

# Birds of a Feather

The logo for 'Turf' features the word in a bold, black, sans-serif font. A green grass blade is integrated into the letter 'u'.The logo for 'Tree Services' is in a bold, black, sans-serif font. A small green leaf is positioned above the 'e' in 'Services'. Below the main text is the tagline 'Taking Tree Care to New Heights' in a smaller, italicized font.The logo for 'DesignBuild' features the word 'Design' in black and 'Build' in orange, both in a bold, sans-serif font. A small orange square is positioned above the 'i' in 'Design'.The logo for 'PLOW' is in a bold, blue, sans-serif font. The letters are slightly slanted to the right.

Source: [www.TurfMagazine.com](http://www.TurfMagazine.com)

Airport turf selection may save lives



O'Hare International Airport, with large strips of grass between runways, has funded a study to look at how to reduce bird strikes through turfgrass species selection.

*PHOTOS BY THERESA KISSANE, UNLESS OTHERWISE NOTED.*

One of the most dangerous aspects of an airplane flight is when it takes off, with a primary threat being flocks of birds that can swoop into jet engines. The crash of US Airways Flight 1549 into New York's Hudson River in 2009 is the most recent example of this threat, which was caused by birds.

Several methods for reducing the risk of bird strikes have been examined over the years, and one of the most interesting is the use of turf selection as a way to reduce the threat. Theresa Kissane, a Ph.D. candidate at the University of Illinois, recently finished a master's thesis on this topic, and it appears that the selection of turfgrass types that contain a toxin to repel birds could reduce the frequency of bird strikes.

Kissane, an ecologist and graduate student research assistant in the department of imperative biosciences, began the study in 2007 at the behest of university professors who had been approached by officials from Chicago's O'Hare International Airport. The airport was going through its O'Hare Modernization Program and wanted to fund a study that looked at the use of turf variety selection to prevent bird strikes. She points out that the Federal Aviation Administration received more than 82,000 wildlife strike reports from 1990 to 2007.

Kissane says, "97.5 percent of those were with birds. There were 11 fatalities and 197 injuries reported." In addition, there were 362,073 hours of aircraft downtime and over \$625 million in annual damage from strikes on aircraft. This is a big problem.

The potential for turfgrass to reduce these incidents comes from the fact that some grass species harbor endophytic fungi, meaning the fungi live inside the plants. Kissane explains that some of these fungi produce toxic alkaloids that make the grasses that harbor them less attractive to animals that feed on or live around grassy facilities. If that could be exploited – i.e., plant grass species that don't attract as many birds around airports – it is feasible that the number of bird strikes could be reduced. At airports that use other methods to reduce bird populations, such as scare tactics, this approach could be less intrusive.

Kissane finished her portion of the project in 2009. Early on, she looked at the existing situation at O'Hare, which has a very large area of grass. "Everything between the runways was grass. They typically use a standard maintenance mix," she notes. The mix generally includes Kentucky bluegrass, perennial ryegrass and fescue varieties selected for their ability to grow with little maintenance rather than their effect on wild birds. At the time of the study, the airport was going toward a tall fescue mix and wanted to know how that would affect bird populations around runways. The birds that typically frequent the airport and pose the largest threat are large birds such as raptors, large flocking species like Canada geese, and small flocking birds like starlings.



A Canada goose takes off from the pond at the test site. Canada geese are a threat to aircraft when they fly around airports.

Kissane set up study plots on University of Illinois property in Champaign. She established 15 test plots around a pond with five types of turfgrasses: non-endophytic tall fescue, endophytic tall fescue, endophytic perennial ryegrass, regular Kentucky bluegrass and zoysiagrass. The methodology was for Kissane (or a research assistant) to sit outside the plot area at a viewpoint and record each type of bird and the number of birds that utilized each plot every five minutes. This was done for a minimum of eight hours per week during the study period except when the plots were covered with ice or snow.

There were three replications of each grass treatment, with observations being of whether birds fed or rested on the plots. In the summer, she found that more songbirds, such as meadowlarks and starlings, frequented the plots, while in the winter there were more geese and ducks. "We found that it depended on which season we were looking at as to which plot they preferred," Kissane says. "They liked the Kentucky bluegrass the most, and we expected that."

The results of the still unpublished final report were that in the spring, the endophytic perennial ryegrass hosted more birds, possibly because the toxins produced by the endophytic fungi were reduced at that time. In the summer, there was no significant difference between any of the grass species. In the fall, the Kentucky bluegrass hosted more birds, with no significant difference between the other species.

Kissane was able to rank the grasses as to their potential usefulness in reducing bird populations by looking at each type of bird and the grass it

utilized, along with the strike risk it posed to aircraft. As expected, Kentucky bluegrass would be the worst type to use because of its popularity with birds. On the other hand, the endophytic perennial ryegrass was deemed the least risk to aircraft, because, although it was the most-used during the spring, it was the least-used during seasons of high-bird use of the airport.

The highest bird strike periods of the year are midsummer and midfall, and during those periods the endophytic ryegrass gave the best results. "I would say that it is a grass that is worth looking into for reducing bird threats at airports," Kissane says. There are other factors at play, however, such as whether the presence of small mammals like mice could attract prey species such as hawks. In addition, the interconnected ecology of these grassy areas at airports brings into play factors like grass fertility and pesticide programs.



Theresa Kissane, a University of Illinois ecologist, says that endophytic perennial ryegrass would be a good choice to reduce bird threats to aircraft at O'Hare

Kissane made her research available to airport officials, but hasn't made any definitive recommendations. She also noted that whatever grass was used should be well-maintained, because as grass plots became more weedy, they tended to attract more birds. That was particularly true of the zoysiagrass plots.

Kissane notes that the 15 test plots were maintained in a similar fashion to the inter-runway grass strips at the airport. They were mowed when they reached a height of about 6 inches, which was about once a month and sometimes more often in the summer. She says that taller grass could be something of a deterrent to birds.

Another component of the study was to look at how soil quality affected bird populations, with earlier studies indicating that low-quality soils could be less attractive to birds. The soil at the initial turfgrass test site was of low quality, so a separate site was selected at a horticultural landscape field lab on campus with the same observation techniques used to look at bird usage. As a result, she could verify that low-quality soils tend to attract fewer birds, though there were much fewer observations in that component of the study. Soil quality was verified by analysis by an independent lab and a university analysis of soil type and bulk density.

The turfgrass study is continuing on plots at the airport with another researcher, Kissane's sister Claire, in charge. In general, however, it has been established that there is validity to the idea that selection of turfgrass type, as well as the condition of the soil it grows on, can be a factor in bird strikes. Thus, more careful grass selection and management at airports could ultimately reduce damage to aircraft and injury to humans.

Don Dale resides in Altadena, Calif., and is a frequent contributor to Turf. He has covered the green industry for more than 10 years.