

ASSESSING THE IMPLEMENTATION OF WILDLIFE HAZARD MANAGEMENT PROGRAMS AT CIVIL AIRPORTS

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ABSTRACT

This paper describes a proposed system for assessing the implementation of wildlife hazard management programs at civil airports. Important management functions and control techniques for controlling wildlife hazards are listed; and habitats, land uses, and food sources are identified that are attractive to wildlife on or in the vicinity of airports.

(Keywords: Wildlife Hazards, Civil Airports)

Wildlife often cause hazards to aviation and many airports have developed wildlife management programs to alleviate these hazards. For example, in recognition of this problem at certified civil airports in the United States, Federal Aviation Administration regulations require the development of wildlife hazard management plans if ecological studies show that wildlife cause safety problems (FAA 1987). The purpose of this paper is to propose a system for assessing the implementation of existing wildlife hazard management programs at either certified or uncertified civil airports. The only papers found describe various methods for evaluating bird management on military aerodromes (Lucid and Slack 1980, Rosseleer 1981, Kull 1984). This paper concerns civil airports and employs different methods.

As the result of a review of pertinent literature, personal knowledge, and discussions with individuals directly involved in controlling wildlife hazards to aviation, I have identified key elements of wildlife hazard management programs. (For the purpose of this paper domestic animals are included under wildlife.) Management functions and control techniques for mitigating wildlife hazards are listed; and habitats, land uses, and food sources are identified that are attractive to wildlife on or in the vicinity of airports. In this system, the elements described in Tables 1-4 are assessed as to the degree that management programs are being implemented. Assessments should be periodic, at least twice a year, so that shortcomings and improvements can be detected (Exhibit A). The table listings are not intended to cover every possibility -- the lists can be changed to meet differing situations.

The proposed system would provide a rapid means of assessing civil airport programs to control wildlife hazards. This would provide benefits to airport administration/management, government agencies responsible for aviation safety, or other organizations that assist in programs to enhance safety, such as aviation insurance underwriters or consultants.

Four assessment categories are used to indicate how well airport wildlife hazard management plans are being implemented. If an assessor finds that an airport has initiated action to reduce a wildlife hazard according to plan and is on schedule, the action would be considered satisfactory, and the assessment symbol (AS) checked (✓) would be "S". If no measures have been taken the assessment would be unsatisfactory -- "U". If implementation of a control measure was behind schedule or only partially accomplished, the assessment could be either needs improvement "NI", or unsatisfactory "U", depending on the seriousness of the hazard. If it is apparent that certain listed techniques or items are not applicable, the assessment would be "NA". If an assessment is either "NI" or "U", a comment by an assessor is required (Exhibit A). Examples of assessments requiring comments are as follows:

A. Management functions related to wildlife hazards on or in the vicinity of airports (Table 1).

- If permits have not been obtained (Code 1.1) for shooting or trapping birds and/or mammals the AS would be "U".
- If animal remains found on runways are being counted to document bird strikes, but are not being identified by species (Code 1.9) the AS would be "NI".

B. Bird control on or in the vicinity of airports (Table 2).

- If bioacoustics were not being used (Code 2.4) the AS would be "U".
- If the installation of plastic or steel wires (Code 2.11) over two airport ponds was behind schedule the AS could be "NI" or "U", depending on the degree of potential hazard.
- If raptors were not being trapped and relocated (Code 2.24) the AS would be "U".

C. Mammal control on or in the vicinity of airports (Table 3).

- If fencing (Code 3.3) was in need of repair the AS would be "NI".
- If rodenticides (Code 3.12) were not being used to control a rodent population attracting raptors, the AS would be "U".

D. Airport habitat and food sources related to wildlife hazards (Table 4).

- If airport litter control was inadequate (Code 4.17), the AS would be "NI".
- If vegetation used as a roost site (Code 4.29) was not being eliminated or made unattractive, the AS would be "U".

Examples of off-airport land uses and food sources are listed in Table 5. Wildlife hazards to airports frequently are attributable to these attractants, but airport managers have no authority over the use of private property. On rare occasions, relief might be obtained if a business or a landowner has not complied with zoning, health, or safety regulations (e.g., garbage dumps). Airport managers should initiate programs to reduce/eliminate the hazards of off-airport wildlife attractants (e.g., garbage dumps, certain agricultural activities), by informing local jurisdictions and landowners of the hazards, and suggesting ways of alleviating them (Code 1.8).

