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POOR LONG GRASS
LOW BIRD DENSITY GROUND COVER
FOR THE RUNWAY ENVIRONMENT

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Abstract

Among bird strike specialists it is generally agreed that making the runway environment unattractive for birds is a better approach than relying on corrective actions that expel birds. The vegetation that best approximates the creation of such an unattractive runway environment is of course dependent on local circumstances like climate and soil condition. Nevertheless, since its successful introduction in the UK in the seventies, the long grass policy (LGP) has been considered the standard in grassland management for runway environments, and is widely recommended by National Aviation Authorities. Meanwhile the LGP in its original, pure form is getting rare. Conditions that differed from the standard UK situation often demanded modifications that sometimes resulted in quite deviant management strategies but aimed for the same results. The RNLAF developed an even more radical, and equally successful terrain management system that is not primarily based on the height of the vegetation but on the reduction of biomass production and is not limited to grass as a groundcover. Since there is no common agreement on how to implement LPG and new strategies in terrain management are being developed, in this paper a plea is made to replace the very general, but suggestive phrase “Long Grass Policy” by one that better fits reality. Wordings like "Airfield Vegetation" or "Low Bird Density Ground Cover" express the aim instead of the mean by which to realise this aim and therefore are more suitable alternatives. Irrespective the phrase, it should be defined as any vegetation for the runway environment that is unattractive for birds, drought, fire and erosion resistant, having sufficient carrying capacity and preferably requiring low maintenance. Long grass, poor grass (and all their intermediates) and strategies that still have to be developed are then simply different approaches to reach such a vegetation. National Aviation Authorities and international agencies like ICAO could use such an alternative phrase in

their recommendations instead of the dogmatic LGP and leave it to the specific circumstances in any country to choose for a strategy by which to realise this.

Key Words: Habitat modification, Long grass, Food sources, Agriculture, Surveys, Liability, Regulations, Standards.

Introduction

Although bird strikes occurred since the beginning of aviation, it was not until the introduction of the jet engine that the problem grew to such proportions that the need to act was evident for all involved. This resulted in the establishment of the IBSC (then BSCE) in 1966 (20-21 July 1966, Frankfurt-Main). During the 1960's and 1970's extensive research was done on the development of active scaring techniques to keep the runway free of birds (Kuhring 1963; Bremont et. al. 1968; Moellen 1971; Stout et al. 1974). The then introduced use of distress calls is still one of the main techniques used. At the same time it was generally recognised that instead of scaring away birds from the runway environment it would be much better not to fully rely on corrective actions but keep these as a last line of defence in case everything else failed. So the attention was focussed on creating a runway environment that is unattractive to birds. In the UK the "Long Grass Policy" (LGP) was developed and proved to be very successful, especially in deterring gulls and waders (Mead & Carter 1973; Brough 1971; Brough & Bridgeman 1980).

For operational, financial and ecological reasons other successful strategies in the management of runway environments have been developed in Germany and The Netherlands. These include low-maintenance grass and propagation of heath (Muntze & Hild, 1999; Grundeler, 1999) and the introduction of the so called "poor grass regime" (Dekker & van der Zee, 1996; Dekker & Buurma, 1997). In the USA 3 studies indicated that LGP may not always result in fewer birds and that its application has to be determined on a species and site specific basis (Seamans, Dolbeer, Carrara & Chipman, 1999).

LGP -being the first habitat management technique that was very successful- has set a standard. Because of its initial success and strong propagation LGP is mentioned in textbooks and regulations as the ultimate approach in habitat management of the runway environment. But, since LGP is not always the most suitable, most effective, and most efficient way of habitat management and other techniques have proven at least as successful, it is important that textbooks and regulations use another, more appropriate term for habitat management of the runway environment. Such a term should express the objective of habitat management instead of just one of the available

techniques. Especially with respect to certification of airfields it is important that guidelines leave it to the airport authority to decide which strategy best fits the needs, instead of just prescribing LGP. Also the development of new techniques is blocked if regulations force airfields into only one direction of habitat management.

