

Tracking Pintails to Help Target Conservation Efforts

Exactly where a northern pintail duck places her nest has a big impact on her nesting success. If she chooses the wrong spot, all her eggs could be destroyed. And pintails really need better nesting success.



The pintail population plummeted during drought conditions in the 1980s and early 1990s. It has never bounced back. These days, the population is about 40 per cent below the long-term average.

So, researchers are striving to gain deeper knowledge about pintail nesting habits to help in targeting conservation programs. Some of this research is taking place in Prairie Canada, a major breeding area for these birds. As part of this effort, Dr. Jim Devries recently led a pilot project to assess the feasibility of using GPS tracking devices to delve into pintail nesting patterns.

Pintails are unusual in their choice of nesting sites. "A lot of ducks like thick vegetation around their nest, probably to hide from predators. But pintails will select nest sites with almost no cover. I have found pintail nests out in the middle of tilled fields that are just black dirt with not a stitch of cover," says Devries, a research scientist with the Institute for Wetland and Waterfowl Research (IWWR) of Ducks Unlimited Canada (DUC).



"So, pintails will choose nest sites in crop stubble. And often they are selecting those sites in April and early May, which is before crops are seeded in western Canada." As a result, the nests are at high risk of being destroyed when the seeding equipment goes through the fields in the following weeks. Researchers think the pintail's tendency to nest in crop stubble is one of the reasons why its population is not recovering.

Trailing pintail hens

"The main reason to understand what habitats are attractive to any duck species is to help in targeting habitat programs on the landscape. And the best way to know where those habitats are is to let the duck tell you," explains Devries.

"Using radio or GPS transmitters allows researchers to get a good idea of how the bird is moving around the landscape, where it eventually places its nest, and whether the nest hatches or not."

Some previous studies have placed transmitters on nesting female pintails to track duckling survival. However, hardly any efforts have tracked pintails from their wintering grounds all the way through their spring migration and the breeding season.

Such tracking information could be invaluable to waterfowl researchers in Prairie Canada. For instance, it could help them to better understand pintail nesting site selection and how nest location relates to things like nest starting date, nesting attempts and hatched nests. And they could potentially use the GPS data to find and visit individual pintails and their nests, and directly collect data on their health and behaviour.

So, Devries and Dr. Bob Clark of Environment and Climate Change Canada are collaborating with a U.S. study that is putting GPS markers on wintering pintails in California, Texas and Louisiana.

Dr. Bart Ballard of Texas A & M University is leading this multi-agency U.S. study. The three-year study, which started in 2018, is tracking differences in pintail body condition.

Ballard and his U.S. colleagues have found that pintails wintering along the Gulf Coast of Texas and Louisiana aren't in as good body condition as pintails that winter in California. "If that condition difference persists all the way to the breeding ground, then that might affect breeding success," Devries says. "Birds arriving on the breeding ground in better condition – more fat typically – will be more likely to nest earlier, devoting time to laying eggs and incubation, than birds in poorer condition."

The U.S. study is aiming to collect data on factors like the pintails' weights in their wintering grounds, habitats where they feed during their spring migration, their weights when nesting, and their nest success.

The task for Devries' team would be to find the nests of marked pintail hens settling in Alberta and Saskatchewan, capture the hens on their nests, and determine their body condition.

"However, before we fully committed to this task, we wanted to get a good handle on the amount of resources we'd have to put towards this," explains Devries. To do that, they needed to answer questions like: How much effort would it take to go out and get daily downloads of the GPS data? How difficult would it be to identify possible nesting sites using the GPS data? And how long would it take to travel to each possible site and thoroughly search for a nest?

The other practical question was whether the transmitter's backpack harness might affect the nesting behaviour of the birds. In the 1990s, Devries and his DUC colleagues had conducted research with mallards to compare different radio transmitter attachment types. They found that the birds with a backpack harness had more problems devoting time to nesting compared to the other attachment methods. The backpack harness is currently the only attachment type that works with the GPS transmitters on moderately sized birds like pintails.

