

**Diego Garcia
Bird Aircraft Strike Hazard (BASH) Plan**

DGREGCOORDINST 5090.2B

Appendix L

DIEGO GARCIA REGIONAL COORDINATOR INSTRUCTION 5090.2B

Subj: BIRD AIRCRAFT STRIKE HAZARD (BASH) PLAN

Ref: (a) OPNAVINST 3710.7S
(b) OPNAVINST 3750.6R
(c) OPNAVINST 5090.1B
(d) NAVFAC P-73, Vol II
(e) FAA Handbook 7110.65
(f) Final Governing Standards for Diego Garcia

Encl: (1) BASH Management Plan, U.S. Navy Support Facility,
Diego Garcia

1. Purpose. To issue enclosure (1), which provides a program per references (a) and (b), to implement a comprehensive and aggressive BASH Program to reduce the potential for collisions between aircraft and birds or other animals. This instruction has been substantially revised and should be reviewed in its entirety.

2. Cancellation. DGREGCOORDINST 5090.2A

3. Background. Reference (a), requires installation that have a flying mission to implement programs to reduce the potential for collisions between aircraft, birds and other wildlife. No single solution exists to the BASH problem at NSF Diego Garcia. A variety of techniques and organizations must be involved to ensure success of this program. The BASH program encompasses all actions which may identify, reduce, or eliminate bird or other animal hazards to aviation, specifically, bird avoidance, bird identification, and bird control (including harassment, grounds maintenance, habitat modification, and depredation).

4. Discussion. Enclosure (1) is the BASH Management Plan for NSF Diego Garcia. It assigns responsibilities, provides guidance and establishes procedures to prevent and minimize potential bird hazards during flight operations.

5. Applicability. This instruction applies to all U.S. Navy Support Facility departments, tenant commands, contractors, and transient units on board NSF Diego Garcia.

6. Objectives. The potential for a serious BASH event does exist at this installation and within the immediate vicinity due to resident and migratory bird species. Daily and seasonal bird movements create various hazardous conditions to aviation. This plan is designed to reduce the bird hazard in and around NSF Diego Garcia.

7. Action. All U.S. Navy Support Facility departments, tenants commands, contractors and transient units involved in aircraft

operations and in the implementation of the BASH program shall implement and comply with the provisions of enclosure (1) as appropriate.

8. Administration. This plan shall be reviewed and updated bi-annually. Recommended changes should be submitted to the Air Operations Officer (NSF N3).

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**BIRD AIRCRAFT STRIKE HAZARD MANAGEMENT PLAN
U.S. NAVY SUPPORT FACILITY
DIEGO GARCIA**

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- Attachment (2) Location of manmade features and conservation areas
- Attachment (3) Land Use Map

CHAPTER 1

GENERAL

1.1 SITUATION

1.1.1 General. OPNAVINST 5090.1B requires Naval Facilities that have flying missions to develop and implement Bird Aircraft Strike hazard (BASH) Plans. BASH plans shall be developed as an integral part of the Integrated Natural Resources Management Plan (INRMP), updated on the same 5 year cycle, and prepared in close cooperation with the facilities Aviation Safety and Aviation Operations Departments. It further requires that all BASH activities will be coordinated with the Navy Safety Center.

NSF Diego Garcia has a large and potentially dangerous bird population of resident and oceanic avian species. Daily and seasonal bird movements in the vicinity of the airport create various hazards to aircraft. Accordingly, the BASH Program is designed to control birds and to provide increased levels of safety during the critical phases of flight. This plan establishes specific procedures to reduce known and future bird hazards. There is no single solution or agency that can solve the bird strike problem. Therefore, a variety of techniques and organizations must be involved in the overall program.

This plan is designed to:

- a. Establish a Bird Hazard Working Group and designate responsibilities to its members.
- b. Establish training for all base members concerning responsibilities and actions.
- c. Establish procedures to identify high hazard situations and to aid supervisors and aircrews in alerting/discontinuing flying operations when required.
- d. Establish aircraft and airfield operating procedures to avoid high hazard situations.
- e. Provide a method for disseminating information to all tenant and transient aircrews on bird hazards and procedures for bird avoidance.
- f. Establish passive techniques to decrease airfield attractiveness to birds.
- g. Establish operational procedures for the lethal control of cattle egrets, an introduced bird species that has been documented to cause damage and present a real threat to aviators and aircraft.
- h. Establish local procedures for reporting of damaging/non-damaging bird strikes.
- i. Establish procedures for the collection and submission of bird strike remains.

1.1.2 Background

1. Bird strikes have plagued naval aviation since its early beginnings. The Navy's first loss of life due to a bird strike occurred in 1914, coincidentally the same year it obtained its first aircraft. Since the Navy Safety Center began documenting bird strikes in 1980, Navy and Marine Corps pilots have reported over 20,000 bird strikes resulting in 2 deaths, 13 aircraft destroyed, 13 pilot ejections, and 247 fodded engines. The Navy Safety Center's review of recent Navy and Marine Corps bird-aircraft mishaps found that the lack of a BASH Plan was a consistent deficiency.

2. Naval Safety Center data shows that 65 percent of all bird strikes occur within the airfield environment. The Safety Center also estimates that only one of four bird strikes is reported, suggesting that an even larger hazard exists.

3. A bird-aircraft strike can cause major damage and loss of life. Because of aircraft design, mission, and airport environment, aircraft operating at NSF Diego Garcia are vulnerable to bird strikes. While severe aircraft mishaps by definition are rare events, it is difficult to estimate the absolute risk of a bird strike causing a crash. Instead, in aviation, it is customary to examine leading indicators that are correlated with mishap risk but occur much more often, i.e., bird populations, near-misses, engine damage and reported strikes. Increases in these factors are considered to show a deterioration in the margin of safety, even if no mishaps take place. Historically, rises in leading indicators were a prelude to major mishaps.

