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March 2006

Protecting the Flying Public and Minimizing Economic Losses within the Aviation Industry: Technical and Direct Management Assistance provided by USDA Wildlife Services at Airports to reduce Wildlife Hazards Fiscal Year 2005

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Dolbeer, Richard A., "Protecting the Flying Public and Minimizing Economic Losses within the Aviation Industry: Technical and Direct Management Assistance provided by USDA Wildlife Services at Airports to reduce Wildlife Hazards Fiscal Year 2005" (2006). *USDA National Wildlife Research Center - Staff Publications*. 134.

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Protecting the Flying Public and Minimizing Economic Losses within the Aviation Industry

Technical and Direct Management Assistance provided by USDA Wildlife Services at Airports to reduce Wildlife Hazards
Fiscal Year 2005



Biologists with USDA Wildlife Services provided technical and operational assistance at a record 674 airports and military airbases in FY 2005 to reduce wildlife hazards to aviation. Operational assistance included live-trapping birds of prey, such as this juvenile red-tailed hawk, at 65 airports. Captured birds were released in areas away from the airports. Studies have shown that juvenile (non-breeding) red-tailed hawks rarely return to airports after translocation. The overall red-tailed hawk population in the USA has increased over 2-fold since 1970. The population in the Great Lakes region has increased over 3-fold.

Compiled by

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March 2006

Protecting the Flying Public and Minimizing Economic Losses within the Aviation Industry

Technical and Direct Management Assistance provided by USDA Wildlife Services at Airports to reduce Wildlife Hazards in FY 2005

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1. Why are aircraft collisions with wildlife a concern at airports?

Aircraft collisions with birds and other wildlife (wildlife strikes) are an increasingly serious economic and safety problem. Cleary et al. (2005) estimated wildlife strikes (98% involving birds) cost the civil aviation industry in the USA about \$500 million per year, 1990-2004. Allan and Orosz (2001) estimated that bird strikes annually cost commercial air carriers over \$1.2 billion worldwide, 1999-2000. At least 195 people died and 165 aircraft were destroyed as a result of bird strikes with civil and military aircraft from 1988-2005 (Richardson and West 2000; Thorpe 2003, 2005; Dolbeer, unpublished data). An additional 18 civil aircraft have been destroyed by deer strikes in the USA since 1983 (Cleary et al. 2005, Dolbeer, unpublished data).

2. Why is the wildlife-strike problem increasing?

Wildlife strikes have increased in the past 20 years because of a combination of expanding populations of many wildlife species that are hazardous to aviation and increasing numbers of aircraft movements (Dolbeer and Eschenfelder 2003). For example, 13 of the 14 largest (>8 lbs) bird species in North America have shown significant population increases in the past 20 years. These species include Canada geese, brown pelicans, sandhill cranes, and bald eagles. Populations of many other hazardous species, such as turkey vultures, snow geese, red-tailed hawks, ospreys, great blue herons, and double-crested cormorants, also have increased dramatically. Furthermore, most of these species have adapted to living in urban environments, including airports. In addition, birds are less able to detect and avoid the quieter turbofan-powered aircraft in use today compared to older, noisier aircraft (Burger 1983, Kelly et al. 2001). Commercial aircraft movements in the USA have increased at about 2% per year since 1980.

3. Can airport authorities and managers be held liable for wildlife strikes?

Based on a summary of cases by MacKinnon et al. (2001) and Dolbeer (2005) and legal reviews by Michael (1986), Wilkinson (1998), and Matijaca (2001, 2005), it is apparent that airport operators must exercise "due diligence" in managing wildlife hazards to avoid potentially serious liability issues. In the USA, the exercise of "due diligence" to manage wildlife hazards initially involves an assessment of wildlife hazards at the airport. Based on the assessment, a wildlife hazard management plan may need to be developed and implemented for airports that are "Part 139"-certificated by the Federal Aviation Administration (FAA, "Part 139"-certificated airports serve scheduled and unscheduled air carrier aircraft with more than 9 seats). The U.S. Code of Federal Regulations requires that these certificated airports experiencing hazardous wildlife

conditions (as defined in 14 CFR Part 139.337) conduct formal Wildlife Hazard Assessments and develop Wildlife Hazard Management Plans as part of the certification standards. There are approximately 572 “Part 139”-certificated airports in the USA (FAA 2006).

