in the feed at artificial feeding sites and seeds deposited in the area by birds, animals, or wind, threaten the integrity of a community. If the invading plant species have a high rate of reproduction, means of

dispersal, and disturbed areas caused by over-browsing, biological invasion is a distinct possibility (Spurrier and Drees, 2000). This possibility has been recognized in numerous areas of Saskatchewan and Manitoba where exotic plant species appear to have been introduced into communities through baits used for ungulates.

6. In many instances, large-scale feeding efforts have created feed-dependent populations existing in numbers that exceed the carrying capacity of their environment (Ozoga and Verme, 1982; Ontario Ministry of Natural Resources, 1997 - see www.mnr.gov.on.ca/mnr/pubs/deer2.pdf; Williamson, 2000). Ozoga and Verme (1982) noted that biomass and plant species composition were negatively impacted after 4 seasons of concentrated foraging by an expanding, supplemented deer population.

7. Despite the age of this report, many of the issues identified in this study remain relevant today. The authors recommend that priority be given to habitat restoration and maintaining deer within the carrying capacity of the environment over supplemental feeding. Supplemental feeding is identified as costly from both a financial and ecological perspective. This study is a key piece of research cited by many researchers today (Doman and Rasmussen, 1944).

8. Supplementally fed deer and elk never totally disregard native forage, and artificially abundant big game populations tend to overbrowse native vegetation severely (Doenier et al., 1997; Murden and Risenhoover, 1996; Schmitz 1990).

9. Mule deer and elk in the West and white-tailed deer in the East have stripped habitats of all available food when populations "irrupted" because of supplemental feeding (Cheatum, 1956; Doman and Rasmussen, 1944; Weigand and Mackie, 1985; McShea et al., 1997; McCullough, 1997).

10. Supplemental feeding of white-tailed deer on rangeland does not affect home range sizes of the animals, although activity within the home range may be altered. Intensity of browse use was greatest near the feeders. Deer tend to select for the better quality plants so range depletion around feeders may be expected. Supplemental feeding of white-tailed deer on rangeland had little effect on total home range sizes of the animals. For females, but not males, access to supplemental feed resulted in smaller core area size. Bioassay of feeding activity using arrays of seedlings around feeders and control sites shows that intensity of browse use is greater near feeders. Deer tend to feed selectively. Concentrated browsing on preferred plant species will lead to range depletion in the vicinity of deer feeders (Cooper et al., 2000).

11. Deer baiting may affect surrounding habitats. Examples of negative habitat changes are the severe damages that have occurred in Michigan, resulting in changes in tree species composition, retarded forest regeneration, and delayed development of stands (Michigan Department of Natural Resources, 1993).

12. Due to increased recruitment, supplemental feeding may make it difficult to maintain deer populations within limits of the habitat carrying capacity. Maintaining deer numbers within habitat carrying capacity is probably the most effective means of reducing density dependent problems (Davidson, 1981).

C. NON-TARGET SPECIES

1. Eastern songbirds have been negatively impacted by abundant deer populations (McShea and Rappole, 1997).

2. The vegetation in an area also may be changed to plants less nutritious and desirable to animals that otherwise would share the habitat (Murden and Risenhoover, 1996).

3. We tested the hypothesis that supplemental feeding of deer on rangelands may negatively impact populations of wild turkeys and other ground nesting birds by concentrating potential nest predators, such as raccoons and skunks, near feeders. Each April for 3 consecutive years, we monitored the survival rates of 200 artificial nests (consisting of 3 chicken eggs per nest) placed in 4 areas with and without supplemental deer feed. Ground nests in the vicinity of feeders were at greater risk of discovery by predators (86%) than were nests in areas where supplemental feed was not available (58.5%). During 1999 we again observed higher predation rates at sites with

feeders. Raccoons and striped skunks were the most abundant nest predators. We recommend that managers concerned with wild turkey and quail production should avoid placing deer feeders in nesting habitat and/or should cease supplemental feeding during the nesting season (Cooper and Ginnett, 2000).

4. Clark et al., (1996) warned that increased nutrition of predators through supplemental feeding could lead to increased productivity, survival and, ultimately, increased populations of predators in the habitat.

5. Neal Wilkins found that 40% of a sampling of 100 bags of deer corn sold in Texas last year (2000) had levels of aflatoxin that were illegal, and 20% had levels that would be toxic to birds and other non-target species, as well as deer if consumed over a long period of time.

6. Deer feeders attract a host of non-target species, including livestock, raccoons, skunks, ringtails, foxes, opossums, porcupines, squirrels, rabbits, hogs, javelinas, turkeys, and numerous songbirds (Rollins, 1996).