The runway environment

The runway environment has to meet a number of requirements:

- it should be sufficiently drained to prevent standing water;
- it should be sufficiently resistant to wind and water erosion;
- it should be flat and have a sufficient carrying capacity (for aircraft that run off the runway and for crash tenders from the fire control);
- it should be unattractive to birds;
- it should be low maintenance, not only for cost effectiveness but also for safety reasons (the runway environment should be free of man and machines).

It is clear that the vegetation of the runway environment is a key factor in these requirements. Since the vegetation has to thrive on a well drained soil it does have to be drought resistant. To prevent the soil from being blown away by jet wash or wind, or being washed away by water, the vegetation also has to have a dense and well-anchored root system. Furthermore, the vegetation must not only just be unattractive to birds but preferable even be an adverse environment for birds. Human activities in the runway environment always mean that extra co-ordination from air traffic control is needed. So for maintenance, the vegetation should require as little human interference as possible.

Traditionally airfields were an integral part of the landscape and only consisted of a grass strip, often surrounded by arable fields and meadows. Possibly that is the reason why later on, when concrete and tarmac substituted grass strips, these runways were often situated in a grassy runway environment. However, taken into account all the requirements for a runway environment, traditionally maintained meadow or lawn grass is not the most obvious choice. It is not very drought resistant; it usually requires a lot of maintenance and (partly as a result of that maintenance) it is attractive to birds that are considered problem species (gulls, waders, rook, starling). But a grass vegetation usually is suitable for motorised vehicles to drive on in case of emergencies and its root system is normally able to keep the soil together.

Established approach

After the large scale introduction of the more sensitive jet engines in the 1960's bird strikes were recognised as a serious threat to flight safety. So in the late 1960's and in the 1970's the attention has been focussed on the development of a grass vegetation for the runway environment that is not attractive to birds, or even better, acts as a deterrent to birds (Austin-Smith 1969; Hild 1971; Mead & Carter 1973; Maron 1977; Hild 1978; Brough & Bridgeman 1980). The general conclusion was that a grass cover that was kept at a minimum height of 15-20 cm was very unattractive to birds. Because of its success, immediately after introduction, this long grass policy (LGP) was widely adopted in the 1980's.

In its ideal form LGP is a system where the grass is cut to ground level each spring and the cut material removed, followed by the application of fertilisers to promote strong growth. The grass then is maintained at between 15 and 20 cm for most of the year, weed control is carried out where necessary (Anonymous 1990). This policy produces a sward that is optimal in its bird deterring properties but requires a rigid and intense maintenance regime resulting in high costs. Therefore variations on the ideal LGP have come into practice.

- "Long grass maintenance involving commercial cropping" (Anonymous 1990). It is clear that such an approach at first sight seems to combine the best of both interests: the bird deterring properties from LGP and the lower maintenance costs. In the long run it may after all not be the best practice since the economical pressure forces the utilising farmer to maximise its crop and thus he will be inclined to let the sward grow higher than 20 cm and cut it lower than 15 cm.

- "Flexible Long Grass Policy" is a habitat management programme that can be described as an adaptable and reactive version of the LGP (personal comment of Mr. T. Dewick of Airfield Wildlife management). It is less rigid than the "textbook LGP" and heavily relies on the availability of local expertise. Preferably the Bird Control Unit -which can be considered as the end-user of the programme- does have this expertise, enabling him to advise the Senior Air Traffic Controller in all matters concerning the habitat management programme. Specific circumstances on Stornoway airport were such that a two year trial was implemented in which even all grass cutting and other maintenance practices were ceased, giving the natural coastal plant community of Marram and Lyme Grasses a chance, which is known to host very few birds (Dewick 1993). The less intensive maintenance regime of the Flexible Long Grass Policy has on RAF Airbases in Scotland resulted in dramatic cost savings. It is emphasised

however that ill-advised attempts to cut costs by inexperienced operators have resulted in disastrous failures elsewhere in the UK and Europe.

