



GHANA
CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR **AC-AD-018**

HAZARDOUS LAND-USE PRACTICES IN AND AROUND AIRPORTS THAT ATTRACT WILDLIFE

GENERAL

Ghana Civil Aviation Authority (GCAA) Advisory Circulars from Aerodrome Safety and Standards (ASAS) Section contain information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a Regulation, and consideration will be given to other methods of compliance that may be presented to the Authority.

PURPOSE

This Advisory Circular provides methods, acceptable to the Authority, for showing compliance with Part 24 of the Ghana Civil Aviation (Aerodrome) Regulations (GCARs), 2011, LI 2004, as well as explanatory and interpretative material to assist in showing compliance.

REFERENCE

This Advisory Circular relates specifically to the Aerodrome GCARs and Manual of Standards (MOS).

STATUS OF THIS AC

This is the first AC to be issued on this subject.

FORWARD

This AC provides Airport Operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

APPROVAL

Issue No : 01	Approved by:  _____ Director-General	_____ 2015
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DEFINITIONS

This appendix provides definitions of terms used throughout this AC.

- **Air operations area.** Any area of an airport used or intended to be used for landing, take-off, or surface manoeuvring of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.
- **Airport Operator.** The operator (private or public).
- **Approach or departure airspace.** The airspace, within 13KM of an airport, through which aircraft move during landing or take-off.
- **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.
- **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.
- **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard
- **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile,
- **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface manoeuvring of aircraft may be under the control of a public agency or privately owned and used for public purposes.
- **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds.
- **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.
- **Retention ponds.** Storm water management ponds that hold water for several months.
- **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground.
- **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works.
- **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material,

including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

- **Wildlife.** Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mammals or other invertebrate, including any part, product, egg, or offspring.
- **Wildlife attractants.** Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's air operation area. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.
- **Wildlife hazard.** A potential for a damaging aircraft collision with wildlife on or near an airport.
- **Wildlife Strike.** A wildlife strike is deemed to have occurred when:

1. GENERAL CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS

1.1. INTRODUCTION.

When considering proposed land uses, Airport Operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards.

1.2. HAZARD RANKING

Hazard rankings can help focus hazardous wildlife management efforts on those species or groups that represent the greatest threats to safe air operations in the airport environment. Used in conjunction with a site-specific Wildlife Hazard Assessment that will determine the relative abundance and use patterns of wildlife species, these rankings can help Airport Operators better understand the general threat level (and consequences) of certain wildlife species and can assist with the creation of a “zero-tolerance” list of hazardous species that warrant immediate attention.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area. Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odour-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential.

Part 3 of the ICAO Airport Service Manual, Doc 9137 states that:

- The concept of compatible land use planning is an outgrowth of the focus of attention on the environmental relationship between airports and their community neighbours. This planning concept is relatively simple and the results can be impressive but the implementation requires careful study and coordinated planning. Land use around airports can influence restrictions on aircraft flights as well as affect aircraft safety.

- Some communities and airports have reached the point where the effect of land use planning guidelines may be minimal. However, there are still instances where their use will result in more compatible airport and community development. Implementation may take the form of aviation system plans, legislation for compatible land uses, easements or land zoning.
- It has long been recognized that land use around the airport can influence bird strikes to aircraft. Birds can be attracted to areas near the airport and in turn go to the airport for food, water, resting or shelter. Some birds may also be struck outside airport property, over a land use that attracts them. In fact, 21 percent of bird strikes reported to the ICAO IBIS system occurred “off airport”. An “on airport” bird strike is that which occurs between 0 to 60 m (0 to 200 ft) (inclusive) on landing and 0 to 150 m (0 to 500 ft) (inclusive) on take-off.

Land uses which have caused specific problems at airports are:

- a) Fish processing;
- b) Agriculture;
- c) Cattle feed lots;
- d) Garbage dumps and landfill sites;
- e) Factory roofs and parking lots;
- f) Theatres and food outlets;
- g) Wildlife refuges;
- h) Artificial and natural lakes;
- i) Golf-, polo-courses, etc.;
- j) Animal farms; and
- k) Slaughter-houses.

In applying this AC on hazardous land use, one must consider the location of a proposed land use in relation to the airport. The location of attractive land use beyond the recommended distance could still create flyways over the airport or through flight paths at the airport. In some cases more than one possible use of an area may have to be considered to ensure that bird hazards will not be increased at or near the airport.

Regulations should be placed on the use of lands surrounding airports to reduce their Attractiveness to birds. These regulations should be directed at all land uses mentioned above. Prior planning is necessary to ensure that incompatible land uses are not allowed to become established.

1.3. INTERNATIONAL BIRD STRIKE COMMITTEE STANDARD

Airports should conduct an inventory of bird attracting sites within the ICAO defined 13km bird circle, paying particular attention to sites close to the airfield and the approach and departure corridors. A basic risk assessment should be carried out to determine whether the movement patterns of birds/wildlife attracted to these sites means that they cause, or may cause, a risk to air traffic. If this is the case, options for bird management at the site(s) concerned should be developed and a more detailed risk assessment performed to determine if it is possible and/or cost effective to implement management processes at the site(s) concerned. This process should be repeated annually to identify new sites or changes in the risk levels produced by existing sites.

