Abstracts

Use of Remote-Sensing Cameras in Wildlife Management

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Inn of the Hills
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WHAT TECHNOLOGY IS OUT THERE?

K. A. CEARLEY, Extension-Associate Wildlife, Texas Cooperative Extension, Department of Wildlife and Fisheries Sciences, 7887 U.S. Highway 87 North, San Angelo, TX 76901-9714

Abstract: The majority of the camera systems available to the general public today which are suitable for unattended wildlife observation are infrared-activated. Generally, the systems can be categorized as either passive infrared (PIR) or active infrared (AIR). PIR systems are generally activated by simultaneously sensing motion and a difference in temperature between ambient conditions of the background and the subject. AIR systems are activated when the subject crosses the invisible "beam" that extends between the transmitter and the receiver, and interrupts the infrared emission. Both types can be adjusted for sensitivity to allow for monitoring selected subjects. Further, systems can be divided into 35MM photography, digital still photography, digital video, and VHS video. 35MM units are available which use PIR and AIR activation. Most digital still photography units are PIR activated and use a flash card for digital storage of images which can either be viewed in the field with a hand-held LCD monitor, or can be downloaded on a computer for long-term storage and viewing. Likewise most digital and VHS video units are activated by PIR, and store images on flash cards and VHS video tapes respectively. The majority of the units are powered by dry cell batteries. The larger units, such as VHS video, are usually powered by gel cell batteries and can be charged by a photovoltaic cell (solar panel). A summary of various units and their respective websites will be included in the workshop handouts.

Notes:

CENSUSING DEER POPULATIONS USING REMOTE CAMERAS

HARRY A. JACOBSON, Professor Emeritus, Department of Wildlife and Fisheries
Mississippi State University

Abstract: My experience with infrared camera censuses has spanned a fifteen-year period. While a professor, I conducted extensive research on census techniques for deer and black bear. Since retirement, I have used infrared-triggered cameras to conduct deer censuses for clients in eight states (Arkansas, Florida, Kentucky, Louisiana, Michigan, Mississippi, New York, and Texas) and in Mexico. The environments I have conducted deer camera censuses in range from the habitat of mule deer in the Sonora Desert to that of white-tail deer in the boreal forest. I have found the cameras to be superior to every other census estimate for deer. When properly conducted I have found winter camera survey estimates provide very acceptable results in all habitat types. However, when censuses are conducted in the fall, they generally underestimate doe numbers and badly underestimate fawn numbers. Fall censuses generally provide adequate representation of bucks present on an area but should not be used for population estimates unless several years of data are available for both fall and winter surveys. When this is done, the degree of error in fall surveys can be determined and correction factors can be added to obtain pre-hunting season population estimates. In addition to the standard method of population estimates from identification of buck numbers by individual bucks photographed, another population estimate can be made by comparing photos of harvested bucks to those in fall camera censuses. By determining the ratio of bucks harvested that were previously photographed to those which were harvested but not previously photographed, it is possible to obtain yet another estimate of buck numbers. For management purposes, I often use a combined fall and winter census of individual bucks photographed, harvest data and the sex and age ratios obtained in a winter camera census to reconstruct fall population estimates. The values of camera surveys are not limited to census. Other uses include determining buck age structures and harvest quotas by age class, identifying specific bucks to either include in the harvest or protect from harvest, to identify general animal condition or presence of diseased or injured animals, and to measure management progress in antler qualities, sex ratios, fawn recruitment and buck age structure from one year to the next.

