It's time to tag monarchs this weekend. **OW2**

Cabin Country: 47 years of bliss near Longville. **OW3**

DO THIS NOW **2** • #STRIBSUMMER **2** • NATURE NOTES **3**

Columnist wants to know: Where are the ducks? **OW3**

FRIDAY, AUGUST 18, 2017

StarTribune

STARTRIBUNE.COM/OUTDOORS • SECTION OW

OUTDOORS

WEEKEND



Photos by SCOTT STOWELL • Special to the Star Tribune

A specially designed paddle by a former environmental education teacher has allowed Scott Bush to do what he has long sought: A trip into the Boundary Waters Canoe Area Wilderness with his sons. The paddle features a shoulder harness, shown below, on which the paddle action pivots.

NO LIMITS

Refashioned paddle transforms a family wilderness experience in northern Minnesota.

By SCOTT STOWELL • Special to the Star Tribune

ELY, MINN. – When he was 7, Scott Bush fell out the passenger door of a moving car and its rear tire ran over his hand. Surgeons attempted to reattach the hand, but to no avail. It was amputated 11 days later. He has lived without it for 35 years.

Bush, of Norwalk, Iowa, didn't let the injury stop him. He played four sports in high school and, what's more, was the founder of Templeton Rye Whiskey. However, he said he hasn't canoed much because having one hand made paddling awkward.

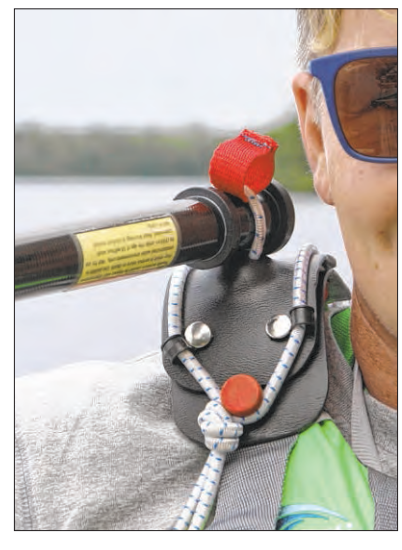
He's had a desire to visit the Boundary Waters Canoe Area Wilderness. He recently booked a guided trip with the Ely Outfitting Co. to take his sons Adrian, 12, and Xavier, 10. As part of the package, the company bought a specially designed paddle to considerably enhance Bush's paddling skills.

"If it turns out that this thing works well, I think it'll be something I want to do a lot more," he said before the trip.

Providing outdoor experiences to disabled people has been the lifework of Cindy Dillenschneider of Washburn, Wis. She was an outdoor education professor at Northland College from 1989 to 2016 in nearby Ashland. Experience showed her that paddle sports are some of the most accessible mediums for people with lower limb impairments. However, people with upper limb impairments don't have that same advantage. She was determined to find a solution.

In 2005, she began prototyping a specialized paddle. After extensive research and a variety of evolutions, Dillenschneider patented a paddle that harnesses to the shoulder of a user's lifejacket. Paddlers then use their good hand and arm for the paddle stroke, with their torso muscles generating power. The paddle is lightweight and adjustable for body size and blade pitch. Its shaft is constructed of carbon fiber with a fiberglass insert. The blade, made of a plastic composite, runs to an elbow joint that bends the upper shaft toward the user's shoulder

See **PADDLE** on OW2 ►



LEARN MORE For more details about the paddle, e-mail Cindy Dillenschneider at DillenschneiderDesigns@outlook.com.



Called to a Minnesota trail

Riding on the Paul Bunyan State Trail on a summer's day was a fun immersion into north-central Minnesota. **Page OW4**

New model may better predict spread of CWD, other diseases

Model shows the areas of fastest growth and could help manage outbreaks in Minnesota.