4. The greatest loss of life due to a bird strike occurred in 1960, when a Lockheed Electra (civilian version of the P-3) ingested starlings into three of its four engines on takeoff and crashed, killing 62 of the 73 aboard. Likewise, in 1995, an AWACS at Elmendorf AFB ingested geese into two engines, and crashed, killing all 24 aboard. Although these crashes occurred 25 years apart, they illustrate that the risk of having another major accident is still very much present. An effective BASH program can reduce the relative risk.

1.1.3 Airfield Installation Description

1. NSF Diego Garcia is an active military airfield. The primary missions supported are USN maritime patrol and USAF contingency support missions, electronic warfare, with logistic and search and rescue operations in a secondary role. The primary aircraft types using the airfield runways include the following: P-3, B-1, B-52, KC-135, KC-10, C-17, C-5, DC-8, and extensive transient aircraft from various Navy and other military commands.

1.1.4 Local Area

1. Installation Description: The NSF Diego Garcia airfield is located on the northwest arm of Diego Garcia's coral atoll that is part of the Chagos Archipelago. Located seven degrees south of the

equator in the central Indian Ocean, Diego Garcia is a horseshoe-shaped atoll, open on the north, has a perimeter of approximately 64 kilometers (37 miles), and a land area of about 2,719 hectares (6,270 acres). Attachment (1) provides the location map of Diego Garcia.

1.1.5 General Topography. Diego Garcia forms a dry-land rim that stretches 64 kilometers (37 miles) end to end, making it one of the most continuous land rims of any atoll in the world. The enclosed lagoon is 21 kilometers (13 miles) long and up to 11 kilometers (4 miles) wide. The dry-land rim is continuous around the lagoon except for a 6-kilometer (4 mile) opening at the north end. The highest elevations of the rim are along the ocean side where some sand dunes reach heights of 4.5 to 9 meters (15 to 30 feet) above mean sea level. Attachment (2) is the installation map of Diego Garcia, which shows the locations of manmade features and conservation areas.

1.1.6 Developed Area. The developed area of NSF Diego Garcia (including the runways) is approximately 22 percent of the total atoll.

1.1.7 Vegetation Cover Types. To the southwest of the airfield is a native vegetative community type identified as littoral shrubland dominated by *Scaevola* (*Scaevola taccada*), as well as *Heliotrope* (*Argusia argentea*) and *Suriana* (*Suriana maritima*). Coconut trees also populate these littoral shrubland areas. On the northeast side of the airfield as a littoral shrubland and littoral forest composed of larger trees such as True kamani (*Calophyllum inophyllum*), Fish-poison tree (*Barringtonia asiatica*), and *Cordia* (*Cordia subcordata*). The grounds along the runways are composed of native and naturalized lawn grasses and ornamental plants. The most common species of these are Buffalo grass (*Stenotaphrum micranthum*) Bermuda grass (*Cynodon dactylon*), and *Fimbristylis* (*Fimbristylis cymosa*). Buffalo and Bermuda grasses are introduced species. *Fimbristylis* is a native sedge found near the sea.

1.1.8 Landfills. The sanitary landfill is approximately 3 kilometers (2 miles) south of the runway. It attracts some cattle egrets (*Bubulcus ibis*) and myna birds (*Acridotheres tristis*), but is far enough from the runway to pose minimum bird hazard potential. If managed properly, the landfill and incinerator area can actually attract certain species like the egret away from the airfield. Attachment (3) is the existing land use map of NSF Diego Garcia.

1.1.9 Sewage Ponds. The two sewage treatment lagoons are located approximately 6 kilometers (4 miles) and 700 meters (0.4 miles) north of the airfield and are not significant bird attractants.

1.1.10 Golf Course. The golf course is located 1.5 kilometers (1.0 miles) to the north of the airfield and is not on the approach or departure pattern for the airfield. It is not a significant bird attractant.

1.1.11 Habitats

The combination of natural environment and man-made bird attractants may increase the potential for a serious bird strike incident.

1.2 SPECIES. Chapter 5 contains a comprehensive listing of birds, which may be observed in the airfield area. There may be occasional sightings of other species during migration, but this list is considered thorough for BASH purposes.

1.3 EXPLANATION OF TERMS

1.3.1 Wildlife Services. An office of the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service which are under contract at certain installations to provide BASH assistance.

1.3.2 Active Bird Dispersal. Harassment techniques employed to disperse birds from airfield and surrounding areas. Methods may include chase, pyrotechnics, bioacoustics, and depredation.

1.3.3 BASH. Bird Aircraft Strike Hazard. General term to describe bird hazards and bird hazard programs. An integrated program based on a sound natural resources management plan. A BASH program promotes land management practices to minimize natural bird attractants, modifies air operations to avoid hazardous bird concentrations. A critical part of the BASH program also involves the disciplined reporting of bird-aircraft strikes and the recovery and identification of avian species involved in strike events.

1.3.4 BHWG. Bird Hazard Working Group. Local committee of facility offices concerned with bird hazards. Executes and makes recommendations to the BASH Program.

1.3.5 BHC. Bird Hazard Condition (BHC). A bird hazard alert condition used to warn aircrew of bird activity.

1.3.6 BHC Red. A severe BHC indicating heavy concentrations of birds on or immediately adjacent to the runway which presents an immediate hazard to flight operations; or any concentration of birds that presents a danger to aircraft.

1.3.7 BHC Yellow. A BHC which indicates that moderate concentrations of birds are in a location that represents a probable hazard to flight operations.

1.3.8 BHC Green. A BHC which indicates sparse bird activity on the airfield and a low probability of hazard.

1.3.9 BASH Window. Known periods of severe bird activity where restrictions to flight operations may be automatically imposed.

1.3.10 BASH Advisory. A radio transmission from Air Traffic Control (ATC) or aircrew reporting specific bird hazard information. May be real time or disseminated via Automated Terminal Information Service (ATIS) broadcasts.

1.3.11 BASH Detection and Dispersal Team (BDDT). Roving airport patrol that reports BHC and disperses problem birds via chase, pyrotechnic, bioacoustics, depredation and other methods.