Notes:

INFRARED-TRIGGERED CAMERAS: A VALUABLE TOOL FOR PATTERNING WHITETAILS

JAMES C. KROLL, Director, Institute for White-tailed Deer Management and Research, Arthur Temple College of Forestry, Stephen F. Austin State University, Nacogdoches, TX 75962

Abstract: Infrared-triggered cameras and monitors have been used successfully in white-tailed deer management, providing valuable demographic information such as sex ratios, fawn crop, recruitment and age structure. It even has been possible to develop accurate population estimates using these devices. But, the purpose of managing deer, in most cases, is to improve the quality of deer and the hunting experience. Learning to pattern deer certainly enhances the experience. Patterning is the art and science of determining what your deer are doing, where they are doing it, and when they are doing it. The idea is to develop a hunting plan that anticipates the activity patterns of your deer. Infrared-triggered cameras provide such a tool. The cameras can tell you much about the daily activity patterns, and how they may be affected by moon phase and position, weather, time of year, hunter activity, etc. We conducted years of research here at the Institute on what factors appear to affect deer activity patterns. Whitetails have the same activity peaks (pre-dawn, mid-day and late evening), no matter which moon phase or geographic location. The magnitude of activity peaks can be affected, however, by various environmental and man-caused factors. Comparisons of activity patterns for hunted and unhunted deer, for example, indicated mature bucks tend to become increasingly nocturnal, and this tendency seems to be genetic rather than learned. Timing your hunting schedule to peak activity, rather than "old wive's tale wisdom," will greatly enhance your chances of success. Further, infrared cameras permit you to study the type of bucks available on your hunting territory. Even the best hunter cannot harvest a quality buck if these animals do not exist on the property. Hence, the cameras provide an inventory of the bucks available; and allow you to assess your chances for success. Uses of infrared-triggered cameras are limited only by your imagination. For example, we have used them to determine timing on the phenology of antler development and breeding. By monitoring your herd from mid-summer through late winter, you will be able to determine the annual period of velvet stripping, rub and scrape establishment, locations of sanctuaries and staging areas, breeding, antler casting and bachelor group formation and breakup. Although addition of these "high-tech" devices to your hunting arsenal might seem to violate fair chase, our experience is that 1) merely knowing the buck is present does not guarantee you will harvest him, and 2) the total experience is enhanced by expansion of the hunting season. Other
applications of the cameras include advertising and marketing of hunting operations, using photographs obtained prior to the current hunting season.

Notes:

DEER RESPONSE TO TRADITIONAL AND NON-TRADITIONAL SCENTS IN MOCK SCRAPES

BEN H. KOERTH, Research Associate, Institute for White-tailed Deer Management and Research, Arthur Temple School o f Forestry, Stephen F. Austin State University, Nacogdoches, TX.

Abstract: Using remote-sensing cameras to count deer usually involves placing the cameras over baited areas or near feeders. However, this often leads to a high number of photographs of non-target animals that are also attracted to bait and feeder sites. It is known deer are attracted to particular visual and olfactory cues. We hoped to use these traits to become more species specific in the animals captured on film. In a 3-year study, we researched the use of commercial deer scents applied to mock scrapes and their effectiveness in photographing deer. Treatments the first year included mock scrapes alone, dominant buck urine alone, estrous doe urine alone, and combinations of urine scents and mock scrapes. All treatments received visits by deer. However treatments receiving the most use were urine scents combined with mock scrapes. A visual cue combined with an olfactory cue appeared to attract deer more frequently. However, little is known whether the animals were attracted to scents used in mock scrapes primarily as a sexual attractant or simple curiosity. To determine the effectiveness of traditional deer scents, the next 2 years we compared buck and doe urine scents to some non-traditional scents in mock scrapes. Using scents in mock scrapes reduced the number of non-target photos significantly. In all years, the majority of deer visiting the mock scrapes were bucks. Using mock scrapes with scents appeared to capture an unbiased sample of all ages of bucks. Thus, using scents with mock scrapes may be a useful method to inventory the buck segment of the population. However, it probably would be a poor technique to determine sex and age ratios needed for a total population estimate.

