A comparison of falconry and hunting with guns with respect to the distribution of local game

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Source: Wildlife Biology, 14(1) : 125-128

Published By: Nordic Board for Wildlife Research

URL: https://doi.org/10.2981/0909-6396(2008)14[125:ACOFAH]2.0.CO;2

SHORT COMMUNICATION

Short communication articles are short scientific entities often dealing with methodological problems or with byproducts of larger research projects. The style is the same as in original articles

A comparison of falconry and hunting with guns with respect to the distribution of local game

Viktor Šegrt, Robert Kenward, Marijan Grubešić & Petar Silić

Šegrt, V., Kenward, R., Grubešić, M. & Silić, P. 2008: A comparison of falconry and hunting with guns on local game and its distribution. - Wildl. Biol. 14: 125-128.

This study compares the impact of falconry and shooting in the same area on game and its distribution. We initiated a short-term assessment to test the hypotheses that falconry is more efficient than hunting with guns and that flying with birds of prey results in less game available for the gun. Rates of encountering and killing prey were compared for a hunting party with five goshawks and, one week later, a hunting party with five guns on the same land in Croatia. Encounter rates of game were similar for hunting with hawks (112 game flushed) and with guns (110 game flushed) one week later. However, the kill rate was higher when hunting with guns (40 game killed out of 110 flushed, 36%) than when hunting with goshawks (9 game killed out of 112 flushed, 8%). Our preliminary study thus suggests that falconry can contribute recreational and financial value to local communities as a complement to shooting, because it does not extract a large number of game animals or reduce the number of game animals available to gun-hunters.

Key words: bag size, falconry, goshawk, gun-hunting, sustainable use

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Received 20 March 2006, accepted 4 January 2007

Associate Editor: John W. Connelly

Falconry has a long and rich history as a traditional way of hunting and it is part of the cultural heritage for European and Asian civilisations. The earliest writing suggesting the practice of falconry is a Chinese description dating from about 700 BC (Xaodie 2005), although a tame hawk is depicted on a fist in a bas-relief from Khosabad dated from around 1700 BC (Harting 1891). Furthermore, falcons were apparently given as presents to Chinese princes of the Hiu dynasty around 2200 BC (Rito 1808 cited in Glasier 1978). The first indisputable evidence of the sport is provided by records of trained hawks introduced from China to Japan in 244 AD (Jameson 1962). Falconry arrived in Europe during Roman times with the Vandal tribes (Lindner 1973) and gave rise to Arabic treatises from the 8th or 9th century AD (Allen 1980). Falconry also played an important role in the conservation of birds of prey in many countries (Cade 2000, Fox 1995, Kenward 1976, 2004), including reintroduction of the goshawk *Accipiter gentilis* to Great Britain, and conservation of the Mauritius kestrel *Falco punctatus*, Californian condor *Gymnogyps californianus* and peregrine falcon *Falco peregrinus* (Cade 1986, Saar 1988, Jones et al. 1994, Wallace 2001).

In countries in which the majority of hunting-grounds are leased by the state to hunting clubs, access for falconers to hunt and train birds is often scarce. Clubs may refuse to admit falconers in Croatia although falconry is a traditional and legal way of hunting there, because of the concern that falconers could scatter game during training and the belief that a trained hawk catches an excessive number of animals every time it is flown. If falconry is to contribute maximally to game conservation through sustainable use of wild resources, within the remit of the Convention on Biological Diversity (Webb 2002, Kenward 2004), misunderstandings about the sport must be addressed. Unfortunately, no study has compared the ecological impact of falconry and shooting in the same area, or assessed the effect of flying hawks before shooting on the distribution of game. Thus, we initiated a short-term assessment to test the hypotheses that falconry is more efficient than hunting with guns and that flying with birds of prey results in less game available for the gun.

Material and methods

We conducted this study in two 3-day periods on the private hunting ground and small game breeding site of Zelendvor, near the town of Varaždin in northwestern Croatia, in the area where Lord Marko Bombelles first successfully bred pheasants *Phasanius colchicus* in captivity and released them for hunting in Croatia in 1870 (Janječić 2004). Pheasants, partridge *Perdix perdix* and quail *Coturnix coturnix* were common in our study area and were also pen-raised and released. Hare *Lepus europaeus* and rabbit *Oryctolagus cunniculus* were also relatively abundant.

During the first three days, five falconers with trained goshawks and four trained bird-dogs participated in the hunt from 09:00 to 16:00 hrs. Falconers moved in a line, about 20 metres apart while four dogs searched the terrain in front. When one of the dogs stopped and pointed a game animal, a falconer would approach the dog, signal it to flush the game and then release his bird. Only one hawk was released at a time.

