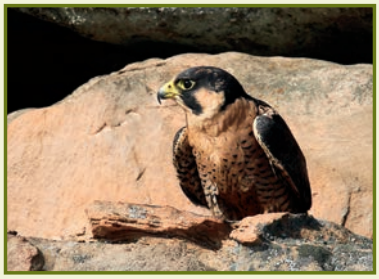

The Project

Monitoring peregrine falcons in the state of New York falls under the watchful eye of the New York Department of Environmental Conservation. More specifically, it is the job of one biologist, Scott Crocoll, who has been surveying and mapping peregrine nest sites for more than a decade out of their central office in Albany, NY.

Their Data Collection Challenges

Nest location is the main challenge in monitoring the peregrine falcon in New York State. Peregrines nest in both urban and wilderness areas across the state—from Buffalo in western New York down to New York City and Long Island and all the way up the Adirondacks almost to the Canadian border. The sheer vastness of this area means having to cover a large amount of territory as efficiently as possible. Where the birds nest—high up on cliff faces in densely wooded areas, on ledges atop skyscrapers, and along the support structures of bridges—intensifies the challenge.

Accessing nonurban nest sites typically involves long treks through densely wooded, mountainous areas and often traversing a body of water to reach the foot of the nest site. Getting there is only half the battle. For protection from predators, peregrines build their nests high above the ground in difficult spots to reach.

Urban nesting sites pose their own set of problems. First, there is gaining access to the buildings and bridges, which involves getting permission from the owners who, according to Scott, “aren’t really keen on having anybody climbing around on top of their buildings or bridges.”

Due to these difficulties, their department was one of the first in the state to actively embrace new measurement technology. As early as 1993, Scott and his then partner, John Ozard, introduced the GPS receiver for capturing location data at nest sites.

GPS definitely made gathering field data easier, but it still required them to physically occupy a location either above or below the nest. In the wilderness this meant standing at the foot of a cliff face, which is often extremely difficult to reach, and which blocks half of the line of sight access to the sky necessary for acquiring a signal from the GPS satellites.

In urban areas, it involved positioning yourself above the peregrine nest, either on the side of a building someplace or underneath a bridge. This meant taking an elevator all the way to the top of skyscrapers, finding some way to get out to the edge of the building without getting killed and then working your way into a position directly above the nest site for an accurate GPS reading. With bridges it often required blocking off a certain portion of the bridge to traffic.

CASE STUDY | Peregrine Falcon Nest Surveying and Mapping New York Department of Environmental Conservation

The challenges they faced, even with GPS, led New York's peregrine program to be one of the earliest to integrate laser measurement into their GPS solution. As a result, they have had firsthand experience over the years with the evolution of laser measurement in GPS/GIS applications.

Their Laser Measurement Solution

In 1996, Scott paired an LTI Criterion 400 Laser with what at that time was a backpack GPS unit. For better satellite signal acquisition, he included an external antenna attached to an extendable surveyor's pole. The addition of the laser meant no longer having to position the GPS unit directly above or below nest locations, but it still wasn't a perfect solution. "The Criterion was not without its limitations though," Scott recalls. "I could accurately log nest locations from a distance, but since it could only capture data at most 15 degrees above or below the horizon, I still had to find a position almost directly across from the nest."

Scott now uses the TruPulse 360 with wireless Bluetooth®, which he pairs with various GPS receivers from Trimble, Ashtech, Telus and Magellan running ArcPad® software. When he does fieldwork, two different manufacturers' GPS receivers can capture data from over 900 meters away if needed. Cliff height doesn't matter because the TruPulse 360 can shoot +/- 90 degrees. "Even if I'm standing at the bottom of the cliff face, I can shoot straight up at the nesting site and be able to hit the thing." Scott exclaims. "Plus, the TruPulse only weighs less than half a pound. This has been a wonderful improvement."

Advancements in laser measurement technology also help with Scott's urban data gathering. He no longer has to physically gain access to the buildings or bridges. According to Scott, "I can go to a site, set up down on the street someplace and have my data done in about five minutes. It's very fast."

Since the peregrine project has enabled them to test a variety of different technologies and equipment over a number of years, Scott has learned a lot about evaluating data-gathering solutions. "A key to not becoming overwhelmed by the options is to first figure out what you really need and go from there," he recommends. "Also, do a demo with the equipment at one of your project sites so you can see firsthand how the technology can help you complete the project better and faster."

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Measurably Superior®
Ph: 1.877.696.2584
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