

Coming to our Senses on Swift Fox Recovery

By Jill Hockaday



Swift Fox
PHOTO: © CALGARY ZOO

Even decades after the last known sighting, swift foxes in Canada achieved a monumental milestone – the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended their down-listing from *endangered* to *threatened*.

However, success in conservation is fragile and frequently fleeting. The Calgary Zoo’s Head of Conservation

Research, Dr. Axel Moehrenschrager, a veteran in species reintroductions and co-chair of the National Swift Fox Recovery Team, knows that swift fox recovery in Canada still has many hurdles to overcome.

“It may be easy to bask in our past success, but there is still more work to do and questions we need to ask to secure a future for swift foxes in Canada,”

says Moehrenschrager. Is there enough swift fox habitat in Canada? What are the impacts of the oil and gas industry on fox survival? How does swift fox conservation in the United States affect the Canadian population? And what is the most effective and efficient way to conduct the next population census?

Through the Husky Energy Endangered Species Program at the

Photos from the Calgary Zoo's motion sensor camera study capturing swift foxes attracted to a scent post.

PHOTOS: © CALGARY ZOO



Calgary Zoo's Centre for Conservation Research (CCR), Moehrenschrager is working in collaboration with provincial and federal government agencies, conservation organizations, universities, industry, community associations and landowners to address these outstanding concerns.

Home on the Range

In Canada an important question is whether we have enough suitable habitat to support full swift fox recovery. Historically these tiny canids, moved freely through 1.6 million square kilometres of virgin North American prairie. In Canada their range once stretched from the foothills of southern Alberta to the Pembina Hills in Manitoba. Widespread conversion of native prairie to agriculture, increased industry activity and urban sprawl has minced this once-expansive range into small pockets of grassland. This alteration of habitat was the primary driver in swift fox extirpation from Canada in the early part of the 20th century.

Today, only about 25 to 30 percent of original prairie remains in Canada and much of this is scattered and isolated with few connecting corridors. Past research has shown that swift foxes thrive in large expanses of short or mixed-grass prairie with high prey availability and limited topographic features, cropland and roads. Currently, there are three small populations in Canada that share a connection through northern Montana.

For several years, researchers at the

CCR have studied swift fox habitat to identify key habitat associations and develop predictive habitat models.

"We've been using these models to advise the federal government and other stakeholders to determine where and which habitat should be protected to sustain the current population," says Moehrenschrager. "However, to fully recover swift foxes we need to project these habitat models into a wider landscape to identify new areas that would be good for foxes, so they can spread out naturally, through translocations or reintroductions."

One of the greatest challenges swift foxes face is that their range exists almost entirely outside of protected conservation areas. Nationally, nearly half of the remaining grasslands are publicly or privately owned and face cultivation or development. This means the support of landowners and local stakeholders and their inclusion in swift fox recovery is critical to the success of the entire program.

Oil and gas activity

Over the past decade Canada's southern prairie has experienced unprecedented intensive oil and gas development, much of it located in prime grassland habitat. The Centre for Conservation Research conducted a preliminary study on the impact of oil and gas development on swift foxes. Using motion sensor cameras, baited with scent posts and positioned near a selected group of oil and gas structures in

southwestern Saskatchewan, researchers were able to assess the visitation of foxes to these particular areas.

Surprisingly, results showed that foxes were regular visitors to oil and gas sites, even long after initial development. The study also suggested they did not respond differently to various types of structures. What is not fully understood is how foxes physiologically react to development and whether these areas are sink habitats – that is, do these areas experience higher rates of mortality and/or lower rates of reproduction in the long term? While it is positive to find foxes utilizing the areas, it is uncertain whether these are suitable long-term habitats for future generations of foxes. More work needs to be done to determine the impact of increased exploration activity and what level is compatible with swift fox existence.

The Montana factor

The Canadian swift fox reintroductions were in large part responsible for the establishment of two self-sustaining populations in Montana after their extirpation in the mid-1950s. So how does the recovery program in Montana fit into the puzzle? The sustainability of the Montana population is critical to the recovery of the entire swift fox complex. "The Montana population acts as a buffer to the Canadian population; with their co-dependence, the populations in Canada and Montana are thought of as a whole," says Moehrenschrager.



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Collaborative genetic research conducted in part by the CCR is necessary to understand how the population moves and fluctuates. Through hair and faecal genetics, researchers are studying the connectivity, dispersal and inbreeding coefficients of these populations.

Currently, the northern Montana and Canadian populations remain isolated from the core swift fox population in the central United States. Vital connection corridors are missing which would link the core populations in areas such as Kansas and Wyoming to the more northern populations. Montana Fish and Wildlife and the World Wildlife Fund are currently conducting camera trapping research in southern Montana to identify new areas that could support swift fox translocations or reintroductions. The ultimate goal is to expand the northern population enough to create a genetic bridge with the core population, in essence returning the natural swift fox linkages that existed several hundred years ago.

The search for a census model

The Calgary Zoo and its partners have been conducting swift fox censuses across the Canadian and Montana prairie for 15 years. One of the primary determinants shaping the upcoming census in 2012-2013 is the availability of sufficient funding. This is driving the team to consider other approaches such as potentially using motion sensor cameras to capture images of swift foxes,

though further assessment is still required to determine its feasibility.

The approach for the last three population censuses has been to subsample 75 percent of townships (10 x 10 km) in southeastern Alberta, southwestern Saskatchewan and north-central Montana with live traps. These were placed beyond the foxes' supposed range, in essence, enveloping the entire population with trapping grids. However, as foxes continued to spread out, it became increasingly difficult to enclose the population using the same sampling regime.

“New techniques will be necessary to assess population status over an increasing territorial range as live trapping requires frequent checking to release captured foxes. Motion sensor camera imaging is less invasive for the foxes, requires fewer people on the ground, is less time intensive and allows sampling of far greater areas,” says Moehrenschrager.

“Unfortunately the cameras don't provide us all the answers. We miss capturing critical data that we can gain through live trapping, such as an understanding of overall health, sex ratio or origin, and more critically, it gives us no real identification of individual animals. It could be six different foxes coming to the camera, or the same fox six times,” says Moehrenschrager.

In conjunction with camera trapping, a process called site occupancy analysis is used which determines the likelihood of foxes being present or not, in a

particular place. While this provides estimates on the presence and absence of the species, a hybrid of sampling techniques may be necessary to identify individual animals.

Thinking longer term

From a scientific point of view, there is good understanding of what swift foxes need to thrive and which areas are highly suitable and unsuitable. Now it's a matter of expanding the picture and looking down the road to guarantee longer term success. Here range protection is key. “We've had dialogue with both federal and provincial government in terms of implementing scientific recommendations for critical habitat. The science has been conducted and now it's a political process,” says Moehrenschrager. “The high level of cooperation between so many agencies and local stakeholders, across provincial and international borders, is quite compelling and is largely responsible for the program's success,” he adds. “Swift fox recovery is complex. It is critical that the simple language of ‘threatened’ versus ‘endangered’ doesn't lull people into a false sense of confidence. We need to ensure we don't lose the critical progress that's been made.”

Jill Hockaday is the Conservation Research Community Administrator for the Calgary Zoo's Centre for Conservation Research.