Where national laws permit, airports, or airport authorities, should seek to have an input into planning decisions and land use practices within the 13km bird circle for any development that may attract significant numbers of hazardous birds/wildlife. Such developments should be subjected to a similar risk assessment process as described above and changes sought, or the proposal opposed, if a significant increase in bird strike risk is likely to result strikes

2. LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2.1. GENERAL.

Hazardous wildlife uses the natural or artificial habitats on or near an airport for food, water or cover. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. In addition to the specific considerations outlined below, Airport Operators should refer *Wildlife Hazard Management at Airports*, prepared by GCAA for further guidance.

This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety.

2.2. LANDSCAPING

Depending on geographic location and plant selection and spacing, airport Landscaping can attract hazardous wildlife. Approach landscaping with caution, and confine it to airport areas not associated with aircraft movements. In cooperation with

a wildlife expert, review all landscaping plans. Monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, take corrective actions immediately. Trees and shrubs that produce fruits are attractive to birds and mammals.

2.3. AQUACULTURE

Aquaculture activities (e.g. fish production) conducted outside of fully enclosed buildings are inherently attractive to a variety of birds. Existing aquaculture facilities/activities within the 13km must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Oppose the establishment of new aquaculture facilities/activities within the 13km.

2.4. AGRICULTURE

2.4.1. Crop Production

Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, do not use airport property for crop production, including hay crop.

2.4.2. Livestock production

Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg-laying operations) often attract flocking birds, such as pigeons, that pose a hazard to aviation. Therefore, keep such facilities outside of the airport vicinity.

If it exists Develop a program to reduce the attractiveness of any livestock operation within airport. Do not graze free-ranging livestock on airport property because the animals might wander onto the air operations area. Livestock feed, water, and manure might attract hazardous birds.

2.5. WASTE/GARBAGE DUMPS AND LANDFILL SITES

Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations shall be located out of 13 km.

The Underwater discharge of any food waste (e.g., fish processing offal) within 13km is not recommended because it could attract scavenging hazardous wildlife.

Recycling centres that accept previously sorted non-food items, such as glass,

Newspaper, cardboard, or aluminium, are, in most cases, not attractive to hazardous wildlife and are acceptable.

Construction and demolition debris (C&D) landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other putrescible waste disposal operations. C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities.

2.6. NATURAL GRASS FIELD FOR (SPORT COURSE)

The large grassy areas and open water found on most grass field are attractive to hazardous wildlife, particularly grass eater birds like gees, ibis etc. These species can pose a threat to aviation safety. Do not site new grass field within 13km. Existing grass field located within 13km must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Ensure these grass fields are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, take corrective actions immediately.

2.7. WILDLIFE REFUGE/ CONSERVATION SITE

Wildlife refuges/conservation site that provide suitable condition for wildlife (e.g. bird sanctuaries) should not be located within 13 km. Existing Wildlife refuges located within 13km must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Ensure these Wildlife refuges are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, take corrective actions immediately.

2.8. WATERBODIES, ARTIFICIAL LAKES

Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and Airport Operators s might need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near public-use airports to ensure a safe airport environment.

In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submerges and emergent aquatic vegetation as natural filters. These artificial marshes may be used by various species of birds, for nesting, feeding, or roosting. Do not establish artificial marshes

Do not discharge wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved grass growth that can be an attractive food source for many species of animals. Also, the grass requires more frequent mowing, which in turn might mutilate or flush insects or small animals and produce thatch, both of which can attract hazardous wildlife. In addition, the improved grass might attract grazing wildlife. Problems might also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2.9. WETLANDS

Provide a variety of functions and can be regulated by local and federal laws. Wetlands typically attract diverse species of wildlife, including many that rank high on the list of hazardous wildlife species (Table 1). If wetlands are located on or near airport property, be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, immediately correct, in cooperation with local, state, and federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a Wildlife Hazard Management Plan (WHMP) will outline appropriate wildlife hazard mitigation techniques. Develop measures to minimize hazardous wildlife attraction in consultation with a wildlife expert.

2.10. SLAUGHTER-HOUSES/ ABATTOIRS

Slaughter-houses/abattoir is known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations shall be located out of 13 km. Existing slaughter-houses/abattoirs located within 13km must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Ensure these slaughter-houses/abattoirs are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions are to be immediately taken.

3. PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF CIVIL AIRPORTS

3.1. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP).

The GCAA will consider the results of the Wildlife Hazard Assessment, along with the aeronautical activity at the airport and the views of the Airport Operator and airport users, in determining whether a WHMP is needed. If the GCAA determines that a WHMP is needed, the Airport Operator must formulate and implement a WHMP, using the Wildlife Hazard Assessment as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport. For WHMPs to effectively reduce wildlife hazards on and near airports, accurate and consistent wildlife strike reporting is essential refer (GCAA-AC-AGA 012 on Wildlife/Bird Strike Reporting). The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3.2. LOCAL COORDINATION.

