APPENDIX B

Scientific Names of Animals Mentioned in Text

Birds

Great Blue Heron	*Ardea herodias*
Glossy Ibis	*Plegadis falcinellus*
American Black Duck	*Anas rubripes*
Gadwall	*Anas strepera*
Osprey	*Pandion haliaetus*
Northern Harrier	*Circus cyaneus*
Peregrine Falcon	*Falco peregrinus*
Gyrfalcon	*Falco rusticolis*
Prairie Falcon	*Falco mexicanus*
Ring-necked Pheasant	*Phasianus colchicus*
Greater Prairie Chicken	*Tympanuchus cupido*
Black Rail	*Laterallus jamaicensis*
Clapper Rail	*Rallus longirostris*
Piping Plover	*Charadrius melodus*
American Oystercatcher	*Haematopus palliatus*
Willet	*Catoptrophorus semipalmatus*
Laughing Gull	*Larus atricilla*
Franklin's Gull	*Larus pipixcan*
Little Gull	*Larus minutus*
Common Black-headed Gull	*Larus ridibundus*
Bonaparte's Gull	*Larus philadelphia*
Mew Gull	*Larus canus*
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Herring Gull	*Larus argentatus*
Iceland Gull	*Larus glaucoides*
Lesser Black-backed Gull	*Larus fuscus*
Glaucous-winged Gull	*Larus glaucescens*
Glaucous Gull	*Larus hyperboreus*
Great Black-backed Gull	*Larus marinus*
Ivory Gull	*Pagophila eburnea*
Roseate Tern	*Sterna dougallii*
Common Tern	*Sterna hirundo*
Forster's Tern	*Sterna forsteri*
Least Tern	*Sterna antillarum*
Black Skimmer	*Rhynchops niger*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Common Barn-Owl	*Tyto alba*
Short-eared Owl	*Asio flammeus*
European Starling	*Sturnus vulgaris*
Sharp-tailed Sparrow	*Ammodramus caudacutus*
Seaside Sparrow	*Ammodramus maritimus*
Song Sparrow	*Melospiza melodia*
Snow Bunting	*Plectrophenax nivalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Boat-tailed Grackle	*Quiscalus major*
House Sparrow	*Passer domesticus*

Mammals

Red Fox	*Vulpes vulpes*
Raccoon	*Procyon lotor*
Meadow Vole	*Microtus pennsylvanicus*

Invertebrates

Periwinkle Snail	*Littorina irrorata*

APPENDIX C

THE PORT AUTHORITY OF NY & NJ

John F. Kennedy International Airport
Jamaica, New York 11430
(718) 244-4444
Richard L. Rowe
General Manager

June 10, 1993

AIRPORT OPERATIONS BULLETIN #93-20

TO: **ALL AIRPORT TENANTS**

SUBJECT: **HOUSEKEEPING AT JFK**

In accordance with the long-standing policy of the airport, I want to remind all of our tenants that proper housekeeping throughout the airport is an important part of our day-to-day functions, not only for maintaining the image of this facility but also to ensure that areas both airside and landside will not become an additional attractant to birds that traverse the boundaries of the airport.

Therefore, I would ask that each tenant review their trash/dumpster/compactor procedures to ensure that in particular all organic matter is placed in the appropriate plastic garbage bags and maintained in closed containers. Furthermore, if present containers become regularly overloaded, you should review container size and pickup frequency.

By achieving full conformance with this policy, I know that we will have done our best to have an environment that will be unattractive to birds and other wildlife.

R. L. Rowe

Richard L. Rowe
General Manager
Kennedy International Airport

JFK 244-93

THE PORT AUTHORITY OF NY & NJ

Memorandum

Copy to you FR

To: All Members of the Command
From: Fred Stinner
Date: June 15, 1993
Subject: **HOUSEKEEPING AT JFK**
Reference:
Copy To:

Refer To	Date	Noted By	Date
Return To		File	

Insp. Ferrante, D.I. Fox, D.I. Romito, Capt. Stinner, Capt. Brown, Lt. Murphy, Tour Commander, Sgts. Escobar, Hubert, Kassimatis, Patrol Sgt., FAR Sgt., Staff Sgt., G. Drasheff, D. McCormick, Desk, Roll Call, Satellite, Main House, Bulletin Board, Bldg. #197, LBA, SBA, PBA, DEA, Detectives, P.O.'s Cotignola, Martin, J. Rae, R. Miller

In accordance with the long-standing policy of the airport, I want to remind all police officers that proper housekeeping throughout the airport is an important part of our day to day functions, not only for maintaining the image of this facility but also to ensure that areas both airside and landside will not become an additional attractant to birds that traverse the boundaries of the airport.

Therefore, I would ask that we review our trash/dumpster/compactor procedures to ensure that in particular all organic matter is placed in the appropriate plastic garbage bags and maintained in closed containers. Furthermore, if present containers become regularly overloaded, we should review container size and pick-up frequency.

By achieving full conformance with this policy, I know that we will have done our best to have an environment that will be unattractive to birds and other wildlife.

Police officers on patrol should check tenant areas for compliance with this memo.

Fred Stinner

Fred Stinner
Operations Captain
Kennedy International Airport

/ava

PA-90A
3-80

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Richard Pol
From: Ralph LaPastina
Date: June 18, 1993
Subject: **GRASS CUTTING, GARBAGE AND DEBRIS FREQUENCIES AND LOCATIONS**
Copy to: R. Louis, F. Mirovsky, J. Mollica, R. Tripoli

STREETSIDE - GRASS CUTTING - LOCATIONS	**FREQUENCY**
V/W entrance to Federal Circle	1 x week
V/W from Federal Circle to Bldg. 269	1 x week
150th St. to North Boundary Road	1 x week
Cargo Areas	Bi-weekly
C.T.A.	1 x week
Areas West of Bldg. 141	Bi-weekly
North Boundary Rd.	1 x week

HOUSEKEEPING - LOCATIONS 55 GALLON DRUMS	**AMOUNTS**	**FREQUENCY**
North Boundary Road Bus Stops	5 DRUMS	5 x week
Cargo Bldg. 80	4 DRUMS	5 x week
V/W Service Roads	4 DRUMS	5 X week
Guard booths	20 DRUMS	5 x week
Bus Stops (other than C.T.A.)	15 DRUMS	5 x week
Public Parking Lots & VIP Lots	49 DRUMS	7 x week
C.T.A.	23 DRUMS	7 X week
3 YARD DUMPSTERS -Bldg. 141 & Bldg. 80	7 UNITS	5 x week
30 YARD DUMPSTERS -Bldg. 141 for Houskeeping and construction debris	1 UNIT	1 x week pickup by a contractor
Lot #9 - Used by Parking Lot cleaning contractor	1 UNIT	
2 roving trucks - Police airport highways and side roads for bulk debris		5 x week

AIRSIDE - GRASS CUTTING

Performed in March and April
No cutting from May 1 through August 1
Cutting resumes August 1 through December
Specific areas cut during May 1 -
August 1 period include around signage, scare guns, approach lighting all done on request.

All areas are cut 4 x year unless there is a special request around Terminals, Hangars and Cargo Buildings.

HOUSEKEEPING LOCATIONS	AMOUNTS	FREQUENCY
3 YARD DUMSPSTERS - IAB GATES	12 UNITS	7 x week
Bldg. 254, 269	4 UNITS	7 x week
Bldg. 161	1 UNIT	5 x week
55 gallon drums - IAB Hardstands	21 UNITS	7 x week
1 roving truck - Police IAB ramp and gate positions, hardstands, Perimeter Service Roads and Cargo Areas		5 x week

Ralph LaPastina
Chief Maintenance Supervisor
General Maintenance
Kennedy International Airport

JFK BIRD CONTROL REPORT

DATE: August 2, 1991

A. Reported Period: From July 1, 1991 to July 31, 1991

B. Reported Aircraft Bird Strikes:

DATE	SITUATION	DAMAGE
7/03/91	4R Arr. @ 06:14	3 Laughing Gulls - No Damage
7/07/91	22R Dep. @ 05:12	3 Laughing Gulls - No Damage
7/07/91	31R Arr. @ 10:56	1 Unknown Gull - No Damage

			TOTAL TO DATE	SAME TIME LAST YEAR
	TOTAL	3	16	14
Bird Carcasses Found:				
Type: Gull 18 Other 1 (17 Laughing Gulls)	TOTAL	19	106	193
Bird Disposal (Shotgun):				
Type: Gull 1 Other -	TOTAL	1	161	95
Requested Runway Sweeps: 131	TOTAL	131	1809	2350

JKG

Jack K. Gartner, Manager
Aeronautical Services Division
Kennedy International Airport

cc: William DeGraaff
Federal Aviation Administration

Richard Dolbeer
USDA/APHIS/ADC

Kevin Buckley
National Park Service

Glenn Morse
Air Transport Association

Joseph Schwind
Airline Pilots Association Int'l

BIRD STRIKE REPORT

DATE: _____ TIME: _____

AIRCRAFT INFORMATION

AIRLINE _____ FLIGHT # _____ TAIL # _____

AIRCRAFT MAKE _____ MODEL _____

AMOUNT OF FUEL DUMPED ON RETURN _____

LOCATION

LOCATION OF STRIKE: _____

ARRIVAL _____ DEPARTURE _____ RUNWAY _____

TIME OF LAST DEP/ARR: _____ DUTY RUNWAY: YES NO

TIME OF LAST RUNWAY SWEEP: _____ TOWER REQUEST: YES NO

AIRCRAFT DAMAGE

_____

_____

_____

CREW STATEMENT

_____

_____

_____

SPECIES & NUMBER OF BIRDS: _____

ADDITIONAL REMARKS

_____

_____

_____

_____

PREPARED BY: _____

DAILY MILEAGE LOG

DATE	SHIFT	NAME	VEHICLE #	STARTING MILEAGE	ENDING MILEAGE	REASON FOR VARIANCE

JOHN F. KENNEDY INTERNATIONAL AIRPORT

BIRD CONTROL REPORT

DATE: _____ SUNRISE: _____

TIDES HIGH AT: _____ LOW AT: _____

TIME	31R	31L	22R	22L	13L	13R	4L	4R	ACTION TAKEN
05:00									
06:00									
07:00									
08:00									
09:00									
10:00									
11:00									
12:00									
13:00									
14:00									
15:00									
16:00									
17:00									
18:00									
19:00									
20:00									
21:00									

RUNWAYS IN USE

TIME	TAKEOFF	LANDING	OVERFLOW

BIRD DISPOSAL

SPECIES	NUMBER
LAUGHING GULLS	
HERRING GULLS	
GREAT BLACK BACK GULLS	
RING BILLED GULLS	
OTHER	
TOTAL	

RUNWAY SWEEPS

TIME	RUNWAY	SWEPT BY	TIME	RUNWAY	SWEPT BY

TOWER REQUESTED RUNWAY SWEEPS: AM_____ PM_____ TOTAL _____

COMMENTS

_____

_____

RUNWAY CLOSURES: _____

DAILY AMMUNITION CONTROL FORM

DATE														
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
.22 BLANKS														
WHISTLE														
NOISE														
SCARE														
LIVE														
TOTAL														

AMMUNITION USED DURING TOUR

															CONTROL USE
.22 BLANKS															
WHISTLE															
NOISE															
SCARE															
LIVE															
SHIFT TOTAL															

AMMUNITION ADDED

															CONTROL USE
.22 BLANKS															
WHISTLE															
NOISE															
SCARE															
LIVE															
SHIFT TOTAL															

WEAPON USE

START	PISTOL														
	SHOTGUN														
END	PISTOL														
	SHOTGUN														
SUPV INITIALS:															

AMMUNITION ON HAND: DATE:

BIRD FORM

DATE: _____

_____ CARCASS(ES) FOUND ON RUNWAY _____

BETWEEN TAXIWAYS _____ AND _____

AND _____ OF RUNWAY CENTERLINE

THE BIRD(S) PLACED IN TRUCK 12/ BLDG 205.

ADDITIONAL REMARKS:

_____

_____

_____

_____

PREPARED BY: _____

ATTACHMENT

D. INFORMATIONAL DETAILS

In accordance with Federal Aviation Regulations Part 139, the following instructions and procedures are used at JFKIA for the prevention or removal of factors that attract or may attract wildlife.

The Airport Duty Manager, in his/her daily aeronautical checks, is responsible for noting the location and number of birds that might become a hazard to aircraft safety. The Airport Duty Manager will disperse the flocks of birds by the following means and will issue the required notifications:

1. A continuous bird patrol is in effect during daylight hours. The bird patrol has been implemented with two vehicles, each equipped with taped distress calls and one equipped with a shotgun, for use in the dispersal of birds near or on active aeronautical areas.

2. At first light the ADM, upon notification by the FAA Control Tower, will dispatch a patrol vehicle(s) to bird sweep the runway(s) proposed for use that day. Upon completion of the bird sweep, the bird patrol will notify the Control Tower on the availability of the runway(s) for use. During daylight hours, the bird patrol will be maintained on a continual basis. During non-daylight hours the ADM, upon notification from the Tower, will effect a bird sweep prior to a runway change and will effect periodic runway inspections to assure that operational runways are free of birds.

3. Upon request for the use of a non-conforming or overflow runway by the FAA Control Tower, a bird sweep shall be conducted to assure that the runway is clear of birds before it is approved for use. During the overflow period, the bird patrol will monitor the runway continually.

4. Upon receipt of a report of birds on the active aeronautical area by the ATCT, either from pilot reports or any other source, the patrol vehicle, following notification and appropriate coordination with the FAA Control Tower, will proceed immediately to investigate the area and to take appropriate action to disperse birds if found and advise the ATCT immediately following the action taken.

5. Appropriate NOTAM will be issued upon the observation of bird concentrations within the area of the airport.

6. The Port Authority will continue to take appropriate action to assure and maintain the sterilized airport surface by the removal of ponds, bushes and weed growth, which attract bird population. In addition, approved chemicals can be used.

7. Supervisors will be on the alert for bird attractants and shall issue a breach of rules violation in those areas where careless housekeeping practices on the part of tenants might create an attraction to birds.

KENNEDY TOWER/PORT AUTHORITY OF NEW YORK AND NEW JERSEY

LETTER OF AGREEMENT

EFFECTIVE:

SUBJECT: BIRD HAZARD REDUCTION

1. PURPOSE: To define actions to be taken to minimize the hazard of bird strikes to aircraft at Kennedy Airport during daylight hours (sunrise to sunset).

2. SCOPE: The procedures contained herein apply unless otherwise coordinated.

3. PROCEDURES:

A. Kennedy Tower shall:

(1) Prior to sunrise, notify the PONYA Airport Duty Supervisor of the runways to be used and request that all runways be inspected for birds. The runways shall not be used until the bird sweep is completed.

(2) Prior to changing service runways or utilizing a non-conforming runway, or entering an overflow configuration, request a bird sweep of the new service, non-conforming or overflow runway(s). The runways shall not be used until a bird sweep is completed.

(3) Inform the PONYA Airport Duty Supervisor of observed or reported bird activity including all bird strikes, on or near the airport movement area. When bird activity is observed or reported to the tower, runways will continue to be considered operational until closed by the Port Authority. All aircraft will be advised immediately of reported bird activity.

B. The PONYA shall:

(1) At sunrise, the Duty Supervisor, upon notification by the control tower, dispatch a patrol vehicle(s) to bird sweep all runways. Upon completion of the bird sweep, the bird patrol will notify the control tower. During the daylight hours, the bird patrol will be maintained on a continuing basis. The control tower shall be advised if a runway is not available.

(2) Upon request from the control tower, the bird patrol will sweep the new service, non-conforming or overflow runway(s).

(3) Upon receipt of a report of birds on the airport movement area, the patrol vehicle will proceed immediately to the area and take appropriate action to disperse birds and advise the control tower of the action taken.

(4) Issue an appropriate Notice to Airmen upon the observation of bird concentrations within the area of the airport.

EVERETT J. SINON, JR.
Chief, Kennedy Tower

ISAAC DORNFELD
General Manager, Kennedy Airport

AERO. SVCS. DIV.
JFK
1993 JUN 10 A 10:56

THE PORT AUTHORITY OF NY & NJ

M E M O R A N D U M

To: Jack Gartner
From: Warren Kroeppel
Date: June 8, 1993
SUBJECT: JFK REDEVELOPMENT PROGRAM - LANDSCAPE / BIRD CONTROL

Reference:

Copy To: B. Abramowitz, T. Kleiner, J. Soave

Just to confirm our conversation this morning, a major study of landscaping for the JFK Redevelopment Program was undertaken in 1988 by Hana Olin. A portion of this study was to recommend trees and shrubs that do not attract birds, due to our ongoing concern about bird control at JFK. Bird control is a continuing criteria for all design work that takes place, and any landscaping that is selected conforms to the list of approved plantings that was developed. As an added note, this concern extends into the design of canopies so that we do not build structures that would provide attractive roosting places.

Another ongoing concern that we have as we design and build our roadways is to eliminate any ponding of water. To date, we have eliminated almost all ponding in the areas where we have completed new construction. The only problem that remains is a small area in the "bowtie", which we are in process of adding drainage.

If you have any questions, please call me at x3503.

