

An account of four experiences with drones at cliffs with nesting falcons

Raptor Resource Project

Overview

While banding nestling peregrine falcons in 2017, the Raptor Resource Project worked with the Untamed Science film crew to collect footage of peregrine falcon banding in the Driftless area of Iowa and Wisconsin. Drones were used to collect footage at four sites. We wanted to share our experience to add to the bulk of knowledge about peregrine falcons and drones.

The Drones

Untamed Science uses white-colored DJI Phantom 3 and 4 Professional drones for filming. In flight, the drones are 20.5 inches wide by 7.7 inches high and their motors are spaced 350 mm diagonally. They are controlled by four rotors. The DJI Phantom 3 has a maximum ascent speed of five meters/second, a maximum descent speed of three meters/second, and a maximum level flight speed of sixteen meters/second. The DJI Phantom 4 has a maximum ascent speed of six meters/second, a maximum descent speed of four meters/second, and a maximum level flight speed of twenty meters/second. The DJI Phantom 4 also has an obstacle avoidance feature. When flying, both drones made a noise similar to that of an electric weed whip.

The drones are controlled remotely through a visual panel that allows the operator to see what the drone is “seeing”. If the operator loses control over the drone, it will return to its landing pad if it hasn’t been too damaged to do so.



Figure 1: The Phantom Three Professional



Figure 2: The Phantom 4 Professional

Drone operators kept the drones 500 feet or more from falcons and did not fly the drones at a level plane or elevation with known eyries or falcons in flight. The intent was to document our activities without disrupting falcons and they did not use the drones to pursue aerial falcons at any time.

Our Observations

Alliant Bluff, Lansing Iowa [43.334722, -91.164167], 10:00AM CT

On June 3rd, 2017, the Raptor Resource Project and the Untamed Science film crew went to a bluff behind the Alliant Energy power plant in Lansing, Iowa to band nestling falcons and obtain footage of banding at a cliff nest box. One adult female peregrine was present. The adult male was not spotted during the time of our visit.

Bander Amy Ries and filmmaker Jonas Stenstrom rappelled down to the nest box, where they discovered three dead nestling falcons: two males and one female. The carcasses were put into a kennel and taken to the top of the cliff for a field examination. While Ries ascended to help conduct the field observation, Stenstrom remained at the nest box.

After some initial kekking, the adult female falcon had seemingly disappeared. She could not be seen in any of her favored perching spots as identified by Ries and two volunteer monitors earlier in the year. The Raptor Resource Project and Untamed Science decided to launch a drone to collect footage of the cliff. Five spotters were deployed with the understanding that if peregrine falcons appeared to react to the drone, it would be immediately brought down. As can be seen from the video footage, neither of the adults approached the drone or were spotted in the area while the drone was flying.

A field examination revealed that the young falcons were extensively bitten under their wings, around their eyes, and in the skin above their ceres. Given that we had already documented blackfly strikes and sent a falcon with similar bites to the Raptor Center for necropsy, we left the carcasses on a mound at the top of the cliff.

Guider's Bluff, Lansing Iowa [43.346140, -91.193744], 12:00PM CT

After filming at Alliant, the Raptor Resource Project and the Untamed Science film crew went to Guider's Bluff, also in Lansing, to band nestling falcons and obtain footage of banding at a cliff eyrie. Ries had confirmed the presence of peregrine falcons earlier in the year, but was not sure where exactly they were nesting on the cliff. We talked with local observers and deployed five spotters below the cliff to watch for peregrine falcons flying into or out of potential eyries, including one that Ries had spotted them at in April of this year. The spotters did not see or hear peregrine falcons in the first fifteen minutes of watching.

After twenty minutes of watching, turkey vultures began kettling over the cliff and flying in front of the cliff face. Again, no peregrine falcons were seen or heard, although they do not always respond to turkey vultures. After twenty-five minutes of watching, two adult bald eagles passed in close proximity to the cliff face. Again, observers neither saw nor heard peregrine falcons. At this point, we began to suspect that there were no falcons present, since falcons usually respond to adult bald eagles near their eyries.

The Raptor Resource Project and Untamed Science decided to launch a drone to get footage of the cliff face and look for signs of falcons or an eyrie. Again, five spotters were deployed with the understanding that if peregrine falcons appeared to react to the drone, it would be immediately brought down. In a ten-minute period, we neither saw nor heard peregrine falcons. We decided to lower the drone

and explore the pothole that Ries had spotted the pair at earlier in the year. If nothing else, we could get some footage of climbers descending a cliff.

Dave Kester, Strenstrom, and Ries roped up and rappelled to the suspected eyrie, which was about 100 feet below the top of the cliff. Much to our surprise, we had an active peregrine falcon eyrie with four healthy young that were around 21 days old. The crew banded the young at the eyrie and left. As can be seen from the video footage, neither of the adults approached the drone or were spotted in the area while the drone was flying. We found it interesting that neither adult peregrine falcon responded to the drone despite its proximity to the eyrie. It is worth noting that neither of the adults were especially aggressive and did not come in close proximity to the two banders or the lone photographer.

