



Bird Aircraft Strike Hazard Management – Aircraft Birdstrike Avoidance Radars – Environmental Services

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BRAC Commission

22 August 2005

AUG 23 2005

Received

BRAC Group

RE: Safety Issues at NAS Oceana and NAS Cecil Field

To Whom It May Concern:

My name is Ron Merritt. I am a retired USAF officer and currently the President of DeTect, Inc., a Florida corporation that specializes in bird and wildlife hazards to aviation. My company is internationally recognized for expertise and experience in the field of bird strike hazards and currently operates the US Air Force Avian Hazard Advisory System (AHAS) under contract. We have a great deal of experience with the bird and wildlife hazard issues associated with NAS Oceana as well as Dare County Bombing Range and the proposed OLF in Washington County, North Carolina. We feel that an additional consideration in the debate about safety and military readiness should be the potential for catastrophic bird strikes during training missions. Please feel free to call me at your convenience at (850) 774-7335.

I certify that the information contained in this submission to the BRAC Commission is accurate and complete to the best of my knowledge and belief as required by Section 2905 of the Defense Base Closure and Realignment Act of 1990."

A handwritten signature in black ink, appearing to read "Ron L. Merritt", with a long horizontal flourish extending to the right.

Ronald L. Merritt

President

DeTect, Incorporated

Enclosures
Report
Resume



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Bird Aircraft Strike Hazard Management – Aircraft Birdstrike Avoidance Radars – Environmental Services

Ronald L. Merritt
President

Summary of Experience

Mr. Merritt has been instrumental to the development of AHAS, a methodology for providing bird strike risk assessments for low-level, military flight operations. Mr. Merritt is a retired Air Force officer with over 20 years of experience as scientist and senior staff biologist. He was an Assistant Professor of Biology at the United States Air Force Academy and the course director for the department's largest core course in general biology. As an officer assigned to the Air Force Institute of Technology, he conducted research in environmental physiology and aquatic toxicology. The last seven years of his Air Force career were spent as the Chief of the Bird Aircraft Strike Hazard (BASH) Team, Environmental Engineering Division, Pentagon, Washington D.C., and later at the Air Force Civil Engineering Support Agency, Tyndall AFB, Florida. He was responsible for providing on-site technical assistance to major commands and bases worldwide in reducing bird strike hazards on airfields and weapons ranges. Additionally, he assisted flying units in developing and scheduling operations on high speed low-level training routes to avoid hazardous bird concentrations. During this time he conducted on-site surveys of bird and wildlife hazards at over 85 airports in 12 countries. He provided technical assistance in the investigation of eleven aircraft mishaps. He was the Air Force expert witness in public hearings and legal proceedings concerning off base land use issues that posed bird and wildlife hazards to aircraft operations. Mr. Merritt has conducted research at many landfills and commercial airports to identify potential bird/wildlife hazards, develop comprehensive management plans, and conduct control training.

His experience in aircraft operations as well as academic and technical aspects of biological sciences has allowed Mr. Merritt to gain a sound background in biological issues that pertain to aviation safety and the associated federal, state, and military regulations concerning these issues. This knowledge has been enhanced by extensive worldwide field experience in airfield evaluations, investigations, and classroom instruction and training. He has given lectures on bird strike hazards and related topics at international conferences in Spain, Germany, England, Finland, Belgium, Israel, New Zealand, Panama, and Chile

Selected Experience

Expert Witness. City of Dubois/Jefferson County Municipal Airport vs. Leatherwood Landfill . Mr. Merritt provided key testimony in the decision of the State of Pennsylvania, Department of Environmental Protection, to deny a permit to site a

municipal solid waste disposal facility near the municipal airport. In a rigorous, protracted hearing, he was able to establish his expertise in field of bird strike hazards and pointed out serious concerns with the demonstration project submitted by the proponents of the landfill.