The establishment of a Wildlife Hazards Working committee (WHWC) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off airport, input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport Operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft.

3.3. COORDINATION/ NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS.

If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, Airport Operators must issue a Notice to Airmen (NOTAM) and encourage the landowner or manager to take steps to control the wildlife hazard and minimize further attraction.

3.4. STATE DEPREDATION PERMITS.

Airports should maintain state depredation permits to allow mitigation and/ or

removal of hazardous species. All protected species require special permits for lethal mitigation or capture and relocation procedures. Endangered or threatened species mitigation also requires special permits. Consultation and permitting is required with the Ghana wildlife conservation/ Parks and Garden.

4. RECOMMENDED PROCEDURES FOR AIRPORTS REGARDING OFF-AIRPORT ATTRACTANTS.

4.1. GCAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

The GCAA discourages the development of waste disposal and other facilities, located within the 13km bird circle.

- Before any project implementation the GCAA reviews development plans, proposed land-use changes, operational changes, if such changes present potential wildlife hazards to aircraft operations. The GCAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.
- Where a Wildlife expert has conducted a further study to evaluate a site's compatibility with airport operations, the GCAA may use the study results to make a determination.

4.2. OTHER LAND-USE PRACTICE CHANGES.

GCAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 13 KM of their airports to promptly notify the GCAA. The GCAA also encourages proponents of such land use changes to notify the GCAA early in the planning process as possible. Advanced notice affords the GCAA an opportunity:

- 1) To evaluate the effect of a particular land-use change on aviation safety and
- 2) To support efforts by the Airport Operator to restrict the use of land next to or near the airport to uses that are compatible with the airport.

4.3. COORDINATION TO PREVENT CREATION OF NEW OFF-AIRPORT HAZARDOUS WILDLIFE ATTRACTANTS

Airport Operators should work with national, regional, local planning and zoning

entities so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within 13 KM. Pay particular attention to proposed land uses involving creation or expansion of slaughter house/abattoir, development of wetland sites, or development or expansion of wastewater treatment facilities. At the very least, Airport Operators should ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 13 KM of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife. This may be accomplished through one or more of the following:

- **Site-specific criteria.** The airport should establish site-specific criteria for what land uses and locations would be of concern based on wildlife strikes and on wildlife abundance and activity at the airport and in the local area. These criteria may be more restrictive, but should not be less restrictive than the guidance provided elsewhere in this AC.
- **Outreach.** Airports should actively seek to provide educational information and/ or provide input regarding local development, natural resource modification or wildlife- related concerns that affect wildlife hazards and safe air travel.
- **External Outreach.** Airports should consider outreach to local planning and zoning organizations on land uses of concern or to local organizations involved with natural resource management (including wildlife management, wetlands management, and parks). Airports should also consider developing and distributing position letters and/ or educational materials on airport-specific concerns regarding wildlife hazards, wildlife activity and/ or attraction, etc. Finally, in coordination with local planning and zoning entities, the airport operator should provide formal comments on local procedures, laws, plans, and/ or regulatory actions such as permits related to land uses of concern.
- **Internal Outreach.** Airports should consider developing and distributing position letters and/ or educational materials on airport-specific concerns regarding species identification and mitigation procedures, wildlife hazards, wildlife activity and/ or attraction, etc. to employees and personnel with access to the air operation area.

4.4. COORDINATION ON EXISTING OFF-AIRPORT HAZARDOUS WILDLIFE ATTRACTANTS.

Airports should work with responsible government body and private land managers to cooperatively develop procedures to monitor and manage hazardous wildlife attraction. These procedures may include:

- Conduct a Wildlife Hazard Site Visit by a wildlife expert
- Conduct regular, standardized, wildlife monitoring surveys
- Establish numbers and kind of wildlife which would trigger certain actions
- Establishment of procedures to deter or remove hazardous wildlife

4.5. GCAA ASSISTANCE.

If there is disagreement on the implementation of any of the guidance in this Section, contact the GCAA Aerodrome Safety and Standard Section for assistance.

4.6. AIRPORT DOCUMENTATION PROCEDURES.

4.6.1. Log Of Wildlife Attractants.

Airports should develop a log to track all contacts from landowners or managers, permitting agencies, or other entities concerning land uses near the airport, as well as on-airport features and developments that could attract hazardous wildlife. In this log maintain documentation sufficient to conduct the reviews below and to make follow- up contact if necessary.

4.6.2. Annual Review Of Log.

- (1) The airport should review this log annually to:
- (2) Review status of individual offsite attractants and any needed changes
Identify synergistic effects of hazardous wildlife attractants
- (3) Identify any existing or potential flyways across or through aircraft travel corridors between hazardous wildlife attractants
- (4) Identify cooperative measures and on-airport wildlife management procedures that would alleviate either one or both of the above two conditions
- (5) Document the participants in the review, items discussed, and changes identified.