7. In our case, (referring to a research project in Texas evaluating the relationship between supplemental feeding and nest predation) hair traps and cameras showed that predators attracted to both the feeders and artificial nests were also the predators most responsible for predation on natural turkey nests (Miller and Leopold, 1992).

8. Wild Rio Grande turkeys typically nest within 400m of water and 840m of tall roosting trees (Ransom et al., 1987). Similar habitat also is attractive to raccoons (Rabinowitz and Pelton, 1986). Placing deer feeders at such sites is likely to attract raccoons and other nest predators and increase predation pressure on turkeys and other ground-nesting birds.

9. Competition among species for limited resources often increases as the density of animals increase in a feeding area (Williamson, 2000).

10. Casey and Hein (1983) investigated the effect of long-term supplemental feeding of white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), and mouflon sheep (*Ovis musimon*) upon co-existing bird populations in a deciduous forest community. This study provides strong evidence that supplemental feeding affects biodiversity. High concentrations of ungulates around feeding sites alter the local habitat which, in turn, leads to changes in the species composition of co-existing bird populations.

11. DeCalesta (1994) investigates how increases in white-tailed deer (*Odocoileus virginianus*) density, as a result of supplemental feeding, have affected songbird abundance and diversity. His results indicate that intermediate canopy-nesting songbirds begin to decrease in abundance at a threshold deer density of between 7.9 and 14.9 deer/km². In addition to the decline in bird numbers, there was a progressive loss of tree species that resulted in habitat fragmentation and reduced biodiversity.

D. HUNTER SUCCESS

1. A 1999 Michigan phone survey of deer hunters revealed that 44% were successful using bait while 52% were successful without bait (Michigan Department of Natural Resources 1999)

2. A 1984 survey (Langenau et al., 1985) found Michigan hunters using bait were no more effective in harvesting deer (2.4 deer per 100 hunter days) than those who did not use bait (2.2 deer per 100 hunter days).

3. A 1993 Wisconsin survey indicated hunting with bait did not increase success rate. During the 1992 gun season, 50% of hunters who used bait harvested a deer while 54% not using bait harvested a deer (Wisconsin Bureau of Wildlife Management 1993).

4. A survey in Michigan found that firearm hunters using bait required approximately the same time to harvest a deer than non-baiters (8.3+ 3.3 versus 7.4+ 2.5 deer/100 days) (Frawley, 2002).

E. DEER MOVEMENT PATTERNS

1. Research has consistently shown that artificially feeding deer alters their natural foraging behavior, which results in changes in deer movement and distribution patterns (Schmitz, 1990). One behavior change frequently observed with deer baiting is increased nocturnal activity (Charles, 1993). A study of captive deer in Michigan documented that a majority of feeding at supplemental food sources occurred at night, and daytime feeding was almost nonexistent (Ozoga and Verme, 1982). In Texas a controlled study of similar baited and non-baited hunting stands indicated the use of baited stands by deer became more nocturnal as the hunting season progressed (Wegner, 1993). It was also noted that deer, especially mature bucks, learn quickly to avoid baited sites during daylight hours. Incidentally most of the bucks (77%) harvested from baited stands were yearlings. A Mississippi study also reported that the daylight activity of bucks decreased as the number of bait sites increased (Wegner, 1993).

2. Garner (2001) monitored 160 radio-collared deer for 2 fall/winter periods in northern Michigan and documented their behavior over feeding sites using both telemetry and direct observations. He demonstrated that, relative to natural forage, supplemental feeding caused reduced home range sizes, increased overlap of home ranges in space and time and dramatic concentrations of activity around feeding sites.

3. Drs. Tim Ginnett and Susan Cooper, studying deer behavior recently at the Uvalde, Texas Experiment Station, found that deer with feeders had a core area of only half the size (133 acres) of those with no feeder (247 acres). They concluded that supplemented deer still browse, use portions of their home range more intensively, and could cause habitat deterioration near the feeders.

4. Increased nocturnal activity has been attributed to deer baiting in Texas (Synatzke, 1981).

5. A Mississippi study noted that 90% of bait station use by bucks was during non-legal shooting hours and over 84% of total use occurred during darkness (Jacobson and Darrow, 1992).

6. In areas dominated by small land ownerships, baiting affects surrounding landowners and hunt clubs by changing deer movements. Adjoining clubs may attempt to "hold deer" on their property (Georgia Department of Natural Resources, 1992). Baiting on public lands is detrimental because it creates hunter conflicts.

