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## **Border-collie Patrols Are Among Newest Methods of Airport Wildlife Control**

*Airport studies have found that the dogs' harassment of birds has helped reduce bird populations and the number of bird-strike accidents. The dogs also have been effective in reducing the presence of other wildlife in aircraft operations areas.*

—  
*FSF Editorial Staff*

In recent years, new programs have been developed to help prevent bird-strike accidents, either by changing aspects of the airport environment that attract birds or by harassing the birds to encourage them to leave areas where encounters with aircraft are most likely. One program involves the use of border collies to patrol airports and to move birds away from airport operations areas.

Bird strikes affect all types of aircraft in all parts of the world. The International Civil Aviation Organization Bird Strike Information System says that in 2000 — the most recent year for which statistics were available — 8,458 bird-strike accidents were reported worldwide.<sup>1</sup> Thousands more were not reported; for example, the U.S. Federal Aviation Administration says that only 20 percent of bird strikes in the United States are reported, and Transport Canada says that it receives reports of about 30 percent of the bird-strike accidents that occur in Canada.<sup>2,3</sup>

Financial losses to aircraft operators worldwide because of bird strikes total at least US\$1 billion per year.<sup>4</sup> Transport Canada has estimated that bird strikes may cost airlines in North America alone \$500 million to \$1 billion a year.<sup>5</sup>

The border collie program was developed in 1998 by Nicholas B. Carter, Ph.D., a zoologist and the director of Border Collie



Rescue, an organization in Melrose, Florida, U.S., that aids in the rescue, training and placement of border collies that have been given up for adoption by their owners, sometimes because the dogs displayed aggressive qualities that made them unsuitable as pets.

The same qualities, however, help them excel at intimidating and harassing birds that congregate around airports and at moving them away — either to more distant locations on the airport or off the airport altogether, Carter said.<sup>6</sup> (The dogs also have been used to harass deer and other wildlife at some airports.) Because border collies have been bred as herding dogs, they work by intimidation and do not engage in activities that might injure or kill birds or wildlife. They rarely bark, and Carter said that their “silent rush attacks” are more effective at moving birds and wildlife than noisy barking would be.

“They’re obsessive, compulsive workaholics, [willing to work] all day, every day, if you let them. The dogs can’t quit after half an hour,” he said. “They also obsess about birds.”

The control of birds requires a “moderately rigorous” program in which a border collie persistently harasses birds to move them away from aircraft operations areas, said Carter’s



*An Israeli Air Force F-16 based at Ramat David Air Force Base in northern Israel was substantially damaged in a bird-strike accident involving several storks (inset). The accident occurred before a border collie was introduced into the base's bird-control program. Millions of large migratory birds, including white storks, black storks and white pelicans, pass through Israel during their spring migration from Africa to Europe and Western Asia and fall migration, when they return to Africa. (Source: Nicholas B. Carter, Ph.D., and Israeli Air Force)*

organization, Border Collie Rescue, in literature about its program. Typically, birds flee to the nearest waterway to avoid the dog, remain there until the threat presented by the border collie has passed and then fly back to the airport. A trained border collie can pursue the birds into the water, leaving the birds no option other than to fly out of the area.<sup>7</sup>

“This must be kept up over the entire airfield as long as the birds remain,” the literature said. “In the beginning ... this means long and intense workdays for the dog and handler, until the bird problem begins to subside. Then it requires daily morning [forays] and evening forays to discourage any [new birds from entering] the airport environment.”

A dog-handler works with the border collie, using whistled commands and spoken commands to tell the dog when to pursue birds and when to stop — for example, to lie down to avoid dispersing a flock of birds into an aircraft's flight path. The border collie typically works near runways during the first week, until birds recognize that there is a predator in the area and move further away to different locations on or off the airport. After that, the dog works primarily near those locations,

returning to the runway areas only occasionally, when birds reappear there.

