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THE IMPACT OF LETHAL CONTROL AS A REINFORCEMENT TECHNIQUE WHEN DEPLOYING IBSC BEST PRACTICE STANDARDS ON AN AERODROME

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ABSTRACT

IBSC best practice standard 4 recommends that; "staff should have access to appropriate devices for the removal of birds/wildlife…" This paper discusses how carefully targeted removal of birds significantly increased the effectiveness of non-lethal active bird control on a European aerodrome. Lethal control, in combination with blank shot, was initially tested at two UK landfill sites to remove any risk of increased bird activity in an airfield environment. Deployment under a 7 days a week, daylight hours regime was implemented at one site and deployment under a 5 days a week, operational hours regime was implemented at the other. Measurements of the number of birds removed and overall numbers of birds present were recorded. Daylight hours 7-days a week control minimised both the number of birds shot and the number of birds present. This regime was therefore implemented alongside a suite of non-lethal bird control measures at a European aerodrome. The number of birds shot and number of birds struck by aircraft were then analysed. The integrated system dramatically improved following the inclusion of lethal reinforcement. Lethal control, used sparingly, and as a reinforcement to more traditional techniques, is highly effective at increasing the response rates of birds to deterrence effort.

Key words: IBSC Best Practice, Shooting, Reinforcement, Control, Gulls, Management, Airfield.

INTRODUCTION

An array of deterrence techniques are available to reduce the problems associated with congregations of birds in a variety of environments (Aylward, 1995; McDonald, 2001; Bomford & Sinclair, 2002; Baxter & Allan, 2006). The effectiveness of some techniques varies between location and can diminish with time (Baxter & Robinson, 2007). Any reduction in the response of birds to a technique following repeated stimulation (habituation) can be problematic when attempting to control birds in an airfield environment. Blank firing pistols, gas cannons and rope bangers, for example, which deter birds with a loud acoustic report often suffer from habituation (pers obs) perhaps because birds are able to confirm there is no physical risk associated with the measures being deployed (Bomford & O'Brien, 1990). Similarly, distress calls, one of the primary tools used for deterring birds from airfields may also suffer

the same fate (Baxter et al., 1999). Active bird controllers therefore need to ensure that they use the tools and techniques they have according to manufacturers best practice instructions. Techniques need to be routinely varied and not over used. In the event that birds or other wildlife are continually being attracted to an airfield, however, effective control may require continuous use.

Lethal reinforcement may therefore help reduce the level of habituation that occurs when systems need to be deployed continuously. This does not suggest that eradication of a problem species is required. The legal status of wildlife varies between countries and the use of live rounds is often banned. Within the European Union, all birds are protected under the birds directive. Exemptions are made, however, to allow each nation to select from a list, species that are can be removed, via designated lethal methods, for the purposes of preserving flight safety. Aerodromes with issues relating to species that are not on that list, need to apply to their relevant licensing authority for a licence to remove individuals of those species. Common gull species (Larus spp.) are, in general, on the list of birds that can be removed through lethal control to preserve flight safety.

Removal of birds may not be as effective, however, as teaching birds to avoid an area. Anecdotal evidence suggests that combining shooting with non-lethal deterrence may offer twin benefits such as those described by (Cleary & Dolbeer, 1999). Firstly, it may be publicly more acceptable as the desired output does not involve eradication or wide scale population control. Secondly, the objective is to allow non-lethal techniques to be used more frequently hence reducing the need for additional lethal control. At Townsville airport in Australia, occasional shooting with live rounds was shown to increase the effect of cracker shells (Bird Hazard Investigation Unit, 1990), whilst in Denmark, similar occasional shooting enhanced the impact gas cannons had on waterfowl present in Danish wetlands (Meltofte et al., 1996). The improvement in efficiency in both cases, however, was difficult to quantify. Unless it can be confirmed that shooting does indeed enhance the effectiveness of other techniques there is little point in attempting to justify its use for anything other than overall population management.

Not all birds respond to conventional deterrence measures in the same way. Pyrotechnics, for example, may not influence aerial insect feeders. Distress calls are not suitable for use on species that do not have a distress call (e.g. Swans, Raptors etc). Trained dogs cannot influence the movements of gulls flying across an airfield etc. Successful management therefore requires a suite of techniques to be available to bird controllers to deter birds from airfields. This paper reports on how lethal control can be used to enhance the effectiveness of such a suite and reduce the birdstrike risk on aerodromes via reinforcement of non-lethal methods as opposed to extensive culling or population control.