By TODD NELSON
Special to the Star Tribune

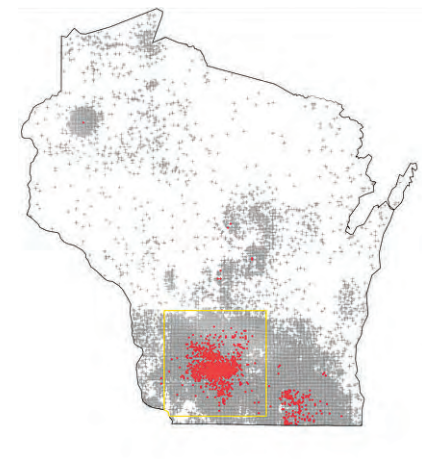
A new, more accurate way to forecast the growth and expansion of chronic wasting disease (CWD) in whitetail deer also could help predict the spread of invasive species such as zebra mussels or the Ebola and Zika viruses, according to researchers.

The forecasting tool presents the probability of CWD infection in a heat map-like format, with darker "hot spots" showing where the disease is growing at a faster rate in a study area in southern Wisconsin, said Daniel Walsh, a U.S. Geological Survey scientist based in Madison, Wis., and an author of a paper describing the newly developed method.

In Minnesota, this type of modeling will be more valuable as the state collects more data, said Chris Jennelle, a research biologist with the Minnesota Department of Natural Resources. That may result from a special January 2018 hunt that the DNR has proposed in three southeastern deer permit areas and a special zone established last year after CWD was discovered in wild deer near Preston and Harmony, Minn.

In the forecast map, darker areas, which could indicate sources of disease, contrast with lighter "cool spots" where the disease is less likely to spread and where it then may die out, Walsh said. The heat map-style graphical represen-

See **MODELING** on OW2 ►



JOHN WILEY & SONS

Clearer picture
Red dots show the location of nearly 2,600 whitetail deer that tested positive for chronic wasting disease from 2002-2014 in Wisconsin. U.S. Geological Survey researchers focusing on the highlighted area used the data to develop a new mathematical model to predict spread of CWD. One takeaway: CWD was more likely to spread inside the Wisconsin River corridor.

Gone fishin' Columnist Dennis Anderson is on vacation. His column returns in the section Aug. 25.

DO THIS NOW *AT STATE, REGIONAL AND LOCAL PARKS*

Monarch tagging
Minneopa State Park
1-2 p.m. Friday

Monarchs, which migrate from Minnesota to Mexico, have declined in numbers over the past decade. Learn how tagging monarchs and tracking their migration patterns can provide information about their biology and conservation. (1-507-384-8890, mndnr.gov)

Wood Wide Web
Sibley State Park
4-5 p.m. Friday

If trees could talk, what would they say? Eavesdrop on the underground "conversations" of trees and catch a rare glimpse of the mysterious social network known as the Wood Wide Web. (1-320-354-2055, mndnr.gov)

Photos in the wild
William O'Brien State Park
2-3 p.m. Saturday

Learn some tips and tricks for nature photography. Bring a camera (smartphone works, too). There also are a limited number of cameras to check out. Meet inside the visitor center. (651-433-0500, mndnr.gov)

Archery pointers
Fort Snelling State Park
10 a.m.-noon Saturday and 1-3 p.m. Sunday

Learn how to use a compound bow. The program is for ages 8 and older. All equipment is provided. Stop by the beach area anytime during the program. (612-725-2724, mndnr.gov).

I Can Paddle! program
Lake Maria State Park
10 a.m.-noon Sunday

Learn the basics of canoeing on lakes. Cost is $25 (for three people per canoe). Must be 5 or older. Reservations required; visit mndnr.gov/reservations or call 1-866-857-2757.