Carter, who previously had trained border collies to clear golf courses of ducks and geese, began developing his program to use the dogs to control birds at airports after watching a television documentary about the dangers of bird strikes to aircraft. For about a year, he studied airport procedures, refined training techniques and worked with several border collies.

In February 1999, a dog trained by Carter began work in an airport wildlife-control program at Southwest Florida International Airport in Fort Myers, Florida.

Carter said that, two months later, airport officials found that “bird numbers were so low that the dog resorted to herding alligators — one of the few remaining moving objects left on the [aircraft operations area]. The dog was [removed] for additional training in alligator avoidance, and in his absence, bird numbers began to rise significantly.”<sup>8</sup>

After the dog's return to the airport, the bird population again decreased.

A study conducted for the airport by the U.S. Department of Agriculture found that in the two years before the dog arrived at the airport, 133 wildlife species were present within the aircraft operations area and just outside its borders. Three categories of birds — wading birds, waterfowl and crows/blackbirds — comprised 92 percent of all observed wildlife.<sup>9</sup>

A second study, conducted during the first seven months of the dog's tenure, found that the number of wading birds observed in the area declined more than 50 percent and that the number of species of wading birds, waterfowl, crows/blackbirds and raptors (birds of prey, including vultures, hawks and eagles) declined 29 percent.<sup>10</sup>

The behavior of birds in the aircraft operations area also changed, Carter said.

“Before February 1999, large aggregates of birds would forage and loaf in the open grassy areas around the runway,” he said. “After the border collie began its work, most birds responded by vacating the [aircraft operations area] altogether, but the few individuals that remained relocated to the protection of the wide drainage swale [ditch] several hundred yards ... from the runway.”<sup>11</sup>

The dog was not permitted to harass birds in that area because of the presence of several alligators.

Similar studies at Dover (Delaware, U.S.) Air Force Base showed that during the first month after a border collie began work in the base's wildlife-control program, the bird population decreased by 150,000 birds (99.9 percent) and that during the first year, bird-strike damage to aircraft was reduced to US\$24,000, compared with an average of \$600,000 a year in the previous two years.<sup>12</sup>

At Cold Lake (Alberta, Canada) Air Force Base, runway incursions by deer decreased from an average of 45 incursions per week in 1998 and 61.25 incursions per week in 1999 — before a border collie began patrolling the airfield — to 3.5 incursions per week in 2000 — after the dog arrived.<sup>13</sup> (Different techniques are taught to border collies who will specialize in moving deer away from runways. In this instance, the dog has been trained to search for the deer and “push them through dense wooded areas” on the air base and away from the runways.)<sup>14</sup>

Carter said that border collies are effective “because they are true predators, representing an actual, not perceived threat to wildlife. Birds and wildlife do not habituate to border collies since the dogs are essentially top predators and are continually moving and changing behavior.”<sup>15</sup>

Training requires about one year for each dog, at a cost of about US\$15,000 to \$25,000 per dog; about 100 hours of

training is required for dog-handlers, Carter said.<sup>16</sup> In addition to their general training in bird and/or wildlife control methods, each dog is “custom-trained” to be prepared for conditions at the specific airport where it will work. Every airport has unique qualities, such as the alligators at Southwest Florida International Airport and deep snow — and snowmobiles, which the dog sometimes rides during winter workdays — at Cold Lake Air Force Base, Carter said.

After the dogs' training has been completed, the dogs are “perfect,” he said. “They don't make mistakes. ... They're like a dog on remote control.”

The dogs precisely obey the commands of their handlers, who typically are wildlife biologists who also work in the development of airport wildlife-control programs, he said. Dogs trained by Carter work at three commercial airports and two military airfields in Canada and the United States and at three Israeli Air Force bases.