7. The spatial distribution of animals can be altered so that population density is significantly increased in the vicinity of the food source (Boutin, 1990; Schmidt and Gossow, 1991; Easton, 1993; Tarr and Perkins, 2002). As animals converge toward focal food sources, their normal daily or seasonal movements can be disrupted (Baker and Hobbs, 1985; Lewis, 1990; Paquet, 1991; Fersterer et al., 2001).

F. SOCIETY AND ETHICS

1. Citizens of the United States, the majority of whom do not hunt, are increasingly skeptical of hunters who tilt the tables too far in their favor. Recreational hunting is supported by the majority of society, (Duda and Young, 1998) but only when hunter behavior is legal and ethical, and hunting itself does not unreasonably compromise the animals' instinct and abilities to avoid or elude their pursuers.

2. Our Constitution established a Public Trust Doctrine, born of English Common Law, wherein natural resources, which were "too important to be owned" belonged to all of us, including navigable waters, scenic and historic sites, and wildlife (Williamson, 2000).

3. David Langford, Director of the Texas Wildlife Association states, "Once animals are dependant on their de facto owners for their nourishment, the principles of wildlife management have been replaced by those of animal husbandry." And, "The more like animal husbandry that wildlife management becomes, the less defensible hunting becomes."

4. One basis for opposition to baiting deals with ethical judgement. Survey respondents opposed to baiting felt baiting was unethical or baiting decreased the quality of deer hunting in Michigan (Minnis and Peyton, 1994). Because of this view, baiting lends ammunition to anti-hunting groups (Kammermeyer and Thackston, 1995).

Animal rights activists argue that hunters are only interested in the kill and that limited broken habitats make hunting about as challenging as shooting fish in a barrel (Georgia Department of Natural Resources, 1992).

5. Fair chase is a set of hunting conditions in which the individual judges the taking of prey as acceptably uncertain and difficult for the hunter (Peyton, 1998). Fair chase issues draw attention of non-hunters to the baiting controversy. Non-hunters' perceptions of hunter behaviors can also create a poor image of those who participate in or allow the practices, and thus erode the credibility of the agency and its hunting constituents (Peyton, 1998). In a 1994 telephone survey of random households, 58% of non-hunters considered deer hunting with bait to be unacceptable (Peyton and Grise, 1995).

6. Past attempts at emergency feeding by the Michigan Department of Natural Resources sent the wrong message to the public and reinforced erroneous ideas about deer management (Michigan Department of Natural Resources, 1999). People mistakenly thought that deer could be stockpiled beyond the carrying capacity of the range.

7. Citizens who recreationally feed wildlife tend to start assuming ownership of the animals in their area and may become inclined to oppose the hunting of "their" animals (Williamson, 2000).

8. Supplemental feeding to increase numbers of deer available for harvest or to improve antler development to increase potential of trophy harvest has many of the same negative perception issues contained within the baiting issue. Supplemental feeding creates conflict between proper management of a state resource to provide ecological benefits and a variety of social needs versus a policy to provide wildlife-related recreational opportunities (Michigan Department of Natural Resources, 1999).

9. United States citizens, the majority of which do not hunt, are increasingly skeptical of hunters who create unfair harvest situations. Society is well served by regulated, ethical hunting. However, supplemental feeding perceive as increasing deer mainly for hunters tends to reduce public support for all hunting and, more importantly, for wildlife management in general (Williamson, 2000).

10. Some hunters and many non-hunters think that hunting over bait is too easy and "unfair" to animals (Lamport, 1996; Michigan Department of Natural Resources, 1999). This practice goes against the principles of "fair chase", a set of hunting conditions that advocate fair hunting requires the taking of prey as acceptably uncertain and difficult for the hunter (Posewitz, 1994; Peyton, 1998). Non-hunter perceptions of "unfair" hunting behaviors can also create a poor image of those who participate in or allow the practice and, as a consequence, erode credibility of the agency and its hunting constituents (Peyton, 1998).

11. A 1998 survey indicated 64% of Mississippi hunters opposed hunting deer over bait. A 2001 survey of Mississippi deer/turkey license buyers indicated 63% of respondents were opposed to a change in hunting regulations that would allow hunting deer over bait (Mississippi Department of Wildlife, Fisheries and Parks, 2001; see <http://www.mdwfp.com/wildlifeissues/articles.asp?vol=6&article=54>). Of these respondents, 67% agreed that hunting over bait negatively influences non-hunter attitudes towards hunting, and 65% agreed that hunting over bait is not considered fair chase.

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