- Amsterdam Airport Schiphol (AAS) has developed yet another version of LGP. Because of operational and financial reasons the spring cutting is not removed. The size (700 Ha) of the high productive (rich top soil) area of grass is such that removing the spring cutting and previous years thatch would mean an endless queue of trailers containing tons and tons of thatch. In the Netherlands environmental laws do not allow to simply dump this, so it would have to be composted at considerable cost. Accumulation of thatch in the vegetation is not considered a real threat since the ongoing extension and reconstruction works mean that most parts of the runway environment have to be re-seeded once every so often anyway (A. Klaver and P. Leijnse personal comment).

It can be concluded that the Long Grass Policy is successful as a bird deterring vegetation. At the same time it is true that the intensive, rigid maintenance scheme means that there are operational and economic incentives to apply the regime in a sub optimal way. This has resulted in a variety of approaches to LGP, not all of them as successful. Furthermore, the bird deterring properties of LGP are restricted to (small) gulls and wader species that are feeding on soil invertebrates. Rooks and larger waders however stand significantly taller and often feed on invertebrates in, rather than beneath, the grass (personal comment of Mr. T. Dewick of Airfield Wildlife Management).

Unfortunately, good experimental research in the underlying theoretical principles of the effectiveness of LGP has not been undertaken. So we still do not know why LGP, if applied properly, is successful. Is it indeed the fact that in long grass it is difficult for birds to find soil living invertebrates to feed on; or is the fact that their sight is obstructed, and thus their safety at stake? If it would be known which of the two supposed factors (Wright 1968) is the dominant one, it would be possible to develop maintenance strategies that are primarily aimed at this single factor. Maybe it would then become possible to avoid the disadvantages that are connected to the high intensity maintenance of LGP, resulting in operational consequences and high costs. Maybe then it would even be possible to extend the effectiveness to more than mainly gulls and waders.

New developments

During the early 1990’s in Germany and the Netherlands initiatives were taken to come to other forms of habitat management of the runway environment.

In Germany, on Frankfurt airport, experiments of low maintenance management on dry, sandy soils were monitored for 5 to 8 years. On plots that had good starting conditions, the growth of heather (Calluna vulgaris) could be promoted by a very low maintenance regime. The resulting heath vegetation is hardly attractive to birds (Muntze & Hild 1999). On Munich airport experiments leading to low intensity grassland management were carried out since 1987 and 1989. By cutting and taking away the cuttings, soil fertility was decreased, resulting in a vegetation that required little maintenance and was unattractive for birds. (Grundeler 1992; Grundeler 1999). Even for the surrounding areas in the vicinity of the airport habitat management strategies were advised that were aimed at the reduction of bird numbers of problem species. These strategies included the low intensity maintenance of grassland areas and creation of a small scale landscape that is not attractive for birds of open spaces that are the main threat to flight safety (Sindern 1992). Also on other German airfields successful experiments with low intensity management, involving the depletion of soil fertility were carried out (Hild 1996; 1999).

In the Netherlands it became evident that the ongoing intensification of agriculture resulted in high numbers of birds from problem species like gulls (SOVON 1987) and geese (Koffijberg et al. 1997). These “culture following” bird species took advantage of the abundance of food that became available. These developments suggested the hypothesis that availability of food is also the key factor that determines the presence of birds in the runway environment. The low bird numbers that for years on row accompanied the very poor natural soil condition on Soesterberg Airbase also indicated this. Low maintenance regimes involving the depletion of soil fertility were started on an experimental basis on 2 airbases (Leeuwarden and Twenthe). After some years of practice the results on these bases were such that the so-called “poor grass regime” has generally been adopted on all RNLAF airbases (Dekker & van der Zee 1996). This “poor grass” regime should not be looked at as a non-maintenance regime. It is very much a regime that is dictated by the natural opportunities and circumstances and can be characterised as a conducted natural development. Soil fertility is gradually decreased by cutting the grass and removing it immediately. As long as soil fertility is still high two cuttings are necessary, if production has decreased enough only one cutting a year will be sufficient. Timing of the cutting(s) is crucial and is fully determined by local circumstances. These local circumstances include biomass production level and presence of seeds, but also potential problem bird species and operational arguments are key factors. Usually cutting the grass of the runway environment, including the removing of the cuttings, takes one or two weekends. Increased bird numbers in relation to such a cutting are hardly experienced and if they do occur are limited, both in bird numbers and in time. If cutting the grass for some reason can not be realised during weekends the spatial planning of the cutting is carefully planned in such a way