1.3.12 Depredation. Technique used to remove problem birds permanently from the airfield and hangars when other scare tactics are ineffective. Permission for some species is required.

1.3.13 Pyrotechnics. Noise producing devices fired from pistol or shotgun. Used by BDDT to scare birds away from runways and airport areas. Pyrotechnics are Class 1.4 explosives.

1.3.14 Bioacoustics. Recorded tapes of bird distress and predator calls used by BDDT to disperse birds off runways and airport areas.

1.3.15 Propane Cannons. Stationary non-projectile sound producing device used to disperse birds from airport areas.

1.3.16 Models/Decoys. Various static devices used to disperse birds from airport areas. May include scarecrows, decoys, Mylar tape, and eye spots.

1.3.17 Falconry. Active dispersal of problem birds using trained Falcons.

1.3.18 Bird Strike. OPNAVINST 3750.6Q (Section 316) indicates that the term "bird/animal strike" is now the correct terminology when referring to incidents involving the collision with all types of wildlife. A bird/animal strike event is considered to have occurred anytime a naval aircraft collides with an animal whether or not damage resulted from the collision. Any contact between a bird or other animal species and an aircraft, whether or not damage occurred must be reported. All wildlife strikes, damaging or non-damaging, are required to be reported to the Navy Safety Center.

1.3.19 Bird Exclusion Zone. The designated area surrounding the airfield where bird habitation is discouraged.

1.3.20 Salvage. The act of collecting wildlife or wildlife remains from an aircraft or from the airfield environment.

CHAPTER 2**ORGANIZATIONAL TASKS AND RESPONSIBILITIES****2.1 BIRD HAZARD WORKING GROUP (BHWG)**

2.1.1 General. The Bird Hazard Working Group is organized to implement and monitor the BASH Plan. It allows Facility offices affected by bird problems the opportunity to meet and discuss possible solutions. The BHWG shall meet regularly with representatives from each organization concerned with bird hazards.

2.1.2 Composition. As a minimum, the group shall have a representative assigned from the following specialties:

- a. Air Operations Officer (Chairman)
- b. Aviation Safety Officer (Co-chairman)
- c. Air Traffic Control Facility Officer
- d. Natural Resources Program Manager
- e. Public Works/ROICC
- f. Deployed VP Squadron Aviation Safety Officer
- g. AMC Aviation Safety Officer
- h. Deployed Air Force Flight Safety Officer
- i. PACAF Aviation Safety Officer
- j. Weapons Department
- k. Security Department
- l. USDA Wildlife Services Biologist (when available)

2.1.3 Authority. The Commanding Officer is responsible for the BASH Program and is approval authority for all BHWG recommendations. The BASH Program is a part of the Aviation Operations Program, and as such, the Air Operations Officer shall monitor the effectiveness of the program. Active participation and communication between the Air Operations Department and the Natural Resources Program Manager is key to ensuring success of this program.

2.1.4 BHWG Meeting Schedule. BHWG will meet quarterly. Additionally, the BHWG will meet as often as necessary to stay current on bird hazards and to discuss solutions, results, and effectiveness of the program. An important concept is that the BHWG address problems as they develop, before they create a serious safety hazard.

2.1.5 BHWG Function

1. Execute and update the BASH Plan.
2. Monitor bird strike reporting procedures to ensure compliance with reference (c).
3. Collect, compile, and review data on all bird strikes.
4. Identify and recommend actions to reduce bird hazards.
5. Recommend changes in operational procedures.
6. Prepare informational programs and safety briefings for aircrews.
7. Establish a Bird Dispersal and Deterrent Team.
8. Establish and update BASH prevention program procedures per applicable DOD and Navy Policies.
9. Seek technical advise from Pacific Division, Naval Facilities Engineering Command (PACNAVFACENGCOM) and other DOD components on issues of implementing BASH prevention and reduction programs. Specifically bird dispersal by the BDDT whenever necessary.

2.2 NSF AIR OPERATIONS OFFICER

1. Chair the BASH Working group meetings and maintain liaison with all aviation activities to develop, maintain awareness, and effectiveness of this Plan.
2. Devise operating procedures for Air Operations personnel, specifically Air Traffic Control personnel, to quantify and disseminate current bird hazard situations and "conditions" to aircraft flight crews.
3. Update the ATCFO in bird hazard abatement issues through the BASH Working group and on a daily basis.
4. Ensure that the BDDT is manned and supplied with appropriate equipment to carry out all depredation activities. Direct, monitor and evaluate the performance of the BDDT.
5. Present quarterly reports on strike data, delayed takeoffs and landings, and BDDT activities at the quarterly Bird hazard Working Group Meetings.
6. Ensure that the BASH program is a part of safety reviews conducted by the Naval Safety Center.

2.3 AIR TRAFFIC CONTROL FACILITY OFFICER (ATCFO)

1. Co-chair the BHWG.

2. Report all bird strikes to the Navy Safety Center.
3. Ensure that all bird strike remains are properly collected, recorded with date and location information and submitted to the Natural Resources Program Manager for identification.
4. Maintain a file of all bird strikes occurring at NSF Diego Garcia and coordinate this file with the [G1]Natural Resources Program Manager.
5. Develop passive, active, and static procedures to reduce BASH hazard.
6. Coordinate broadcasting of current bird activity on the Airport Terminal Information Service (ATIS) during all Bird Hazard Conditions (Red, Yellow, and Green).
7. Ensure that the Bird Dispersal Deterrent team is properly trained on the pre-approved methods and use of pyrotechnic equipment and live ammunition.
8. Activate the BDDT and authorize the use of pre-approved methods to disperse flocks of birds posing a hazard to air operations, based on the following:
 - a) Information relayed by taxiing or airborne aircraft
 - b) Observations made by the ATC or Crash and rescue personnel.
 - c) Observations made by Air Operations personnel.
 - d) Observations made by the NSF NRPM.
 - e) Direction of the Air Operations Officer.
9. Notify BIOT Police and NSF Security if pyrotechnics or firearms are to be use on the airfield.
10. Coordinate with the NSF Air Operations Officer and the Natural Resources Program Manager to identify any bird hazards to aircraft and implement corrective action.
11. Request assistance, as needed, from the Air Operations, Public Works Department, NRPM, Fire Department, BASE Security, and other operational squadrons based at NSF Diego Garcia.
12. Ensure that all squadrons, deployed and transient aircrews report ALL bird strikes.
13. Maintain annual files of all bird strikes reported. Maintain this file indefinitely to establish and document trends
14. Maintain and provide the NRPM with the quarterly reports to measure bird hazard identification, habitat management, and bird harassment actions to establish and compare with baseline data and to assess operational effectiveness and impact to the target species, environment, wildlife, and natural resources.