TABLE 1.

| CODE | |
|------|--------------------------|
| 1.1 | Acq and |
| 1.2 | Arr mon wild loc |
| 1.3 | Dele |
| 1.4 | Enst elin |
| 1.5 | Enst wild |
| 1.6 | Est cont |
| 1.7 | Eva twic |
| 1.8 | Inte zoni prob |
| 1.9 | Main dail chan iden |
| 1.10 | Main haza |
| 1.11 | Moni |
| 1.12 | Oper staf cond area when |
| 1.13 | Repo auth |
| 1.14 | Sup wild |
| 1.15 | Train wild field |

TABLE 1. MANAGEMENT FUNCTIONS RELATED TO WILDLIFE HAZARDS ON OR IN THE VICINITY OF AIRPORTS

| CODE | ITEMS | ASSESSMENT | | |
|------|---|------------|----|---|
| | | S | NI | U |
| 1.1 | Acquiring wildlife control permits from federal, state, and local agencies. | | | |
| 1.2 | Arranging for ecological assessments, studies, and monitoring, as needed, to evaluate the hazard potential of wildlife attracted by habitats, land uses, and food sources located on or in the vicinity of airports. | | | |
| 1.3 | Delegating authority and responsibility. | | | |
| 1.4 | Ensuring that airport habitats are managed to reduce or eliminate wildlife attractions. | | | |
| 1.5 | Ensuring that airport policy prohibits the feeding of wildlife and the exposure of food wastes. | | | |
| 1.6 | Establishing a communication capability between wildlife control and ATC personnel. | | | |
| 1.7 | Evaluating wildlife hazard management programs -- at least twice a year. | | | |
| 1.8 | Interacting with local jurisdictions and land owners about zoning, land use, and the resolution of wildlife hazard problems in the vicinity of airports. | | | |
| 1.9 | Maintaining wildlife control log books that would be a daily record of wildlife control activities, environmental changes, wildlife interactions, and animal remains identified by species. | | | |
| 1.10 | Maintaining a system for warning pilots about wildlife hazards (NOTAMS, ATC, BIRDTAMS, RADAR observations, etc.). | | | |
| 1.11 | Monitoring bird concentrations (e.g., local movements). | | | |
| 1.12 | Operating a wildlife patrol system with a trained field staff (wildlife specialists, control officers, etc.), conducting surveillance/inspections of critical airport areas (runways, etc.), and effecting wildlife control when needed or requested. | | | |
| 1.13 | Reporting all aircraft wildlife interactions to aviation authorities (e.g., bird strikes). | | | |
| 1.14 | Supervising, implementing, and coordinating airport wildlife hazard management programs. | | | |
| 1.15 | Training personnel responsible for implementing airport wildlife hazard management programs, especially the field personnel. | | | |

TABLE 2. BIRD CONTROL ON OR IN THE VICINITY OF AIRPORTS

| CODE | TECHNIQUES | ASSESSMENT | | | |
|------|---|------------|----|---|----|
| | | S | NI | U | NA |
| | DISPERSE, DETER, EXCLUDE, REPEL | | | | |
| 2.1 | Arm waving (24/min.) | | | | |
| 2.2 | Avitrol | | | | |
| 2.3 | Balloons suspended above ponds | | | | |
| 2.4 | Bioacoustics | | | | |
| 2.5 | Chemical repellents | | | | |
| 2.6 | Electronically generated noise (e.g. Av-Alarm) | | | | |
| 2.7 | Falconry | | | | |
| 2.8 | Tall grass/short grass | | | | |
| 2.9 | Netting | | | | |
| 2.10 | Nixalite (stainless steel needles placed on ledges) | | | | |
| 2.11 | Plastic or steel wires | | | | |
| 2.12 | Propane cannons | | | | |
| 2.13 | Pruning vegetation | | | | |
| 2.14 | Pyrotechnics | | | | |
| 2.15 | Radio-controlled small aircraft | | | | |
| 2.16 | Scarecrows | | | | |
| 2.17 | Shooting to scare | | | | |
| 2.18 | Stuffed birds, gull models, raptor decoys | | | | |
| | REMOVE | | | | |
| 2.19 | Drugging | | | | |
| 2.20 | Nest and egg destruction, oiling eggs | | | | |
| 2.21 | Poisoning | | | | |
| 2.22 | Predators (dogs, foxes, coyotes, pigs, etc.) | | | | |
| 2.23 | Shooting | | | | |
| 2.24 | Trapping and relocation (e.g., raptors, geese) | | | | |