Program Manager. New Orleans International Airport. Mr. Merritt conducted a multi-year study of bird and wildlife hazards at the New Orleans International Airport. The program included monthly field surveys, identification of daily and seasonal bird movement patterns using visual observations as well as conventional and Doppler radar, control team training, coordination of training with local landfill operations and wildlife management plan development. Mr. Merritt also used innovated vertical scanning radar to assess bird activity over nearby landfills relative to aircraft flight patterns.

Program Manager. McKinney Municipal Airport. Mr. Merritt developed management plans for the municipal airport and landfill facilities in McKinney, Texas. The program includes bird and wildlife survey work, on-site training, and formal plan development and implementation. Additionally, he evaluated landscape plans as well as assessed agricultural out lease programs at the airport.

Program Manager. Tallahassee Regional Airport and Wastewater Treatment Plant. Mr. Merritt led a team of biologists to assess habitat use in the vicinity of the Tallahassee Regional Airport. This effort is focusing on surrounding land use (wastewater plant, solid waste transfer station) as well as local turf management program. The program resulted in an integrated approach to bird control at both the airport and the wastewater plant. Other critical aspects of this plan was the evaluation of coyote control methods, bio-solid disposal, controlled burn programs, and fencing.

Program Manager. Avian Hazard Advisory System (AHAS), Mr. Merritt is the program manager for the development of an innovative methodology for providing bird strike risk assessments for low-level, military flight operations. The Avian Hazard Assessment System (AHAS) was the result of over ten years of research into the possibility of using the nationwide network of Doppler weather radar (WSR 88-D) as the basis for bird hazard identification. AHAS combined traditional risk prediction from the USAF Bird Avoidance Model (BAM) with sophisticated weather forecasting models as a basis for refining periods of time when migration intensities would be greatest. AHAS provided daily forecasts of hazardous conditions along specified low-level routes and ranges as well as hourly updates based upon radar observations. Mr. Merritt provided logistical support for the program and assisted directly in providing hazard advisories during the test period which required 24 hour a day support. The overwhelming success of this initial investigation resulted in the expansion of the project into other geographic regions. The AHAS concept is now under consideration for development in other regions of the world including Europe and the Middle East.

Project Manager. Air National Guard (ANG) Bird Aircraft Strike Hazard (BASH) Plans, Nationwide. This project includes the on-site assessment of 18 ANG facilities and the development of an integrated BASH plan required under AFI 91-202. The effort includes coordination with commercial airport operators at joint use facilities and development of management plans that comply with both military and FAA requirements. Installations completed to date include: Burlington, Vermont; Fort Smith, Arkansas; Smoky Hill Bombing Range, Kansas; Townsend Bombing Range, Georgia; Phoenix, Arizona, Tucson, Arizona, New Orleans Naval Air Station; Meridian, Mississippi; San Juan, Puerto Rico; Duluth, Minnesota; Baltimore, Maryland; Birmingham, Mississippi, and Port Hueneme, California.

Program Manager. Moody Bird Avoidance Model (BAM), Moody Air Force Base (AFB), Georgia This three year project used small scale radar, thermal imagery, radio and satellite telemetry, and bird vocalization monitoring to determine bird activity in the vicinity of Moody AFB and the Grand Bay Bombing Range. The predictive models were based on historical data which calculates risk of a damaging bird/aircraft strike over time and space. The final product for this project included a BAM for both the Grand Bay Bombing Range and a BAM for the airfield at Moody AFB. The airfield BAM represents a new concept in bird avoidance modeling. The airfield BAM operates on a 24 hour a day schedule and provides relative risk assessment for the two runways at the installation. The program is critical in the determination of local Bird Hazard Advisories that result in restrictions of flight operations.

Project Manager. Bird Aircraft Strike Hazard (BASH) Plan, Daytona Beach International Airport, Daytona Beach, Florida. Mr. Merritt conducted field surveys of bird movement patterns and on-site assessments of potential bird attractants at the Daytona Beach International Airport, Daytona International Speedway, and the Volusia County Landfill. These three facilities are owned by the county and became the target for concern following a serious gull strike to a commercial air carrier. Mr. Merritt developed a draft integrated plan that addresses concerns at each facility within the framework of current environmental concerns for endangered species and other protected species. The draft plan was widely accepted and will be finalized following the summer and fall surveys.