2.4 DEPLOYED/VISITING SQUADRONS

1. Provide representative to the BHWG.
2. Ensure that the NSF Diego Garcia BASH Indoctrination Brief is received upon arrival.
3. Ensure aircrew briefings are conducted on local bird hazards.
4. Issue specific guidance to squadron personnel for reporting observed hazardous bird activity to the Tower or Base Operations.
5. Issue specific guidance to maintenance personnel for reporting of all discovered bird strikes on aircraft to the Squadron Safety Officer.
6. Issue procedures for the preservation and submission of bird remains if discovered on an aircraft. Even the smallest fragment of a feather should be preserved for identification.
7. Ensure aircrew comply with reference (d) mandatory reporting of all bird strikes, damaging and non-damaging.

2.4.1 Squadron Safety Officers

1. Attend BHWG meetings.
2. Ensure bird strikes are reported per reference (d) and this instruction.
3. Ensure any applicable bird activity data is readily available to aircrews during mission planning.
4. Make seasonal bird hazards a regular topic at flying safety meetings. Use movies, articles, and other information, as appropriate, to maintain awareness.

2.5 NSF PUBLIC WORKS OFFICER (PWO)

1. Provide representative to the BHWG.
2. Based upon the direction of the BHWG, maintain runway lateral and approach zones in a manner that is least attractive to birds. This may include but not limited to: mowing, brush/tree removal, planting bare areas, leveling high/low areas, improve drainage, broad leaf weed control, waste disposal control, and pest management.
3. Develop procedures for removal or control of bird attractants identified by NRPM, PACNAVFACENCOM Biologists, or the BHWG.
4. Ensure training is conducted for all PW and base support (DG-21) personnel (sweepers, etc) covering responsibilities, actions, and techniques applied under this instruction, specifically in the areas of bird strike remains collection and bird advisories to the Tower.

2.6 NATURAL RESOURCES PROGRAM MANAGER (NRPM)

1. Request and maintain annual funding in support of the BASH Program.
2. Provide representative for BHWG.
3. Recommend changes to environmental conditions and management practices to reduce bird strike potential. These changes will be presented to the BHWG for consideration.
4. Initiate necessary environmental documentation for airfield modifications as required by law.
5. Conduct periodic avian/airfield surveys.
6. Maintain and review the file of all bird strikes occurring at NSF Diego Garcia.
7. Provide Natural Resources support as outlined below:
 - a. Obtain and maintain permission required for harassment, depredation, salvage, collection, and possession of all protected avian species at NSF Diego Garcia from the British Representative.
 - b. Pursue non-lethal means to reduce the BASH situation at NSF Diego Garcia and consider lethal means only as a last resort.
 - c. Train BDDT. This training will focus on the use and techniques of active scare methods, as well as placement of static deterrent devices.
 - d. Brief the BHWG on seasonal bird hazards and changes to current airfield conditions.
 - e. Assist in the identification of all bird strikes occurring at NSF Diego Garcia.
 - f. Coordinate with PACNAVFACENGCOM Fish and Wildlife Biologists for needed technical assistance regarding BASH program implementation and on-site BASH Program review no less than every two years. This assistance and review will encompass:
 - (a) Review and certification of NSF Diego Garcia's BASH Plan as technically adequate.
 - (b) Techniques for bird control at the airport and nearby facilities.
 - (c) Evaluation of landfills, incinerators, weapons ranges, sewage plants, and wildlife preservation areas for strike increase potential.
 - (d) Identification of bird strike remains.
 - (e) Information and training on bird scaring and depredation equipment.
8. Coordinate wildlife studies as necessary to improve wildlife hazard control, assess the potential impacts of control activities on

wildlife populations and distribution, and evaluate the potential effects of wildlife displacement.

2.7 BIRD DETERRENT AND DISPERSAL TEAM (BDDT)

1. Responsibility for the bird detection and dispersal is an airport management function and as such falls under the control of the NSF Air Operations Officer. The Air Operations Officer will establish a trained team to carry out detection, dispersal, and depredation activities.
2. Have immediate access to bird scare and depredation equipment and bird control efforts within the airfield environment.
3. Be properly trained in the use of pyrotechnics and depredation equipment.
4. Reports directly to the NSF Air Operations Officer.

2.8 SECURITY DEPARTMENT

1. Provide representative for BHWG when required.
2. Develop firearm check-in/out procedures.

2.9 WEAPONS DEPARTMENT

1. Provide representative for the BHWG when required.
2. Provide Ready Storage Lockers (RSL) for BASH Class 1.4 pyrotechnics and small arms ammunition.
3. Provide Class 1.4 weapons storage safety training to BDDT.
4. Provide 12 gauge shotguns and bird shot ammunition for BDDT.
5. Provide firearms safety training to BDDT members.
6. Provide cleaning supplies for BDDT firearms.
7. Develop and maintain Standard Operating Procedures (SOP) for BDDT members for the use and handling of pyrotechnics and firearms (NAVSEA Op 5 Vol. 1, Rev 6).

CHAPTER 3

CONCEPT OF OPERATIONS

3.1 GENERAL. The BASH program is an ongoing process including both information dissemination and active/passive bird control techniques.