TABLE 3. MAMMAL CONTROL ON OR IN THE VICINITY OF AIRPORTS

| CODE | TECHNIQUES | ASSESSMENT | | | |
|------|---|------------|----|---|----|
| | | S | NI | U | NA |
| | DISPERSE, DETER, EXCLUDE, REPEL | | | | |
| 3.1 | Cattle guards | | | | |
| 3.2 | Chemical repellents sprayed on vegetation | | | | |
| 3.3 | Fencing | | | | |
| 3.4 | Herding | | | | |
| 3.5 | Pyrotechnics | | | | |
| 3.6 | Rodent resistant sheathing on electrical and communication cables | | | | |
| | REMOVE | | | | |
| 3.7 | Controlled hunting (e.g., deer, canines) | | | | |
| 3.8 | Den destruction (e.g., foxes, coyotes) | | | | |
| 3.9 | Fumigants/gas cartridges (woodchucks, etc.) | | | | |
| 3.10 | Kill trapping (e.g., beavers, muskrats) | | | | |
| 3.11 | Live trapping and relocation or euthanasia (dogs, etc.) | | | | |
| 3.12 | Rodenticides (mice, ground squirrels, etc.) | | | | |
| 3.13 | Shooting (woodchucks, badgers, rabbits, hares, etc.) | | | | |
| 3.14 | Tranquilizing and relocation (e.g., deer) | | | | |

TABLE 4.

| CODE | |
|------|-------------|
| 4.1 | Agri |
| 4.2 | Anti |
| 4.3 | Ap |
| 4.4 | Aqu |
| 4.5 | Car |
| 4.6 | Com |
| 4.7 | CU |
| 4.8 | Dra |
| 4.9 | Ear |
| 4.10 | Fee |
| 4.11 | Fla |
| 4.12 | Fis |
| 4.13 | Gar |
| 4.14 | Ins |
| 4.15 | Lan |
| 4.16 | Lan |
| 4.17 | Lit |
| 4.18 | Low |
| 4.19 | Mar |
| 4.20 | Mud |
| 4.21 | Nes |
| 4.22 | Oxi |
| 4.23 | Pas rap |
| 4.24 | Plo (ro |
| 4.25 | Rep |
| 4.26 | Res |
| 4.27 | Ret |
| 4.28 | Rod rac |
| 4.29 | Ro |
| 4.30 | San |
| 4.31 | See |
| 4.32 | Sew |
| 4.33 | Sew |
| 4.34 | Sew |
| 4.35 | Sho |
| 4.36 | Str pole |
| 4.37 | Tre |
| 4.38 | Wat |
| 4.39 | Wat |
| 4.40 | Wee |

TABLE 4. AIRPORT HABITAT AND FOOD SOURCES RELATED TO WILDLIFE HAZARDS

| CODE | ITEMS | ASSESSMENT | | | |
|------|---|------------|----|---|----|
| | | S | NI | U | NA |
| 4.1 | Agricultural crops (grains, forage, legumes, etc.) | | | | |
| 4.2 | Animal remains | | | | |
| 4.3 | Apiaries | | | | |
| 4.4 | Aquatic vegetation | | | | |
| 4.5 | Canals, creeks | | | | |
| 4.6 | Commissaries, aircraft waste | | | | |
| 4.7 | Culverts (open) | | | | |
| 4.8 | Drainage ditches | | | | |
| 4.9 | Earthworms | | | | |
| 4.10 | Feeding birds and mammals (by people) | | | | |
| 4.11 | Flat roofs (gull nesting sites) | | | | |
| 4.12 | Fishing from shore (bait, fish) | | | | |
| 4.13 | Garbage dumps | | | | |
| 4.14 | Insects | | | | |
| 4.15 | Landfills containing organic matter | | | | |
| 4.16 | Landscaping | | | | |
| 4.17 | Litter | | | | |
| 4.18 | Low areas (puddles) | | | | |
| 4.19 | Marshes, swamps | | | | |
| 4.20 | Mud flats | | | | |
| 4.21 | Nesting sites (gulls, egrets, raptors, etc.) | | | | |
| 4.22 | Oxidation ponds (sewage) | | | | |
| 4.23 | Pastures, grassland (livestock, ungulates, rodents, raptors, etc.) | | | | |
| 4.24 | Plowing, cultivation, haying, harvesting, etc. (rodents, insects, worms) | | | | |
| 4.25 | Reptiles, amphibians, fish | | | | |
| 4.26 | Reservoirs, lakes, natural ponds | | | | |
| 4.27 | Retention ponds (water, de-icing fluid) | | | | |
| 4.28 | Rodents, beavers, muskrats, rabbits, hares, raccoons, skunks, badgers, etc. | | | | |
| 4.29 | Roosting vegetation (starlings, crows, egrets, etc.) | | | | |
| 4.30 | Sand and gravel quarries, borrow pits | | | | |
| 4.31 | Seed producing vegetation | | | | |
| 4.32 | Sewage lagoons | | | | |
| 4.33 | Sewage outfalls | | | | |
| 4.34 | Sewage sludge | | | | |
| 4.35 | Shorelines | | | | |
| 4.36 | Structures (buildings, hangers, lights, towers, signs, poles, etc.) | | | | |
| 4.37 | Trees, brush, shrubs, woodlots (cover, browse, etc.) | | | | |
| 4.38 | Water fountains | | | | |
| 4.39 | Waterways | | | | |
| 4.40 | Weeds | | | | |

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