Project Manager. Bird/Wildlife Hazard Assessment, Dallas-Fort Worth International Airport, Texas. Mr. Merritt is leading a team of biologists and aviation safety specialists in the assessment of bird and wildlife hazards on this 18,000 acre facility. The project includes determining best land management practices, habitat modification, active control procedures and training requirements.

Project Manager. Covel Gardens Landfill Assessment, San Antonio, Texas. Mr. Merritt collected two years of field data on bird movement patterns in the San Antonio region. He developed a comprehensive bird management plan and conducted semi-annual training for operations staff at this large landfill owned and operated by Waste Management of Texas.

Project Manager. Airport/Landfill Assessment, Town of Taos, New Mexico. Mr. Merritt collected field data on bird movement patterns associated with the landfill and airport in response to plans to expand both facilities. The final report included details on bird movements associated with the landfill and other surrounding areas and provided guidelines for future landfill development in the area. The final report received approval from the FAA and enabled community planners to continue site selection and development of both facilities.

Project Manager. Bird/Wildlife Hazard Assessment, Nashville International Airport, Nashville, Tennessee. Mr. Merritt led a team of biologists and aviation safety specialists in the assessment of bird and wildlife hazards at this busy hub airport. The team provided recommendations on habitat management and active bird control measures as well as developing documentation systems for tracking bird control efforts and strike reports. Mr. Merritt has continued to work with the airport operations staff to find improved methods of habitat control as well as the use of terminal Doppler weather radar to detect birds roosting near the airport.

Expert Witness. State of Georgia, Environmental Protection Division, Landfill Site Assessment, Long County, Georgia. This project included site assessment of several locations in the vicinity of a proposed landfill site near the Townsend Bombing Range in Georgia. The project included data collection and analysis as well as expert testimony in an administrative hearing in support of the EPD's denial of an operational permit for the landfill. The denial was upheld based upon the data and testimony.

Summary of Prior Experience

Louis Armstrong, New Orleans International Airport	Wildlife Hazard Assessment/ Plan
Tallahassee Regional Airport/Smith Water Plant	Integrated BASH Plans
Augusta Regional Airport/Messery Water Plant	Integrated BASH Plans
Arnold AFB, TN	BASH Plan
Cyprus-Tohono Copper Mine, AZ	Bird Control Program
Covel Gardens Landfill/Waste Management Inc.	Landfill Demonstration/Mgt Plan
Saratoga County Landfill/Saratoga County, New York	Site assessment/Expert Witness
Townsend Bombing Range/State of Georgia, EPD	Site assessment/Expert Witness
Dallas Fort Worth International Airport, Texas	BASH Plan Review
Moody BAM Development/USAF BASH Team	Range/Base Risk Model
BASH Plan / NAS Oceana	BASH Plan Development
BASH Plan Review- Cannon AFB/USAF BASH Plan	BASH Plan Review
Powerstone Landfill, Dublin, Ireland/Weston FTA	Landfill assessment/Expert Witness
Seymour Johnson AFB, NC/USAF BASH Team	BASH Assessment/Program Review
MacDill AFB, FL/USAF BASH Team	BASH Assessment/Program Review
Barksdale AFB, LA/USAF BASH Team	BASH Assessment/Program Review
Charleston AFB, SC/USAF BASH Team	BASH Assessment/Program Review
McChord AFB, WA/USAF BASH Team	BASH Assessment/Program Review
Pope AFB, SC /USAF BASH Team	BASH Assessment/Program Review
Travis AFB, CA /USAF BASH Team	BASH Mishap Investigation
Andrews AFB, MD /USAF BASH Team	BASH Assessment/Program Review
Dover AFB, SC /USAF BASH Team	BASH Assessment/Program Review