Warren

Warren Kroeppel
Manager, Operations Planning
JFK Redevelopment Program

FILE#BIRD_1

PORT AUTHORITY OF NEW YORK AND NEW JERSEY
JFK INTERNATIONAL AIRPORT
AERONAUTICAL CONSTRUCTION
REVISED 5/21/93

PROJECT TITLE	CONTRACT #	DESCRIPTION/SCOPE OF WORK	CONSTRUCTION START	CONSTRUCTION COMPLETED
I. COMPLETED 1992				
A. Rehab. T/W "H", IAB Ramp	JFK-690	Provides for the repaving of the taxiway, electrical and drainage work.	Completed	
B. T/W "F" & "J" Modifications	JFK-220.073	Provides for widening of taxiway intersections, paving, electrical and drainage work.	Completed	
C. Rehab. of T/W's "I&O"	JFK-630	Provides for the repaving of T/W "I" & "O" sections, electrical and drainage work.	Completed	
D. Rehab. of T/W "P"	JFK-660	Provides for the repair of T/W "P" keel section, electrical & drainage work.	Completed	
E. Rehab. R/W 4R-22L	JFK-663	Provides for the repaving of the runway, electrical and drainage work and regrooving of runway.	Completed	
F. Rehab. of T/W's "R&S"	JFK-672	Provides for the repaving of the taxiway, electrical and drainage work.	Completed	
G. Rehab. T/W's "K-K" IAB Ramp	JFK-677	Provides for the repaving of the taxiway, electrical and drainage work.	Completed	
H. Installation of Wick Drains	JFK-220.070	Provides for installation of wick drains in grass areas between R/W's 4L and 4R to improve drainage.	Completed	

PROJECT TITLE	CONTRACT #	DESCRIPTION/SCOPE OF WORK	CONSTRUCTION START	CONSTRUCTION COMPLETED
II. IN-PROGRESS				
A. Relocation of T/W "I" & "O"	JFK-220.067 **	Provides for the re-routing of T/W's "I" & "O", the sections between Van Wyck Expressway and JFK Expressway. Work includes the construction of new taxiways, paving, drainage and new centerline and edge lighting etc.	9/17/92	6/15/94
B. Aeronautical Improvements - Phase IIIA	JFK-220.069 **	Improves aeronautical operations. Work includes construction of new taxiway sections, "ZB", "MB", "ZA".	7/29/92	6/15/93
C. Fuel Leak Detection System	JFK-110.112 *	Improves capacity for detecting leaks on existing fuel line pipes, aeronautical areas. Installation of leak detection equipment.	7/24/92	8/15/93
D. Aeronautical Paving Repairs	JFK-692 **	Provides for the rehabilitation of various taxiway pavements. Includes an overlay, slurry seal coating, electrical and drainage work. T/W "M" from R/W 13R to Service Road T/W "ZA" from "O" to new pavement T/W "B" North of T/W "X" T/W "J" from T/W "Z" to T/W "O" T/W "E" from T/W "X" R/W 14-32 T/W "BB" North of T/W "X" T/W "X" from R/W 13L to T/W "WA" T/W "Z" from T/W "J" to T/W "G" T/W "WA" North of T/W "X" T/W "O" from T/W "A" to T/W "D"	10/5/92	6/29/93
E. Fibrous Conc. Rehabilitation R/W 13L	JFK-702 **	Provides for rehabilitation of the fibrous concrete slabs at R/W 13R and T/W "PD", electrical and drainage work.	9/15/92	Completed

PROJECT TITLE	CONTRACT #	DESCRIPTION/SCOPE OF WORK	CONSTRUCTION START	CONSTRUCTION COMPLETED
F. T/W "QD" Widening	JFK-804.101 **	Provides for the widening & repaving of T/W "QD" and the repaving of T/W "Q" from T/W "PD" to T/W "QD", electrical and drainage work.	10/30/92	5/30/93
G. Consolidated Micro-Tunneling	JFK-220.080 *	Provides for the microtunneling for 138KV feeder, etc., across T/W "I" & "O" and R/W 13L-31R.	2/1/39	7/30/94
H. Rehabilitation of R/W 13L-31R	JFK-720 **	Provides for repaving of R/W 13L-31R. Work includes asphalt overlay and grooving, electrical & drainage work.	6/15/93	12/1/93
I. Protect RC Pipes	JFK-220.076 **	Provides for the installation of concrete slabs to protect box culverts at T/W "E" and T/W "Y" and at R/W 22R, North R/W 31R, electrical and drainage work.	6/15/93	11/30/93
J. Aeronautical Capacity Improvements Phase IIIB	JFK-220.077 **	Provides for storm water pipe lines to Thurston Basin and Jamaica Bay. The drainage lines are for the newly constructed T/W "ZB". Work includes excavating, installation of culverts, and construction of outfalls.	4/15/93	6/30/94

III PLANNED 1993 (DESIGN IN PROGRESS)

A. Rehabilitation of R/W 13R-31L	JFK-736 **	Provides for repaving of R/W 13R-31L. Work includes asphalt overlay and grooving, electrical & drainage work.	9/15/93	6/1/94

PROJECT TITLE	CONTRACT #	DESCRIPTION/SCOPE OF WORK	CONSTRUCTION START	CONSTRUCTION COMPLETED
B. Aeronautical Paving Repairs	JFK-722 **	Provides for the repaving of various taxiway pavements. Includes asphalt overlays, electrical & drainage work. T/W "Z" from T/W "H" to R/W 31L T/W "L" from R/W 31L to Bldg. 54 T/W "A" from R/W 13L to T/W "O"	7/15/93	12/30/93
C. Rehab. of Boat Ramps, South of R/W 4R & adjacent outfall #13	JFK-711 * JFK-730 *	Provides for the widening of boat ramp South of R/Ws 4R & 4L. Includes installation of concrete slabs, construction of loading dock.	5/15/93 9/18/93	9/30/93 12/30/93
D. Rehab. of Restricted Service Roads	NA *	Provides for the repaving of various restricted service roads including CTA perimeter RSV, parallel to R/W 13R, parallel to T/W "R" & "S", parallel to T/W "X", etc.	7/15/93	12/30/93
E. Rehab. of Erosion Pavement	A3-900.103 *	Provides for the repair, seal coating, repaving of erosion pavement between T/W "I" & "O", drainage improvements.	9/15/93	12/30/93
F. Rehab. of IAB Apron Pavement	JFK-721	Corrects ponding condition at various gate positions and hardstands, paving and drainage work.	7/21/93	12/30/93
G. Rehab. T/W "G", IAB Ramp	JFK-725 **	Provides for repaving of taxiway, electrical and drainage work.	6/21/93	9/30/93
IV PLANNED 1994 (DESIGN IN PROGRESS)				
A. Rehab. T/W "E"	JFK-746 **	Provides for the repaving of taxiway, electrical and drainage work.	4/1/94	3/15/94

PROJECT TITLE	CONTRACT #	DESCRIPTION/SCOPE OF WORK	CONSTRUCTION START	CONSTRUCTION COMPLETED
B. Rehab. Various Taxiways	JFK-A **	Provides for the repaving of taxiway, electrical and drainage work.	4/1/94	10/1/94
C. Rehab. Erosion Pavement	JFK-YYY **	Provides for the repaving, sealcoating of aeronautical erosion pavement, drainage work.	4/1/94	8/1/94

Notes:

* No significant impact on runways or taxiways
** Will impact runway/taxiway (closure, shorten runway, etc).

1993. Proc. Great Plains Wildl. Damage Control Conf. 11:In Press.

Methyl Anthranilate Formulations to Repel Birds from Water at Airports and Food at Landfills

Richard A. Dolbeer, Jerrold L. Belant and Larry Clark, U.S. Department of Agriculture, Denver Wildlife Research Center, 6100 Columbus Avenue, Sandusky, OH 44870 (RAD, JLB); Monell Chemical Senses Center, 3500 Market Street, Philadelphia, PA 19104 (LC)

Abstract: We evaluated 2 experimental (ReJeX-iT™ TP250 and AP-75) formulations of methyl anthranilate (MA) to repel birds from 2-17 temporary pools of water during 3 1-week periods at John F. Kennedy International Airport, May-August 1991. Bird (primarily laughing gulls [*Larus atricilla*] and mallards [*Anas platyrhynchos*]) use of MA-treated pools was reduced ($P \leq 0.03$) during 2 of the 3 periods. A second set of experiments in outdoor cages evaluated the repellency of another MA formulation (ReJeX-iT™ AP-50) to cowbirds (*Molothrus ater*) and ring-billed gulls (*L. delawarensis*) when applied directly to food or when mixed with food and a landfill cover material (ConCover 180®). At AP-50 concentrations $\geq$0.30% (0.15% MA) applied either directly to millet or to ConCover 180®, cowbird feeding on millet was reduced ($P < 0.01$). ConCover 180® alone protected millet from cowbirds when uncovered, untreated millet was available. Gulls were repelled ($P < 0.05$) from fish immersed in ConCover 180® with 1% AP-50. These studies indicate MA formulations have potential for reducing the attractiveness to birds of standing water at airports and food at landfills.

Bird strikes to aircraft are of increasing concern to the aviation community (BSCE 1990). One factor contributing to strikes is that gulls and other bird species often flock to temporary pools of fresh water at airports after heavy rains (Blokpoel 1976). Another factor is the location of waste disposal facilities near airports which gulls and other bird species use as a food source (Burger and Gochfeld 1983, Greig et al. 1986). The U.S. Federal Aviation Administration issued Order 5200.5 in 1974 to prohibit waste disposal sites within 10,000 ft (3,000 m) of runways used by turbine-powered aircraft. This order was revised in 1990 (Order 5200.5A) to include landfills from 10,000 feet to 5 miles (8 km) of runways "that attract or sustain hazardous bird movements from feeding, water or roosting areas into, or across the runways and/or the approach and departure patterns of aircraft". Thus, airport and landfill operators have incentives to eliminate standing water and putrescible waste on and near airports. If elimination is not possible, management actions should be taken to reduce the attractiveness of these sites to birds.

Development of an environmentally safe chemical formulation that would repel birds from water on airports and putrescible waste at landfills should have wide utility, providing an additional technique to enhance existing bird control and harassment activities. MA, a GRAS-listed human food flavoring (Jenner et al. 1964, Code of Federal Regulations 1988) may be a suitable repellent (Mason et al. 1989, 1991). Dolbeer et al. (1992) documented the effectiveness of experimental (ReJeX-iT™ brand) formulations of MA in repelling ring-billed gulls and mallards from open water in cage studies.

One problem with using MA at landfills is developing a formulation or carrier that will allow the active chemical to cover the garbage at the landfill surface. A potential solution is to incorporate MA into new materials developed to cover garbage on a daily basis. One such product is ConCover 180®, a blend of polymers containing clays and recycled cellulose that, after mixing with water, can be sprayed as a slurry over exposed refuse in place of soil.

We present results from 2 sets of experiments. The first set (May-Aug 1991) evaluated 2 ReJeX-iT™ formulations of MA applied to water at John F. Kennedy International Airport (JFKIA), New York. Our second set of experiments (Aug-Sep 1992) tested the hypothesis that a ReJeX-iT™ formulation of MA mixed with ConCover 180® would reduce consumption by birds when applied to food in a controlled environment (captive birds in cages).

Methods

Field Tests in Water at JFKIA

Testing was limited to 14-19 May, 9-12 July and 28 July-2 August, the only times standing water was present from May-early August 1991.

14-19 May.--Testing was at 2 ponds 100-160 m southeast of taxiway H (Ponds H1 and H2) and 2 ponds 100-200 m east of runway 22L at taxiway FA (Ponds FA1 and FA2). These temporary ponds ranged in size from 150-4,000 m^2 at the start of observations (Table 1). Ponds H1 and H2, in an area of grassy vegetation, were 60 m apart. Ponds FA1 and FA2, in an area of low (0.5 m) shrubs and grass, were 100 m apart.

Ponds were observed for 5-min intervals throughout the day for 2 days pretreatment and for 2-3 days posttreatment (until the smallest pond of the pair had dried up). The number of birds, by species, in or entering the water during each 5-min period was recorded. A *t*-test was used to test for differences in the mean number of birds/5-min for pre- and posttreatment periods for each pond.

The treatment consisted of applying 1 of 2 MA formulations (Table 1) to the water in 1 of the 2 ponds at each site. Immediately prior to treatment, surface area and volume of water were estimated for each pond by measuring the major and minor axes lengths and the depth at 3-5 locations along the major axis. ReJeX-iT™ TP250 was applied at the rate of 20 ml/m^2 of water surface via a hand-held sprayer as the applicator waded through the pond. ReJeX-iT™ AP-75 was applied at the rate of 1 g/L of water by sprinkling the material from a bucket as the applicator waded through the pond. Control ponds were waded through in a similar fashion.

8-12 July.--Testing was at 4 temporary pools of water on taxiways. These pools ranged in size from 5-75 m^2 at the start of observations (Table 2) and were at least 200 m apart. These pools were selected for treatment because birds were observed in them after rainfall on 6-7 July. All 4 pools were treated with 1 g AP-75/L of water. Bird observations and statistical tests were as described above for the May tests.

28 July-2 August.--Two taxiway-ramp areas, WA and B, were observed during a pretreatment period of 28-31 July. WA and B were about 0.5 km apart. WA had 8 pools of water covering 3,743 m^2 ($x \pm SD = 468 \pm 123$) within a 2-ha area and B had 9 pools covering 4,026 m^2 ($x \pm SD = 447 \pm 143$) within a 2-ha area. Pools in WA and B were treated with AP-75 as above from 0900-1000 on 1 August. Posttreatment observations were made at each area during the remainder of 1 August and on 2 August. At each area, a few minor pools on the peripheries (i.e., within 100 m of treated pools) were overlooked at the time of treatment (because we noted no birds in them during pretreatment observations) and left untreated. The dimensions of these pools were not measured but we estimate they comprised <10% of the surface area of treated pools.

Unlike the tests in May and early July, observations at each area were made continuously for approximately 2-hr periods 2-4 times daily. Total bird-minutes of pool use (e.g., 2 birds in a pool for 1 minute equals 2 bird-minutes) was recorded for each observation period for treated and untreated pools. There were 10 2-hr periods covering 1,240 observation minutes pretreatment and 10 2-hr periods covering 1,307 observation minutes posttreatment for the 2 areas combined. Observations were terminated on the afternoon of 2 August because most water had evaporated.

A *t*-test was used to test for differences in mean bird minutes of pool use during the 2-hr observation periods pretreatment and posttreatment. A *t*-test was also used to test for differences in mean bird-minutes of pool use in the treated and untreated pools during the treatment period.

Cage Tests with ConCover 180[R] over Food

Experiments were conducted in Erie County, Ohio. Birds were captured locally in decoy traps (cowbirds) or by rocket net (ring-billed gulls), July-September 1992. Water was provided ad libitum during all tests. Birds were released after completion of testing.

Test Materials.--We used a MA-based formulation (ReJeX-iT™ AP-50, 50% MA, hereafter referred to as AP-50). AP-50 is a white, free-flowing, granular solid completely miscible in water.

Following manufacturers instructions, ConCover 180[R] was blended using an electric mixer. With the mixer on low speed, we placed 417 ml of water into a mixing bowl and added 150 g of ConCover 180[R] powder. We then added 35 g of paper mulch and mixed for 5 min. When required for a treatment, AP-50 and/or 100 g of white millet was then added and mixed. Next, 0.7 ml of a foaming agent was added and mixer speed was increased to expand the volume of the material about 2-fold.

Millet/AP-50 Tests with Cowbirds.--Thirty cowbirds were placed in cages for ≥1 week to adapt to aviary conditions. Prior to testing, cowbirds were provided millet ad libitum. For testing, cowbirds were assigned randomly to 6 groups of 5 birds. Each group was placed in a 2.5- x 2.5- x 2.0-m outdoor cage, with a tarp covering 1/2 the top of the cage to provide shade.

To test the repellency of AP-50 with millet, we treated 4 1,000-g batches of millet with AP-50 at concentrations of 0.14%, 0.30%,

0.50%, or 1.00% (g/g; 1.40 g, 3.00 g, 5.00 g, or 10.00 g, respectively). Millet and AP-50 were mixed for 30 sec in a plastic 3.8 L container. Ten ml of corn oil were added and the mixture was shaken for an additional 30 sec. Four control batches were made by adding 10 ml of corn oil to 1,000 g of millet.

On test day 1 at 1400, food was removed from each cage. We then placed 2 food cups, each with 100 g of millet (1 treated, 1 untreated, randomly assigned positions 0.5 m apart) in each cage. Food cups were removed and weighed 24 hrs later and replaced with untreated millet for 24 hrs. We conducted 4 24-hr tests on alternate days using a different concentration of AP-50 during each test.

We used randomized block analysis of variance (ANOVA; SAS Inst., Inc. 1988) to assess whether the amount of treated and untreated millet consumed among tests differed and if any differences occurred in the total amount of food consumed in both cups among tests. If significant differences occurred, Tukey tests were performed to detect which treatments differed.

ConCover 180^R/AP-50 Tests with Cowbirds.--We first conducted a 4-day, 2-choice test. On test day 1 at 1600, food was removed from the cages and each group of birds was presented 3 aluminum trays (39- x 26- x 2-cm). Each tray in this 3-choice test contained 1 of 3 treatments; (1) 100 g of millet, (2) 100 g of millet evenly distributed within a 2-cm layer of ConCover 180^R, or (3) 100 g of millet evenly distributed within a 2-cm layer of ConCover 180^R mixed with 1.00 g of AP-50 (0.14% g/g). For treatments 2 and 3, a piece of 4-mm thick cardboard was placed in the bottom of trays to absorb water from the mixture. We drilled 5 holes in the bottom of each tray to provide drainage. Each tray containing only millet was weighed before being presented to the birds. Trays were assigned a randomly selected position in a row with 0.5-m spacing between trays. At 1600 on day 2, 24 hrs after placement, trays were removed from the cages and those containing only millet were weighed to measure the amount of millet displaced by the birds during the previous 24 hrs. We also visually estimated the percent of surface area disturbed for each of the treatments containing ConCover 180^R. This observation procedure was repeated on days 3, 4, and 5.