Richard A. Dolbeer, scientist for the U.S. Department of Agriculture Wildlife Services program in Sandusky, Ohio, U.S., said that border collies have helped reduce bird strikes but that the use of border collies alone will not solve the problem.<sup>17</sup>

“People are looking for a magic solution,” Dolbeer said. “But it takes an integrated approach with different elements — wildlife management, very effective ways of frightening the birds and dispersing them.”

The airports that use border collies for bird-strike prevention use them as one element in a larger bird-control program.

For example, Vancouver (British Columbia, Canada) International Airport for years has operated a wildlife-management program to control birds and other wildlife, both by changing the airport environment to make it less attractive to birds (the habitat-management program) and by using a variety of methods to scare birds away from aircraft operations areas (the wildlife-control program).<sup>18</sup>

Two border collies were introduced into the wildlife-control program in November 1999; after one of the two dogs was struck by a truck and killed during a training session outside the aircraft operations area, the program continued with one dog.

“We thought it would be a good addition to our wildlife-management program,” said Brett Patterson, director of aviation operations. “Birds become very habituated to any tool you use in harassment ... and this added another tool.”<sup>19</sup>

The airport is on an island located along a major Pacific flyway (a geographic course followed by birds migrating between



*A border collie obeys a handler's command to pause during bird-harassment work at Southwest Florida International Airport in Fort Myers, Florida, U.S., while an airplane is taxied nearby. The pause is necessary to avoid action that might startle birds and prompt them to fly into an airplane's path.* (Source: Nicholas B. Carter, Ph.D.)

breeding areas and wintering areas) and surrounded by several parks and wildlife-conservation areas. Officials of the airport and the wildlife-conservation areas work together to ensure that the uses of the airport and the conservation areas are compatible.

Patterson said that the airport's 24-hour-a-day wildlife-control program moves about 1 million birds a year away from the aircraft operating area. Several million more birds are estimated to be in the area.

In recent years, the airport has recorded between 50 bird strikes and 60 bird strikes a year; the number has been relatively unchanged even as the 10-year average of annual aircraft movements has increased from about 250,000 to about 350,000, Patterson said.

Because border collies have been working at the airport for only two calendar years, "statistically speaking, we can't make any conclusions," he said. Nevertheless, he said that the number of birds observed on the airfield during the first three months of 2000 was 40 percent lower than the number observed during the same period in 1999 and that populations of geese and ducks have been "critically impacted" by the dogs' presence.

"The biggest difference is in migratory birds — ducks and geese," he said. "They're not on the airfield at all."

The dog works with four dog-handlers who are among the airport's 13 wildlife control officers. The dog and an accompanying dog-handler patrol the airport's roads, drainage ditches and dikes, typically for about four hours to six hours at a time, for a total of about 12 hours a day.

Patterson said that the patrols "establish [the airport as] the dog's territory, and the birds have learned to stay away from the airport. [The birds] know that there's a predator at the airport." In this manner, he said, the dog not only constitutes a threat to the birds to aid in controlling them but also — simply because of its presence on airport grounds — constitutes a modification of the airport environment that has made the airport less appealing to many birds.

Not all birds respond to the dog's presence, however.

"Some small birds just jump out of the way and move on but don't really leave," Patterson said. "And the bald eagle — being at the top of the food chain — isn't bothered by anything."

Most other raptors, including hawks, also are un intimidated by the dog, he said. In some instances, the use of pyrotechnic devices has been effective in removing raptors from the aircraft operations area.