Offutt AFB, NE /USAF BASH Team	BASH Assessment/Program Review
Westover AFB, MA/USAF BASH Team	Aircraft Mishap Investigation
Davis Monthan AFB, AZ /USAF BASH Team	BASH Assessment/Program Review
Luke AFB, AZ /USAF BASH Team	BASH Assessment/Program Review
Laughlin AFB, TX /USAF BASH Team	BASH Assessment/Program Review
McConnell AFB, KS /USAF BASH Team	BASH Assessment/Program Review
Kelly AFB, TX /USAF BASH Team	BASH Assessment/Program Review
Whiteman AFB, MO /USAF BASH Team	BASH Assessment/Program Review
Dyess AFB, TX /USAF BASH Team	BASH Assessment/Program Review
Edwards AFB, CA /USAF BASH Team	BASH Assessment/Program Review
Ellsworth AFB, SD /USAF BASH Team	BASH Assessment/Program Review
Randolph AFB, TX /USAF BASH Team	BASH Assessment/Program Review
NAS Merimar, CA /US Navy	BASH Assessment/Program Review
Scott AFB, IL /USAF BASH Team	BASH Assessment/Program Review
NAS PAX River, MD/US Navy	BASH Assessment/Program Review
Little Rock AFB, AR/USAF BASH Team	BASH Assessment/Program Review
Tinker AFB, OK /USAF BASH Team	BASH Assessment/Program Review
Keesler AFB, MS /USAF BASH Team	BASH Assessment/Program Review
Tyndall AFB, FL /USAF BASH Team	BASH Assessment/Program Review
Hurlbert Field, FL /USAF BASH Team	BASH Assessment/Program Review
Homestead AFB, FL /USAF BASH Team	BASH Assessment/Program Review
Edwards AFB, CA /USAF BASH Team	Wildlife Control-Hurricane Andrew
Reno, Nevada /USAF BASH Team	BASH Assessment/Program Review
Niagara Falls, NY/USAF BASH Team	Aircraft Mishap Investigation
Duluth, MN /USAF BASH Team	BASH Assessment/Program Review
Fargo, ND /USAF BASH Team	BASH Assessment/Program Review
Richmond, VA /USAF BASH Team	BASH Assessment/Program Review
Atlantic City, NJ /USAF BASH Team	BASH Assessment/Program Review
Rhein Main AB, Germany/USAF BASH Team	BASH Assessment/Expert Witness
Ramstein AB, Germany/USAF BASH Team	BASH Assessment/Program Review
Sembach AB, Germany/USAF BASH Team	BASH Assessment/Program Review
Zweibrucken AB, Germany /USAF BASH Team	BASH Assessment/Program Review
Hahn AB, Germany /USAF BASH Team	BASH Assessment/Program Review
Bitburg AB, Germany /USAF BASH Team	BASH Assessment/Program Review
Invercargill Aerodrome/CAA New Zealand	BASH Assessment/Program Review
Gisbourne Aerodrome, New Zealand/CAA New Zealand	Airport BASH Assessment
Wellington IAP, New Zealand /USAF BASH Team	Airport BASH Assessment
Christchurch IAP, New Zealand/CAA New Zealand	Airport BASH Assessment
Auckland IAP, New Zealand/CAA New Zealand	Airport BASH Assessment
Napier Aerodrome, New Zealand/CAA New Zealand	Airport BASH Assessment
RNZAF Base Ohakea, New Zealand/CAA New Zealand	Airport BASH Assessment
RNZAF Base Whenuapai, New Zealand/CAA New Zealand	BASH Assessment/Program Review
RNZAF Base Wigram, New Zealand/CAA New Zealand	BASH Assessment/Program Review
RAF Mildenhall, UK/USAF BASH Team	BASH Assessment/Program Review
RAF Lakenheath, UK/USAF BASH Team	BASH Assessment/Program Review
RAF Alconbury, UK/USAF BASH Team	BASH Assessment/Program Review
RAF Fairford, UK/USAF BASH Team	BASH Assessment/Program Review
RAF Bentwaters, UK/USAF BASH Team	BASH Assessment/Program Review
RAF Sculthorpe, UK/USAF BASH Team	BASH Assessment/Program Review
Howard AFB, Panama/USAF BASH Team	BASH Assessment/Program Review
Santiago IAP, Chile/Santiago IAP	BASH Assessment/Program Review
Torrejon AB, Spain/USAF BASH Team	Airport BASH Assessment
Ascension Island Wideawake Airfield/USAF BASH Team	BASH Assessment/Program Review
	Sooty Tern Research/BASH Review