On day 5, a plastic sheet gridded with 4- x 4-cm cells was placed over each tray containing ConCover 180^R. Ten cells (16% of total surface area) were selected randomly for each tray and the percent of surface area disturbed by birds in each cell was recorded. From the center of each tray we removed an 80-mm diameter circular sample (5% of total volume). These samples were separated by hand and the number of whole millet seeds was counted. Cowbirds were maintained using pre-test conditions during days 5 and 6.

We then conducted 24-hr, 2-choice tests. Procedures were identical to day 5 of the 3-choice test except only trays containing ConCover 180^R and millet or ConCover 180^R, AP-50, and millet were used. We conducted 3 24-hr, 2-choice tests using concentrations of AP-50 at 0.14%, 0.30%, and 0.50% (g/g; 1.00 g, 2.11 g, and 3.52 g, respectively). Untreated millet was provided ad libitum on days when tests were not conducted.

Randomized block ANOVA, with repeated measures (days), was used to compare changes in the amount of surface area disturbed between treatments with ConCover 180^R during the 4-day, 3-choice test. We used *t*-tests to compare the number of seeds remaining and mean surface disturbance between treatments with ConCover 180^R. Randomized block ANOVA was also used to determine whether differences occurred in the percent of surface area disturbed and the number of seeds remaining between treatments within and among the 3 24-hr tests. If significant differences occurred, Tukey tests were performed to determine which treatments differed.

ConCover 180^R/AP-50 Tests with Ring-billed Gulls.--Twenty-four after-hatching year ring-billed gulls were placed in 2.5- x 2.5- x 2.0-m outdoor cages for 1 week to adapt to aviary conditions. Whole fish (gizzard shad [*Dorosoma cepedianum*]; mass [$x \pm SD$] = 9.6 ± 0.4 g, length = 90.3 ± 1.2 mm, n = 40) were provided daily in trays identical to those used during tests. For tests, 12 gulls were paired randomly, 1 pair in each of 6 cages.

Experimental design for tests involving ring-billed gulls was similar to that described for the 24-hr tests involving cowbirds except the 2 treatments were 10 whole fish placed within 2-cm layers of ConCover 180^R with or without AP-50. After pouring ConCover 180^R into the trays, fish were aligned in 2 rows of 5 on the surface, then completely immersed. We conducted 1 1-hr test on each of 4 consecutive days using concentrations of 0.30%, 0.50%, 0.75%, and 1.00% (g/g) AP-50. We alternated pairs of gulls such that each gull was tested once every other day. Gulls were provided untreated fish on non-test days.

Randomized block ANOVA and Tukey tests were used to assess whether the number of fish consumed differed among tests and between treatments within a test. Means are reported with ±1 standard error. Differences were considered significant at $P < 0.05$.

Results

Field Tests in Water at JFKIA

14-19 May.--The number of birds using the 2 ponds treated with TP250 or AP75 declined ($P \leq 0.03$) from pretreatment to posttreatment. In contrast, bird numbers at 1 of the untreated ponds remained constant ($P = 0.80$) while bird numbers at the other pond increased ($P < 0.01$) during posttreatment (Table 1). Overall, bird use of the 2 treated ponds declined from a mean of 2.7 birds/5-min during pretreatment to 0.3 birds/5-min during posttreatment. Waterfowl, primarily mallards, were the most frequently observed birds.

8-12 July.--Bird use declined ($P < 0.01$) in the 4 pools posttreatment, averaging 0.1 bird/5-min compared to 4.6 birds/5-min pretreatment (Table 2). The pools attracted primarily laughing gulls.

30 July-2 August.--The pools averaged 15.7 bird-minutes/120 observation minutes during pretreatment at the 2 areas compared to 3.7 bird-minutes/120 observation minutes during posttreatment (Table 3). Although this was a 76% reduction in bird use posttreatment, the

reduction was not significant ($P = 0.12$) because of high variability in bird numbers among observation periods. Birds using the pools primarily were rock doves (*Columba livia*) and gulls.

During posttreatment, bird use was noted in several previously overlooked, untreated pools on the periphery of the treated pools. We recorded 35.6 ± 54.8 bird-minutes/120 observation minutes in these untreated pools compared to 3.7 ± 7.0 bird-minutes/120 observation minutes in treated pools ($t = 1.83$, 16 df, $P = 0.08$).

Cage Tests with ConCover 180[R] over Food

The color of ConCover 180[R] after complete mixing was light blue. Addition of AP-50 at any of the concentrations used changed the color to light green.

Millet/AP-50 Tests with Cowbirds.--Treated millet consumption by cowbirds decreased ($F = 39.48$; 3,20 df; $P < 0.01$) with increased levels of AP-50 up to 0.5% (Table 4). There was no difference ($P < 0.05$) in consumption of treated millet with 0.5% and 1.0% concentrations of AP-50. There was a treatment effect ($F = 230.25$; 1,40 df; $P < 0.01$) and day x treatment interaction ($F = 16.83$; 3,40 df; $P < 0.01$), with lower total millet consumption occurring during the 0.5% AP-50 test. Overall millet consumption (treated and untreated seed) was similar ($P > 0.05$) among the remaining 3 tests.

ConCover 180[R]/AP-50 tests with Cowbirds.--During the 4-day test using 0.14% concentration AP-50, cowbirds did not use either treatment containing ConCover 180[R] until after day 2 when ≥73% of the untreated millet had been consumed ($F = 67.23$; 3,30 df; $P < 0.01$; Fig. 1). The percent of surface area disturbed on both ConCover 180[R] treatments then increased substantially. There was no difference ($F = 90.75$; 1,10 df; $P = 0.69$) in the percent of surface area disturbed between ConCover 180[R] treatments with and without AP-50. The day x treatment interaction was not significant ($F = 0.13$; 3,30 df; $P = 0.78$).

After day 4, there was no difference ($t = -0.78$, 10 df, $P = 0.45$) in the mean number of millet seeds remaining in trays containing ConCover 180[R] only (504 ± 64) or ConCover 180[R] with AP-50 (560 ± 31). The percent of surface area disturbed was also similar ($t = -0.61$, 10 df, $P = 0.56$) between ConCover 180[R] (95 ± 3) and ConCover 180[R] with AP-50 (98 ± 2%). We noted that most millet seeds had sprouted by the end of the test in both the ConCover 180[R] and ConCover 180[R] with AP-50 treatments.

Millet consumption differed ($F = 34.60$; 5,30 df; $P < 0.01$) during the 24-hr, 2-choice tests. There was also a treatment effect ($F = 56.83$; 1,30 df; $P < 0.01$) and test day x treatment interaction ($F = 10.94$; 2,30 df; $P < 0.01$). Cowbirds were repelled ($F = 9.08$; 2,15 df; $P < 0.01$) by ConCover 180[R] treatments containing AP-50 at concentrations ≥0.30% (Table 5). There was no difference ($P < 0.05$) in percent of surface area disturbed and number of millet seeds remaining between trays with ConCover 180[R] and 0.3% or 0.5% AP-50. There were 46% and 42% more millet seeds remaining in the 0.3% and 0.5% AP-50-treated trays, respectively, than in trays with ConCover 180[R] only.

ConCover 180^R/AP-50 Tests with Ring-billed Gulls.--There was an overall difference (F = 4.26; 7,40 df; P < 0.01) in the number of gizzard shad consumed. Gulls consumed less total fish during the test with 0.3% AP-50 than during the test with 0.5% AP-50 (Table 6). There was also a treatment effect (F = 10.83; 1,40 df; P < 0.01), with gulls consuming more gizzard shad overall from treatments without AP-50. Gulls consumed more (P < 0.05) gizzard shad from trays with ConCover 180^R only than from trays with ConCover 180^R containing 1.0% AP-50. There were no differences (P > 0.05) in the number of fish consumed between treatments within the other 3 tests. The test day x treatment interaction was not significant (F = 1.74, 3,40 df; P = 0.17).

Gulls easily located fish under ConCover 180^R, perhaps detecting fish by odor. Three partially digested fish were found on the ground in 1 cage, apparently regurgitated during the test with 0.5% AP-50.

Discussion

Field Tests in Water at JFKIA

Rainfall was 22% below average and the mean temperature was 1.8° C above average during May-July 1991 (Unpubl. data, NOAA, JFKIA). The lack of standing water for sustained periods of time precluded longer-term evaluations with a suitable number of replications to thoroughly test the efficacy of TP250 and AP-75 in repelling birds from water. Nonetheless, the data obtained were supportive of results obtained in cage trials (Dolbeer et al. 1992).

TP250 did not disperse uniformly over the water surface but tended to coalesce in globules 1-5 cm in diameter that the wind blew to the leeward side of the pond. Perhaps the addition of a surfactant would disperse the material more uniformly over the surface. Similarly, AP-75 tended to form globules 2-10 mm in diameter on pool bottoms. The addition of a dispersing agent might result in a more uniform distribution of AP-75 throughout the pools.

Additional field tests should be conducted to more clearly evaluate the efficacy of MA formulations for repelling birds from water at airports. To circumvent the problems of unpredictable rainfall and insufficient experimental units (pools of water), we suggest the use of 1-m diameter plastic pools (50-L capacity) as used in previous cage trials (Dolbeer et al. 1992). These pools could be placed in locations away from air traffic with predictable bird activity such as at landfills. The pools could be filled with fresh water to conduct controlled, replicated experiments with free-ranging birds.

Cage Tests with ConCover 180^R over Food

AP-50 was repellent to cowbirds and ring-billed gulls at food sources, although a higher concentration (0.50% MA) was required to repel ring-billed gulls than cowbirds (0.15% MA). Cowbirds were repelled by similar concentrations of MA during tests using millet mixed with ConCover 180^R and those using millet only. Cowbirds in this study were repelled at a MA level about 50% lower than that necessary to reduce food consumption by starlings (*Sturnus vulgaris*) and red-winged blackbirds (*Agelaius phoeniceus*) (Mason et al. 1991).

Mallards and Canada geese (Branta canadensis) avoided shelled corn treated with 1.0% MA (Cummings et al. 1992).

Cowbirds displayed aversion to millet mixed with ConCover 180^R only during the 3-choice test when free, untreated millet was available. Thus, ConCover 180^R alone may reduce foraging by some bird species, provided alternate, more accessible food is available.

Repellency of gulls was not observed until AP-50 concentrations were at 1.0% (0.5% MA). This was 3-13 times greater than levels of AP-50 required to repel cowbirds during this study and to repel gulls (ring-billed and herring) from small pools of water during 2-choice tests (Belant et al. 1992). The difference in repellency between cowbirds and ring-billed gulls may be related to variation in taste perception (Espaillat and Mason 1990). Also, the effectiveness of repellents may depend upon the material being protected (e.g., water vs. food) (Rogers (1978).

Sprouting of millet did not appear to be hindered by ConCover 180^R or ConCover 180^R with AP-50. In fact, the moisture content and consistency of ConCover 180^R probably provides an excellent medium for millet seed germination. As ConCover 180^R can be sprayed as a slurry for distances to 50 m, applications such as seeding of highway right-of-ways, or aerial seeding of small grains warrant further investigation.

Testing of MA formulations and landfill cover materials as bird repellents at food sources under controlled conditions should be conducted with other bird species that frequent landfills (e.g., European starlings, herring gulls) to further evaluate repellency. Because other factors (e.g. social dominance, flock behavior) that could influence repellency were not addressed in this study, we also recommend field tests at landfills to examine repellency to free-ranging populations of birds.

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Table 1. Bird[a] numbers in 2 pairs of 10- to 40-cm deep ponds of water in vegetated areas at John F. Kennedy International Airport, 14-19 May 1991. One pond of each pair was treated with a ReJeX-iT™ formulation of methyl anthranilate (MA).

Pond	Pond surface area (m^2)	MA formulation[b]	Pretreatment (14-17 May) N	No. birds/5-min. $\bar{x}$	SD	Posttreatment (16-19 May) N	No. birds/5-min. $\bar{x}$	SD
H1	150	Control	14	1.3[c]	1.6	22	1.4[c]	1.2
H2	1,300	TP250	21	4.1[d]	2.6	36	0.5[d]	1.0
FA1	4,000	Control	24	4.3[e]	2.7	4	9.0[e]	2.5
FA2	300	AP-75	10	1.2[f]	1.1	5	0[f]	0

[a] Ducks (76%), gulls (9%), other species (14%).
[b] TP250 contained 25% MA in vegetable oil applied at rate of 20 ml/m^2 of water surface; AP-75 contained 75% MA in polymer matrix applied at rate of 1 g/L of water.
[c] Means are not different (t = 0.21, 34 df, P = 0.80).
[d] Means are different (t = 7.45, 55 df, P < 0.01).
[e] Means are different (t = 3.25, 26 df, P < 0.01).
[f] Means are different (t = 2.40, 13 df, P = 0.03).

Table 2. Bird[a] numbers in 4 ≤4-cm deep pools of water on taxiways at John F. Kennedy International Airport pre- and posttreatment with ReJeX-iT™ AP-75 (75% methyl anthranilate) at 1 g/L of water, 8-12 July 1991.

Pool	Pond surface area (m^2)	Pretreatment (8-9 July) N	No. birds/5-min. $\bar{x}$	SD	Posttreatment (9-12 July) N	No. birds/5-min. $\bar{x}$	SD
V	75	2	6.0	0	13	0.1	0.3
ZG	5	1	4.0	0	4	0	0
WW13L	24	1	4.0	0	5	0	0
WA	39	1	3.0	0	7	0.1	0.4
Total		5	4.6[b]	1.4	29	0.1[b]	0.3

[a] Gulls (92%), other species (8%).
[b] Means are different, t-test comparing all observations pre- and posttreatment (t = 16.67, 32 df, P < 0.01).

Table 3. Bird[a]-minutes of use in 3-cm deep pools of water on taxiway-ramp areas at John F. Kennedy International Airport pre- and posttreatment with ReJeX-iT™ AP-75 (75% methyl anthranilate) at 1 g/L of water, 28 July-2 August 1991.

Area	No. of pools	Pool surface areas (m^2)	Pretreatment (28-31 July) Bird-minutes/ 120 observation minutes N	$\bar{x}$	SD	Posttreatment (1-2 August) Bird-minutes/ 120 observation minutes N	$\bar{x}$	SD
WA	8	3,743	5	12.8	19.8	5	0	0
B	9	4,026	5	18.6	28.3	5	7.5	8.7
Total	17	7,769	10	15.7[b]	23.2	10	3.7[b]	7.0

[a] Rock doves (34%), laughing gulls (31%), ring-billed gulls (23%), herring gulls (*L. argentatus*) (9%), and American crows (*Corvus brachyrhynchos*) (3%).

[b] Means are not different, *t*-test comparing all observations pre- and posttreatment ($t = 1.59$, 18 df, $P = 0.12$).

Table 4. Grams of untreated and ReJeX-iT™ AP-50 (50% methyl anthranilate)-treated millet consumed by brown-headed cowbirds during 24-hr, 2-choice tests conducted on alternate days, 17-25 August 1992. Each cage held 5 cowbirds. Means within a column with different letters are significantly different ($P < 0.05$, Tukey tests).

Test no. (% AP-50 [g/g])	Millet (g) consumed by cowbirds: With AP-50 $\bar{x}$	SE	Without AP-50 $\bar{x}$	SE	Total $\bar{x}$	SE
1 (0.14)	20.0	1.4 A	28.5	3.7 A	48.6	4.6 AB
2 (0.30)	9.2	2.2 B	34.8	3.2 B	44.0	8.6 AB
3 (0.50)	1.2	0.8 C	33.8	3.5 B	35.0	10.4 A
4 (1.00)	2.3	0.3 C	46.8	3.1 C	49.2	13.8 B

Table 5. Number of millet seeds remaining and percent of surface area disturbed by brown-headed cowbirds in ConCover 180® and ConCover 180® with ReJeX-iT™ AP-50 (50% methyl anthranilate) treatments during 3 24-hr, 2-choice tests conducted 16 August-2 September 1992. Each cage held 5 cowbirds. Means within a column with different letters are significantly different ($P < 0.05$, Tukey tests).

Test no (% AP-50 [g/gl])	Concover 180/AP-50				ConCover 180			
	No. of seeds remaining		% surface area disturbed		No. of seeds remaining		% surface area disturbed	
	$\bar{x}$	SE	$\bar{x}$	SE	$\bar{x}$	SE	$\bar{x}$	SE
1 (0.14)	673	41 A	89	5 A	722	23 A	94	2 A
2 (0.30)	995	81 B	14	6 B	681	80 A	68	10 AB
3 (0.50)	1173	32 B	2	1 B	825	102 A	64	10 B

Table 6. Number of gizzard shad in ConCover 180® and ConCover 180® with ReJeX-iT™ AP-50 (50% methyl anthranilate) consumed by ring-billed gulls during 1-hr, 2-choice tests conducted 12-15 September 1992. Each cage held 2 gulls. Means within a column with different letters are significantly different ($P < 0.05$, Tukey tests).