Notes:

USING REMOTE CAMERAS TO MONITOR SPECIES VISITATION AT FEEDER STATIONS

DALE ROLLINS, Professor and Extension Wildlife Specialist, Texas Cooperative Extension, Department of Wildlife and Fisheries Sciences, 78887 U.S. Highway 87 North, San Angelo, TX 76901-9714

Abstract: Providing supplemental feed to deer and other wildlife is a common management practice in Texas. However, few practitioners can gauge whether such practices are effective, either biologically or economically. Feeder use by nontarget species (e.g., raccoons) often accounts for > 50% of the activity at such feed stations. Remote-sensing surveillance with various camera (35 mm, digital) and video units allow managers to estimate feed use by various animals. Most of the feeder surveillance that I've conducted since 1993 has been with active-infrared units (i.e., TrailMaster 1500), and to a lesser degree with passive-infrared units (e.g., DeerCam, Buckshot 35). When monitoring free-choice feeders, block off one side of the feeder to force visitations on the side nearest the camera. Set the camera about 25 feet away and make sure that the entire feeder (plus about 10 feet on either side) is "covered" by the viewfinder of the camera. I use 400 ASA film and have good illumination out to about 35 feet. For active-infrared units, attach the transmitter and receiver solidly (i.e., with screws) to the trough. Be sure and bury (or otherwise protect) the camera cable, else it will be chewed into by rodents or rabbits. From a research standpoint, I want to ensure that each photographed "event" is "independent", i.e., that it is a random observation. To do so, I use a time-delay interval of 30 minutes between photographs. This timing usually provides about 2-3 days of surveillance with a 36-exposure roll of film. Take at least 100 frames of film at each feeding station, then compute the visitation rates by various species. While visitation rates can be estimated with still photography, feed consumption cannot. However, newer technology (e.g., video surveillance) could be used to determine bite counts and feeding times to estimate consumption by species. You may also want to compute the visitation rates at feeders over the 24-hour period and seasonally. If you are observing considerable use at feeders during daylight hours (especially mid-afternoon), odds are that nontarget species (e.g., raccoons) are monopolizing the feeders at night. Using a cage trap at feeders can reduce the visitation rate by (and presumably feed loss to) raccoons.

Notes:

FEED EVALUATION USING 35MM REMOTE-SENSING CAMERAS: WHERE DO I START?

CRISTY G. BROWN, Instructor, Wildlife Science, Tarleton State University, Stephenville, TX

Abstract: Millions of dollars are spent on supplemental feeding of wildlife every year. How much of that feed is actually reaching the species of interest? One method for determining the success of supplemental feeding programs is to use 35mm remote sensing cameras. By using the correct experimental design, 35mm remote sensing cameras can help evaluate effective feeder placement, determine the effectiveness of alternative feeds and allow the property owner to have photographic proof of animals frequenting their property. To determine where cameras/feed sites should be placed, use a map of the property and determine the different habitat types (uplands, lowlands, planted food plot areas, etc.). To best represent the property, one should have equal representation from each of the habitat types. When evaluating different feed types it will be necessary to have a cluster of feed sites at each random point within that habitat type. The cluster will include the alternative feed(s) being evaluated and a control feed (usually whole corn). Cameras should be set up to take pictures continuously on a 10-minute interval to avoid duplicate pictures. The first picture for every camera should include the feed site number. This may be painted on the feeder or written on paper and held in front of the camera. By taking this first picture, photographic results will be matched to the appropriate feed site. Cameras should be operational for at least 2 weeks and should be checked every other day (or more often if necessary). After photographs are developed, results will need to be analyzed. The property owner will then be able to determine which feeder sites were most effective and whether the alternative feed was more effective than the control. The use of remote sensing 35mm cameras can help make supplemental feeding programs more cost-effective and provide valuable information about wildlife feeding habits.

Notes:

EVALUATING FEED PREFERENCE USING LOW-END VIDEO SURVEILLANCE

BEN D. TAYLOR, Graduate Research Assistant, Texas Agricultural Experiment Station, 7887 U.S. Highway 87 North, San Angelo, TX 76901-9714.