Education

B.S. Zoology, University of Arkansas, 1975

M.S. Biology, North Texas State University, 1978

Graduate Studies, PhD-ABD, University of North Texas, 1987

Professional Affiliations

Steering Committee Bird Strike Committee - USA

**Bird Aircraft Strike Hazards
A Comparison of Strike Risk
At
NAS Oceana and NAS Cecil Field
Using the USAF
Bird Avoidance Model**

By

**Ron Merritt
DeTect Inc
Panama City, Florida**

Introduction.

Recent developments in the Base Realignment and Closure (BRAC) process have illuminated safety concerns and encroachment issues at NAS Oceana. While most of these concerns have revolved around aircraft movement areas relative to human populations there are additional safety concerns that involve bird and wildlife hazards. Each year the military and commercial aviation industries suffer over a billion dollars in losses due to strikes with birds and other wildlife. These strikes may result in severe damage to aircraft and occasionally loss of life. The military takes this risk seriously and has developed several programs to help minimize the loss. These programs include airfield bird and wildlife control programs, strike reporting, and bird avoidance technologies. Avoidance technologies include the Bird Avoidance Model (BAM), and the Avian Hazard Advisory System (AHAS) both systems work together to identify areas where significant bird strike risk exists. The BAM is a historical model that is used for planning, while the AHAS is used in near real-time, for avoiding areas that have been confirmed by the nationwide weather radar system (NEXRAD) has having biological targets in the atmosphere. It is significant that bird strike concerns are a key issue in the current environmental lawsuit brought against Navy planners attempting to site an Outlying Landing Field (OLF) in Washington County, North Carolina.

NAS Oceana vs. NAS Cecil Field.

There are significant differences in the environments in which these two installations are located. Subsequently, there are differences in the potential for serious bird strikes as well. The US BAM provides an excellent means by which each can be evaluated for bird strike hazards (Appendix 1). An analysis of the BAM for these two locations was conducted on 22 August 2005 to compare the risk ratings for the installations (Appendix 2). The BAM is executed in 26 biweekly intervals, each interval is divided into four daily periods (dawn, day, dusk, and night). For the purpose of this analysis, dawn and dusk are combined as each represents a shorter portion of a 24 hour period. In this analysis, NAS Oceana has a higher bird strike risk than NAS Cecil Field during 33 of the 78 possible time

intervals (**42.3% of the year NAS Oceana has a greater bird strike risk than NAS Cecil Field**). At no time during the year does NAS Cecil Field have a higher bird strike risk than NAS Oceana!

Additional Concerns.

In addition to the comparison of risk values at each installation, it is critical to know that the areas surrounding NAS Oceana exhibit severe bird strike risk during much of the winter. In fact, severe ratings are common in the surrounding training areas such as Dare County Bombing Range and the proposed OLF site in Washington County. This is due to the proximity of NAS Oceana to heavily used areas of the Atlantic Flyway, as well as wintering grounds for geese and tundra swans. Figure 1 depicts both NAS Cecil Field and NAS Oceana during the first week of January (day). Notice the severe area (in red shading) just east and southeast of NAS Oceana.