Of these processes, the most critical is the aircrew notification and warning system. This system establishes procedures for the immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds that pose a hazard to flight safety. Additionally, a cautionary advisory is published in the DOD Flight Information Publication AP/1 under Supplementary Airdrome Remarks.

3.2 BIRD HAZARD WARNING SYSTEM. The following standardized BHC will be used at NSF Diego Garcia to warn aircrew and support personnel of the current bird threat to operations. These codes are identical to the USAF codes in section B of the DOD FLIP (Flight Information Handbook). Bird locations should be given with the condition code.

3.2.1 BHC Red (Severe)

1. Generally defined as heavy concentrations of birds (more than 15 large or 30 small) on or immediately adjacent to the active runway or other specific locations that presents an immediate hazard to flight operations. Active dispersal will be initiated during this BHC and BDDT personnel shall remain on the airfield actively involved in dispersal techniques until this BHC is downgraded. Aircrews should apply applicable Go/No-Go criteria.

Note: RED may also be declared when birds of any size or quantity present an immediate hazard.

3.2.2 BHC Yellow (Moderate). Generally defined as moderate (concentrations of 5-15 large or 15-30 small) birds observable in locations that represent a probable hazard to flying operations. Positive actions should be taken to disperse the concentrations of birds that are causing the hazard.

3.2.3 BHC Green (Low). Sparse bird activity on and above the airfield (less than described in Yellow) with a low probability of hazard.

Note: Personnel making BHC reports may not necessarily follow the numerical numbers in Table 1. These are just a guide. If, in the judgement of the observer, the number of birds is less than those indicated for a specific BHC, but a hazard is believed to exist, a higher BHC may be declared. Example: Condition Red may be declared if one Magnificent Frigate Bird is immediately adjacent to the active runway.

NSF DIEGO GARCIA BIRD HAZARD CONDITIONS

BHC	MODIFIER	BIRD ACTIVITY
RED	SEVERE	15+ large birds, or 30+ small birds

YELLOW	MODERATE	5-15 large, or 15-30 small
GREEN	LOW	Sparse bird activity

Table 1

Note: BHC descriptions will be reported using the colors (Red) vice modifiers (Severe). Until DOD standardizes this system, either of these terms may be encountered at other military airfields. While each base may have a slightly different definition for its hazard conditions, an associated level of danger can reasonably be ascertained from either reporting standard. Requests for clarification from ATC or airport management are recommended when confusion or doubt exists.

3.2.4 Bird Watch Alert. A general warning that indicates when weather, time of day, and seasonal conditions make an influx of birds onto the airfield likely. Upon receipt of special conditions, airfield management will set the alert and the Tower will include a general statement in ATIS broadcasts.

3.2.5 BASH Window. BASH windows are based on historical bird survey data that show specific times when a hazard is known to exist, i.e., mowing events and egret activity, etc. When BASH windows are set, aircraft operations during these time frames are not recommended. The Air Operations Officer will post BASH windows on the rolling NOTAMS display. Squadron flight schedulers should avoid scheduling operations during BASH windows. Guidance for aircraft operations is contained in Chapter 4.

3.3 BIRD HAZARD CONDITION REPORTS

3.3.1 Bird Hazard Reporting. The NSF Air Operations Officer, tower personnel or designated representative ensures hazardous conditions are reported. Declaration of a BHC will be based on the following:

- a. Visual observation of bird activity on or near the airfield by Tower or BDDT personnel.
- b. Information relayed by ATC Radar, airborne and taxiing aircraft.
- c. Observations relayed to the Tower by any of the following personnel: airfield facilities, weather observers, LSO, ground electronics maintenance, airfield lighting technicians, crash crews, arresting gear maintenance, sweepers, mowers, security police, transient line personnel, and any other personnel driving on the airfield.
- d. ATC or weather radar observation.

3.3.2 BASH Detection/Dispersion Team BHC Reporting

1. The most accurate and real-time reporting of bird hazard information is obtained from the BDDT. This roving patrol is present

on the airfield on a regular basis and is in the best position to make accurate BHC reports.

2. When the BDDT is patrolling the airfield, they will have the primary responsibility to make BHC reports to the control tower. At a minimum, reports will be made hourly for inclusion in tower ATIS broadcasts. The BDDT will continue to make real-time reports and update BHC as hazard conditions change.

3. Once BHC RED (Severe) has been declared, the condition will be updated, at a minimum, every five minutes until downgraded. When aircraft are holding for BHC RED, the BDDT will report to the Tower immediately if initial attempts to disperse the birds have failed. During BHC RED, the BDDT shall remain on the airfield and be actively involved in dispersal techniques until BHC RED is downgraded.

3.3.3 BHC Declarations by Maintenance Personnel, Sweepers, Grass Mowers, and Others

1. If a bird hazard exists, other personnel may notify the BDDT or Tower as applicable. This notification can be made on a radio net or by telephone. Telephone reports can be passed to Base Operations at extension 3322. Reports should include:

a. Identity of caller (agency for ground personnel, call sign for aircrews.)

(1) Location.

(2) Altitude.

(3) Time of sighting.

(4) Approximate number of birds.

(5) Type of birds (if known).

(6) Behavior of birds (soaring, flying to or from a location, etc.)

3.3.4 Aircrew Reporting. Aircrews should report significant activity as follows:

a. Notify Tower.

b. On a low-level route/range area, notify ATC and NSF Diego Garcia Schedules after landing.

3.4 DOWNGRADING BHC. Once a BHC has been declared, it shall be downgraded commensurate with updated information. The Control Tower will make the final determination on BHC.

3.5 BIRD HAZARD COMMUNICATION. Disseminating BHC is critical to BASH effectiveness. The agencies below will disseminate the BHC by the following means:

3.5.1 Control Tower Communications

1. Include BHC on ATIS Broadcasts.
2. Notify inbound/departing aircraft of BHC if aircraft has received ATIS and the BHC has changed.
3. Provide additional bird advisories per reference (e).
4. The Tower Supervisor will direct the BDDT to the location where the wildlife is posing a problem.
5. Pass BHC to ODO/Flight Planning.
6. For rapidly changing BHC place a statement on ATIS advising aircrews to contact Ground, Tower, or Final Controller for the latest BHC.
7. If BHC RED is declared for extended periods of time and will impact flying operations, Tower will ensure that NSF Diego Garcia Approach is aware.