The Vancouver wildlife-management program includes other techniques — many of them also used in various combinations in wildlife-management programs at other airports — to encourage them to move away from the aircraft operations area. The techniques include the following:<sup>20</sup>

- Gas cannons, which explode periodically to frighten birds with their sound. The cannons must be moved regularly to prevent birds from becoming accustomed to them;
- Pyrotechnic devices, which are available in a variety of forms, all designed to frighten birds with loud noise, flashes of bright light or both;
- Sirens and electronic wailers, scare devices that produce random variations of sounds from ultrasonic speakers and audio speakers, which are designed to startle birds into flight. The birds apparently do not become accustomed to the random combinations of sounds and sound frequencies generated by the devices;<sup>21</sup> and,
- Nets and wires, which can be installed to block birds' access to some areas. For example, netting can be used

to prevent birds from entering areas beneath bridges, and wire can be installed on ledges, posts, signs and other roosting areas and perching areas.<sup>22</sup>

When individual birds have not responded to any of the techniques used by the wildlife-management program, the birds have been shot. The number of birds killed by wildlife control officers, however, has decreased since the border collies began work, Patterson said. He said that airport statistics show that the 1,239 birds shot in 2001 is about 56 percent less than the number shot in 2000 and about 62 percent less than the number shot in 1999.<sup>23</sup>

“We attribute a lot of that to the dog; the biggest habitat modification has been the dog,” Patterson said.

At other airports, a variety of other programs are being used to control birds and other wildlife, including:<sup>24</sup>

- Broadcasts of recordings of a bird species' distress calls. This technique is most effective if distress calls are broadcast only occasionally and used in combination with pyrotechnics and the firing of weapons;
- Chemical repellents in various forms, including sticky substances that can be applied to surfaces, making the birds uncomfortable when they perch on them; methyl anthranilate (artificial grape flavoring), which can be



*A border collie harasses birds at the beginning of the wildlife-control program at Dover (Delaware, U.S.) Air Force Base. Before the program began, weekly bird counts included about 50,000 snow geese and 30,000 Canadian geese within 1.25 miles (two kilometers) of the base. By the end of the month, the count totaled 26 geese; during the same period, data gathered by the Delaware Department of Natural Resources showed an increase of more than 50 percent in the number of snow geese in the state and an increase of 310 percent in the number of snow geese in the wildlife-conservation area closest to the base. Pilots said that they observed large numbers of birds in fields adjacent to the area patrolled by the dog. (Source: Nicholas B. Carter, Ph.D.)*

applied to fields or standing water and which tastes especially bad to birds; anthraquinone, which can be applied to fields or food and which causes mild digestive disturbances in birds; and other taste repellents and odor repellents for deer, rabbits and other mammals;

- Falconry, or use of other trained birds of prey to frighten birds by exposing them to their natural predators. This technique has been used occasionally at airports in Europe and North America since the 1940s;
- Traps, which can be used to catch specific birds that have not been discouraged by bird-scaring programs. After they are trapped, the birds are relocated in suitable habitats far enough from the airport that their return is considered less likely; some specialists recommend a distance of at least 50 statute miles (80 kilometers). The specialists also recommend that captured pigeons be killed; relocated pigeons often fly long distances to return to the site of their capture;
- Radio-controlled model aircraft, which can be directed precisely to encourage birds to move away from an airport. Some radio-controlled model aircraft are designed to look like falcons and/or to fire pyrotechnic devices; and,
- Hogs, which were used during several bird-breeding seasons in the mid-1990s on Gull Island at the Lake Hood Seaplane Base, part of Ted Stevens Anchorage (Alaska, U.S.) International Airport. Three hogs roamed Gull Island (so named because it was “literally covered in sea gulls,” said airport Deputy Director Corky Caldwell), chasing birds and eating their eggs.<sup>25</sup> The airport staff installed a feeder to supplement the hogs’ egg diet and a mud wallow for their comfort on warm days,<sup>26</sup> and the hogs were “very effective,” Caldwell said. “They ate themselves out of a job.”<sup>27</sup>

The airport has used conventional methods of bird control and wildlife control before, during and after the hog program, and in the years since the hogs’ departure, birds have continued to avoid the island, he said.

Border-collie patrols of airports are among the most recent efforts to reduce airport bird populations. Use of the dogs, typically in combination with other bird-control programs, has helped to reduce not only the numbers of birds on airport grounds but also the number of bird-strike accidents.♦

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