4. How does an airport manage wildlife hazards?

Managing wildlife hazards at airports is a complex, public-sensitive, endeavor involving many species of wildlife governed by the Migratory Bird Treaty Act and various federal, state and local regulations. Because of the complexity and sensitivity involved in managing wildlife hazards, airports are required to employ professional biologists trained in wildlife hazard management at airports (14 CFR Part 139.337) to assess hazards and to assist in the development, implementation, and evaluation of wildlife hazard management plans. Such professionally developed and implemented management plans minimize the likelihood of catastrophic or major-damage wildlife strikes on an airport and provide crucial support during litigation in the aftermath of any significant strike event that might occur. Cleary and Dolbeer (2005) provide detailed information on the development and implementation of these management plans as well as on FAA regulations and guidelines regarding wildlife hazards to aviation.

5. What role does USDA Wildlife Services play in managing wildlife hazards at airports?

The USDA/APHIS/Wildlife Services (WS) program provides federal leadership for resolving conflicts between wildlife and people. The WS program, with professional biologists available for consultation and other services in all 50 States, is internationally recognized for research and management programs in wildlife damage control.

The FAA, which has only 1 staff wildlife biologist to deal with wildlife hazards to aviation nationwide, relies on the WS program to provide professional assistance to airports. The FAA has had a Memorandum-of-Understanding (MOU) with USDA/APHIS/WS since 1989 (updated in 2005) stating that “FAA or the certificated airport may request technical support from WS to lessen wildlife hazards” (Cleary and Dolbeer 2005). In addition, the Department of Defense (DoD) has a similar MOU with USDA/APHIS/WS for assistance with wildlife damage issues at DoD facilities (Cleary and Dolbeer 2005). Many wildlife hazard management programs on airports are developed, implemented or overseen by WS biologists. USDA/APHIS/WS receives no appropriated federal funding to deal with wildlife hazards at airports but is authorized by the U.S. Congress to enter into cooperative service agreements with airport authorities and other entities to provide services on a cost-reimbursable basis.

5a. At how many airports did WS biologists provide assistance in reducing wildlife hazards in 2005?

The number of civil and military airports requesting assistance from WS has steadily grown over the past 16 years in concert with increasing levels of wildlife hazards (Fig. 1). WS assistance grew from 42 airports in 1990^a to 636 airports in 2004. In 2005, WS biologists provided 131 staff-years of assistance at a record 674 airports (502 civil, 100 military-civil joint use, and 72 military) in 50 states, 2 U.S. territories, and 6 foreign countries (Table 1). Assistance was provided at 379 of the approximately 572 “Part-139”-certificated airports in the USA (Table 2). The 379 certificated airports where WS provided assistance served 492 million commercial

^a Years refer to Federal Fiscal Years (e.g., 1990 = 1 Oct 1989-30 Sep 1990).

passengers and recorded 18.9 million commercial aircraft movements in 2004 (Table 3). In addition, these airports recorded 2.2 million military aircraft movements (FAA 2005).

5b. What types of assistance were provided by WS biologists at airports to reduce wildlife hazards in 2005?

WS biologists provided a wide range of technical and direct management assistance at airports in 2005 (Tables 4, 5). Consultations with airport authorities regarding wildlife issues was the most common technical service provided (655 airports) followed by training of airport personnel in wildlife identification and control methods (220 airports involving 1,418 personnel). Other technical assistance provided included Wildlife Hazard Assessments, development of Wildlife Hazard Management Plans, and Environmental Assessments (157, 107, and 75 airports, respectively).

Direct management assistance included lethal control of hazardous wildlife (202 airports), non-lethal dispersal of hazardous wildlife (175 airports), modification of habitats to discourage wildlife (160 airports), and capture and translocation of wildlife (65 airports, Table 4). Lethal control of protected species was done under state and federal permits as a last option after non-lethal options had been determined to be ineffective or impractical.

5c. At how many airports did technical or direct management assistance by WS biologists result in a reduction, suppression, or prevention of hazards caused by wildlife in 2005?

WS biologists estimated that technical or direct management assistance resulted in a reduction, suppression, or prevention of wildlife hazards at 483 (72%) of the 674 airports where some type of assistance was provided (Table 6). This total included 274 (72%) of the 379 "Part 139"-certificated airports assisted. These estimates of successful intervention are conservative. WS biologists indicated that there was insufficient time since management actions had been implemented or insufficient information from airport personnel to assess whether or not hazards had been reduced, suppressed, or prevented on 50, 75, and 78 airports, respectively. Wenning et al. (2004) provided a summary of specific accomplishments by WS biologists at airports nationwide in reducing wildlife hazards since 1990.