Test no. (% AP-50 [g/gl])	Number of fish consumed					
	With AP-50		Without AP-50		Total	
	$\bar{x}$	SE	$\bar{x}$	SE	$\bar{x}$	SE
1 (0.30)	3.3	1.4 A	4.7	1.4 A	8.0	1.9 A
2 (0.50)	7.7	0.8 A	8.2	0.6 A	15.8	1.0 AB
3 (0.75)	4.7	1.5 A	7.8	0.7 A	12.6	1.9 AB
4 (1.00)	3.0	1.0 A	8.0	0.8 A	11.0	1.9 B

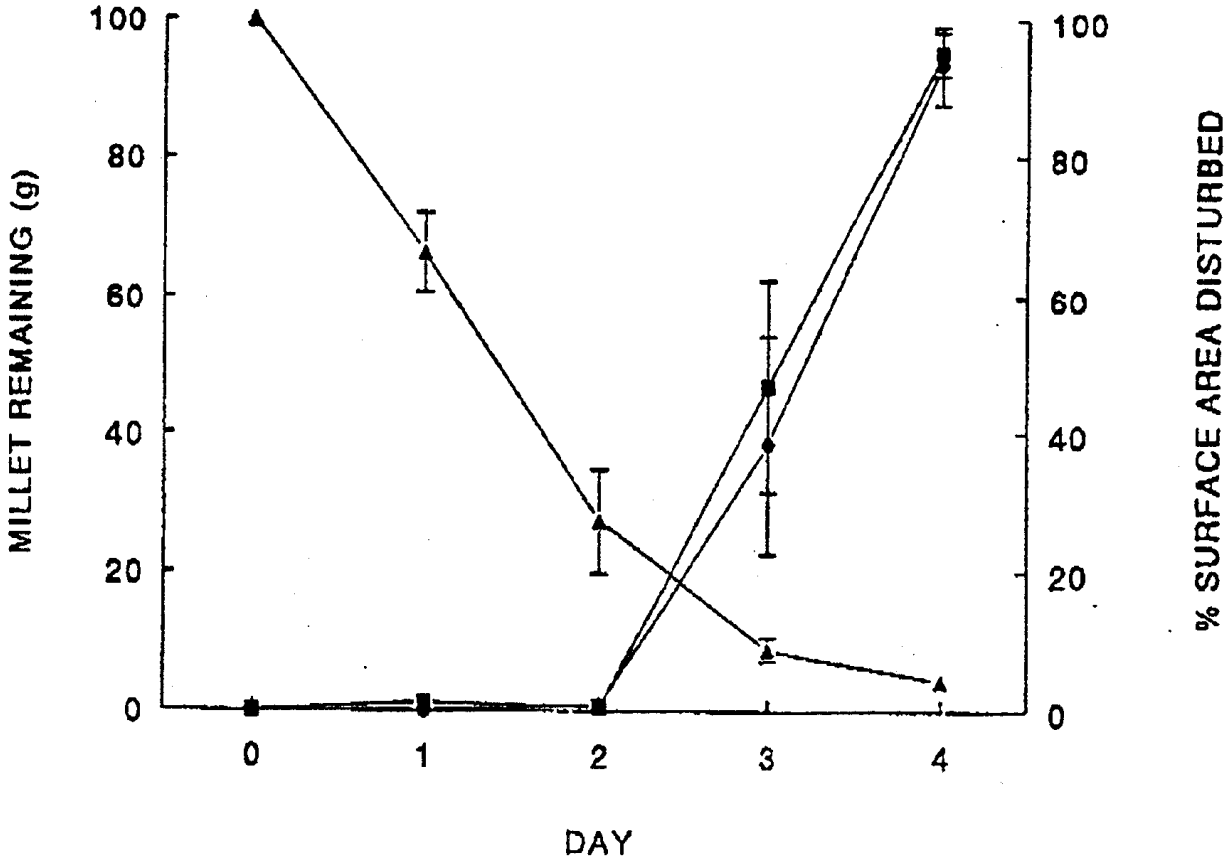


Figure 1. Percent of surface area disturbed ($\bar{x} \pm SE$) by brown-headed cowbirds in ConCover 180® (circles) and ConCover 180® with ReJeX-iT™ AP-50 (squares; 0.14% g/g, 0.50% methyl anthranilate) treatments in relation to grams of untreated millet (triangles) remaining during a 4-day, 3-choice test, 11-15 August 1992. Each cage held 5 cowbirds.

PMC Specialites Group

A DIVISION OF PMC, INC.

20525 Center Ridge Rd., Rocky River, OH 44116
PHONE: 216-356-0700

ReJeX-iT™

WILDLIFE MANAGEMENT

Order Entry No: X20RJ7050

501 Murray Road, Cincinnati, OH 45217
PHONE: 513-242-3300 FAX: 513-482-7377

TECHNICAL BULLETIN # BA-4812

R e J e X - i T ™ AP-50

ReJeX-iT™ AP-50 has been formulated from Food Grade ingredients that meet or exceed US Food Chemical Codex (FCC) and US Pharmacopeia (USP) Specifications and comply with the British Pharmacopeia (BP). ReJeX-iT™ AP-50 is a free flowing, granular powder that can be blended into other products.

TYPICAL PROPERTIES:

Appearance	White, free flowing, granular solid.
Odor	Reminiscent of concord grape.
Bulk Density	432 g/l, 3.7 lbs/gal.
Solubility	0.27 g/100 ml in water.
Assay	50% technical active.
Moisture	0.5% maximum.
Toxicity	Acute oral LD_{50} in rats is >5000 mg/kg body weight.
Safe Handling	Avoid excessive exposure. As a general precaution, good personal and general hygiene and good housekeeping should be followed.

USE:

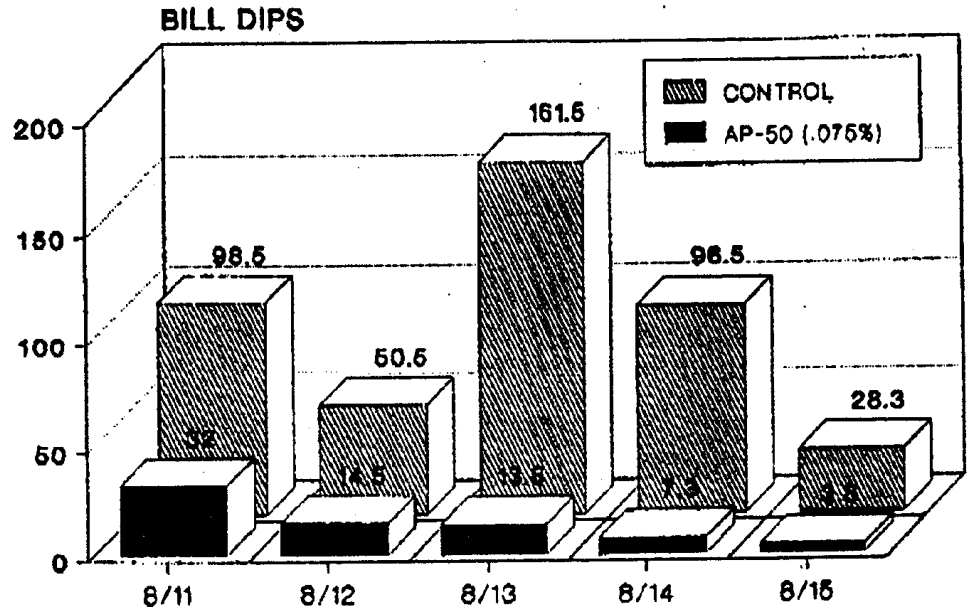
EPA REG. No. 580-356

For the reduction of bird activity in temporary pools of standing water on airports apply ReJeX-iT™ AP-50 at a rate 1.2 lbs/100 gal (2 oz/sq.yrd water surface). If the water is deeper than 2-3 inches, add additional 2 oz/sq.yrd to the water surface. Apply by spreader, or spray as a slurry, at 3-4 week intervals as increased bird activity might require.

This information is believed to be reliable; however, all recommendations are made without guarantee, since the conditions of use are beyond our control. All products are sold without warranty, expressed or implied, and on the condition that purchasers shall make their own tests to determine suitability of usch products for their purpose and that all risks are assumed by the user. Statements contained

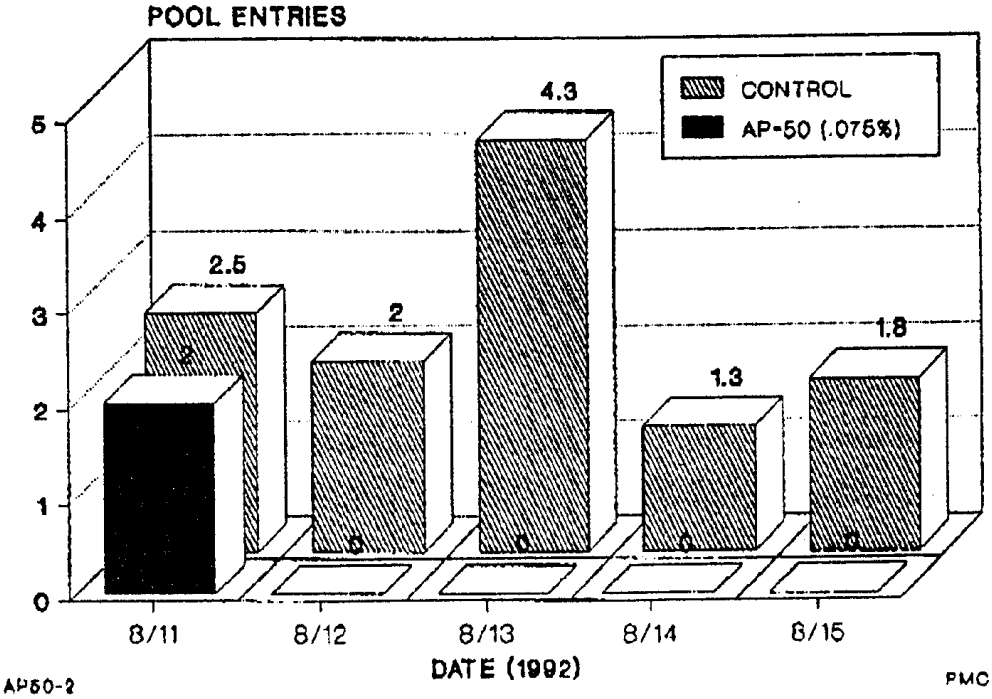
ReJeX-iT™ AP-50

EFFECTS ON RINGBILL & HERRING GULLS



AP50-1

PLASTIC POOLS WITH 100 LITER WATER



AP50-2

PMC 8Q

DRAFT

ReJeX-iT™ AP-50

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION

ReJeX-IT™ AP-50 has been formulated from Food Grade ingredients that meet or exceed U.S. Food Chemical Codex (FCC) and U.S. Pharmacopeia (USP) specifications and comply with the British Pharmacopeia.

CAUTION: Excessive exposure may cause eye and skin irritation. Wear rubber gloves for long-term and repeated contact. Wear safety glasses when handling. Wear respirator for application of product. Keep away from open flames. Keep container closed when not in use. Use in ventilated areas only.

ENVIRONMENTAL HAZARDS

Do not discharge into lakes, streams, ponds, or public waters unless in accordance with an NPDES permit or as per use directions. For guidance, contact your Regional Environmental Protection Agency office.

DIRECTION FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS: This product may be used to repel birds such as ring-billed gulls, Canada geese, and mallards from landfills and temporary pools of standing water. Wear protective gloves when applying or otherwise handling product for long-term and repeated contact.

Temporary Pools of Standing Water: Apply ReJeX-IT™ AP-50 at a rate of 1.2 lbs/100 gal of water (1.5 parts/1000 parts of water w/w) at 3-4 week intervals. Adjust timing of subsequent applications as required by bird activity and anticipated seasonal migrations. For pools of water less than 2-3 inches deep, apply ReJeX-IT™ AP-50 at a rate of 2 ounces per square yard of water surface. Do not add additional product if there is no birds activity.

Landfills: Mix 50-150 lbs of ReJeX-IT™ AP-50 with each 500 gal of landfill cover spray (such as DayControl® or ConCover® from New Waste Concepts, Inc.) for each 5,000 sqft of working face per day.

ACTIVE INGREDIENT:

ReJeX-IT™ MA.....	50%
INERT INGREDIENTS	50%
Total	100%

ReJeX-IT™ MA is the trade name for the Technical Grade Active Ingredient, Methyl Anthranilate

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

On contact with eyes, wash with water for 15 minutes. Wash exposed skin with soap and water. Wash contaminated clothing before reusing.

Manufactured for

PMC SPECIALTIES GROUP

501 Murray Road, Cincinnati, Ohio 45217

1-800 543-2466 FAX (513) 482-7377

EPA EST. No. 058035-OH-001 EPA REG. No. 580-356

STORAGE & DISPOSAL

STORAGE: Store only in original container, in a dry place inaccessible to children, pets, and domestic animals. Store apart from pesticides, fertilizers, food or feed that may cause cross-contamination from odor.

DISPOSAL: Spray mixture, or rinse water that cannot be used according to label instructions must be disposed of according to Federal or approved State procedures. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration, if allowed by State and local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner as the liner.

WARRANTY STATEMENT

NOTICE: The manufacturer warrants that this product conforms to the chemical description on its label. When used in accordance with label directions under normal conditions, this product is fit for its intended purpose. Since timing, method of application, weather and ground conditions, mixture with other chemicals, and other factors affecting the use of this product are beyond our control, no warranty is given concerning the use of this product contrary to label directions, or under conditions which are abnormal or not reasonably foreseeable. The buyer and/or user assumes all risks of any such use.

12/93

SECTION I

MANUFACTURER:	PMC SPECIALTIES GROUP
ADDRESS:	501 Murray Road Cincinnati, OH 45217
EMERGENCY TELEPHONE:	(513) 242-3300
FOR TRANSPORTATION EMERGENCY:	(800) 424-9300
CHEMICAL NAME AND SYNONYMS:	Methyl Anthranilate
TRADE NAMES AND SYNONYMS:	ReJeX-iT™ AP-50
CHEMICAL FAMILY:	Aromatic Acid Ester
FORMULA:	$C_8H_9NO_2$, $C_6H_4NH_2CO_2CH_3$
CAS REGISTRY NUMBER:	134-20-3
DOT SHIPPING:	Not Regulated (Methyl Anthranilate)
PRODUCT NUMBER:	X20RJ7050

SECTION II HAZARDOUS INGREDIENTS

MATERIAL	%	TLV (Units)
Methyl Anthranilate	~50%	Unassigned

SECTION III PHYSICAL DATA

BOILING POINT:	No Data
FREEZING POINT:	No Data
BULK DENSITY:	432 g/l
VAPOR PRESSURE AT 20° C:	< 1mm Hg
VAPOR DENSITY:	No Data Found
SOLUBILITY IN WATER:	~.15%
% VOLATILES BY VOLUME:	50% as MA
EVAPORATION RATE:	No Data Found
APPEARANCE AND ODOR:	Solid, free flowing granular, Grape like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: No Data
AUTOIGNITION TEMPERATURE: No Data Found
FLAMMABLE LIMITS IN AIR: No Data Found
EXTINGUISHING MEDIA: Carbon Dioxide, Dry Chemical, Foam
SPECIAL FIRE
FIGHTING PROCEDURES: Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None Assigned

EFFECTS OF OVEREXPOSURE: Excessive exposure may cause skin and eye irritation. Other toxic effects are unknown. Methyl anthranilate is included in the GRAS (Generally recognized as safe) list.

EMERGENCY AND FIRST AID PROCEDURES: IF INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet. IF ON SKIN: Wash affected area thoroughly with soap and water. IF IN EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention. IF SWALLOWED: Never give anything by mouth to an unconscious person. Give several glasses of water. If vomiting is not spontaneous, induce vomiting by gently touching the back of the patient's throat with a finger. Keep airway clear. Seek medical attention.

TOXICITY DATA:

Oral LD_{50} (rat) >5,000 mg/Kg

SECTION VI REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Oxidizing Agents
HAZARDOUS DECOMPOSITION PRODUCTS: BY FIRE: Carbon Dioxide, Carbon Monoxide and Oxides of Nitrogen.
HAZARDOUS POLYMERIZATION: Will Not occur

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED: Spilled material can be collected and held for reclaim or placed in a covered waste disposal container.

WASTE DISPOSAL METHOD: Sanitary landfill or incinerate in approved facility. Do not incinerate closed containers. Dispose of in accordance with federal, state and local regulations regarding pollution.

SECTION VIII SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION: Wear a respirator approved by NIOSH/MSHA for organic vapors, fumes and mists in areas laden with vapor.
VENTILATION: Local exhaust preferable, general exhaust acceptable.
PROTECTIVE GLOVES: Required for long or repeated contact.
EYE PROTECTION: Wear safety spectacles with unperforated sideshields.
OTHER PROTECTIVE EQUIPMENT: Eye wash, safety shower.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not store near open flames or oxidizing agents. Avoid storing in high temperature areas.

OTHER PRECAUTIONS: Avoid excessive exposure. Do not take internally.

REVISED: August 31, 1992
SUPERCEDES: May 4, 1992

The information contained herein is based on the data av[illegible]

Memorandum

To: Files

From: George Haas

Date: September 11, 1992

Subject: Gull Management Program on the John F. Kennedy International Airport

A meeting was held on September 11, 1992 at the John F. Kennedy International Airport (JFKIA) between representatives of the U. S. Fish and Wildlife Service (Service), the Animal Damage Control section of the Animal and Plant Health Inspection Service (ADC), and the Port Authority (PA) to review the gull management program at the John F. Kennedy International Airport. George Haas, Gene Hester, and Sam Librandi represented the Service. Janet Sillings represented ADC. Jack Gartner (Director of Airport Operations) and Sam Chevalier (Director of the Bird Control Unit) represented the Port Authority. Mr. Gartner reported JFKIA owned approximately 5,000 acres and that this property had a 12 mile perimeter, and that JFKIA has a long history dealing with bird problems.

The Service issues a depredation permit to JFKIA to kill migratory birds posing a threat to aircraft and human safety. Over 14,000 gulls (primarily laughing gulls) were shot under this permit in 1991. The National Park Service (NPS) has criticized the management program at JFKIA and a 1992 report entitled "Birds and the Potential for Bird Strikes at John F. Kennedy International Airport" funded by PA identifies 17 management recommendations (pp. 51-52). Particular emphasis was placed upon these management recommendations during this review.

