

Third in a series of reports on School Project Awards.

Icarus, the Sun and Microwave Telemetry—a Winning Combination

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The New Zealand falcon has been listed as threatened by the NZ Dept. of Conservation

Daedalus made wings out of wax and feathers for him and his son, Icarus, to escape the Minotaur's labyrinth. Enchanted by the fact that he could fly, Icarus tried to reach the sun but fell from the sky when he got too close and his wings melted. We overcame this problem by strapping a solar-powered PTT on the back of Icarus, our New Zealand falcon (NZF), and reaped a double dividend—insulation and power to burn!

As part of Microwave Telemetry's tenth anniversary celebration in 2001, they encouraged schools around the world to submit project applications to win a free PTT. New Zealand's Palmerston North Girls High School, in conjunction with Massey University,

was one of four winners. Never before had anyone been able to follow the secretive NZF so we were over the moon. With our prize in hand we were able to apply for a government grant to pay for satellite time—again we were successful.

The New Zealand falcon, *Falco novaeseelandiae*, occurs only in this country and is a species under pressure. It's thought there are about 400 breeding pairs of the bush falcon in the North Island but no one knows for sure. Because of its limited numbers, it has been classified as 'threatened' by the Department of Conservation.

We had heaps of good advice from Bill Green (formerly of the Canadian Peregrine Foundation), Ken Meyer (Avian Research and Conservation Institute) and Guan Oon (Argos) and before long we were set. We practiced fitting the PTT harness countless times, drove around a third of this small country, walked untold miles in the bush and then, one memorable morning (14 February 2002), we attached the 18g solar PTT to Icarus, a 540g NZF.

Since then we've been on a very sharp learning curve. At the start of each day we download the coordinates, convert them to a New Zealand grid reference and feed the results into ArcViewGIS to see where Icarus has been. During the first week or so Icarus flew an average of 40 kilometers per day but then settled into an average of about seven kilometers per day. Once a month the bird appears to go on a 'walkabout', sometimes venturing off 80 kilometers or so and then returning within 24 hours.

We've been lucky too—our bird spends most of the time in a commercial pine forest, Fletcher Forest, and the owners have been exceptionally helpful. They gave us one-meter resolution color orthophotos of the area as well as daily meteorological recordings.

We have a mine of data to work with. The high school girls (roughly five groups of five) have had a number of tutorials. The location data was sent to them and they became familiar with the technology.

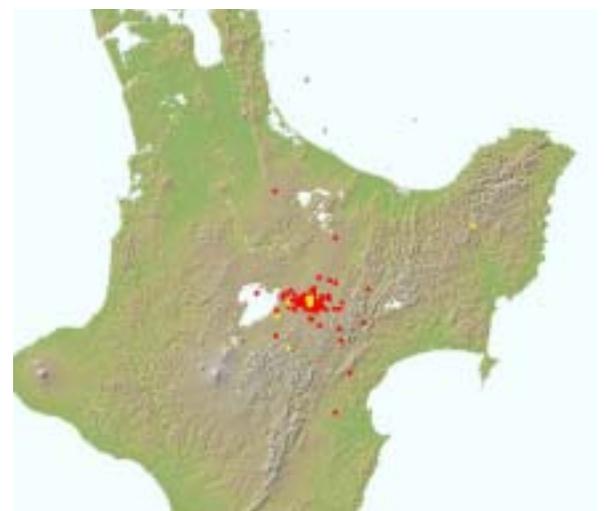
We confirmed that the NZF is a very sedentary animal and hoped to track the bird to its nest site during the 2002/3 breeding season. The nest was easily found and we confirmed the device had not harmed the bird at all, in fact, she went through the last breeding season smoothly, producing three chicks. Her chicks were weighed and banded and prey remains and castings collected from around the nest for examination. Using further funding from a government grant we put an infrared camera near the nest to record the comings and goings and how the birds nest and nurture their young.

Next, the students will correlate meteorological, biophysical, and location data and write reports on their findings. They will then make a presentation to the public. The school also hopes to do well in the 2003 National Science Fair.



Photos courtesy of Noel Hyde

Icarus, a 540g New Zealand falcon, is ready for release after being fitted with an 18g solar PTT



North Island, New Zealand. During the first few weeks, Icarus flew an average of 40 km per day, then settled in to an average of 7 km per day.



Data points indicate that Icarus made frequent foraging trips to feed hungry chicks.