MATERIALS AND METHODS

Two geographically isolated landfill sites situated in lowland agricultural areas of inland England were selected for this study. Site one was located approximately 10km from a major roost site for Black-headed (Larus ridibundus) and Herring (Larus argentatus) with site two approximately 15km from a similar roost. Both sites had compact (<1Ha) active tipping areas used from 0800 to 1700 Monday to Friday. Both sites were run by the same waste management company and had a policy of covering waste with a minimum of 100mm inert material at the end of each working day. Both sites accepted over 250,000 tonnes of domestic waste each year. Both sites had previously recorded over 1,000 mixed gulls between October and March each year (Baxter 1999). The active face was screened by man made bunds from the surrounding countryside. Tipping areas were not visible from fields off site.

Mean gull numbers and behaviour were recorded by counting all birds present using standard methods (Bibby et al., 2000) with Swarovski 10x42 binoculars. Winter gull numbers at both sites were stable throughout the period (Baxter & Allan, 2008). A 4-week pre-control period occurred at both sites. Bird

numbers and their locations on or over the site were monitored every hour on two randomly selected days each week between dawn and dusk. A minimum of 4-weeks control was then deployed. Control was implemented by a contractor who fired blank rounds to deter gulls then live rounds if deterrence was unsuccessful and birds proceeded to land. Numbers of birds shot and number of blanks / shot fired were recorded. Control was implemented by a full-time bird controller between dawn and dusk, seven days a week on landfill site A, and from 0800hrs to 1630hrs, Monday to Friday on landfill site B. Automated rope bangers or a gas cannon were deployed on site B when staff were not present. Monitoring was continued as for pre-control.

The regime of lethal reinforcement that prevented gulls using the landfill site, and resulted in the fewest birds being shot, was used in the active bird control regime at an airport. The numbers of 'gulls', and 'other' species struck were then analysed. Mean strike data over two reinforced years was compared to mean strike data over three none lethal reinforcement years. These data were also contrasted with strike levels at a similar airport, over the same time-frame, where lethal reinforcement was never implemented.

RESULTS

Landfill

During pre-treatment at site A, Black-headed gulls made up 46% of the gull population and Herring gulls 53% of the population. During pre-treatment at site B, Black-headed gulls made up 29% of the gull population and Herring gulls 71% of the population. Common, Lesser Black-backed and Great Black-backed gulls accounted for less than 1% of the total gull numbers present at both sites. Analyses were completed on 'gulls' in total.

Treatment was deployed for seven weeks from 15th January to 4th March 2001 at site A. Treatment was implemented from 19th February to the 16th March 2001 at site B. The number of birds initially shot was similar on both sites (68 vs 61 birds). A significant reduction in the numbers of gulls shot as the trials progressed occurred at site A (Kruskal wallis Chi = 20.432, $P < 0.001$) but not at Site B; Kruskal wallis Chi = 2.614, $P = 0.455$.

Table 1. Impact of lethal and deterrent shooting at landfill site A.

Period	Mean No. gulls (per hour)	No. gulls shot	No. rounds used
Pre-treatment	5714.89	0	0
Deterrence: Week 1	4433.90	76	352
Week 2	1597.64	39	463
Week 3	587.67	4	293
Week 4	284.77	10	331
Week 5	96.08	2	187
Week 6	47.00	0	191
Week 7	146.14	5	144
Summary		136	2081

Table 2. Impact of lethal and deterrent shooting at landfill site B.

Period	Mean No. gulls (per hour)	No. gulls shot	No. rounds used
Pre-treatment	1225.1	0	0
Deterrence: Week 1	519.9	61	228
Week 2	50.8	45	320
Week 3	134.6	77	284
Week 4	23.7	37	307
Summary		220	1039

Mean numbers of birds shot during dawn to dusk deterrence (Landfill site A) was 19.4 birds per week. Mean numbers of birds shot during operational hours deterrence (Landfill site B) was 55 birds per week. After the initial two weeks of deterrence, numbers shot at landfill site A decreased to 4.2 birds per week. At landfill site B, no change occurred (57 birds per week). No significant pattern in the times of day birds were shot emerged. Both regimes significantly reduced the numbers of gulls present but the operational hour regime saw no reduction in the numbers of gulls killed. The total number of rounds fired (lethal and blank shot fired) declined under the dawn to dusk regime. This did not occur during operational hours deployment at landfill site B. Deployment of lethal reinforcement throughout dawn to dusk hours reduced the overall number of shots fired and reduced the numbers of birds killed.

Airport

A mean of 29.66 strikes with gulls per year (n= 3 years), occurred prior to the deployment of lethal reinforcement at a European airport (A). A mean of 39.5 gullstrikes over the same period occurred at another European airport (n = 3 years) (B). 37.4 gulls per month were shot as part of the reinforcement at airport A. A peak of 78 gulls were removed in August (approximately 2.5 birds per day). A minimum of 5 birds were shot in February and March; the equivalent of just one bird every six days. 90% of shot birds were identified as juvenile in summer (July – September) and 40% were in juvenile (sub-adult) plumage in winter (December to March). Response to the presence of a bird control vehicle following lethal reinforcement in winter resulted in birds departing the airfield prior to shots being fired. The level of effort did not change with full time permanent bird control patrols on either airfield. Lethal reinforcement at airport A resulted in the number of gull strikes declining to 6.5 per year (n = 2). No lethal reinforcement occurred at airport B and strike rates fell marginally to 34 gull strikes per year (from 39) Level of effort did not change on either airfield.