Raptors in the yard
Lowry Nature Center
2-4 p.m. Sunday

Meet captive raptors. Drop in anytime. This program is free. (threeriversparks.org)

Bird banding
Lowry Nature Center
9 a.m.–noon Saturday

Wild songbirds will be trapped, studied, banded and released. (763-694-7650, threeriversparks.org)

Family kayaking
9-11 a.m. Saturday
Cedar Lake Farm Regional Park

Learn kayaking safety and proper paddling. Equipment provided. Cost is $20. Call 763-559-6700 to make a reservation. This program is for ages 8 and older. (763-694-7777, threeriversparks.org)

Eclipse parties
Various state parks
Monday

A total solar eclipse is happening Monday across the United States. (The path of totality courses across the country, but Minnesota will see a partial eclipse). Special glasses to safely view it will be provided. Go online to see details about viewing events at Afton, Itasca, Sibley and other state parks. (mndnr.gov)

#STRIBSUMMER

What are you doing or observing in the outdoors this summer? Snap a photo, tag it #Stribsummer, post it on Instagram or Twitter, and you might see it here or reposted in our @startribune feed.



@elizabeth_after60
(Turtle Lake, Shoreview)

"Inventing that product has brought liberty and joy to a whole bunch of people."
Bending Braches president Ed Vater, on Ann Dillenschneider's specially designed paddle for the disabled

Revamped paddle gets high marks

◂ **PADDLE** from OW1
and lower shaft to the blade.

Dillenschneider said the paddle is the first of its kind. It also benefits people who have both hands but experience issues from carpal tunnel syndrome, stroke or traumatic brain injuries.

Destigmatizing

Beyond the physical assistance of the paddle, Dillenschneider describes it as an equalizer.

"I really wanted to make a person feel good about who they are, about what they can do with it and that they should feel equal to anyone else who has a paddle in their hand," she said.

She added that outdoor professionals are in a unique position to introduce people with disabilities to the natural world. Unfortunately, the outdoor industry has sometimes fallen short and disregarded portions of the population, she said. But since she began her design, many businesses, groups and individuals have provided generous support. The primary components are produced by paddle-maker Bending Branches in Osceola, Wis.

Branches president Ed Vater said the concept is entirely Dillenschneider's. However, the company has donated components and fine-tuned the paddle's production. An avid paddler himself, Vater noted its intangible impact.

"Her inventing that product has brought liberty and enjoyment to a whole bunch of people," he said.

Though her patent is from 2007, Dillenschneider said the paddle design is constantly evolving to meet the needs of the greatest number of users at all skill levels. As a result of the tweaking, she said she hasn't been able to inventory her costs and finalize a price. She's also trying to reduce the cost to make the paddle more affordable. She noted that it's well-suited for outfitters, organizations and rental businesses.

The Ely Outfitting Company was the first outfitter to buy a paddle for rent by its customers. The paddle cost was $400 and rents for $10 per day.

The proof in the paddle

Ely Outfitting founder Jason Zabokrtsky said that when Bush initially contacted the company he mentioned his hand disability. Zabokrtsky was impressed with his gumption and was bound to make their wilderness adventure happen.



SCOTT STOWELL • Special to the Star Tribune
Scott Bush, shown with his boys, Adrian and Xavier, said his specially designed paddle helped him keep up. "It made a huge difference for me."

"I bought it just for this trip," Zabokrtsky said. "We think everybody deserves to experience the Boundary Waters even if they have something that makes it a little more challenging."

When Bush returned from the trip, he said the paddle was well-designed. It adjusted easily and snapped quickly onto his lifejacket. He also found that when his primary arm became tired, he could disconnect the paddle, anchor the upper shaft against his opposite arm and paddle at a 45-degree angle.

"It made a huge difference for me," he said. "I was basically worthless on a canoe, and I was able to do a pretty good job on this trip."

Bush went on about the paddle's significance to his group contributions. He said his sons thought the paddle was cool because they knew he wasn't very good at paddling. On the trip, he also watched his sons step up. They literally carried their own weight at portages and took ownership of map-reading to plan the next day. Bush said that team effort was particularly important.

"Every generation kind of thinks the next one is soft, including me... I thought it was interesting to really work together," he said. "Every day that we think back to it, we're going to remember it very fondly and even more so as time goes on."

