



DERREN SLINDE

Team Epsilon SaberBOTz (left to right): Varun Gupta, Poojha Prabahasundar, Samantha Burkard, Eric Ma, Clay Kreimeier, Sohail Shaik, Arber Januzi, Corbin Slinde and Calvin Slinde.

The Wren-i-gade

HOW SCIENCE, TEAMWORK AND STANDING UP TO A BULLY MADE A MIDDLE SCHOOL GROUP THE BLUEBIRD'S BEST PAL — FOR LIFE.

Derren Slinde

When a group of middle school students from Middleton-Cross Plains Area School District learned the bluebird of happiness was experiencing anything but that when it came to the winged world of nest box wars, they decided to join forces with a conservation professor to help the bird claim its rightful place in nature's birdhouse battles.



Eastern bluebirds face threats from other birds that vie for nest boxes or destroy their eggs.

HERBERT LANGE

"There are birds that compete with bluebirds for nesting boxes," Glacier Creek Middle School student Varun Gupta said, noting the bluebird's competitive culprits typically are tree and house sparrows, starlings and house wrens. "And some of them can be very nasty."

Who knew those pretty bird songs that fill the air actually may be nest box battle cries? In this case, those cries served as the rallying cry for Varun and his student research team who chose the plight of the beautiful bluebird as theirs in an annual, international team event that uses science, technology, engineering and mathematics (also known as STEM curriculum) to develop real-life solutions.

In a smart, strategic move to up their chances of success, the team tapped the counsel of Stan Temple, noted emeritus professor of conservation with the University of Wisconsin-Madison and Aldo Leopold Foundation advisor.

Along the way the team considered high-tech answers such as a facial recognition tool. Yes, bluebirds have faces. In the end they settled on a simple, but effective way to slam the door on the beaks of the bullies — a little barricade the team likes to call, cue the music, Wren-i-gade.

This is the story of how these middle schoolers created the housing save that's really for the birds!

Learning is FUN! FIRST LEGO League competition

The student team from Middleton-Cross Plains is one of thousands from 88 countries who participated in the 2016 annual robotics program known as the FIRST LEGO League. The league's website says this program is designed to help tomorrow's innovators use creative thinking and teamwork to research and develop real-life solutions to real-life problems. The teams, who have adult coaches, also must design and construct a robot using the LEGO MINDSTORM™ technology for an exciting and fun tabletop competition. The competitors are ages 9-14. Last year's theme was "Animal Allies: How could we improve the way we interact with animals?"

First step? The Middleton-Cross Plains team had to pick an animal. They went for the eastern bluebird because of its reputation as a happiness symbol, and the fact that nesting bluebirds face aggressive and hostile house sparrows — that sounds like something out of a Hitchcock movie.

However, thanks to the wise advice of



Team members Corbin Slinde (left) and Eric Ma helped evaluate 100 bluebird nest boxes in the village of Cross Plains to see how well they met the bluebirds' needs.

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Professor Temple, the students learned the real nest box threat facing the bluebird is the smaller house wren. The wrens are known to destroy the bluebirds' nests, then pierce their eggs and pull them out of the nest. That is a horror movie!

Adding to the team's challenge of devising a solution was the fact that the house wren is a native species protected by law, making it illegal to harm the bird or to interfere with their active nests.

Now that the team had its animal, its goal and a handle on the law, their objectives became clear:

- Increase awareness about how to create the ideal habitat for bluebirds to nest.
- Design a device to prevent house wrens from claiming an empty nest box.

Finding answers in backyards

With Professor Temple's help, the team went to the Dane County community of Cross Plains where they worked in pairs and evaluated 100 bluebird nest boxes to determine how well the residents were meeting bluebirds' needs.

The students assessed the nest boxes using these five criteria:

- Was the nest box mounted on a pole?
- Did it have a predator guard?
- Was the nest box located in an open field with scattered trees?
- Was it located far from woods?
- Finally, was the nest box surrounded by vegetation of low height (i.e. mowed lawn)?

Here's the good news: They found

more than half satisfied four out of the five criteria necessary for creating a suitable habitat for bluebird nesting. Way to go, Cross Plains! Now, the not-so-good news: They observed a predator guard, which prevents climbing predators from accessing the nest box, in only a quarter of the nest boxes surveyed.

Now that the study was complete, it was on to creating the solution.

How to say "no" to house wren guests – and still make budget

Student Poojha Prabhahasundar said the team thought about the solution with this goal: Create a device to prevent the house wrens from claiming an empty nest box.

Poojha noted the team first explored the use of facial recognition technology and color sensors in the nest box. "The idea was that when a bird that wasn't a bluebird entered the nest box, the sensors would trigger audio and visual deterrents that would scare the bird away."

Wow.

But, the reality of a tight budget entered the kids' jaw-dropping brainstorming. "Taking a high-tech approach seemed exciting to our team at first," Poojha said. "But we soon realized such

a solution would not be economically feasible."

It was at that point, teammate Calvin Slinde remembers, the team shifted gears and opted instead for a low-tech, low-cost approach. The team picked a name that would tell any bully bird to think twice about entering a bluebird domain.

"We chose the name, 'Wren-i-gade', because our solution is a device that acts as a barrier to keep house wrens out of a nest box," Calvin said. And it's weight-activated.

The Wren-i-gade is a small plastic pressure-activated door that blocks the entry hole into the nest box. The team designed the device to fit into existing bluebird nest boxes with no drilling, screwing or other attachments. The pressure-sensitive perch triggers the barrier door to drop and allow entry only when the weight of the bird is greater than 20 grams. Because the weight of the average house wren is 10-12 grams, it cannot access the nest box. The weight of the average bluebird is 27-34 grams and will therefore release the barrier door, allowing access to the nest box.

Making the papers and a difference

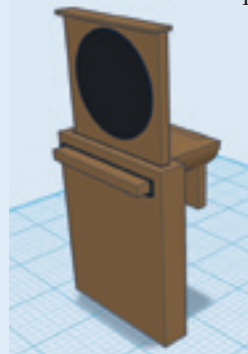
The team hopes to have a Wren-i-gade device available for testing this spring. They also are working with Professor Temple to have their research published in the Wisconsin Society of Ornithology's peer-reviewed journal, *The Passenger Pigeon*. And they have been the subject of local stories in the Cross Plains newspaper, *The News-Sickle-Arrow* and in the *Badger Birder Newsletter*.

The team presented their research and solution at the Badgerland Regional FIRST LEGO League Tournament at Madison College this past November.

Varun, Poojha, Calvin and the whole team hope the Wren-i-gade will make it easier and less stressful for bluebirds to find and keep nesting boxes so their population continues to flourish happily for years

to come.

Learn about the FIRST LEGO League at www.firstlegoleague.org/



CALVIN SLINDE

The Wren-i-gade has a pressure-sensitive perch that allows entry to birds that weigh more than 20 grams, essentially barricading the tiny house wren from entering the nest box.

Derren Slinde is the coach of FIRST LEGO League team Epsilon SaberBOTz, manager of STEM-based Destination Imagination teams in Middleton, and a bluebird enthusiast.