DISCUSSION

Gulls fail to respond to active deterrence techniques when they learn that a direct threat to their safety is not present. Bird controllers need to ensure that they continue to persue birds hard in order to ensure they are sucessfully deterred from an airfield. In both the waste disposal and airfield environments during these studies, however, gulls were unwilling to leave the sites. The effort required to deter birds from landfill facilities (based on number of rounds fired) significantly declined, however, when lethal reinforcement was implemented. Shooting as a reinforcement measure may therefore help to expediate

the response of birds to leave an area. It is not clear how birds 'learn' that lethal reinforcement will occur in an airfield environment. It is possible that birds in a landfill environment are more driven to stay as they are capable of gaining significant food resources in a very short space of time. Failure to respond to the initial stimuli (none lethal deterrence) may thus be more likely in a landfill environment than an airfield one.

Despite this, birds in the waste management environment did not appear to learn that reinforcement would occur when it was not implemented or available at all times. Gulls foraging on Site B outside operational hours were disturbed by loud bangs but were not subject to reinforcement. It appears, therefore, that the inconsistent nature of reinforcement (sometimes a loud bang would be followed by lethal control, other times no lethal control would follow), was sufficient to lead to gulls remaining on the landfill site even when reinforcement was about to be used. Where reinforcement was always used (Site A), it resulted in birds immediately responding to the initial loud bang. As such, far fewer birds risked remaining at the site hence far fewer needed to be shot. It is possible, therefore, that lethal control may be more effective as a reinforcement method if strategically deployed for several consecutive days or weeks as opposed to randomly or infrequently. Studies may be required to ascertain the most appropriate frequency of deployment in different airport environments.

Birds are less likely to be persistent in an airfield environment if loafing or resting on the site and not feeding continuously. The need for consecutive deployment of reinforcement may not, therefore, be as important as on a landfill site. Nevertheless, in order to reduce risk to flight safety, if gulls cannot be deterred from an airfield environment by standard measures, reinforcement ideally provides both an instant response to a hazard, and hopefully reduces the likelihood that such a hazard will occur on the airfield in future.

Summary

Lethal control, unless being deployed to remove populations of birds, should be deployed as a last resort or in urgent situations. The ability to reinforce non-lethal control as and when required is key in terms of minimising the number of individuals that are shot. If birds fail to respond to non-lethal methods their deterrence will benefit from reinforcement as often as necessary.

Literature Cited

Aylward,M.F.. Bird control at landfill sites. Proceedings Sardinia 95, Fifth International Landfill Symposium . 1995.

Baxter,A.T., Allan,J.A., 2006. The use of raptors to deter scavenging birds from landfill sites. Wildlife Society Bulletin 34:1162-1168.

Baxter,A.T., Allan,J.R., 2008. Use of lethal control to reduce habituation to blank rounds by scavenging birds. Wildlife Management 72:458-463.

Baxter,A.T., Robinson,A.P., 2007. A comparison of scavenging bird deterrence techniques at UK landfill sites. International Pest Control. In press.

Baxter,A.T., Bell,J.C., Allan,J.R., Fairclough,J.. Interspecificity of distress calls. Proceedings of Birdstrike Committee USA / Canada, 192-200. 1999.

Bibby,C.J., Burgess,N.D., Hill,D.A., Mustoe,S., 2000. Bird Census Techniques. 2 edition. Academic Press: San Diego.

Bird Hazard Investigation Unit. Bird hazards to aircraft at Townsville airport: causes and management strategies. 1990. Civil Aviation Authority, Canberra.

Bomford,M., O'Brien,P.H., 1990. Sonic Deterrents in Animal Damage Control: A Review of Device Tests and Effectiveness. Wildlife Society Bulletin 18:411-422.

Bomford,M., Sinclair,R., 2002. Australian research on bird pests: impact, management and future directions. Emu 102:29-45.

Cleary,E.C., Dolbeer,R.A., 1999. Wildlife Hazard Management at Airports; a manual for airport personnel. US Federal Aviation Administration, Washington DC.

McDonald,D., 2001. Urban bird management: an evaluation at the millennium. International Pest Control 43:20-23.

Meltofte,H., Schaffer,A., Nielsen,J., 1996. Hunting intensity in important bird areas in Denmark, 1985-1994. Dansk Ornitologisk Forenings Tidsskrift 90:159-174.