A pilot to look at logistics

So, Devries led a pilot project in 2019 to assess these practical considerations. Funders for the pilot included the Alberta NAWMP Partnership's Science Fund, DUC-IWWR, the North American Wetlands Conservation Act Fund, the Alberta Conservation Association and Cabela's Canada Outdoor Fund.

"In 2019, out of a total of 32 marked pintail hens, 17 crossed into Canada. Ten of those settled in different parts of Alberta and Saskatchewan. By 'settled' I mean that the pintails spent time in wetlands and some upland locations that we thought might be nests," he says.



"We thoroughly searched about 75 potential nesting sites across southern Alberta and southwestern Saskatchewan. And we found only one nest, which was in southwestern Saskatchewan."

This really low nesting effort may have been because the marked pintails were not behaving normally.

"We think that when pintail hens settle in Prairie Canada, typically they stay in one general area, probably several square miles in size. They feed in the wetlands in that area and when they have enough reserves, they'll start laying a nest. [If the nest hatches successfully, they'll stay in that area all summer.] If the nest is destroyed, they might try one or two more times," he says.

“The one nesting pintail that we found had this typical behaviour. However, the other marked pintails would come to an area, stay for a week or two, and then jump quite a distance to some other area, stay for a while, and then jump again. We think this behaviour of moving around within the Prairies is rather abnormal.”

Devries suspects the backpack harness inhibited the pintails’ nesting efforts. Not only did his previous transmitter attachment research indicate this possibility, but his team sighted marked pintails spending a lot of time preening and fussing with the backpack straps.

Next steps

“The pilot study did exactly what we wanted it to. It gave us an idea of the logistics of trying to find nests of pintails fitted with the GPS transmitters. And it highlighted the fact that the transmitter attachment may be compromising the nesting behaviour a bit,” explains Devries.

“However, I think the type of information that the transmitters are providing in terms of bigger scale landscape selection within Prairie Canada probably has value.” In other words, Devries thinks the marked birds might still follow their normal behaviour when, for instance, they choose between a cropland-dominated and a grassland-dominated landscape. Such choices could be deeply ingrained in a pintail’s genetic makeup.

The U.S. researchers plan to put the transmitters on about 160 female pintails during each of the 2019-20 and 2020-21 wintering seasons. And some of those birds will come to Prairie Canada and provide GPS data on where they are stopping.

“We are not going to go out and try to find any pintail nests in Prairie Canada this year. In the future, if alternate GPS transmitter attachment methods are developed, we may try another pilot effort with nest finding,” Devries says.

“However, in 2020, we may use some of the GPS information to look at the characteristics of the landscapes in which these birds settle. The marked pintails could provide a great test to see how well our current models predict where pintails are actually going.”

Devries is referring to models he helped to develop in the mid-2000s. He and his DUC colleagues spent a lot of time searching for pintail nests to get an idea of where these ducks nested. From that data, they built models to predict how pintails will distribute their nests in a landscape and what nest success they will have in different habitats. Those models are used to guide pintail conservation efforts in Prairie Canada.

“Having a really good understanding of where pintails are settling and the characteristics of those landscapes helps us determine where to target our conservation programs,” he explains. Some of those programs involve protecting existing wetlands and grasslands, and converting some annually cropped land into grassland to provide safer nesting habitat for pintails.

DUC’s other key pintail habitat program focuses on encouraging farmers to grow winter wheat. “Winter wheat is a win-win. It is a crop that farmers can make a good profit on, it is attractive to pintails, and their nest success in winter wheat is really good,” he notes.

“Unlike most crops grown in western Canada, winter wheat is seeded in the fall and starts regrowing in early spring. That means pintails will nest in it and their nests will be undisturbed by spring seeding. Their nest success in winter wheat is higher than pretty much any other habitat, including grassland.”



Science Profiles

Devries' pilot project is just one piece of the overall research effort in Prairie Canada by DUC and its partners in Alberta NAWMP and the Prairie Habitat Joint Venture that is essential to helping pintail populations bounce back.