3.5.2 Tower Communications

1. Notify the Air Operations Officer when the BHC is changed to Condition Red.

3.6 BIRD DISPERSAL TEAM PROCEDURES. BDDT will regularly patrol the airfield. BDDT SOP procedures are contained in Appendix A.

a. Prior to initiation of dispersal actions the BDDT leader will coordinate the location and methods with the Tower Supervisor and ensure that BHC RED has been declared prior to dispersal activities on the duty runway.

b. Horns should be used before pyrotechnics are used.

c. Pyrotechnics should be used when available. These consist of screamers, whistle bangers, and cracker shells.

d. Propane sound cannons will be placed around the airfield and moved periodically (once every few days) to prevent habituation.

e. If the methods above do not work or the birds become accustomed to the hazing, it may become necessary to remove birds via lethal methods to reinforce the dispersal methods.

f. When the target flock or problem birds are dispersed, Tower shall be notified so the BHC can be lowered.

Note: Lethal control is currently limited to the cattle egrets within the designated shooting zone set by the British Representative.

3.7 BASH DISPERSAL EQUIPMENT

3.7.1 General. There are a variety of methods for dispersing birds using static, pyrotechnic, and depredation equipment. Any or all of these methods may be used at NSF Diego Garcia to control bird locations. The BDDT are specially trained in use of this equipment.

3.7.2 Static Deterrent Devices. Static deterrents may include, but are not limited to: propane cannons, scarecrows, silhouettes, and effigies. They are often very effective in bird deterrence. Static devices are designed to augment the activities of the bird dispersal teams. At no time should static deterrents be considered a replacement for dispersal teams. Static devices should be moved by the BDDT 50-100 feet from their existing locations at least every few days. This activity will inhibit the decline in their deterrent effect occurring as wildlife become accustomed to the device.

3.7.3 Propane Cannons. The BDDT will position and operate propane sound cannons based on active runway, bird locations, and air traffic density. Locations will be changed every few days to avoid habituation by the birds. At a minimum, one cannon each will be placed in the approach end, midfield and departure end.

3.7.4 Bioacoustics. Bioacoustics are audio taped distress or predator calls of actual birds. Special care must be taken to play the tape in short intervals to prevent habituation by the birds. Birds should respond by taking flight or becoming alert. These calls are effective for waterfowl, gulls, songbirds and shorebirds. Pyrotechnics should be used in conjunction with bioacoustics to enhance complete dispersal. Bioacoustics will be the first option employed to control airfield bird habitation.

3.7.5 Pyrotechnics. Pyrotechnics are effective for dispersing most bird species. Pyrotechnics are fired from modified pistols and 12 gauge shotguns. Pyrotechnics may include a variety of devices similar to commercial fireworks, including bangers, whistlers, screamers, and salutes. These small but very loud firecrackers are shot from the pistol/shotgun into flocks or near individual animals to frighten them away when they are discharged. Proper procedures for using Pyrotechnics are as follows:

a. Liaison with the Tower prior to discharging pyrotechnics and coordinate the location. If aircraft operations are imminent, ensure the BHC is raised prior to initiating dispersal operations.

b. Inform Security Police prior to discharging pyrotechnics on the flight line.

c. Use ear and eye protection, and gloves.

d. **DO NOT LOAD THE GUN IN THE VEHICLE!** Step outside, cock the gun, load the cap then load the pyrotechnic in the barrel of the gun.

e. Point the gun at 45 degrees or higher into the air, preferably toward the flock of birds. Turn AWAY from the gun and pull the trigger.

3.7.6 Lethal Control (Depredation). Depredation of birds reinforces the other methods. Shooting one or two from a flock then following with a volley of pyrotechnics is generally a very effective strategy for deterrence. Currently, the only birds authorized by the British Representative for depredation is the cattle egret.

3.7.7 Record Keeping. BDDT will maintain daily activity logs. These logs will document all bird dispersal operations to include species, location, methods, and number of birds dispersed. Monthly data will be summarized at BHWG meetings.

3.8 CRASH CREW PROCEDURES. If fire-fighting crews detect egrets or other birds presenting a BASH potential, they will pass the information to the BDDT or Tower. When BDDT is not manned, crash vehicles may be used to disperse birds as required.

3.9 LAND MANAGEMENT PROCEDURES. One of the most effective and permanent methods of discouraging birds from using the airfield is the removal of attractive habitat features. Passive control methods are described below. Although effective, budget restrictions may preclude incorporating all of these measures. Implement land management procedures when funding and manpower resources are available.

3.9.1 Managing Grass Height

1. Current Navy BASH instructions encourage facilities to maintain a uniform grass height between 7 and 14 inches. Long grass discourages flocking species because reduced visibility disrupts interflock communication and prevents predator detection. NSF Diego Garcia should maintain the airfield grass height at the maximum 14-inch suggested height. Since the two most commonly struck birds at NSF are the cattle egret and the common myna, the grass should be maintained as high as Navy airfield regulations and current mowing equipment will allow.

3.9.2 Controlling Broad-leafed Weeds. Keep broad-leafed weeds to a minimum on the airfield. Apply herbicides as necessary for control. Broad-leafed weeds attract a variety of birds, may produce seeds or berries, and may limit grass growth. Obtain permission and assistance in herbicide selection for weed control, appropriate grass seed selection, fertilization, and erosion control vegetation from BASH team recommendations, PACNAVFACENCOM, U.S. Soil Conservation Service, or the Agricultural Extension Service.

3.9.3 Planting Bare Areas. Eliminate bare areas on the airfield. Plant grass as necessary and appropriate to maintain ground cover at the highest allowable height.