The primary air strike hazard at JFKIA results from a breeding colony on adjacent NPS property within Jamaica Bay. These birds fly over the airport on foraging flights inland during breeding season. Both Ms. Sillings and Mr. Gartner report that little feeding opportunity exists on JFKIA by laughing gulls and it is unknown where these birds feed.

The group reviewed the entire non-lethal program and then Mr. Chevalier, Mr. Haas, Mr. Hester, Mr. Librandi and Ms. Sillings toured JFKIA to inspect this program. The following is a summary of this review of the non-lethal gull management program on JFKIA:

<u>Grass management</u>: There has been no grass mowing on the air-side of JFKIA during the period of May 1st to August 1st since 1985 (the grass is cut around the terminal and along the roadways leading to the airport). We noted that the vegetation was sparse in some areas adjacent to the runways

and taxiways and that there was a lot of disturbed soil in those areas. Mr. Gartner reported that there is a lot of disturbed land due to the construction and improvements by the PA. Mr. Chevalier felt that even though the vegetation was sparse, it still discouraged roosting or feeding on these areas by the laughing gulls. Ms. Sillings confirmed these observations.

The PA mows the grass on the Van Wyck Expressway. This area does not receive a high amount of laughing gull use and PA does not feel that this is an attractant to laughing gulls.

We visited the Van Wyck Expressway and observed less than 10 herring gulls roosting within the traffic circle. Birds using this area do not pose a threat to aircraft.

We concluded that the grass management program on JFKIA was acceptable and that the grass areas along the runways, taxiways and parking areas did not attract gulls or other birds.

Insect Control: We discussed the possible food sources for laughing gulls and a preliminary review showed that japanese beetles were an important food item. ADC will summarize information collected from laughing gulls shot in 1991 and 1992 soon. Insecticides (adulticides) are routinely used on the airport for mosquito control and this spraying is thought to adequately control japanese beetles. Mr. Gartner will provide the Service with a list of the chemicals and the schedule of spraying for evaluation of this program.

Feeding: Mr. Gartner admits that gulls are fed at JFKIA by taxicab drivers in their queue areas and that the PA needs to establish and enforce an anti-feeding ordinance.

We visited the taxi queue areas. We did observe taxi drivers feeding approximately 30 pigeons in two queues. These birds were not in an area posing a threat to aircraft; however, we did recommend that the PA enact and enforce a regulation banning the feeding birds on PA lands (including signs).

Garbage Management: The PA does not have dumpsters on the JFKIA grounds, instead they use compactors. Mr. Gartner reports that garbage is not available to gulls on the Airport because of these compactors.

We discussed the status of garbage dumps surrounding JFKIA. All the landfills within the area have been closed and sealed. There are no active garbage dumps to attract laughing gulls to fly through the airspace at JFKIA.

We visited the trash compactors. We did not observe any birds near the 2 compactors that we visited, nor did we see any garbage available to birds near these compactors. We did observe plastic material around the Trans World Airlines (TWA) terminal (no food items). Mr. Chevalier reported that this company was not properly disposing its plastic garbage and that PA was

working with this company to improve its management. We did not observe any birds in the TWA area and overall we observed 3 herring gulls and 7 rock pigeons on the air-side of the terminal area.

We concluded that the garbage management program on JFKIA was acceptable and that JFKIA garbage did not attract gulls or other birds to JFKIA.

Water Management: Water management is a important method to discourage gull use. The PA has an extensive drainage system to remove water from the airport area. JFKIA is built on a filled-wetland and there are constant changes in land levels as these former wetlands settle. The PA fills in low spots as they develop. The PA uses a grooving machine on paved areas to ensure that water flows into the existing drainage system. The PA uses styrofoam wicks to drain low spots and has experimented with methylphthanalate as an aversion agent on standing water areas (this is an experimental use of this chemical prior to its registration). Mr. Gartner admits that water used to remain on paved area and that this standing water was used by gulls for drinking and bathing; however Mr. Gartner feels that they now are able to remove this water quickly from the airport area.

Mr. Haas and Mr. Hester arrived at JFKIA via airplane in the afternoon of September 10th following heavy thunderstorms and observed no standing water on the airport. We observed little standing water during our tour of the airport and were shown the drainage methods (drains, grooved areas, and wicks) in use. We observed only 1 herring gull standing near a shallow pool of water along a taxiway.

We concluded that the water management program was acceptable. Little water was available for gulls, and the use of these pools by birds was discouraged by the Bird Control Units.

Bird Control Units: The Bird Control Unit discourages herring gulls, great black-backed gull, ring-billed gull, laughing gull, black duck, Canada goose and brant use of JFKIA. Patrols occur 16 hours a day for 365 days a year. These patrols use shotguns with live shells and shell crackers and distress calls (tape recorders). The daily routine of the Bird Control Unit is to patrol the active runway at first light to confirm that it is clear of birds for the Federal Aviation Administration (FAA). These patrols are conducted (1) whenever the use of a runway is initiated, (2) whenever bird concentrations are observed by the control tower, and (3) before each Concord take-off or landing. The Bird Control Unit also patrols the airport and looks for any flocking on or near the runways. The Bird Control Unit kills between 2-300 birds annually to reinforce non-lethal techniques in a year (this does not include the special effort directed at laughing gulls during the breeding season). In addition the Bird Control Unit uses mylar tape and 20-25 entrenched zon guns on the bay side of the airport to discourage gulls and other birds.

We discussed the staffing issue raised by NPS regarding the Bird Control Units. Gartner reported that the FAA certifies the airport management program and that the FAA and ADC feels that the Bird Control Unit is adequately staffed.

We observed 11 birds on the air-side of JFKIA at the time of our tour (the laughing gulls were not using the airport at this time). We also observed a sweep made by Bird Control Unit personnel prior to a Concord Jet takeoff and the permanent placement of zon guns along the runways. We concluded that the Bird Control Unit was adequately staffed and was an acceptable program. This program used the best available methods and, with the exception of laughing gulls foraging from the Jamaica Bay breeding colony, reduced the number of migratory birds using the airport.

Bird Strike Data: The bird strike data has been consistently collected by the same person since 1975. Mr. Chevalier patrols the runways when they are closed and records all carcasses of birds that are killed. He records the location, condition of the carcass, whether the runway was recently in use and the position of the carcass relative to the runway. This data collection program is consistent with other airport data collection programs for documenting bird strikes.

Our review of the non-lethal program revealed an emphasis on habitat management and harassment to reduce air strike hazards at JFKIA, while also reducing the need to kill migratory birds. The habitat management and harassment methods represented the state-of-the-art. As a result of this inspection, we recommend that Mr. Gartner (1) provide the Service with information about the insect spraying program as soon as practical and (2) pass and enforce an ordinance banning the feeding of wildlife on PA lands before applying for their 1993 permit.

During the course of this visit, we also reviewed the shooting program. This review is as follows:

Shooting Program: This shooting program begins in mid-May and is based upon the bird hazard, i.e. the increase in laughing gull flights over the airport. These flights increase markedly as the young are hatched and continue until the young are fledged and leave the colony. The shooting program begins with the hatching of eggs in the nearby breeding colony. This shooting program is stopped when the majority of young have left the colony and the number of over-flights has markedly decreased.

This shooting program is in addition to the occasional shooting done by the Bird Control Unit during the remainder of the year. This shooting program is directed at gulls flying over JFKIA and posing a threat to aircraft. Laughing gulls from the Jamaica Bay breeding colony are the primary species shot during this program. Ms. Sillings presented data on the effectiveness of the shooting program. The number of air strikes was significantly reduced during the 1991 and 1992 shooting programs.

We concluded that laughing gulls flying over the JFKIA during the breeding season from nearby Joco marsh posed a significant threat to aircraft and human safety. We also concluded that the special shooting program for gulls was justified, until other actions are taken to discourage laughing gulls from nesting within the proximity of this major airport.

The 1992 report entitled "Birds and the Potential for Bird Strikes at John F. Kennedy International Airport" which was funded by PA contains 17 management recommendations. These recommendations are frequently cited in the press and it was necessary to specifically investigate them during this review. The following is our evaluation of the potential value of each recommendation:

1. "Airport management should initiate a program of 100% tall grass on all operational and non-operational areas of JFKIA."

This is a standard management recommendation for airports experiencing bird hazard problems. JFKIA has been doing tall grass management since 1985.

2. "All water puddles on JFKIA must be eliminated. Notably wet areas between taxiways H and J and by the 31R middle marker should have the highest priorities for immediate elimination."

JFKIA has an active water management program. We observed little standing water during our visit. This management recommendation has been addressed.

3. "Numbers of Laughing Gulls feeding along the Van Wyck Expressway must be reduced. Gulls are attracted to these areas and research must be conducted to determine the best way to eliminate gulls from these areas."

Only a small portion of the Van Wyck Expressway is under the administration of PA. This portion receives little laughing gull use and birds using this area do not pose a direct threat to aircraft. Mr. Gartner and Mr. Chevalier report that they have observed little use by laughing gulls on other portions of this Expressway.

4. "Edgemere Landfill should be closed as soon as possible. This landfill is a major attract to gulls."

The Edgemere Landfill was closed prior to the issuance of the 1992 PA funded report. There are no active landfills near JFKIA.

5. "The potential attractions of Aqueduct Race Track should be addressed and corrected."

The Aqueduct Race Track is not under the authority of PA. Mr. Gartner and Ms. Sillings report that this property receives little use by laughing gulls during the breeding season.

6. "The Aqueduct may be more important to gulls as a major evening staging area. Future work should examine this closely."

This recommendation is merely a restatement of #5. See comments regarding recommendation #5.

7. "The Jamaica Sewage Treatment Plant is an unacceptable attractant to gulls, especially Laughing Gulls, and methods such as wire strung over all settling tanks should be examined as a possible means to prevent and eliminate gull use of the Plant.

The Jamaica Sewage Treatment Plant is not under the authority of PA. Mr. Gartner and Ms. Sillings report that this property receives little use by laughing gulls during the breeding season.

8. "Information needs to be collected on numbers, distribution, and habitat requirements of island-nesting bird species nesting on JBWR in close proximity to JFKIA."

To our knowledge, no data collection programs have been initiated. ADC did conduct an aerial survey of the laughing gull colony in 1992, as a condition under their New York depredation permit.

9. "Current bird deterrant (sic) methods at the airport should be expanded (i.e., harassment by the bird dispersal unit. Other bird deterent (sic) methods (i.e., shooting) need to be investigated."

The bird deterrent program at JFKIA represents acceptable state-of-the-art methodology. The JFKIA program emphasizes a non-lethal approach, i.e. habitat management and harassment. The 1991 and 1992 shooting programs directed at high numbers of laughing gulls flying over this airport are necessary and have significantly reduced the number of air strikes.

10. "Birds loafing on JFKIA must be continually and immediately harassed to reduce their occurrence."

JFKIA uses habitat management and harassment to reduce the attractiveness of this property to birds and to reduce the threat to human safety. The harassment program represents the state-of-the-art.

11. "Airport management should expand the number of personnel on bird dispersal units."

There is no evidence that the Bird Control Unit is under-staffed. Neither ADC or FAA feel that this is the case. We observed no evidence that staffing was a problem.

12. "JFKIA should accelerate the draining of large depressions that fill with rain water to reduce the availability of water on the airport."

This recommendation is a restatement of #2. See comments for that recommendation.

13. "All dumpsters on or around the airport should be kept closed at all times, and policed."

JFKIA currently uses trash compactors. No dumpsters were observed. These compactors deter birds from feeding on garbage.

14. "Taxi stands in the street-side terminal area should be cleaned as often as is neccessary (sic) to eliminate all sources of food scraps from these areas"

This is still a problem. We will work with Mr. Gartner and Ms. Sillings to assure that this problem is solved before the 1993 breeding season. However, there was little evidence that large concentrations of birds result from feeding by taxi drivers and that these birds represented a serious hazard to aircraft.

15. "Feeding of any birds at taxi stands, airport construction sites, etc., should be eliminated as this may act as an attractant to gulls. Violators should be fined."

This recommendation is a restatement of #14. See the comments for that management recommendation.

16. "The potential for bird-aircraft interactions at JFKIA would be lowered if the number of Laughing Gulls nesting on Joco Marsh were reduced."

Joco Marsh is owned by NPS and any management of this marsh to discourage nesting near a major airport would have to be approved by NPS.

17. "Numbers of Laughing Gulls nesting on Joco Marsh could be reduced in several ways. One feasible method would be through initiation of a multi-year oiling program. Best results would be realized by conducting 2 sprayings between days 14 and 24 in the incubation period if political and logistical constraints permit."

This recommendation is a restatement of #16. See comments for that management recommendation.

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control
RD#2, Box 360-C
Locust Grove Rd.
Pittstown, NJ 08867-9529

Mr. Patrick Martin
Special Licenses Unit
NY DEC Division of Fish and Wildlife
50 Wolf Road
Albany, NY 12233

June 20, 1993

Dear Mr. Martin:

This is in response to your letter of June 3, regarding conditions attached to my Depredation License DWP93-057, issued on May 18, 1993, to address emergency conditions involving gulls at John F. Kennedy International Airport (JFK). I have addressed each of the four questions below; responses are based on site visits I conducted at JFK and information provided to me from Port Authority records of maintenance and bird control activities. I have tried to include an appropriate level of detail, and have attached file documents that substantiate my descriptions. If additional details are required, please contact me as soon as possible so that I may provide an appropriate response.

Since at least the late 1960's, the Port Authority has worked to identify and reduce wildlife hazards at JFK (Attachment A). I have discussed and attended documents regarding JFK's most recent program.

1. What is the current policy and method of implementation regarding the feeding of birds at taxi stands and other areas within airport boundaries?

It has not been documented that significant feeding of birds at taxi stands occurs; if any does occur, it has not been shown to create a significant attractant to gulls. As reported by the expert panel of ornithologists based on their one-week evaluation of JFK's bird-aircraft collision hazard, data collected at JFK "indicate clearly that most of the laughing gull strikes involve adult birds traversing the airfield whilst collecting food for their young." This conclusion has been further substantiated by my personal observations at JFK since 1991. Gulls involved in collisions are crossing JFK airspace as they travel between the Jamaica Bay colony and off-airport feeding sites that are abundantly distributed throughout Queens and western Long Island. There are no significant food attractants at JFK that are exploited by gulls (see answer to question #2).

Since the feeding of birds at taxi stands may provide some attractant value for birds, it should be eliminated. To further that goal, the Port Authority has posted signS prohibiting the feeding of birds at taxi stands and mandating the placement of trash in trash cans (Attachment B). A taxi driver education program is in effect via the posting of signs and distribution of handbills. Memos have recently been circulated to reinforce long-standing policies at JFK to report airside and landside bird observations, placement of trash in closed containers, and no feeding of birds at taxi stands and in other areas (Attachment B).

All commissaries are periodically reminded to use waste management equipment and methods that do not attract birds. This is monitored by the Port Authority.

2. Are there open dumpsters or open containers in any area that might attract gulls? What are the procedures for trash removal?

It is the Port Authority's policy (Attachment B, memo of June 10, 1993 from General Manager Rowe to all airport tenants) that all organic matter is placed in plastic garbage bags and maintained in closed containers. Refer to Attachment C for the number and type of trash collection containers in place at JFK. Dumpsters and drums are emptied 5-7 times per week. Dumpsters are not open, but are enclosed trash compactors. Additionally, three roving trucks police airport highways and side roads for the removal of bulk debris. The Port Authority has recommended that all airport tenants continually review their trash containers' adequacy in handling trash flow (Attachment B). Most of the trash removal at the airport is contracted out to Baisley Carting, of Jamaica, NY (718-656-5272).

3. Can you please provide details (i.e. frequency of mowing, for example) concerning the grass management program in and around JFK?

Long grass management on airside areas of JFK has been implemented since 1987. In these areas, no grass cutting occurs from May 1 through August 1, in order to reduce the attractant value for birds, especially gulls. In some areas, limited grass cutting occurs immediately around propane scare guns, approach lighting, and signs, for safety and fire hazard concerns. Cutting may occur during the fall and spring periods, but typically no more than four times per year. However, during 1992, the only airside cutting occurred in late August, and no cutting occurred during the spring of 1993. Grass cutting does occur on landside areas adjacent to the Van Wyck Expressway, cargo areas, and North Boundary Road at one week intervals, but has not been shown to provide a significant attractant for birds. These areas represent a very small percentage of all grass areas of JFK.

In order to further reduce the attractant value of grassy areas at JFK, the airport conducts an insect management program to reduce the amount of insects present in these areas. Applications of insecticides are included as part of JFK's ongoing bird hazard reduction program. More detailed information regarding the nature and frequency of insecticide application at JFK can be obtained from Port Authority staff person, Joe Gallagher at (718)244-3609.

In addition to grass management, the Port Authority has a policy to continually review landscaping plans and vegetation management conducted by itself and its airport tenants (Attachment D). As part of the JFK Redevelopment Program, a major landscaping study was undertaken in 1988. Trees and shrubs that do not provide food, shelter, and roost sites for birds were recommended, and any landscaping that is selected must conform to the list of approved plantings that was developed.

4. What is the airport's policy and current implementation on the control of storm water on and adjacent to runways?

The Port Authority's goal is to eliminate all accumulations of water on the airport (Attachment D). Due to its location adjacent to Jamaica Bay, the achievement of this goal requires constant maintenance and monitoring. The wet areas identified in the University of Massachussets 1991 study were drained (between taxiways H and J) or filled in with topsoil (near 31R middle marker) in 1991. No other major wet areas have been developed or were allowed to persist. Construction of a drainage system running the full length of the north/south runway and taxiway network is underway. During 1992, the Port Authority completed eight (8) major projects to improve drainage through installation of wick drains, and conduct of repaving and filling projects (Attachment E). Additionally, seven similar projects are in progress, and nine are planned for 1993 and 1994.