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Table 1. Staff-years expended and number of civil, joint-use, and military airports served by USDA Wildlife Services (WS) biologists in provision of technical and direct management assistance to reduce wildlife hazards to aviation, FY 2005.

State/ Terr.	WS staff yrs	Number of airports assisted				State/ Terr.	WS staff yrs	Number of airports assisted			
		Civil	Joint use	Mili- tary	Total			Civil	Joint use	Mili- tary	Total
AK	8.96	21	8	2	31	ND	0.59	11	0	2	13
AL	0.09	5	1	0	6	NE	4.00	2	1	1	4
AR	0.01	2	0	1	3	NH	0.92	5	1	0	6
AZ	3.77	10	1	3	14	NJ	1.83	7	1	2	10
CA	6.48	15	3	4	22	NM	0.02	2	0	1	3
CO	2.28	9	2	2	13	NV	0.10	1	0	0	1
CT	0.02	3	1	0	4	NY	3.59	20	4	0	24
DE	0.15	2	0	1	3	OH	2.27	24	4	1	29
FL	4.71	16	2	5	23	OK	4.87	6	7	3	16
GA	1.21	10	0	3	13	OR	0.49	7	3	1	11
GU	2.29	4	1	1	6	PA	3.04	22	3	2	27
HI	25.15	10	3	3	16	PR	0	0	0	0	0
IA	0.41	10	2	0	12	RI	0.15	0	1	0	1
ID	0.08	5	0	1	6	SC	1.84	6	1	3	10
IL	6.51	12	3	1	16	SD	0.11	20	2	1	23
IN	1.91	12	2	1	15	TN	1.75	5	5	1	11
KS	1.05	5	1	0	6	TX	3.01	7	7	4	18
KY	4.97	13	1	0	14	UT	0.52	3	2	0	5
LA	0.03	7	0	1	8	VA	6.76	14	2	4	20
MA	1.84	7	3	1	11	VI	0.30	1	1	0	2
MD	1.57	11	1	2	14	VT	0.71	5	1	0	6
ME	0.21	7	1	1	9	WA	4.01	15	6	1	22
MI	0.89	36	2	1	39	WI	1.38	25	2	1	27
MN	1.35	27	3	0	30	WV	0.43	1	0	0	1
MO	3.66	7	1	1	9	WY	0.35	6	1	0	7
MS	2.93	4	2	1	7	Foreign	0.16	5	0	2	7 ^a
MT	0.02	2	1	0	3						
NC	5.28	10	0	6	16	Total	131.00	502	100	72	674 ^b

^a Brazil, Italy, Kenya, Mexico (2), Spain, and Uganda.

^b For comparison, WS biologists provided assistance on 42 airports in FY 1990, 193 in 1998, 396 in 2001, 544 in 2002, 565 in 2003, and 636 in 2004 (see Fig. 1).

Table 2. Number of “Part 139”-certificated airports and non-certificated airports requesting assistance from USDA Wildlife Services (WS) for wildlife hazard issues, FY 2005.

Airport class (14 CFR Part 139)	Number (%) of airports requesting assistance
“Part-139”-certificated ^a	379 (56)
Non-certificated	288 (43)
Foreign ^c	7 (1)
Total	674 (100)

^a The U.S. Code of Federal Regulations (14 CFR Part 139.337) requires the Federal Aviation Administration (FAA) to issue airport operating certificates to airports that serve scheduled and unscheduled air carrier aircraft with more than 9 seats or that the FAA Administrator requires to have a certificate. “Part 139”-certificated airports experiencing hazardous wildlife conditions as defined in Part 139.337 must conduct formal Wildlife Hazard Assessments and develop Wildlife Hazard Management Plans as part of the certification standards. There are approximately 572 “Part 139”-certificated airports in the USA (FAA 2006).

^b The 379 certificated airports where WS provided assistance served 492 million passengers and recorded 18.9 million commercial aircraft movements in 2004. In addition, these airports recorded 2.2 million military aircraft movements (See Table 3).

^c The 5 civil airports in foreign countries were certificated for passenger traffic by their governments.