3.9.4 Fertilizing. Use government approved fertilizer to selectively stimulate grass growth to promote a uniform cover.

3.9.5 Removing Edge Effect. Maintain the airfield as uniformly as possible to reduce the transition zone between two distinct habitat types (e.g., brush to grassland).

3.9.6 Leveling of Airfield. Level or fill high or low spots to reduce attractiveness to birds and prevent standing water.

3.9.7 Removing Dead Vegetation. As soon as possible, remove dead vegetation such as brush piles, and the cover it affords.

3.9.8 Removing Bird and Animal Carcasses from the Airfield. This is to avoid attracting scavengers that feed on them. Forward remains, which may have been caused by collision with aircraft, to Air Operations for identification and reporting procedures.

3.9.9 Pest Control. Invertebrates and rodents are key food sources for many birds. Periodically survey and reduce these pests when required.

3.9.10 Maintaining Drainage Ditches. Regularly inspect ditches to keep them clear. Maintain ditch sides as steeply as possible (minimum slope ratio of 5 to 1) to discourage wading birds and emergent vegetation. Improve drainage as necessary to inhibit even temporary ponds or puddles. When able, cover ditches with netting/plastic fencing.

3.9.11 Employing Erosion Control Vegetation. Use vegetation that is appropriate for the region and does not produce seeds at heights below 14 to 18 inches.

3.9.12 Eliminate Roosting Sites. Control bird roost and nesting sites by vegetation control. Remove or prune trees to reduce the number of perches and nest sites if necessary. Shooting adult birds at roost and nesting sites is encouraged, to maximize manpower and resources. Eliminating roost and nesting sites will provide the best way to minimize problem birds from the airfield environment.

3.9.13 Bird Proof Buildings and Hangars. Often, bird proofing of buildings and hangars is required to exclude problem-nesting species. Excluding birds from a structure they currently utilize will often displace them to an adjacent structure. Existing birds should be destroyed (in accordance with the depredation) prior to the exclusion effort whenever possible. Denying access by screening windows, closing doors, and blocking entry holes is most effective. When necessary consider:

a. Toxic perches. Install where maximum numbers of birds will contact them. Ensure perches are maintained with avicides to remain effective (IMPACTS NON-TARGET BIRDS. NEEDS BRITREPS APPROVAL)

b. Pellet guns. A short-term solution only. Proper safety equipment and skilled personnel are required.

c. Netting. Install under superstructure to exclude birds from roosting areas.

d. Avitrol. USE OF AVICIDES OR AVITROLS NOT INCLUDED IN THE PEST MANAGEMENT PLAN - PMP. The PMP addresses pest management to include health and environmental safety (not flight safety) among others. Annex 7 Pest Control does not deal with avitrols.

e. Trapping and removal. Use a large cage with food and water to trap birds. Release birds away from buildings or depredate if permitted by law. TRAPPING AND REMOVAL REQUIRES BIOT APPROVAL

f. Design features. If designing a new hangar, consider locating supports on the exterior.

g. Door coverings. Use netting or plastic strips suspended over the doors to exclude birds. Ensure no tears or holes are present that allow birds access to the hangar.

h. Sharp projections. Use in limited areas such as ledges and overhangs, or small places where birds cannot be allowed. Too expensive for large areas.

i. Night harassment. Use high-pressure air or water to make hangars an undesirable roosting site. Persistence is the key. REQUIRES BIOT APPROVAL

CHAPTER 4**AIRCREW PROCEDURES****4.1 PLANNING THE FLIGHT**

1. Check FLIP AP/1 (Supplementary Aerodrome Remarks) and NOTAMs for information about permanent and seasonal bird problems at both departure and destination airports and on route of flight.
2. Check rolling local NOTAMs and flight planning displays for BHC and BASH Windows in effect.
3. Consult with the Squadron Safety Officer or Squadron Duty Officer for additional BASH information.
4. Brief all crewmembers on potential bird problems and a strong lookout doctrine.
5. Discuss emergency procedures before departure, including aborts following a strike and engine failure. Note: 75% of all multi-engine strikes occur to engines on same side.
6. Discuss procedures for cockpit lost communications, including change of aircraft control.
7. Consider using combination sunglasses and visor during daylight hours and the clear visor at night during all low-level phases of flight.

4.2 AT THE AERODROME

1. Prior to taxi, listen to ATIS for current BHC. Ask Tower for specific bird locations or additional information.
2. When taxiing, watch for birds on the airport. The most frequently struck birds (egrets) have a gray or black coloring on their back making them hard to see on the tarmac or concrete. Flocking birds may be partially hidden in grass areas. Report bird sightings to the Tower.
3. Birds on the ground face into the wind and may not see or hear you coming. They may take flight just prior to you reaching them.
4. If birds are observed, notify the Tower and request that BASH personnel disperse them before takeoff if they are in a location that presents a likely danger to your or another aircraft.
5. Increase interval on section departures to 20 seconds during condition Yellow. The lead aircraft in flight can cause birds to lift and circle behind causing a strike to the wingman.
6. Use landing lights during takeoff, climb, descent, approach and

landing. Although there is no conclusive evidence that birds see and avoid aircraft lights, they will make the aircraft more visible.

7. Travel as much as possible above the bird layer. More than 50% of all strikes occur below 100' and 88% of all strikes occur below 2000 feet. In practice, this means to climb to 100 feet AGL as rapidly and safely as possible and continue to climb without delay to 2000 feet.

8. If you see birds ahead, attempt to pass above them, as birds usually break away downward when threatened.

9. If dense bird concentrations are expected, avoid high-speed descent and approach. Reducing speed can significantly reduce impact energy. The force of impact is roughly proportional to the square of the aircraft speed.

10. If flocks are encountered during approach, go around for a second attempt, the approach area may then be clear.

11. When able, descend and climb-out in a straight line. This makes it easier for the birds to anticipate your flight path and thus get out of your way.