Port Authority Bird Control Unit personnel conduct bird control activities on the airport during all daylight hours, 365 days per year. Part of their duties include monitoring water pools on the airport. Small pools of water that accumulate after rains are dispersed for more rapid evaporation, are eliminated by grooves carved in the pavement, and work requests are submitted for draining or filling.

The EPA-registered bird taste repellent Methyl Anthranilate (MA) (sold commercially as ReJeX-iT, Trademark)(Attachment F) has recently been registered and made commercially available, due in part to experimentation conducted by ADC personnel on JFK during 1991 and 1992 (Attachment G). MA will be included in JFK's ongoing bird hazard reduction program, and will be used to treat water pools in the intervening period before they can be eliminated by drainage, etc.

Also attached for your review is a brief outline of JFK's Bird Control Unit procedures (Attachments H). Runway sweeps are conducted before each runway opening, and as required and as requested by the tower to document and eliminate bird presence. Bird Control Unit staff use pyrotechnics, propane scare guns, distress calls, shooting, and other methods to reduce bird presence on the airport. Additionally, the Port Authority has experimented with other less traditional techniques, such as the use of eyespot balloons, and the use of radio-controlled model airplanes. Bird Control Unit staff are required to issue a breach of rules violation wherever airport tenants are observed creating attractants for birds (Attachment H).

I trust this information will be useful to you in reviewing JFK's on-airport bird hazard control program. I will work with DEC Regional Wildlife Manager Joseph Pane to schedule a site visit to JFK to review implementation of this program.

Please contact me at ((08)735-5654 if I can be of further assistance.

Sincerely,

Janet L. Sillings

Janet L. Sillings
State Director, ADC NJ/PA/LI&NYC

Enclosures
CC: Rick Owens, Assistant Regional Director, ADC
Jack Gartner, JFK, Port Authority
Joseph Pane, NY DEC Division of Fish and Wildlife

United States Department of Agriculture

Animal and Plant Health Inspection Service

Animal Damage Control

RD#2, Box 360-C
Locust Grove Rd.
Pittstown, NJ 08867-9529

Mr. Jack Gartner, Manager
Aeronautical Services Division
JFK International Airport
Jamaica, NY 11430

July 13, 1993

Dear Mr. Gartner:

This is a follow-up to a number of field visits and discussions that have occurred over the past few weeks.

1. Documentation of gull presence at JFK during summer, 1993.

As per our recent discussion, ADC biologists and biological technicians have begun weekly gull surveys on streetside areas of JFK. Surveys will be conducted of grassy areas adjacent to the Van Wyck Expressway, the Jamaica Sewage Treatment Plant, and the Taxi Hold Areas associated with terminals. Bird presence, feeding by people, and signage will be noted and summarized in a letter report to you by the end of August.

During the surveys ADC conducted on Wednesday, July 7 (6:00 am-8:00 am) and Tuesday, July 13, no gulls were observed at any of the locations surveyed. No incidences of feeding were observed, and garbage was not available to birds.

2. Status of taxi stands as they relate to birds.

Based on my observations at JFK since 1991, human activities around taxi stands do not attract significant numbers of gulls. To provide up-to-date quantitative information on this issue, and to document if feeding does occur, ADC is surveying taxi stands each week. Based on three visits to the seven (7) taxi stands on Wednesday, July 7 and Tuesday, July 13, I make the following observations/recommendations:

a) No incidences of feeding were observed
b) No gulls were observed in the taxi areas.
c) Signs prohibiting the feeding of birds were posted in four of the taxi hold areas. Posts without signs were noted in several others, probably as a result of damage from weathering.

3. Jamaica Sewage Treatment Plant access.

In order to obtain a better evaluation of the extent to which gulls are present at the Sewage Treatment plant, I am requesting that you contact a representative from the facility and obtain permission for ADC personnel to visit the site for 15-20 minutes each tuesday. Please contact me as soon as possible so a more complete inspection of the facility can be included in our survey.

4. Vegetation Management at JFK.

As we agreed this morning, the Port Authority is revisiting its vegetation management program at JFK. Additionally, the current condition of vegetation management and an evaluation of potential future vegetation management strategies will be included in the EIS currently being developed by Louis Berger and the agencies. As has been the case in the past, ADC will review at your request any landscaping plans under consideration at JFK regarding their compatibility with ongoing bird deterrent measures.

5. Agency site inspections of JFK.

There will be an inspection of JFK by the New York DEC, U.S. Fish and Wildlife Service, and the National Park Service on Friday, July 16, beginning at 5:00 AM. We will come in from the field to meet with you between 10:00-11:00 AM.

I trust that this information is a useful summary of some important recent activities. I look forward to hearing from you about access to the Sewage Treatment Plant. Please contact me at (908)735-5654 if you would like to discuss these issues further.

Sincerely,

Janet L. Sillings

Janet L. Sillings
State Director, ADC NJ/PA/LI&NYC

CC: Rick Owens, ARD, ADC
Carl Bausch, USDA APHIS ADC

United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Animal Damage
Control

RD#2, Box 360-C
Locust Grove Rd.
Pittstown, NJ 08867-9529

Mr. Jack Gartner
Division of Aeronautical Services
Building 269
JFKIA
Jamaica, NY 11430

July 30, 1993

Dear Mr. Gartner:

Enclosed is a Field Trip Report completed for the interagency field visit conducted at JFK on Friday, July 16, 1993. As you will note, a thorough tour of the airport was provided by the Port Authority to representatives from the National Park Service, New York DEC, U.S. Fish and Wildlife Service, and USDA APHIS ADC. I expect that each of these agencies will similarly complete field visit reports or letters of findings. If I am supplied with these, I will forward a copy on to you.

Sincerely,

Janet L. Sillings
State Director, ADC NJ/PA/LI&NYC

Enclosures
CC: Rick Owens, ARD, ADC
Attendees

FIELD TRIP REPORT

LOCATION:	JFK International Airport Queens, New York
DATE:	Friday, July 16, 1993
TIME:	5:00 AM - 9:30 PM
OBSERVERS:	USDA APHIS ADC/ J. Sillings U.S. Fish and Wildlife Service/ G. Haas J. Gate National Park Service/ A. Stewart J. Tanacredi NY DEC Fish and Wildlife/ J.Pane R. Miller Port Authority of NY & NJ/ C. Zeilfelder

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ACTIVITIES:

5:00 AM	Observe laughing gull flight paths from end of RW4L. Most birds flying to south and west
5:55 AM	Observe wick drain systems Porous drain pipe on shoulder of RW 4L and approach of 22R
6:50 AM	Observe taxiways milled with grooves for drainage Visited trash compactors (no dumpsters). Toured taxi hold areas, observed signs that prohibit feeding, no feeding occurring, no gulls observed. * Observe grass, no birds present on/near grassy areas. *
8:00 AM	Break Tanacredi and Stewart leave
8:30 AM	Tour airport, Bergen Basin and Station A (shooting program).
9:30 AM	Tour concludes: Sillings, Haas, Gate, Miller, Pane Zeilfelder picks up NPS personnel (Avrin and Riepe) to conduct additional tour of airport.

General Observations:

The field visit was conducted between 5:00 and 9:30 AM. The group's general impression was that there were very few birds entering airport airspace. During the early-morning observation of the colony from the end of RW 4L, most birds seemed to be flying south/southwest.

The group visited areas that had been identified as problem areas with ponding; most had been filled or drained with wicks or porous pipes. One wet area was observed with cattails and phragmites. No birds were observed there.

All trash receptacles were compactors or otherwise covered.

During the tour of the airside of JFK, vegetative cover was observed. Some areas were uniformly covered, others had patchy coverage. The group generally agreed that birds do not appear to be attracted to the grassy areas regardless of uniformity of cover. The height of the grass (approximately 12") appears to remove attractiveness value of grass for gulls.

Seven taxi hold areas were visited. No food was available for birds, and no feeding was observed. Signs prohibiting feeding of birds were observed in six areas. In these locations, pigeons are more likely to be attracted than gulls.

G. Haas (FWS) agreed to provide Berger and Associates with National Wetland Inventory maps for Jamaica Bay.

A. An Ecological Study of John F. Kennedy International Airport and Vicinity with Recommendations to Alleviate Bird Hazards to Aircraft Operations

The U.S. Fish and Wildlife Service's Division of Wildlife Assistance conducted bird surveys and other field activities at JFKIA during 1975 and 1976 in order to determine bird species that are hazardous to aircraft safety, to assess the airport's attractiveness to birds, and to develop management recommendations for implementation at JFKIA. The final report was written by A. Godin, and was submitted to the Port Authority in March, 1976.

REPORT SUMMARY

In 1975, the Federal Aviation Administration (FAA) requested that the USFWS conduct an ecological study of JFKIA and its environs in order to permit the development and implementation of management actions to reduce the birdstrike hazard and increase public safety. This request was in part motivated by the November 12, 1975 crash of a DC-10 that collided with herring gulls at JFKIA. All of the 139 passengers that were on board were able to safely evacuate the aircraft moments before it burst into flames and was completely destroyed by fire. There were more than thirty other bird-aircraft collisions at JFKIA in 1975, a number of which resulted in costly aircraft damage. The study's objectives were to identify bird species that pose hazards to aircraft and the characteristics of the airport which attracted the birds, and to assess the relative hazard of the various bird species.

The location of JFKIA adjacent to the National Park Service's Jamaica Bay Wildlife Refuge has and will contribute to a continual birdstrike problem since many bird species are attracted to the diverse habitats found in the area. The airport's location within the Atlantic Flyway may exacerbate the hazard.

Gulls are noted as the major hazard to safe aircraft operations at the airport due to their large size, flocking behavior and high local abundance throughout the year. More than 700,000 gulls (ring-billed, herring and great black-backed) migrate through and/or overwinter in the New York metropolitan area each year. The nearby Edgemere and Fountain Avenue landfills provide ample food resources for these populations of birds. The airport is bound on three sides by tidal wetlands, mudflats, and beaches, which provide abundant feeding, loafing, and nesting areas for gulls. Gulls fly over critical airport airspace, and are attracted to the airport to feed on short-grass strips along runways and taxiways.

European starlings are noted as potentially hazardous to aircraft, and as many as 10,000 starlings were noted flying over runways at dusk and dawn while travelling to and from the roost site in conifer trees near the chapel pool. Starlings have also been observed feeding in the bayberry along the runways. Ducks and geese are considered potential hazards to aircraft, and are present in Jamaica Bay in great numbers during migratory periods. These species have been observed using wet areas on JFKIA. Some species of shorebirds utilize the flats adjacent to the airport throughout their fall and spring migration, feeding and resting in the short grass areas. Ring-necked pheasants inhabit the heavy brush and grass in the airport operations areas. Pigeons roost in hangars and feed on airport grounds, and are considered only incidental to the aircraft hazard. Further, certain raptors hunt small mammals in the vicinity of the runways, thus presenting some potential hazard to aircraft.

There were many attractants for birds at JFKIA, including food, water, shelter, nesting, loafing, and roosting resources. Starlings, blackbirds, mourning doves, and other species use airport vegetation for feeding, nesting, and roosting. Starlings use the Austrian pines located along the Van Wyck Expressway as a roost site. The man-made chapel pool, marshy areas between runways 4L-22R and 4R-22L, pools on pavement areas and on the roofs of buildings all provide drinking, bathing, and loafing areas for birds and mammals. Storm sewer outlets and tidal flats attracted gulls, shorebirds, waterfowl, and starlings.

Certain buildings were used as nesting and roosting sites by gulls, shorebirds, starlings, and waterfowl. Mice, rabbits, and black-tailed jack rabbits occur on the airport, and are a source of food for avian predators. Carcasses of mammals attract gulls. Garbage and food scraps are prevalent around the airport, and are very attractive to birds.

Twenty-one management recommendations were provided, including the following:

- Conduct bird harassment activities by a shotgun patrol during all daylight hours, 365 days per year.
- Communicate with the city of New York to close nearby landfills.
- Remove water (chapel pool, ponding, temporary pools) from the airport.
- Remove pine trees, common reed, bayberry and other vegetation that attracts birds.
- Prohibit feeding of birds on the airport.
- Remove mammals, pigeons, and dogs by trapping or shooting.
- Modify the beach south and east of the airport to remove its attractiveness to birds.
- Hire a full-time wildlife biologist to coordinate all bird management programs and activities at JFKIA.
- Maintain complete records of birdstrikes.
- Provide training to personnel involved in bird management activities.
- Develop an Airport Bird Management Plan for JFKIA, documenting actions to be taken and target dates when appropriate.

B. An Ecological Approach to the Control of Laughing Gulls at JFK International Airport, New York City

The National Park Service Cooperative Research Unit Center for Coastal Environmental Studies at Rutgers University conducted field studies at JFKIA and at Gateway National Recreation Area to determine factors associated with the incidence of laughing gull-aircraft collisions at JFKIA. The final report was written by NPS Principle Investigator P.A. Buckley and Rutgers University graduate student M. M. Gurien, and was submitted to the Port Authority on December 31, 1986.

REPORT SUMMARY

After the 1979 establishment of a laughing gull nesting colony in JoCo Marsh, laughing gulls became an important component of the birdstrike problem at JFKIA. The overall objectives of the study were to determine what factors contribute to the presence of laughing gulls at JFKIA, and to develop management strategies to reduce those factors, with minimal adverse effects on the environment. The specific objectives of the study were to evaluate the relationship between grass height and percent vegetative cover on the number of laughing gulls on the airport, to determine the importance of paved surfaces (with and without water) to gulls, and to determine the species composition, distribution and abundance of prey items (insects) on the airport.

In 1985 and 1986, 36 experimental plots were established between runways 4L/22R and 4R/22L. Laughing gull abundance and distribution, grass height, abundance and distribution of insects, and percent vegetative cover were recorded for each plot once each week in 1985 and irregularly (whenever gulls were present) in 1986. Stomach content analysis for chicks in the colony and for adult laughing gulls found dead on runways at JFKIA were conducted.

There were significantly more laughing gulls (468) in the 18 short-grass (2″) plots than in the 18 long-grass (18″) plots (14 gulls). Laughing gull presence was positively correlated with abundance and distribution of Oriental beetle larvae; Oriental beetle larvae abundance, though, was not dependent on grass height. Laughing gull abundance and distribution was not related to plant species composition and percent vegetative cover. Laughing gulls were most abundant in grass during late June and July, corresponding to beetle emergence. Laughing gulls avoided long-grass areas, regardless of the presence of Oriental beetles. Japanese beetles were not correlated to laughing gull abundance or distribution at JFKIA, and did not constitute a major food item of adult laughing gulls found dead on the airport. Most observations of laughing gulls on pavement were in freshwater ponds created after a rain in pavement depressions. Adult laughing gulls' stomachs contained significant proportions of adult Oriental and Green June beetles. Chicks consumed primarily fish, mollusks, crustacea, and insects.

The following features of JFKIA are attractive to gulls: short grass areas, Oriental beetles, freshwater ponds on taxiways and runways. Recommendations for laughing gull control at JFKIA include the following: 1. increase grass length in key aeronautical areas, 2. eliminate freshwater ponding, and 3. maintain current levels of the JFKIA Bird Control Unit. Airport resources appear not to be critical to the survival of the Jamaica Bay laughing gull population. Measures taken to reduce the airports attractiveness to laughing gulls are not expected to adversely affect the breeding colony in Jamaica Bay.

C. Bird Hazards to Aircraft At JFK International Airport

A four-member team conducted a site visit to JFKIA during June, 1989, and reviewed the airport's birdstrike data collection procedures, operation of JFKIA's Bird Control Unit, and other programs and activities related to the birdstrike hazard. An aerial survey of JFKIA and the adjacent Jamaica Bay laughing gull nesting colony was conducted. The Final Report was written by Dr. L.S. Buurma (Board of BSCE, The Netherlands), Dr. J.E. Karlson (Lund University, Sweden), Dr. V.E.F. Solman (Bird Strike Consultant, Canada), and Dr. C.S. Thomas (Manchester Airport, England), and was submitted to the Port Authority in Month, year.

REPORT SUMMARY

The panel acknowledged the extreme nature of the birdstrike hazard caused by having a major international airport adjacent to a large refuge, but noted that hazards created by the nesting colony could not be considered in isolation from hazards posed by other birds. The situation is exacerbated by the continued operation of landfills in the vicinity of JFKIA. The extensive birdstrike data collected by BCU personnel indicate the potentially serious hazard posed by birds to aircraft operations at JFKIA. The following improvements are recommended in order to allow a full assessment of the hazard posed by laughing gulls:

1) comprehensive collection and analysis of standardized data on the spacial and temporal distribution of birds on the airfield, and

2) survey of bird movements of birds over the airport.

In light of the serious nature of the hazard and the planned expansion of JFKIA operations, a reappraisal of JFKIA's commitment to bird control measures should include the following:

1) improved drainage,

2) appropriate vegetation management,

3) reduction of edible waste, and

4) daily monitoring to detect possible secondary impacts.

The following improvements are recommended for the operation of the JFKIA's bird hazard reduction program:

1) increased and improved staffing,

2) better-equipped vehicles,

3) appropriate use of distress call tapes,

4) increased availability of pyrotechnics, and

5) proper operation of propane cannons.