Table 3. Number of passenger enplanements and aircraft movements in 2004 (FAA 2006) at 379 “Part 139”-certificated airports and 288 non-certificated airports in USA requesting assistance from USDA Wildlife Services (WS) for wildlife hazard issues, FY 2005.

Airport class (14 CFR Part 139)	Number of passenger enplanements	Aircraft movements (departures and arrivals)			
		Com- mercial	General aviation ^a	Military ^a	Total
“Part-139”- certificated	492,383,138	18,916,647	16,283,025	2,243,729	37,443,401
Non- certificated	498,789	513,738	10,532,283	563,506	11,609,527
Total	492,881,927	19,430,385	26,815,308	2,807,235	49,052,928

^a Includes itinerate and local (take off and land at same airport) movements. Military aircraft movements at the 54 non-FAA certificated military airbases where WS provided assistance are not included in these totals.

Table 4. Types of technical and direct management assistance provided by USDA Wildlife Services (WS) biologists to reduce wildlife hazards at airports, FY 2005.

Category of assistance	Type of assistance to reduce wildlife hazards	Number of airports	% of total airports assisted (n = 674)
Technical	Consultation regarding wildlife issues	655	97
	Training of airport personnel	220 ^a	33
	Wildlife Hazard Assessment	157	23
	Wildlife Hazard Management Plan	107	16
	Environmental Assessment	75	11
Total Technical Assistance		661	98
Direct management	Lethal control of hazardous wildlife	202	30
	Non-lethal dispersal of hazardous wildlife	175	26
	Habitat modification	160	24
	Live-trap/ translocation of wildlife from airport	65	10
Total Direct Management Assistance		278	41

^a Number of airports where training took place; personnel from additional airports attended some of these training courses (See Table 5).

Table 5. Number of airports where technical training was provided in the identification and management of wildlife hazards to aviation and total airport personnel trained by USDA Wildlife Services (WS) biologists, FY 2005.

State	Number of airports ^a	Number of persons trained	State	Number of airports ^a	Number of persons trained
AK	27	118	NE	4	16
AL	2	5	NH	3	6
AZ	14	183	NJ	1	5
CA	5	100	NV	1	0
CO	3	49	NY	20	107
CT	2	8	OH	4	25
FL	1	2	OK	5	60
GA	1	4	OR	1	4
GU	4	16	PA	4	26
IA	5	27	SC	2	8
IL	2	80	SD	5	19
IN	4	21	TN	1	24
KS	6	12	TX	4	9
KY	4	7	UT	3	39
MA	6	11	VA	7	21
MD	1	8	VI	1	3
ME	9	10	VT	2	3
MI	2	8	WA	12	64
MN	2	23	WI	4	18
MO	3	44	ZFG	5	65
MS	1	5			
NC	16	133			
ND	11	22	Total	220	1,418

^a Personnel from several airports sometimes attended training courses provided by WS at an airport; thus, total airports from which personnel received training is greater than indicated.

Table 6. Number of “Part 139”-certificated airports and non-certificated airports at which technical or direct management assistance by USDA Wildlife Services (WS) biologists resulted in a reduction, suppression, or prevention of hazardous conditions caused by wildlife, FY 2005.

USDA WS technical or direct management assistance resulted in:	Number of airports (% of total airports assisted)		
	“Part 139”-certificated airports (n = 379)	Non-certificated airports (n = 295)	All airports (n = 674)
Reduction of hazards from target wildlife species ^a	249(66)	190 (65)	439 (65)
Suppression of hazards from target wildlife species ^b	229 (61)	165 (56)	394 (59)
Prevention of hazards from target wildlife species ^c	152 (40)	99 (34)	251 (37)
Reduction, suppression, or prevention of hazards from target wildlife	274 (72)	209 (71)	483 (72)^{d e}

^a As examples, airport installed anti-perching devices or removed vegetation attractive to hazardous wildlife because of WS recommendation; WS successfully initiated program to remove hazardous wildlife from the airport.

^b Successful WS direct management activities or technical assistance recommendations initiated in previous years were continued or maintained in FY 2005 (e.g., continued management of vegetation, continued removal of deer as a follow-up to more extensive removal initiated in earlier year to initially get problem under control).

^c WS recommendation or intervention resulted in prevention of development or activity that would have resulted in increased wildlife numbers at airport (e.g., prevention of on-airport wetland mitigation, landfill expansion near airport, or planting of landscape vegetation attractive to wildlife).