12. Avoid flying one hour before and after dawn and dusk to the maximum extent practical.

13. Avoid flying over the 3 islets and the bird sanctuary located on the eastern arm of the atoll.

4.3 ACTIONS FOLLOWING A BIRD STRIKE

1. If airborne, complete the damaged aircraft checklist per specific NATOPS procedures.

2. During a takeoff or planned touch and go, the aircraft commander should assess the option of aborting if a bird strike occurs, and if enough runway remains to stop. Bird strike damage cannot be accurately assessed in flight and may result in a complex airborne emergency. Only maintenance personnel on the ground can make damage assessments. Several bird strikes that appeared to cause minor damage have proven to be much more substantial and, had aircrews continued the mission, a serious emergency could have resulted. Structural damage, such as a dent in the wing, has led to fuel and hydraulic system failures. Birds lodged in landing gear have prevented gear extension.

3. Aircrew experiencing en route bird strikes should abort the mission when possible.

4. After landing, if you suspect or have had a strike, check the aircraft for damage.

4.4 BIRD STRIKE REPORTING

1. Post flight follow-up and reporting of bird strikes are an essential and important part of the BASH program. After a strike:

a. If airborne, inform Control Tower and complete emergency landing, if required. Ensure that any bird remains possibly remaining on the runway are removed.

b. After post-flight inspection, preserve any remains (however slight) and turn in to the Base Operations 370-3322. Fill out the Bird Strike Information Card and place it with the remains. Notify the Air Operations Department at 370-3319 for the remains to be processed and identified.

c. Report strikes even if no bird remains are found on the aircraft. Air Traffic Control or Fire Department personnel may be able to retrieve the bird(s) from the airfield.

d. Follow up local reporting by completing the Bird/Animal Strike Hazard Report on the Navy Safety Center web site www.safetycenter.navy.mil. Both damaging and non-damaging strikes are required to be reported. Forward a copy to the Air Traffic Control Office.

2. The BASH team also encourages aircrew to report near misses that involve evasive action or whenever the proximity of the miss is "too close for comfort." These may also be submitted to the Naval Safety Center's web site.

4.5 BIRD IDENTIFICATION. All strike data is entered into both local and Navy Safety Center databases to help track and identify bird hazards. Therefore, it is necessary to know which species are causing bird strike problems so appropriate measures can be taken. Identification of bird remains is essential. If bird remains are found on the aircraft, the following preservation procedures shall be followed:

a. Remove all remains from aircraft, and place in zip lock plastic bag. It does not take much (remains) to identify the bird species. Even if just a small part, feather or bloody smear with down, the species can be identified through microscopic techniques. Fill out Bird Strike Information Card with requested information and place all remains in the freezer located at Base Ops. Notify ATC of the remains so the remains can be identified by the Natural Resources Program Manager.

b. Once the bird is identified, the original bird strike report sent into the Navy Safety Center may be updated with the species information

4.6 OPERATIONAL LIMITS AND GO/NO-GO CRITERIA

1. BHC RED

a. BASH dispersal efforts will be initiated immediately after BHC Red is set. Normally, the hazard can be removed within five minutes.

However, if initial dispersal efforts have failed, the Control Tower will update delay information in five minute intervals to allow aircrew ample time to calculate fuel/divert/ mission planning.

b. The following guidance for aircrew actions during BHC RED is recommended:

(1) Fuel and weather permitting, inbound aircraft will hold until BDDT actions or natural movements have lowered the hazard condition, otherwise proceed to alternate.

(2) Departing aircraft will hold on deck until BDDT actions or natural movements have lowered the hazard condition.

(3) Wind and weather permitting, request an off-duty runway from ATC if that runway hazard/BHC is lower

Note: If the bird/animal hazard is fouling the runway, the Control Tower will close the runway per FAA directives. Tower clearance will not be issued; accordingly, all operations will be at the discretion and risk of the pilot in command.

2. BHC YELLOW. The following guidance for aircrew actions during BHC YELLOW are recommended:

a. Delay or terminate practice approaches.

b. Modify altitude above the hazard (restricted low approach to 500 feet AGL, etc.)

c. Initial takeoffs and full stop landings are at the aircraft commander discretion.

d. Increase interval on section departures to 20 seconds minimum.

e. Increase spacing to a minimum 6000 feet between landing aircraft.

CHAPTER 5

LOCAL BIRD SPECIES

5.1 GENERAL. The following is a summary of birds within the NSF Diego Garcia airfield environment. Associated with each is a brief description of how they can be controlled or avoided. Each control measure will require action by one or more tasked organizations as described in Chapter 2. It is very important to know which avian species or airfield attractants are present before control techniques can be effectively applied.

5.2 NSF DIEGO GARCIA AVIAN HAZARDS

5.2.1 Avian Species

5.2.1.1 Resident Birds (Egrets, Maynabs, Fodys, Herons, Doves etc.).

The most common species in this group found at NSF Diego Garcia is the cattle egret. It is attracted to the short grasses of the mowed airfield environment to feed primarily on insects and other invertebrates. Most of these species are attracted to grasslands and shallow waters where they feed on fish, insects, amphibians, reptiles, and arthropods. Increasing the grass height of the airfield environment will cause some birds to seek other areas of shorter grass. Steepening the sides of ditches and ponds and removing emergent vegetation will drastically reduce accessibility to food sources. Control of these species is best accomplished by aggressive shooting program, habitat modification and food source elimination. Persistent harassment using pyrotechnics, gas cannons and bioacoustics is necessary to discourage birds from using the airfield for food and shelter.

5.2.1.2 No gulls recorded/sighted on DG

5.2.1.3 Sandpipers/Shorebirds. The most significant hazard from these birds occurs when large numbers flock in tight groups, particularly during migration and along coastlines. To control these birds, proper grass height management must be observed. Water in puddles should be eliminated and ditch banks steepened to limit access to these birds. Pyrotechnics and bioacoustics can be used for all species and some respond well to falconry.

5.2.1.4 Terns/Seabirds. These are fish eating, gull-like birds in coastal areas and on some major river systems and lakes. Avoid flying near areas where these birds may be active, such as nesting colonies or piers in coastal areas. Remove the food source if these birds pose a significant hazard.