12-Mile Bluff, Alma, Wisconsin [44.3095833, -91.5423], 11:00AM CT

The Raptor Resource Project and Untamed Science went to 12-Mile Bluff on June 5th to band nestling falcons and obtain footage of banding at a cliff. We knew that falcons were present and nesting in a nest box in a large pothole on the cliff.

Kester rappelled to the eyrie, flushing the female falcon from the nest box. He found five eggs. Given their vivid color and lack of pigment flaking, he assumed that they were relatively fresh and he began ascending immediately. Although the female falcon did not strike Kester or come close to him, she began a territorial defense as soon as she was out of the box and Kester was the center of her attention.

Based on our previous two experiences with falcons and drones, the Raptor Resource Project and Untamed Science decided to launch a drone while Dave was ascending. Five spotters were deployed with the understanding that if peregrine falcons appeared to react to the drone, it would immediately be brought down.

The drone was flown to the west, in front of the cliff, where it hovered several hundred feet in front of it. In the footage, a falcon can be seen swooping towards Dave, although it does not come close to him. It does not appear to notice or approach the drone.

Maiden Rock, Maiden Rock, Wisconsin [44.5, -92.2866666], 12:00PM CT

After 12-Mile Bluff, we went to Maiden Rock. We knew where the eyrie was and a falcon entered it within five minutes of our arrival, so we knew it was active. Three rappellers (Kester, Rob Nelson with Untamed Science, and John Howe with RRP) rappelled to the Maiden Rock eyrie, which is located on a wide rock ledge along a horizontal crevice. They found three healthy young falcons roughly 19-21 days of age, which they loaded into a kennel for banding at the top of the cliff. All three rappellers stayed at the eyrie.

The adult falcons displayed a relatively high level of territorial aggression, calling and flying around the eyrie without coming close to or striking the rappellers. After observing the interaction between the falcons and the rappellers, Untamed Science received permission from the DNR property manager to launch the drone. Given that these falcons were more aggressive than those previously filmed, eight spotters were deployed and the drone was launched at a 90-degree angle from the top of the cliff to minimize the chance of an interaction within the falcons' airspace.

During the entire time the drone was hovering above the cliff, the falcons remained focused on the banders at the eyrie and did not react aggressively to the drone, although the female appeared to notice it. Dean Peterson, a former Fish and Wildlife Service employee with experience releasing and banding bald eagles, observed that the female peregrine turned her head to watch the drone when it flew over her, but did not deviate from defending her eyrie to attack it.

Discussion

In deciding to allow use of drones at our eyries, we needed to weigh the likelihood of falcons striking at or interacting with the drones versus the usefulness of using drones to film their territory and help locate potential eyries. While videos have been posted showing various birds of prey interacting with or striking at drones, the potential use of drones with cameras for the observation of wildlife could be very beneficial to wildlife management agencies and researchers. We enacted a very conservative and careful plan to experiment with drone filming for both reconnaissance and documentation. While care was taken to avoid any interaction between peregrine falcons and the drones, we were surprised they didn't react more aggressively. We considered the following factors in their lack of response:

- The falcons at Maiden Rock and 12-Mile Bluff may have assigned a higher priority to defending against obvious threats at their eyries than to potential threats further away.
- The falcons may not have recognized the drones as a threat. Drones do not look like or move like birds of prey, and falcons have no experience to help them identify drones as dangerous.
- Not all falcons are willing to strike unknown or large targets. We know from experience that many falcons are not willing to strike people, and some will not even come close. The same likely holds true with other large and/or unknown threats such as drones.
- Since we took care to keep drones away from known eyries and outside a level plane with flying falcons, the drones may have been outside the falcons' territorial zone. Falcons often ignore other birds of prey that aren't close enough to constitute a threat.

Although it appears that at least some nesting falcons won't automatically attack drones in proximity to their eyries, our observations leave many questions unanswered. Would it be safe to fly drones in falcon airspace when the falcons weren't distracted by threats at the eyrie? Would especially aggressive falcons be more likely to attack a drone? Would falcons be more likely to attack a drone that looked or moved like a falcon or a threat to falcons? Would non-territorial falcons attack drones off-hand? The behavior of the adult falcons at Guider's Bluff was most puzzling to us. Why didn't they defend or even alarm call in response to the drone we flew in front of their cliff? We didn't think we would find any falcons to band considering their complete lack of response to both bald eagles and our drone.

Given the potential conservation risks and rewards of drone usage, we need to know more about how to use them safely around birds. We hope our observations are helpful to agency personnel and researchers who are considering the use of aerial cameras/drones for monitoring and management of raptors.