US Air Force Bird Avoidance Model (BAM) for January 1 – 14, Day

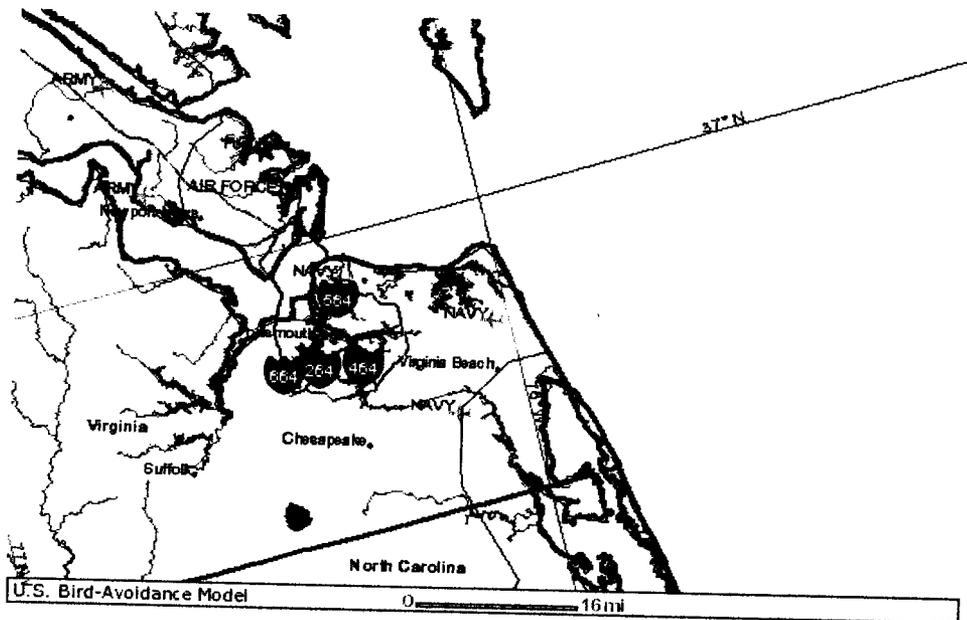
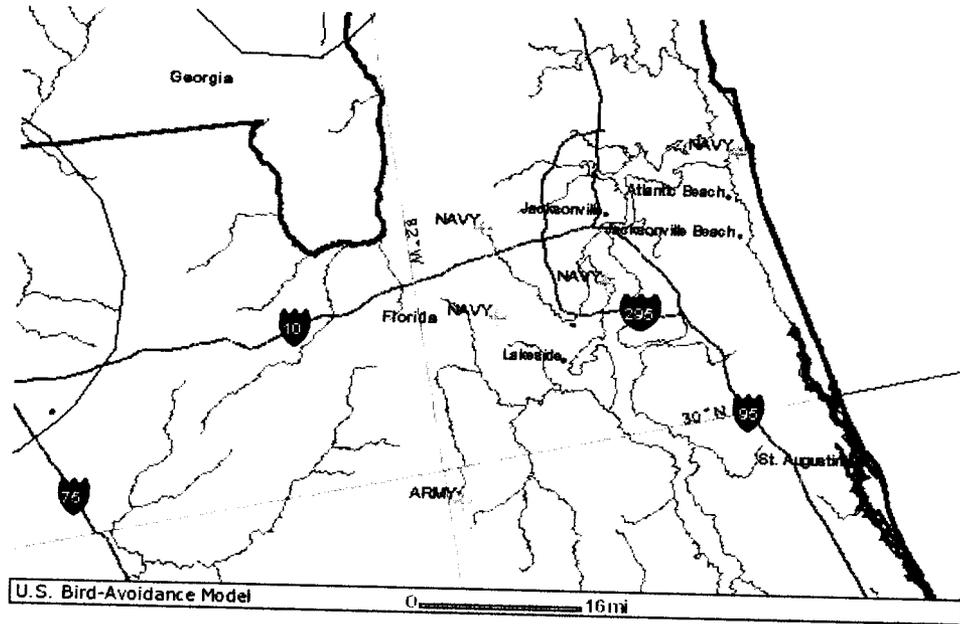