Following a successful flight, the hawk would be removed from the prey and secured to the glove, with the prey placed in a bag before the hunt continued. The falconer whose hawk killed the bird waited for the other four falconers to use their birds before releasing his again. While hunting with goshawks, we recorded the number of times dogs marked the location of game, number of game flushed after marking, successful flight of a hawk (resulting in a kill), unsuccessful flight, and refusal by the hawk to hunt after the game was flushed.

A 3-day hunt with guns and bird-dogs occurred one week later in the same study area. Again, five hunters and four dogs participated. Hunters moved in a line, about 20 metres apart. When one or more dogs stopped and pointed a game animal, the hunters would approach the dog and signal it to flush the game. If more than one animal was flushed, more than one hunter would shoot at the game at the same time. While hunting we recorded the number of times dogs marked the location of game, number of game flushed after marking, successful shooting (resulting in kill), unsuccessful shooting, and the number of times that no shots were fired because shooting would endanger other hunters.

Results

During the three days of hunting with goshawks, dogs located game on 59 occasions and a total of 112 game birds and hares were flushed (Table 1). Nine flights out of 34 were successful, without significant differences in success among prey species (Pair-wise Fisher Exact tests: $P > 0.12$). During hunting with

Table 1. Numbers of hunting opportunities, game hunted and hunting efficiency during three days for trained hawks and a shooting party a week later in the same area.

Type of hunting	Number of times game was located	Occasions (%) when hawk flew/gun fired	Successful flights or shooting (%)	Total number of game flushed	Number killed as a proportion of number flushed				
					Pheasant	Partridge	Quail	Hare	Overall
Falconry	59	34 (58%)	9 (15%)	112	7/67	0/25	2/9	0/11	9/112 (8%)
Shooting	48	33 (69%)	23 (48%)	110	23/73	6/14	4/12	7/11	40/110 (36%)

goshawks only nine of the 112 flushed prey species were killed, resulting in an overall success rate of 8%.

During the three days of hunting with guns, dogs located game 48 times and a total of 110 small game animals were flushed, 40 of which were killed (see Table 1). Again there was no significant difference in success among different prey species ($\chi^2 = 3.06$, $df = 3, P > 0.3$). However, the overall success rate was 36%, some 4.5 times greater than when hawks had been flown ($\chi^2 = 24.27, df = 1, P < 0.001$).

Goshawks refused to chase prey on 25 (42%) of 59 occasions (see Table 1). Refused flights were not significantly more frequent than the 15 times (31%) when shots were not fired because they would have endangered other hunters ($\chi^2 = 0.96$, $df = 1$, $P > 0.3$). However, game was killed on 23 (70%) of 33 occasions when guns were fired, whereas hawks killed in 9 (26%) of 34 flights ($\chi^2 = 10.87$, $df = 1$, $P < 0.001$). Overall, falconers were significantly less successful than hunters with guns ($\chi^2 = 11.896$, $df = 1, P < 0.001$).

When game was hunted with guns a week after hunting with falcons, game animals were encountered on 11 fewer occasions (48 vs. 59). However, only 2% fewer prey individuals were found by gun-hunters (110) than falconers (112). Therefore, although some individuals were removed by hawking, there was no significant reduction of game animals available for gun-hunters.

Discussion

There is little published information available that compares falconry and gun-hunting. Kenward and Gage (in press) assessed the ecological impact and economics of hunting Scottish red grouse *Lagopus lagopus scotticus* with falcons and guns. When grouse were driven by beaters over a line of concealed guns, hunters typically shot about 25 grouse per day, with the landowner receiving € 100-200 per grouse. In areas where grouse were shot by hunters walking with dogs, each hunter might kill 10 per day, and the landowner would gain € 27-40 per grouse. In comparison, falconers on one estate paid the landowner € 65 per grouse, but each caught only 0.3 grouse per day.

The 26% success rate for falconry we recorded was similar to that reported by other researchers on woodpigeons *Columba palumbus* and game birds (Kenward 1978, Fox 1981). Although individual trained hawks have achieved success rates as high as 50-60% (Fox 1981) in attacks on moorhens *Gallinula chloropus* and rabbits, this still remains below the 70% recorded for shooting in this study.

Our preliminary study suggests that falconry can contribute recreational and financial value to local communities as a complement to shooting, because it does not extract a large number of game animals or reduce the number of game animals available to gun-hunters. Moreover, wastage is minimised in falconry because no animals are wounded without being harvested (Fox 1995). If it is necessary to create a zone of low-intensity hunting in the vicinity of protected areas (Roberts et al. 2002), or areas where sparse game would not sustain a large harvest, falconry seems very appropriate (Kenward & Gage in press). Falconry can also have value in areas where use of firearms is potentially hazardous to humans or structures (Saar et al. 1998) if hunting is desired in these areas.

Our study was limited in scope and it was conducted without replication. As such it provides some tentative conclusions and guidance for future work. A more detailed study with replicated study areas and hunting periods would allow a better understanding of this issue and provide game managers with more compelling data on which they can base management decisions.

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