^d These estimates of successful intervention are conservative because WS biologists indicated that there was insufficient time since management actions had been implemented or insufficient information from airport personnel to assess whether or not hazards had been reduced, suppressed, or prevented on 50, 75, and 78 airports, respectively.

^e For comparison, WS biologists estimated that technical or direct management assistance resulted in a reduction, suppression, or prevention of hazards from target wildlife at 409 airports in 2002, 441 airports in 2003, and 479 airports in 2004.

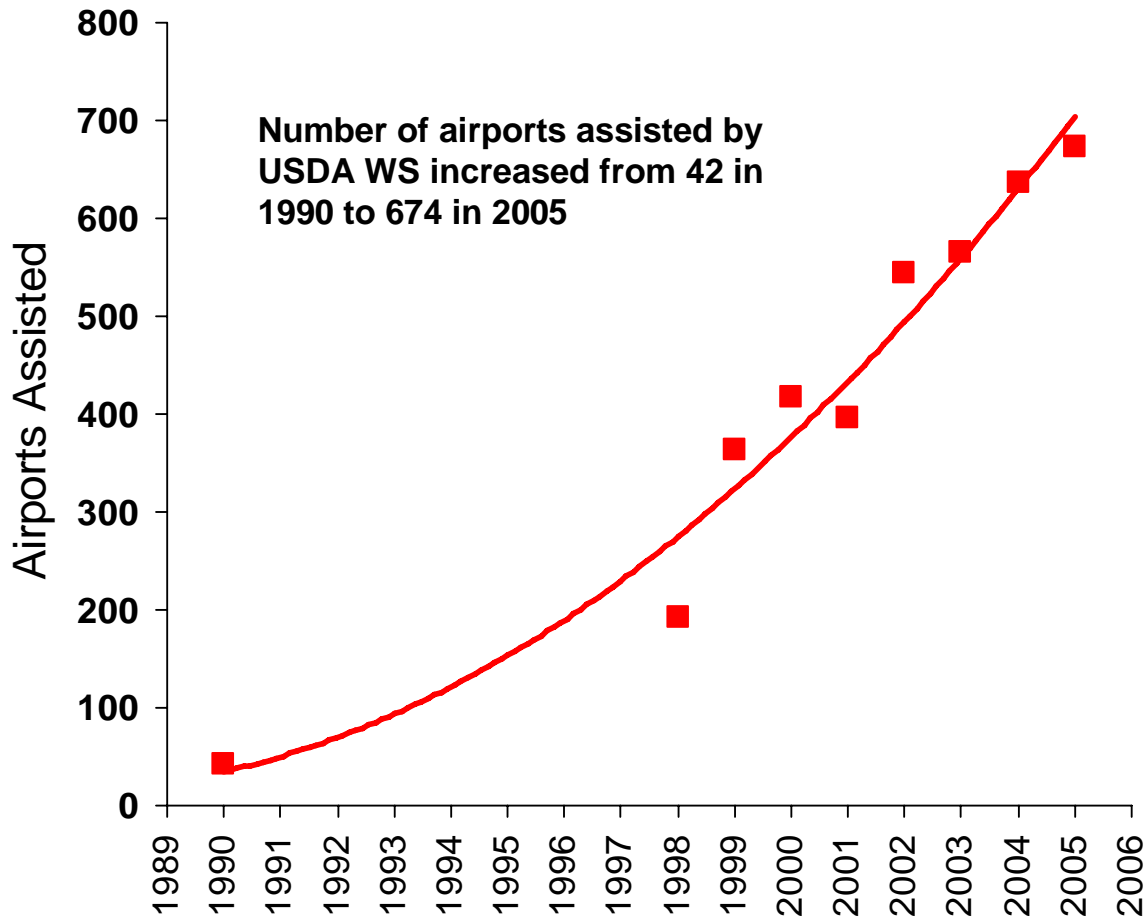


Figure 1. The number of airports served by USDA Wildlife Services (WS) biologists in provision of technical and direct management assistance to reduce wildlife hazards to aviation, 1990-2005. In 2005, WS biologists provided assistance at 674 airports (502 civil, 100 joint military-civil use, and 72 military) in all 50 U.S. States, 2 U.S. Territories, and 7 foreign countries.