

# To Catch a PREDATOR

## REMOTE VIDEOGRAPHY OF GROUND NESTING BIRDS

by Peter Coates and Michael Casazza

Like James Bond and Sherlock Holmes, even the stealthiest spies and investigators have nothing like the covert gadgets that are currently employed by wildlife researchers. Well-camouflaged micro-cameras with digital video recorders (DVR) have been deployed at a variety of locations to collect critical information by spying on nesting birds. The information captured from video systems is used to inform management about bird populations and identify who's who among nest predators, as well as to investigate factors related to predation and incubation behavior. Many scientific studies have reported that nest predation can be a limiting factor for avian population productivity and sustainability. Although this video technology was developed for security purposes, it has proven to be an effective tool to aid in the conservation and management of bird species and their habitats.

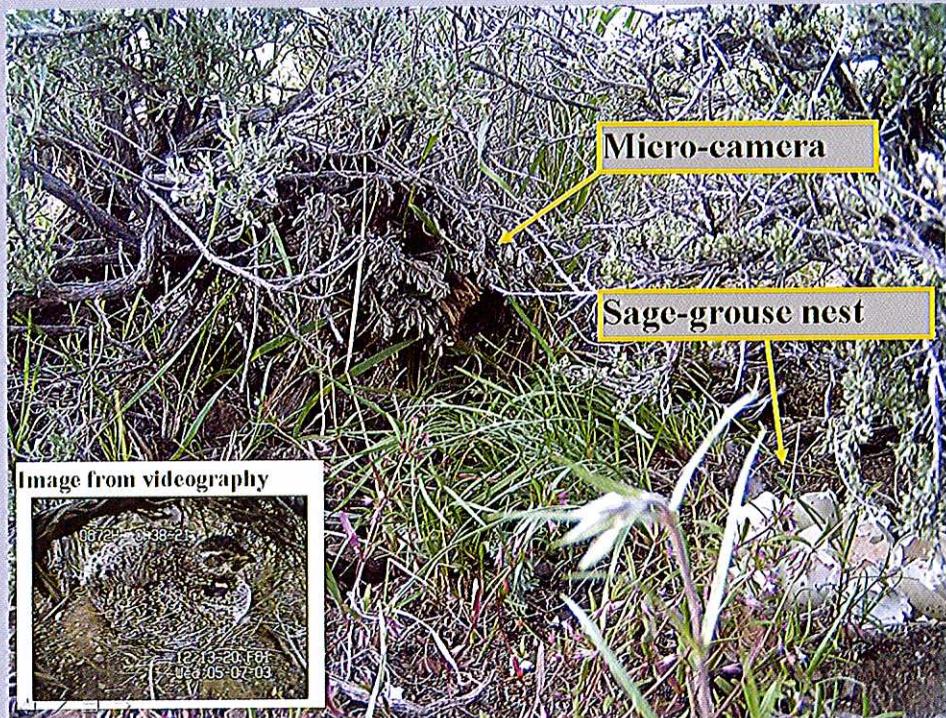
The best type of video-monitoring system to deploy depends upon the species being studied and the environmental conditions. In general, an advanced sys-



This screen shot caught a raven, the study's most common nest predator, red-handed.

Photo Courtesy of USGS

tem consists of a high-resolution micro-camera (about the size of a roll of quarters) equipped with infrared-emitting diodes to allow night vision. A thin cable extends 150' from the camera to a silent DVR that collects around-the-clock data. The hid-



Micro-cameras are about the size of a roll of quarters and equipped with night vision for around-the-clock monitoring.

Photo Courtesy of USGS

den cable allows the entire system, including the deep-cycle, gel-celled battery, to be placed away from the nest to prevent either attracting or deterring predators. Most systems are placed in remote locations where options to power the unit are limited. Because using

glimpse into the black box of predator-prey interactions. One recent finding from a study we conducted on sage-grouse indicated that ground squirrels may sometimes be unfairly linked to nest predation. As it turns out, ground squirrels that we have captured on video in the western U.S. were not capable of

### Reviewing footage is like taking a glimpse into the black box of predator-prey interactions.

hard drives to store images consumes energy rapidly, memory cards are used instead. When electric power is available, networked computers allow the streaming of live video through the internet while storing data on a server.

Reviewing footage is like taking a

opening sage-grouse eggs because of limitations in their jaw size. In other words, eggs from these large-bodied birds were simply too big for ground squirrels to open. In addition, video revealed that ground squirrels often visited nests after hatch or after predation by the actual predator and simply consumed remains

of eggs. Perhaps these critters were implicated as nest predators based on evidence left at the scene of the crime: scat and tooth-marked egg shell fragments.

And while videography has captured numerous species of nest predators, including bobcats, coyotes, badgers, and weasels, one of our important findings indicates that the common raven is responsible for the most nest damage of the several nesting species we studied. This should be of conservation concern considering that numbers of ravens have increased an estimated 300 percent in the past 27 years in the US, including 1,500 percent increases in some areas of California. The primary reason for this increase appears to be largely related to human activity. Human-altered landscapes provide resources (e.g., landfills and roadkill) that act to increase raven reproduction and survival.

However, the relationship between predators and their prey is not simply a matter of population numbers. Habitat composition plays a significant role in whether or not a nest is successful by impacting the likelihood that a nest will be detected by the keen eye of a raven or the nose of a fox or coyote. Evidence from our remote videography and field measurements indicate that a reduction in nesting cover coupled with an increase in raven numbers is associated with high predation rates of sage-grouse. Ravens use visual cues to hunt, and the loss of nesting cover appears to increase their hunting efficiency.

Videography has revealed even more complexity to this issue. As it turns out, with sage-grouse the number of ravens in the environment influenced the time of day when the female grouse moved to and from her nest to forage, as well as the amount of time she spent foraging. Thus, elevated predator numbers and habitat loss may place excessive physiological stress on birds during the nesting season and may even partly explain nest abandonment that occurs without any clear reason. Similar studies can be conducted

on nesting waterfowl to help identify important nest predators.

Okay, maybe spying on nesting birds is not a threat to national security like the threats that James Bond often faced. But you have to admit, this technology has

## Similar studies can be conducted on nesting waterfowl to help identify important nest predators.

led to some interesting discoveries about predator-prey interactions and has allowed us to identify nest predators with a degree of certainty that was previously not possible when we were limited to simply examining after-the-fact evidence

at depredated nests. These tools can provide valuable insight into future waterfowl management programs and the information will be crucial to help us in managing our natural resources in a changing environment. In this case, we should heed the words of the character Sherlock Holmes who stated, "It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts." 

*Dr. Peter Coates and Michael Casazza conduct avian research for the USGS Western Ecological Research Center.*



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