that the location of newly mown grass is never limited to parts near the runway. Where conditions are favourable the growth of heather is encouraged by cutting the grass at a height which makes light available for the small heather plants. Coincidentally the poor grass regime has additional advantages, it produces a strong and extensive root system which makes the vegetation very resistant to drought and erosion, thus ensuring a good carrying capacity. Furthermore, with the decrease of soil fertility a natural habitat is created that favours uncommon and rarer plants.

In a study that involved the year round monitoring of flying birds on 29 locations, covering a variety of land use in the vicinity of Eindhoven Airport it became clear that the least number of flying birds were found above heath (De Hoon & Buurma 2000). This is in line with the experiences of bird control units who always stated that there were hardly birds seen in or above the still small patches of heath on airfields.

In the USA in 1998 in 3 studies no clear advantage of long grass over short grass could be established (Seamans, et al. 1999). Whether these results contradict the earlier UK studies (e.g. by Brough & Bridgeman 1980) because of the different (American) bird species involved, different grass species or that other site specific conditions are responsible is not clear. Furthermore, in their recently published “Wildlife Hazard Management at Airports” Cleary & Dolbeer (2000) state that a long grass approach in arid regions is extremely hard to maintain and long grass may result in increased rodent populations. In their manual they provide no general guidelines on grass height or vegetation type.

Conclusions

The long grass policy as developed in the UK in the 1970’s is an effective habitat management strategy against certain bird species that cause a problem to aviation in the Atlantic NW European region. It is not however, and never has claimed to be, the ultimate panacea for all bird problems on all airfields. It is surprising therefore that LGP has nearly become a dogma. Instead of being regarded as a **mean** by which to reduce bird numbers in the runway environment it has been regarded as an **objective** to reach. This attitude might be a consequence of the fact that for decades in most regulations long grass has been and mostly still is mentioned as a recommendation (Anonymous 1990; Transport Canada 1994; ICAO 1991;). Although these recommendations are not mandatory and therefore do leave the freedom for other choices than LGP, and in practice LGP comes in many variations, the average airport manager has to be firmly convinced before adopting a habitat management strategy that deviates from the generally

recommended one. Ultimately these recommendations that are laid down in regulations could even act as a blockade against new developments.

It is therefore important that new wording is developed that does not mix up means and objectives and accommodates regulations that encourage new developments. There is common agreement on the objective: a vegetation of the runway environment that is hostile for those bird species that form a bird strike hazard in the specific area in which the airfield is located. “Low Bird Intensity Ground Cover” is such a general phrase but it is probably better to simply refer to “Airfield Vegetation”, implying that the vegetation of the runway environment does have to meet special requirements. Regulations that use these more general phrases do recognise that it is the objective that counts. Furthermore, such regulations administer justice to the fact that there are many ways to reach the objective, depending on regional and local conditions. Recent developments in the USA are hopeful in this respect. Cleary & Dolbeer (2000) in their manual specifically state that they do not provide general guidelines on grass height or vegetation type and advise “the consultation of professional wildlife biologists and horticulturists to develop a vegetation type and mowing schedule that is appropriate for the growing conditions and wildlife at the location”.

Poor long grass or long poor grass, that is not the question. Finding the best-suited strategy to reach the best possible result in the given situation is the challenge we have to face in the new millennium

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