Figure 1. BAM Maps for NAS Cecil Field and NAS Oceana

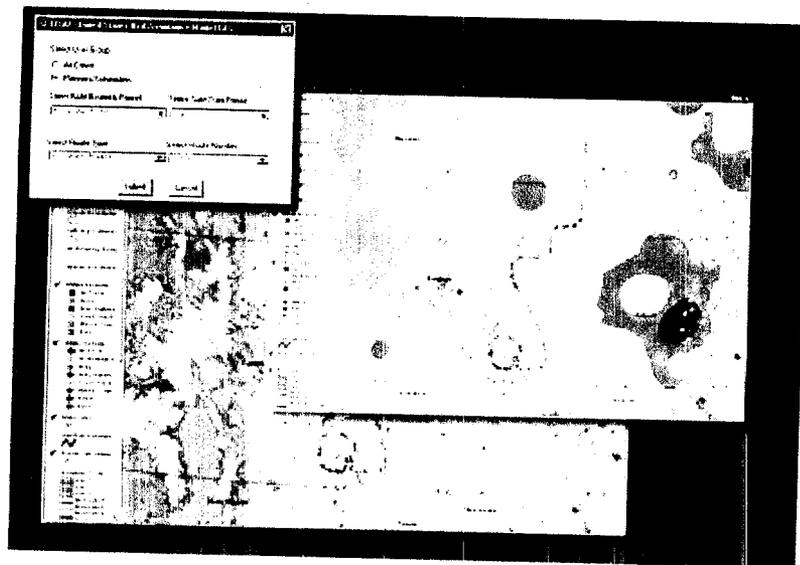
Conclusion.

Bird Aircraft Strike Hazards pose a real threat to military aviation. The high speeds and low altitudes of fighter aircraft often result in severe damage to aircraft and periodically loss of life. To minimize this impact the military uses avoidance technologies to schedule training around areas that periodically have high densities of hazardous bird species. In some areas, this results in either a severe loss of training opportunities, or the decision to fly in hazardous conditions. When compared to NAS Oceana, NAS Cecil Field offers the US Navy a much safer flying environment.

Appendix A.

USAF Bird Avoidance Model (BAM).

The United States Air Force Bird Avoidance Model (BAM) was developed as a tool for mission planning, airfield management, and environmental assessments. The BAM uses Geographic Information System (GIS) technology to integrate geospatial data and calculates risk surfaces that are projected against military low-level training routes, ranges, military operating areas, and installations. The BAM uses nationwide data sets obtained from Breeding Bird Surveys, Christmas Bird Counts, and National Wildlife Refuges and distributes densities of species of concern through the year. Species of concern include birds that have documented reports of causing substantial damage to aircraft. The model consists of GIS raster grids, which span the conterminous United States. The value for each cell (or pixel) is equivalent to the sum of the mean bird mass (in ounces), for all species of concern present during a particular daily time period, for one of 26 two-week periods in a year. The model also distributes these species based upon activity at dawn, day, dusk, and night. The model can be executed on-line at www.usahas.com.



Appendix B.**USAF BAM Analysis**

All data extracted from the US BAM by DeTect Inc. The US BAM is available on-line at www.usahas.com.