It is evident that the laughing gull colony in its present location presents an unacceptable hazard to aircraft operations at JFKIA. Most laughing gull strikes involve adult birds traversing the airfield while collecting food for their young, and some probably involve non-breeding laughing gulls. The laughing gull problem cannot be resolved by action on the airport alone. A laughing gull control program is recommended for 1990 that should result in the abandonment of the colony via egg-oiling of 100% of the nests. Control on the colony must not increase the hazard to aircraft and must not affect nontarget species. Conduct of the egg-oiling program in successive years would likely result in colony-abandonment, and could be augmented with other techniques to hasten this result. Cooperation and coordination of Port Authority and NPS goals, activities, and responsibilities are recommended.

D. Birds and the Potential for Birdstrikes at JFK International Airport

University of Massachusetts (UMass) researchers and NPS personnel conducted field activities at JFKIA and in Gateway National Recreation Area between June and September, 1990. The final report of activities was written by C.R. Griffin and E.M. Hoopes of UMass and was submitted to J.T. Tanacredi and P.A. Buckley of the NPS in September 1991. The NPS submitted the report to the Port Authority of NY & NJ in December, 1991.

REPORT SUMMARY

The overall goal of this report is to provide data on numbers, distribution, and ecology of birds at John F. Kennedy International Airport (JFKIA) and to assess the potential for birdstrikes. Project objectives were to:

1) gather information on birds utilizing the airport (species, age, sex, abundance, behavior, activities, habitat use, birdstrikes),

2) determine ecological factors of the Jamaica Bay laughing gull colony (nesting chronology, behavior, movements inferred from color-marking study),

3) conduct an experimental egg-oiling program in the laughing gull nesting colony and evaluate its impacts on birdstrikes at JFKIA, and

4) develop a management plan for reducing the potential for birdstrikes at JFKIA.

Generally, the greatest numbers of birds observed in all areas occurred during June. The greatest numbers of birds were observed on grass-covered areas, especially within the Aqueduct Race Track. Gulls were most often seen, in operational areas, either performing maintenance behaviors near standing water between taxiways or loafing on the concrete pads at the ends of runways.

The numbers of birds found dead at JFKIA have steadily increased since 1980, with an annual peak in birdstrikes occurring in June. Laughing gulls comprised 72% of all dead birds found from June to September of 1990. Approximately 70% of the adult laughing gulls found dead on JFKIA in 1990 were breeding birds from the adjacent nesting colony. The number of laughing gulls found dead has correlated with the number of birds nesting in JBWR. An examination of stomach contents of birds found dead on the airport indicated that insects were the most frequently-consumed item, followed by refuse, fishes, crustaceans, arachnids, and others. The survey of the laughing gull nesting colony indicated 7,629 nests. Laughing gulls were first observed in Jamaica Bay in early April, and first nested on JoCo Marsh on May 19. Average clutch size was 2.3 eggs, and the peak of hatching was June 20; fledgling was nearly completed by early August. Productivity ranged from 0-1.36 chicks per pair, and predation from feral dogs accounted for many losses. Radio-tagged birds were observed in all areas, but the limitations due to heavy traffic, limited access, and limited range of radio transmitters resulted in data that was biased towards birds that were stationary. Laughing gulls comprised 54% of all birds flying over the airport, and were most-commonly flying in a North-South direction. Laughing gull flyovers between June and September occurred on more than 6100 occasions, and involved birds going between the colony and off-airport staging areas.

A total of 3,675 nests' eggs were oiled (47.7% of total number of nests), and a sample of these (516 nests) were subsequently monitored to determine efficacy of oiling eggs. A single application of oil was successful in eliminating hatching in 64.5% of the nests.

Many types of areas on and around JFKIA were used by a variety of bird species for either food, water, or loafing. Puddles and other temporary standing water sources were frequently used by gulls and other water birds for drinking and preening. Laughing gulls were observed feeding at the dumpsters and at the taxi stands, and on grassy areas such as along the Van Wyck Expressway. The Jamaica Sewage Treatment Plant, the infield of the Aqueduct Race Track, and the Edgemere Landfill also were observed to attract gulls.

Gulls account for the majority of bird-aircraft interactions at JFKIA. Laughing gulls, which are present in the area for only six months each year, account for half of all strikes. In 1990, JFKIA ranked twentieth in operations, but first in number of birdstrikes. Studies indicate that gulls pose the greatest threats to aircraft compared to all other threats (mechanical failure, pilot error, weather).

Management Recommendations:

1. Maintain a 100% tall grass management program.
2. Eliminate all water puddles.
3. Reduce the number of laughing gulls feeding along the Van Wyck Expressway.
4. Close Edgemere Landfill.
5. Remove attractants at Aqueduct Race Track.
6. Research the possibility of the Aqueduct as an evening staging area.
7. Examine and implement methods to eliminate gull use of Jamaica Sewage Treatment Plant.
8. Collect data on other bird species nesting at JBWR.
9. Expand current bird deterrent methods in use at JFKIA.
10. Continual harassment of birds loafing at JFKIA.
11. Expand number of personnel on bird dispersal units.
12. Accelerate drainage of depressions filling with rainwater.
13. Close and patrol of dumpsters on or around the airport.
14. Clean-up of the street-side terminal taxi stands.
15. Eliminate bird feeding on or around the airport.
16. Reduction in the number of laughing gulls nesting on JoCo Marsh.
17. Initiation of a multi-year egg-oiling program.

E. Shooting Gulls to Reduce Strikes with Aircraft at JFK International Airport, 1991-93

This document reports on field activities conducted by ADC biologists during May-August, 1991-93. The final report was written by R.A. Dolbeer and J.L. Sillings, and was submitted to the Port Authority of NY & NJ in November, 1993.

REPORT SUMMARY

The collision of birds with aircraft poses serious hazards to safe aircraft operations at John F. Kennedy International Airport. Laughing gulls have been the species most frequently (47%) struck by aircraft at JFKIA, averaging 157 aircraft incidents involving 170 birds per year from 1988-90. Laughing gulls are present from May through September at a nesting colony adjacent to the airport on the Gateway National Recreation Area, which is administered by the NPS. Other gull species, which are present in the area throughout the year, contributed to 37% of bird-strikes during the same time period. A total of 52 non-gull bird species comprised the remaining 16%. A bird control program involving habitat alteration and the use of bird-frightening techniques has been applied at JFKIA and has reduced the number of birds present on JFKIA, but it has not been effective in deterring gulls from flying over the airport. Previous studies (Buurma et al., and Griffin and Hoopes 1991) have concluded that the majority of laughing gulls involved in collisions with aircraft at JFKIA are traversing the airport's airspace between the nesting colony and off-airport sites.

From 1991 through 1993, a program whereby USDA APHIS Animal Damage Control (ADC) wildlife biologists used shotguns (100% steel shot) to shoot gulls flying over the airport was implemented from May to August of each year. The program's objective was to reduce the population of gulls flying over the airport as well as to reinforce the bird reduction programs by conditioning the gulls to avoid the airport. In 3401 person hours of shooting, 35,692 gulls were killed, 91% (32,534) of which were laughing gulls. The numbers of great black-backed, herring, and ring-billed gulls shot were 399, 2400, and 359, respectively. No non-target populations were affected by the program.

The number of laughing gulls struck by aircraft during May through August was reduced by 66% in 1991, 89% in 1992, and 90% in 1993 when compared to the number of strikes occurring within the same months of 1988-90. The number of strikes involving other gull species decreased comparably. In spite of the removal of 32,534 laughing gulls in 1991-93 (over twice the number of adults in the Jamaica Bay), the Jamaica Bay nesting colony declined by only about 20% from 1990 to 1993. The shooting program is effective in reducing gull-aircraft collisions, but does not appear to have a significant impact on the laughing gull nesting colony. The annual removal of 10,000 to 13,000 adult laughing gulls at JFKIA in 1991 and 1992 represented 5 and 6% of the estimated adult population in nesting colonies from Virginia to Maine. These colonies have been growing at annual rates of more than 5%. Band recoveries indicated that some of the gulls shot at JFKIA had migrated to JFKIA during the summer. These data indicate that there are a significant number of non-nesting laughing gulls in the vicinity of JFKIA, and that there is migration into the area throughout the summer months.

An alternative long-term approach to solving the problem would be to develop a plan to relocate the laughing gull nesting colony away from Jamaica Bay. A seasonal on-airport shooting program should continue to minimize the number of gull-aircraft collisions until long-term actions to relocate the colony can be fully implemented. The Port Authority should continue an aggressive bird management program, including habitat management and the use of bird deterrent measures, to prevent gulls and other birds from using the airport for feeding and loafing.

THE PORT AUTHORITY OF NY & NJ

One World Trade Center
New York, N.Y. 10048

Carol Ash
Director
Office of Environmental
Policy and Management

(212) 435-2229

FEDERAL EXPRESS

August 3, 1993

Dinah Bear, Esq., General Counsel
Executive Office of the President
Council on Environmental Quality (CEQ)
Washington, D.C. 20503

Re: Laughing Gulls - John F. Kennedy International Airport

Dear Ms. Bear:

I have received a copy of your June 25, 1993, letter to Mr. Carl Bausch of the United States Department of Agriculture (USDA) regarding your recent visit to John F. Kennedy International Airport (JFK) on the matter of Laughing Gulls. On behalf of our Executive Director and the Port Authority, I would like to bring you up to date on some of the actions the Port Authority has taken and provide our perspective on some of the recommendations you have made.

By way of introduction, I am the Director of the Port Authority's recently created Office of Environmental Policy and Management. Among my responsibilities is the provision of policy guidance to our operating departments and facilities on environmental matters. While I was not available to be present at your June 2, field reconnaissance at JFK, Jack Gartner of our Aviation Department, Harry Barr of our Law Department and my Assistant Director, Christopher Zeppie, were in attendance and have kept me briefed on the issues and recommendations as they have emerged.

At the outset, I would like to thank you for your intercession on behalf of the flying public and the "avian population" on this matter. While it is self evident that the Laughing Gull Colony in its present location presents a hazard to aircraft operations at JFK, I remain optimistic that a safe airport operation can coexist with a neighboring wildlife refuge if it is recognized that protection of both interests should be the common goal of all parties. In the interest of advancing that common goal, I offer the following for your information and consideration with respect to the recommendations set forth in your recent letter.

CEQ Recommendation 1

> "The FAA should, in cooperation with the JFK management and the New York and New Jersey Port Authority, articulate, if possible, what level of risk is considered safe for pilot and passenger safety in the context of the programmatic EIS. If that is not possible, the FAA should explain why it is not possible. If the ADC and the cooperating agencies working on the programmatic EIS believe that it would be helpful in reaching a decision about the reduction of risk, they should work on an analysis of the risk posed by the presence of the birds to the planes. However, this topic should not become the overwhelming focus of debate; rather, all parties should admit the obvious and move on to take steps to reduce the risk of pilots, passengers and the birds."

As you are aware, the Federal Aviation Administration (FAA) is the federal agency charged with the responsibility of ensuring safe airport operations throughout the country and we have, again, put the question before them, the same question having arisen at the public scoping meeting for the preparation of the EIS in May of this year. The FAA's current position is that elucidation of an acceptable level of risk due to bird strikes is not possible.

With respect to the comment by Jack Gartner, Manager of Operations at JFK, at your June 2, meeting that "zero risk is our goal", that comment is meant to dramatize the gravity of our safety concerns. Lethal measures are interposed when seasonal gull activity as observed by ADC's certified wildlife biologists is significantly heightened at the commencement and during the nesting season.

As you indicated in your letter, the risk analysis approach may not be a viable one in terms of designing or evaluating a particular gull control program and various alternatives thereto. In our opinion, which I believe is consistent with yours, trying to devise a model which translates "excess gull activity" into risk of mortality to the flying public will not likely yield meaningful results, and therefore, should not be pursued as a basis for evaluating alternatives.

CEQ Recommendation 2

> "Representatives of the Secretary of the Interior and the Secretary of Transportation should review this situation and mandate compliance with 16 U.S.C. S460cc-(e). Such compliance should be party of the proposed action for the programmatic EIS which has been initiated by ADC."

The Port Authority concurs in the observation that both the Secretary of Transportation (FAA decision makers) and the Secretary of the Interior (National Parks Service, Fish and Wildlife Service decision

makers) must develop a mutually acceptable plan. To that end, the Port Authority initiated briefings for all the agencies on the ongoing Gull Control Program at JFK. Unfortunately, there has been little input by agencies on issues which have, in the past, been perceived as not within their sphere of responsibility. The federal statute you cite (16 U.S.C. sec.460cc-2(e)) may well be the motivating factor needed to develop a more proactive posture on the part of all agencies. The Port Authority remains committed to facilitating the development of a mutually acceptable Gull Control Program which integrates on-airport, off-airport, and within-the-nesting-area actions, which are identified through the EIS process as viable alternatives.

CEQ Recommendation 3

> "The Service should cease treating these permits under a categorical exclusion, and should implement appropriate NEPA compliance for the depredation permit. It should also re-examine its responsibilities under the Migratory Bird Treaty Act and consider becoming a cooperating agency for preparation of the programmatic EIS."

The Port Authority has no comment regarding the propriety of a categorical exclusion under NEPA for the issuance of Bird Depradation Permits by U.S. Fish and Wildlife Service. However, we are gratified that the U.S. Fish and Wildlife Service has recognized and continues to recognize the serious threat to safety that the gull activity poses to JFK operations. Further, it is noted that U.S. Fish and Wildlife Service <u>is</u> a cooperating agency for preparation of the NEPA EIS.

CEQ Recommendation 4

> "The Port Authority should immediately develop a program of planting and maintaining tall grasses and/or wildflowers in all airport areas. They should work with local botanists to identify which species will work best in these areas to achieve the characteristics called for in the studies regarding JFK grounds.
>
> The Port Authority should vigorously enforce its "no feeding" policy, and continue in its efforts to eliminate areas of attractive habitat near the airport grounds."

Please be aware that over the years the Port Authority has implemented a number of suggestions regarding landscaping design and plantings, as well as other practices, geared to discouraging gulls from entering the airport. The Port Authority herewith transmits excerpts from a report entitled, "JFK Redevelopment Program Investigation Studies: Bird Hazards-Soils-Irrigation", prepared by Hanna/Olin, Ltd. Landscape Architects in December of 1988 (see attachment no. 1). This report articulates a series of landscape design principles, including species lists, layouts, maintenance, etc. geared to minimizing the attractiveness of the landside of JFK to birds, including gulls. The recommendations of

the report have formed the basis for landscape design projects which are undertaken as part of the Port Authority's Capital Improvement Program and Redevelopment Program at JFK. In fact, at least on one project involving federal funding, the Port Authority has obtained written sign-off by technical staff of USDA's Animal Damage Control Unit (ADC) (see attachment no. 2). After a series of internal discussions, the Port Authority has reached the decision that we will institute this review requirement for all capital projects on the landside, regardless of the source of funding. Additionally, we will review landscaping programs undertaken by our tenants for conformance with the recommendations of the Hanna/Olin Report through our Tenant Alteration Application Process.

Furthermore, the Port Authority is evaluating a redesign of the landscaping at the Van Wyck entrance to JFK and at Federal Circle in advance of the redevelopment programs which will occur in the future at these locations.

With respect to JFK's airside, while it is true that the Port Authority has not achieved a uniform height of grasses in the infield areas and areas adjacent to taxiways, we believe that the minimum height achieved, approximately twelve inches, is effective in discouraging gulls. This practice has been in effect since 1986 as recommended by the Rutgers University Study. On July 16, a field reconnaissance was undertaken by a number of the federal and state agencies involved in the gull control program and in the EIS preparation (see attachment no. 3). They indicated to us during that visit that the airside grasses, as they presently exist in varying height are effective in discouraging gulls. We are attempting to get verification of this in writing from the agencies which made field visits on July 16.

Please be aware that the Port Authority uses and requires construction contractors to use a seed mix of either tall fescue or hard fescue which encourages growth to a uniform, acceptable height. However, since the completion of construction activity by contractors does not always coincide with the planting season, the Port Authority will reseed those areas disturbed by construction in both the spring and the fall of every year.

With regard to the no feeding policy at taxi stands and similar areas, please be advised that since your visit, additional and more substantial signage has been installed at appropriate locations. We requested that a notice be put in a local trade paper to remind drivers not to feed the birds (see attachment no. 4). Additionally, periodic daily inspections of taxi hold areas are made by Port Authority supervisors and, when required, emergency cleanup efforts are initiated in addition to regular cleaning routines. Daily observations of bird activity at all landside locations are also made and recorded.

With respect to attractive habitat near airport grounds, the Port Authority has written to the operators of the Jamaica Sewage Treatment Plant and Aqueduct Racetrack notifying them that their areas may be attractive to gulls. We will now request to meet with them to ascertain the significance of these sites with respect to gull activity and what, if anything, can be/should be done to reduce their attractiveness (see

attachment no. 5).

CEQ Recommendation 5

> "The U.S. Fish and Wildlife Service and The Port Authority of New York and New Jersey should become cooperating agencies for the programmatic EIS. The purpose and need for the EIS should be modified to include implementation of the law requiring the Departments of the Interior and Transportation to develop a mutually acceptable plan for operation of the airport in conjunction with the mission of the Jamaica Bay Unit. A high priority should be set on setting aside turf battles and working towards a solution which will lessen the probabilities on both human and avian fatalities."

As previously mentioned, the U.S. Fish and Wildlife Service is a cooperating agency. If CEQ and USDA believe that it is appropriate for the Port Authority to participate in the EIS development as a "cooperating agency" under 40 CFR 1508.5, we would be pleased to do so.

I hope the foregoing has been of some value to you in your efforts as a catalyst for a cooperative effort in formulating a comprehensive gull program at JFK and surrounding areas. Please feel free to call on me if there are additional matters you wish the Port Authority to undertake or if you would like additional information or clarification.