Scott Stowell is a freelance writer and photographer from Ely. He can be reached at scottstowell09@gmail.com.

New model might better predict spread of CWD

◂ **MODELING** from OW1
tation offers more information about the growth and spread of disease over time in an area than more typical distribution maps, which simply pinpoint where the disease is present or absent.

"We can model the growth of the disease in an area and how it's spreading through an area," Walsh said. "That allows us to look at what's affecting growth in the disease in the area. The other nice thing is that we can look at past management actions to see which ones may be most efficacious or most effective at slowing growth or preventing spread. That's how we think it could be useful."

The new model outperformed traditional prediction methods, according to the USGS.

"The traditional techniques describe the pattern in the current data that you have in hand," Walsh said. "This model is better at forecasting, projecting out where we don't have data yet. Looking at the process of growth and spread allows us to do better at predicting what the prevalence rates, for example, might be in future years."

The forecasting model uses sophisticated mathematics to make statistical inferences and forecasts about probabilities — in this case concerning the growth and spread in the prevalence of CWD in whitetails — to forecast and understand the mechanisms driving that growth and spread, the paper states.



DENNIS ANDERSON • danderson@startribune.com
U.S. Geological Survey scientists think they have come up with a better model for predicting where a disease like chronic wasting might spread before actual data is gathered.

Walsh and a USGS colleague developed the forecasting model with researchers at the universities of Kansas State, Colorado State and Utah State. Their work, presented in a paper published earlier this year, focused on an area of southwestern Wisconsin.

The study found that the disease grew rapidly during the latter part of the 2002-2014 study period, especially among older males, and that the trend likely would continue in that area, according to a USGS statement. The model found that CWD could spread nearly twice as fast in the Wisconsin River corridor than outside of it, USGS reported, and likely will grow faster in highly forested areas.

The study involved nearly 2,600 positive cases of CWD found in close to 104,000 deer in southwestern Wisconsin tested over that period. CWD, a brain disease that's fatal to deer, elk and moose, isn't known to affect humans.

Walsh said researchers will test the model on 2015-16 CWD data recently received from the Wisconsin DNR. Where this study looked at proportion of hardwood forest and human development, whether the area was within or outside the Wisconsin River corridor, and the sex and age of the sampled deer as variables that could predict CWD prevalence, future work will include more detailed variables.

"There's a lot of work still to be done on getting a good handle on the disease and its ecology and how it operates in the landscape," Walsh said. "This is going to be a good tool to help us start to nail down some of the big questions."

Applications are wide

The forecasting model, Walsh said, represents a relatively new application to wildlife disease of mathematical equations used to describe diffusion — picture a drop of dye spreading through a beaker full of water — and in weather forecasting, Walsh said.

It has applications beyond CWD. The Kansas State researcher has applied the model to the spread and growth of white-nose syndrome in bats, Walsh said, while the one at Colorado State has modeled the movement of an invasive species, Eurasian collared doves.

"It could be any kind of invasive species or disease, human or wildlife or agricultural," Walsh said. "Not knowing the data for sure, but something like Ebola or Zika cases where we have infection starting from a source and spreading out. Any type of diseases or invasive species that's introduced into an area and then spreads out would be a good case study for this type of tool or model."

The model offers a "solid foundation for characterizing disease growth in a location," said Minnesota DNR's Jennelle, who said he has been talking to the study's authors. Wisconsin, Jennelle noted, has a much larger data set to use.

"I'm definitely interested in using this approach if it might help us," Jennelle said. "I'm hoping that when we do surveillance again in that area this coming year we don't find any CWD. That would be the best thing. I hope our efforts to knock it down actually worked. We'll see this fall."

Jennelle said he also thought the forecasting model might be applicable to avian flu on a regional or national level.

"It would be interesting to see how it would apply to other systems and invasive species," Jennelle said. "Maybe it would be applicable to zebra mussels' spread. That would be really interesting."

Todd Nelson is a freelance writer from Woodbury.