Biweek	Period	Installation	Average risk	Installation	Average risk	Greater Risk
1	Dawn/Dusk	Cecil		2 Oceana	2.1015625	Oceana Higher
1	Day	Cecil		2 Oceana	2.0976563	Oceana Higher
1	Night	Cecil		1 Oceana	2	Oceana Higher
2	Dawn/Dusk	Cecil		2 Oceana	2.1015625	Oceana Higher
2	Day	Cecil		2 Oceana	2.0976563	Oceana Higher
2	Night	Cecil		1 Oceana	2	Oceana Higher
3	Dawn/Dusk	Cecil		2 Oceana	2.1015625	Oceana Higher
3	Day	Cecil		2 Oceana	2.0976563	Oceana Higher
3	Night	Cecil		1 Oceana	2	Oceana Higher
4	Dawn/Dusk	Cecil		2 Oceana	2	Equal
4	Day	Cecil		2 Oceana	2	Equal
4	Night	Cecil		1 Oceana	2	Oceana Higher
5	Dawn/Dusk	Cecil		2 Oceana	2	Equal
5	Day	Cecil		2 Oceana	2	Equal
5	Night	Cecil		1 Oceana	2	Oceana Higher
6	Dawn/Dusk	Cecil		2 Oceana	2	Equal
6	Day	Cecil		2 Oceana	2	Equal
6	Night	Cecil		1 Oceana	2	Oceana Higher
7	Dawn/Dusk	Cecil		2 Oceana	2	Equal
7	Day	Cecil		2 Oceana	2	Equal
7	Night	Cecil		1 Oceana	1.984375	Oceana Higher
8	Dawn/Dusk	Cecil		2 Oceana	2	Equal
8	Day	Cecil		2 Oceana	2	Equal
8	Night	Cecil		1 Oceana	1.6601563	Oceana Higher
9	Dawn/Dusk	Cecil		2 Oceana	2	Equal
9	Day	Cecil		2 Oceana	2	Equal
9	Night	Cecil		1 Oceana	1	Equal
10	Dawn/Dusk	Cecil	1.9833333	Oceana	2	Oceana Higher
10	Day	Cecil		2 Oceana	2	Equal
10	Night	Cecil		1 Oceana	1	Equal
11	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
11	Day	Cecil		2 Oceana	2	Equal
11	Night	Cecil		1 Oceana	1	Equal
12	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
12	Day	Cecil		2 Oceana	2	Equal
12	Night	Cecil		1 Oceana	1	Equal
13	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
13	Day	Cecil		2 Oceana	2	Equal
13	Night	Cecil		1 Oceana	1	Equal

14	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
14	Day	Cecil	2	Oceana	2	Equal
14	Night	Cecil	1	Oceana	1	Equal
15	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
15	Day	Cecil	2	Oceana	2	Equal
15	Night	Cecil	1	Oceana	1	Equal
16	Dawn/Dusk	Cecil	1.95	Oceana	2	Oceana Higher
16	Day	Cecil	2	Oceana	2	Equal
16	Night	Cecil	1	Oceana	1	Equal
17	Dawn/Dusk	Cecil	1.9875	Oceana	2	Oceana Higher
17	Day	Cecil	2	Oceana	2	Equal
17	Night	Cecil	1	Oceana	1	Equal
18	Dawn/Dusk	Cecil	2	Oceana	2	Equal
18	Day	Cecil	2	Oceana	2	Equal
18	Night	Cecil	1	Oceana	1	Equal
19	Dawn/Dusk	Cecil	2	Oceana	2	Equal
19	Day	Cecil	2	Oceana	2	Equal
19	Night	Cecil	1	Oceana	1	Equal
20	Dawn/Dusk	Cecil	2	Oceana	2	Equal
20	Day	Cecil	2	Oceana	2	Equal
20	Night	Cecil	1	Oceana	2	Equal
21	Dawn/Dusk	Cecil	2	Oceana	1.4765625	Oceana Higher
21	Day	Cecil	2	Oceana	2	Equal
21	Night	Cecil	1	Oceana	2	Equal
22	Dawn/Dusk	Cecil	2	Oceana	1.9726563	Oceana Higher
22	Day	Cecil	2	Oceana	2	Equal
22	Night	Cecil	1	Oceana	2	Equal
23	Dawn/Dusk	Cecil	2	Oceana	2	Oceana Higher
23	Day	Cecil	2	Oceana	2	Equal
23	Night	Cecil	1	Oceana	2	Equal
24	Dawn/Dusk	Cecil	2	Oceana	2	Oceana Higher
24	Day	Cecil	2	Oceana	2	Equal
24	Night	Cecil	1	Oceana	2	Equal
25	Dawn/Dusk	Cecil	2	Oceana	2	Oceana Higher
25	Day	Cecil	2	Oceana	2.1015625	Oceana Higher
25	Night	Cecil	1	Oceana	2.09375	Oceana Higher
26	Dawn/Dusk	Cecil	2	Oceana	2	Oceana Higher
26	Day	Cecil	2	Oceana	2.1015625	Oceana Higher
26	Night	Cecil	1	Oceana	2.0976563	Oceana Higher
					2	Oceana Higher