Sincerely yours,

Carol Ash

Carol Ash
Director
Office of Environmental Policy
and Management

Attachments

1) Excerpts from Hanna Olin Report entitled; "JFK Redevelopment Program Investigators Studies: Bird Hazards - Soils - Irrigation".

2) Two letters as follows: Letter dated 5/30/89 to Mr. Allan H. Haack, General Manager, Aviation Planning Division, from Edwin B. Butler, State Director, ADC, regarding JFK International Airport, 150th Street Landscaping; Letter dated 10/20/89 to Mr. Edwin Butler, State Director, ADC from Allan Haack, Manager, Aviation Planning, same subject.

3) Field Notes: Janet Sillings (ADC) - 07/16/93

4) Letter dated 7/13/93 to Mr. Mike Rosenthal, Recording Secretary Taxi Drivers Union Local 3036 from T. Lewendowski, Supervisor, Transportation Services at JFK re: Message in Taxi News on Gull Feeding

5) Two letters as follows: Letter dated 6/23/93 from C. Ash, Director, Office of Environmental Policy and Management to Albert Appleton, Commissioner, New York City Department of Environmental Protection re: Port Authority Gull Control Efforts.

Letter dated 6/23/93 from C. Ash to Mr. Alan Mehldau, Property Manager, Aqueduct and Belmont Racetracks re: Port Authority Gull Control Efforts JFK International Airport

Copy to:

Carl Bausch
Deputy Director
Environmental Analysis and Documentation
Animal and Plant Health Inspection Services
U.S. Department of Agriculture

Janet Sillings
State Director/Wildlife Biologist
Animal Damage Control Program
U.S. Department of Agriculture

William DeGraaff
Manager, Safety and Standards Branch
Federal Aviation Administration

Don Barry
Counselor to the Assistant Secretary for
Fish, Wildlife and Parks
Department of the Interior

Arthur Stewart
Deputy Superintendent
Gateway National Recreation Area

Joseph Pane
New York State Department of Environmental Conservation

Don Peterson, Environmental Coordinator
Division of Endangered Species and Habitat Conservation
U.S. Fish and Wildlife Service

Stanley Brezenoff
Executive Director, The Port Authority of New York and New Jersey

U.S. Department
of Transportation
**Federal Aviation
Administration**

Eastern Region

Fitzgerald Federal Building
John F. Kennedy
International Airport
Jamaica, New York 11430

MAY 14 1993

Mr. Gary Parsons, Chief
Bureau of Wildlife
New York State Department
of Environmental Conservation
50 Wolf Road
Albany, NY 12233-4754

Dear Mr. Parsons,

This letter is in reference to the John F. Kennedy International Airport (JFK) Gull Control Project, and the Application for a New York Department of Environmental Conservation (DEC) Fish and Wildlife License to Collect or Possess.

I understand that a stipulation settling a lawsuit has been entered into concerning issuance of a DEC Fish and Wildlife License to shoot gulls before the preparation and implementation of an Environmental Impact Statement (EIS), "subject to the provisions of the emergency exemption in ECL ¶8-0113 and 6 NYCRR 617 (2) (q) (4)".

This is to advise that in the opinion of the Federal Aviation Administration an "urgent situation" exists at JFK which requires the taking of emergency actions which are immediately necessary on a limited and temporary basis for the protection or preservation of life, health, property or natural resources.

Statistical studies have demonstrated a marked decrease in bird/aircraft strikes during periods when a bird depredation (shooting) program was in effect. Migratory gulls have historically returned to nest in marshes adjacent to JFK commencing in May and for a period of three to four months thereafter. Since such a program is not in effect, an urgent emergency situation exists.

The potential for aircraft malfunctions due to bird strikes with the very serious potential for loss of human life creates an emergency situation. In light of the urgent situation identified by the FAA, the United States Department of Agriculture Animal and Plant Health Inspection Service Animal Damage Control seeks issuance by DEC of a Fish and Wildlife License to shoot at gulls which, upon entering airspace over JFK, create a documented serious hazard to aircraft and human life.

Your cooperation in promptly issuing the DEC Permit will be greatly appreciated.

Sincerely,

William J. DeGraaff
Manager, Safety & Standards Branch

United States Department of the Interior

NATIONAL PARK SERVICE
North Atlantic Region
15 State Street
Boston, Massachusetts 02109-3572

IN REPLY REFER TO:

October 7, 1992

N1419(NAR-P&RP)

Mr. Gary Larsen
Regional Director
Animal Damage Control
Eastern Regional Office
7000 Executive Drive Center
Suite 370
Brentwood, Tennesee 07027

Dear Mr. Larsen:

Thank you for your letter of August 13 summarizing our meeting of August 5 regarding bird-aircraft collisions at John F. Kennedy International Airport (JFKIA). It is so important that we work closely to resolve this critical issue in a manner which will eliminate the threat to human safety.

We both agree that laughing gulls are a significant factor in the threat to human safety at JFKIA. We are all of one mind in working to address the real issue of the safety of the flying public.

We acknowledge that intervention is sometimes necessary to control natural populations of birds and other wildlife particularly where human safety is involved. The nature of that intervention is, or should be, the proposed action for environmental analysis and should include alternatives that address relocation or even elimination of the laughing gull colony in Jamaica Bay. Thus, we suggest that the proposed action for environmental analysis should be:

> "To manage the laughing gull colony in Jamaica Bay so as to reduce or eliminate its effect on the safety of airport operations at JFKIA".

We are anxious to participate with your agency, the Port Authority of NY/NJ (PANY/NJ), the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation and others in that analysis so that we can be a contributing factor to resolving the problem at the airport. The immediate action we will take as

a result of that analysis will, no doubt, complement immediate actions which the PANY/NJ will need to take to eliminate or reduce the threat from airport based activities.

In the larger context, all of these actions should contribute to the development of a long-range strategy which the affected agency can use to assure the safety of the flying public at JFKIA.

Please contact me at your earliest convenience so that we may determine how we should proceed.

Sincerely,

Marie Rust

Marie Rust
Regional Director

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control
Denver Wildlife Research Center
Ohio Field Station
6100 Columbus Avenue
Sandusky, Ohio 44870
(419) 625-0242
(419) 625-8465 fax

23 March 1994

Mr. Jack Gartner
Manager-Aeronautical Services
JFK International Airport
Port Authority of New York/New Jersey
Bldg. 269
Jamaica, NY 11430

Dear Jack:

The U.S. Air Force has provided our research station with funding to conduct research on body densities (mass/volume) and flock densities (individuals/volume) of birds as a follow-up to work we did during the summer of 1992 (see attached report). The goal of the project is to develop a data base of body densities and flock densities for bird species throughout the world that frequently are struck by aircraft. These data will allow more accurate and realistic modeling and testing of individual bird and flock impacts on windshields, fan blades and other engine and airframe components for military and commercial aircraft--efforts that should result in safer aircraft. As you know, bird collisions with aircraft in the United States result in over $100 million in damage each year plus the occasional loss of human life.

As part of this project, we are asking for your cooperation to photograph flocks of birds flying over or near JFKIA during the week of 16 May 1994. Dr. John Allan of the British Ministry of Agriculture, Food and Fisheries (MAFF) will be visiting at that time with a stereographic camera system that allows estimation of flock densities. We would like to use JFKIA at this time to test the system and collect data. Laughing gulls will be starting their seasonal flights over the airport at this time and large numbers of brant and cormorants are also in the area. Last year a strike involving 24 brant was recorded in May.

What we would need is an escort such as Charlie Zielfelder for 2-3 days to take us to various points on the airport boundaries to photograph flocks of birds. There is a possibility we also would want to have the PA boat take us out in Jamaica Bay for a few hours to photograph towering flocks of laughing gulls over the nearby nesting colony.

I hope these plans will meet with your approval and that you can assist us in this important project. Please let me know if you have additional questions and I look forward to your reply.

Sincerely,

Richard A. Dolbeer
Project Leader

cc: Dr. J. R. Allan
Ms. J. L. Bucknall

APPENDIX D

United States Department of Agriculture

Animal and Plant Health Inspection Service

Animal Damage Control

RD#2, Box 360-C
Locust Grove Road
Pittstown, NJ 08867-9529

Mr. Peter Talorena
Plant Chief, Jamaica WPCP
NYC Dept. Environmental Protection
150-20 134th Street
Jamaica, New York 11430

August 10, 1993

Dear Mr. Talorena:

This is a follow-up to an August 5th meeting I attended at your facility with members of your staff, the Port Authority of New York and New Jersey, and Ms. Betty Ann Adamson of the DEP. The purpose of the meeting was to reestablish the dialogue among our agencies to assist us in identifying and managing bird attractants around JFK. As I am sure you are aware, the interaction of birds and aircraft at JFK has the potential to result in the loss of human life, and so it is an issue of great management concern.

At our meeting last week, it was concluded that the Plant does not attract large numbers of birds. Observations of birds made by Plant personnel generally corroborate observations made by myself and ADC biologists working with me. In general, we have seen no more that 25-30 gulls associated with the Plant. Your staff also reported that there does not seem to be a seasonal increase or decrease in gull numbers, and that there are roughly the same number of gulls present this year as in past years.

The most important conclusions of our meeting are as follows:

1. The Jamaica Plant does not present a significant attractant to gulls. This statement was made by Ms. Adamson and was supported by anecdotal observations of Plant employees, and bird survey results of ADC biologists.

2. It is not appropriate at this time to modify Plant operations or structures to reduce bird use of the area.

3. Plant personnel and the NYC DEP will notify the Port Authority and ADC (Sillings) if there is a change in the pattern of bird use of the Plant. At that time, the situation will be reevaluated, and management recommendations will be submitted by ADC to the DEP, as appropriate.

4. Plant personnel will continue their informal monitoring of birds at the Plant. ADC will provide Plant personnel with bird species identification sheets (attached). It is recommended that a field guide to birds be purchased and kept at the Plant for reference.

5. ADC biologists will conduct bird observation surveys in the Plant as staff time allows. ADC will call the Plant one day prior to surveys to gain authorization.

It was a pleasure meeting with your staff last week. Please feel free to call me at (908)735-5654 if you have questions, comments, or concerns regarding these issues. Again, thank you for making your staff available to meet with us, and for your ongoing participation in our program to reduce the bird-aircraft collision hazard at JFK.

Sincerely,

Janet L. Sillings

Janet L. Sillings
State Director, ADC NJ/PA/LI&NYC

CC: Rick Owens, ARD, ADC
John Tanacredi, NPS
George Haas, USFWS
Joseph Pane, NY DEC
Jack Gartner, JFKIA
Christopher Zeppie, Port Authority
Carl Bausch, USDA BBEP
Joseph Maser, Louis Berger and Associates

FIELD TRIP REPORT

Place: Jamaica Sewage Treatment Plant
Date: Thursday, August 5, 1993
Time: 1:30 - 3:00 PM

Participants:

Janet L. Sillings, USDA APHIS ADC
Jack Gartner, JFKIA
Christopher Zeppie, Port Authority NY & NJ
Betsy Adamson, NYC DEP
Thomas Zultowski, NYC DEP Jamaica WPCP
Anthony Primato, NYC DEP Jamaica WPCP
Beth Petrillo, NYC DEP Bureau of Clean Water
Richard Gardner, P.E., NY DEP Bureau of Clean Water
Jamaica WPCP staff

Activities:

- approximately 25 gulls present at plant
- no seasonal or annual pattern of bird use noted by Plant employees
- the Plant does not seem to be a significant attractant for gulls (Adamson)
- Gulls that are present prefer the primary tanks, where Haas and Pane observed gulls on 7/15/93.
- Plant structures or operations need not be altered since the Plant does not appear to attract significant numbers of gulls (Adamson).
- Plant personnel will contact Port Authority and ADC (Sillings) if the situation changes and more birds are seen.
- Management action will be reevaluated if an increasing number of birds are present at the Plant.
- ADC biologists will be permitted to conduct bird surveys inside the Plant, after calling for authorization one day prior.

Follow-Up:

Sillings will provide a meeting summary/trip report for distribution.

Plant will continue to monitor birds and will notify PA and ADC if situation changes.

Observations:

26 laughing gulls associated with pre-tanks
3 pigeons on/around pre-tanks
1 ring-billed gull

United States Department of Agriculture

Animal and Plant Health Inspection Service

Animal Damage Control

RD#2, Box 360-C
Locust Grove Rd.
Pittstown, NJ 08867-9529

Mr. Ev Svendsen
Resident Manager, Aqueduct
The New York Racing Association, Inc.
Jamaica, New York 11417

August 10, 1993

Dear Mr. Svendsen:

This is a follow-up to our meeting of Thursday, August 5 among personnel from the Port Authority of New York and New Jersey , The New York Racing Association, Inc., and USDA APHIS Animal Damage Control. As was described to you by Mr. Jack Gartner and Mr. Christopher Zeppie of the Port Authority, the interaction of birds and aircraft at JFK International Airport is of serious concern since it has the potential to result in loss of human life. As we discussed at our meeting last week, JFK has been working with Federal and state natural resource management agencies for many years to develop a program to reduce the hazards associated with birds at JFK. As part of that ongoing process, the Port Authority and ADC have been working with off-airport sites that have the potential to serve as attractants for gulls. Our goal is to identify potential attractants, evaluate their attractiveness value and impacts on air safety at JFK, and to work with the managing agency to reduce or eliminate those factors that attract birds.

Enclosed for your review are a number of informational leaflets, including ones regarding Canada geese, pigeons, gulls, and sources of supply for materials. I have also enclosed leaflets that pertain to the feeding of birds. Please feel free to contact me if I can provide more detailed information than that which is contained in the leaflets.

Based on our meeting, I have the following recommendations for your consideration:

1. Stop all feeding of birds. This can be accomplished by posting signs that prohibit the feeding of birds, and by distributing brochures to track visitors. You might want to include a short "Don't Feed the Birds" paragraph in some of your already-existing track literature. Refer to the enclosed materials for wording and justification. Although some people will persist in feeding birds regardless of your actions, many people will stop once they have been informed.

2. Manage your 40 acres of infield grass at a height that does not attract geese and gulls. Grass should be maintained at a height of 12"-14", and should be mowed in the autumn to prevent seed heads from developing (geese eat seed heads of grasses). Maintaining long grass will prohibit geese from using the area since they apparently do not feel secure in long grass, and do not

eat it. Additionally, long grass will reduce food (insect) availability for gulls, and it disrupts their normal loafing behavior. Maintenance of long grass will reduce your costs associated with mowing.

3. Plant alternate ground covers such as pachysandra instead of grass. Geese and gulls do not prefer this ground cover. If future plans include landscaping new areas or changing existing areas, consider using vegetative cover other than grasses.

4. The two 2.5-acre ponds in the middle of the infield area attract geese and gulls, while providing an attractive environment to users of your facility. To reduce bird use of the ponds, while maintaining their obvious aesthetic values, I recommend that you install a grid of monofilament fishing line or stainless steel wire over the water. The grid will deter birds from landing on the water and would be barely visible to Track visitors. Refer to the attached leaflets for specifics on installation.

5. Whenever possible and appropriate, harass birds away using safe and legal techniques, such as the firing of pyrotechnics. Contact you local Police Department to determine if there are local ordinances that control the discharge of these items. As you reported to us last week, your staff has used pyrotechnics with some success.

These recommendations are provided for your consideration. I greatly appreciate your review of the enclosed materials. Please feel free to call me at (908)735-5654 if I can provide any additional information. I would be available to meet with you and your staff again if you would like a demonstration of any of the techniques we discussed, or if you would like a more in-depth discussion of the recommendations. Again, it was a pleasure meeting with you.

Sincerely,

Janet L. Sillings

Janet L. Sillings
State Director, ADC NJ/PA/LI&NYC

Enclosures
CC: Rick Owens, ARD, ADC
Jack Gartner, JFKIA
Christopher Zeppie, JFKIA
Carl Bausch, USDA BBEP
George Haas, USFWS
Joseph Pane, NY DEC
Joseph Maser, Louis Berger and Associates
John Tanacredi, NPS

FIELD TRIP REPORT

Place: Aqueduct Race Track
Date: Thursday, August 5, 1993
Time: 3:00 PM-4:00 PM

Participants:

Janet L. Sillings, USDA APHIS ADC
Jack Gartner, JFKIA Division of Aeronautical Services
Christopher Zeppie, Envt'l Policy and Mgt., Port Authority
James Morrison, The New York Racing Association
Ev Svendsen, The New York Racing Association

Activities:

- gulls have been observed by Aqueduct employees on the ponds and grass of the infield area and on the track.
- some people feed birds at the Track
- security people do use pyrotechnics to harass birds away at times, but this is sensitive since horses are often present.
- racing occurs between October and May
- simulcast programs are run in July and August
- the infield area is approximately 40 acres, with two small (2.5 acre) ponds
- Horse training occurs 5:00-10:00 AM
  Racing occurs 12:30 - 4:30 PM
- Aqueduct personnel expressed concern for problems caused by geese and pigeons fouling spectator areas and the track.
- the avian taste repellent, Methyl Anthranilate, may become available for use on ponds of water for goose and gull control (currently not labeled for this use).

Follow-Up:

- ADC will provide a letter of control options and appeal to solicit assistance in reducing attractiveness of track for gulls.
- ADC will provide demonstration of techniques if requested by Port Authority and Aqueduct.
- Aqueduct will consider implementation of recommendations.
- Port Authority will continue to work with Aqueduct to encourage and develop bird control activities at the Track.

Observations:
- 8 laughing gulls and 15 herring gulls on track
- 25+ geese on ponds
- pigeons and starlings associated with structure