Abstract: Over the past year we have utilized the Trophyview video surveillance camera system to document feed preference of white-tailed deer, feral hogs, and raccoons exposed to whole cottonseed. We selected the Trophyview system using 3 principles: (1) quantity and quality of data, (2) clarity of picture and field of view , and (3) system simplicity and cost. On the basis of the quantity of data, video surveillance system best suited the objectives of the project as it was important to record if the animals were actually consuming whole cottonseed (we have recorded instances of raccoons visiting feeders with whole cottonseed, but cannot determine if they consume the feed by looking at a 35 mm still photograph). It is also possible to estimate intake rates by animals by counting bites per minute. The Trophyview system has a high enough quality picture that allowed us to record species visitations and sex of deer. The daytime depth of field of the cameras is restricted only by the distance the camera is placed away from the feeder. But the power of the infrared light source limits the depth of view at night (about 5 yards away, and 3 yards wide). The Trophyview system is all enclosed in a weather protective housing, and is simple to set-up. It met our cost requirement as one system could be purchased for about $1,000. The system could be enhanced if it included a programmable delay interval between successive events.

Notes:

USING REMOTE CAMERAS TO STUDY QUAIL NESTING

DALE ROLLINS, Professor and Extension Wildlife Specialist, Texas Cooperative Extension, Department of Wildlife and Fisheries Sciences, 7887 U.S. Highway 87 North, San Angelo, TX 76901-9714

Abstract: Low nesting success is one factor contributing to the decline of bobwhites across much of their range. Over the last 10 years, several studies have used remote surveillance to monitor nest depredations. All of the work I've been involved with has used active-infrared 35 mm camera units (TrailMaster 1500) to monitor fates of simulated ("dummy") nests. We've used this system to characterize the modus operandi of various nest predators. This employs a nest containing 3 chicken eggs situated on a line between the receiver and transmitter. The sensing beam should be positioned just above ground level (remove any vegetation that may cause false events). Position the camera about 10 feet away; I prefer a low camera angle (about 2 feet off the ground). Protect the camera cable from rodents by encasing it in PVC pipe or securing it off the ground in overhead tree limbs. For this type of surveillance, I recommend a camera delay interval of about one minute between successive photographs. Coupling remote cameras with "dummy nest" transects (to monitor actual rates of nest depredation; see *http://teamquail.tamu.edu* for more information on Texas Quail Index) provides a convenient way to assess the relative importance of potential nest predators. More recent video technology has enhanced our understanding of nest depredation even more. In addition to the "traditional" nest predators (e.g., raccoons, skunks), video surveillance has identified novel depredations by nontraditional predators, including white-tailed deer and barred owls. Web sites where such video can be viewed include: Tall Timbers Research Station (*http://www.ttrs.org*) and the Ames Plantation (*http://www.amesplantation.org/video/clip02.html*).

Notes:

USING REMOTE CAMERA SYSTEMS FOR MISCELLANEOUS SURVEILLANCE

JOHN WALKER, Resident Director, Texas Agricultural Experiment Station, 7887 U.S. Highway 87 North, San Angelo, Texas 76901-0714.

Abstract: Four types of wildlife surveillance cameras were compared 1) passive (TrailMaster 500), or 2) active (TrailMaster 1500) 35 mm film cameras, passive low end digital (Game-Vu) and passive low end video (Trophyview). The low end digital and video cameras were the simplest to operate, while the active 35 mm was at least an order of magnitude more difficult to keep operational. The low end digital camera had the least sensitive infrared detector which sometimes resulted in images in which the subject could not be identified because it was so close that it filled the viewing area. The passive 35 mm cameras had the highest incidence of "false events", i.e., frames in which no animals were detected. Overall the quality of images on the low end digital cameras were significantly worse than the other systems but nonetheless were of sufficient quality to distinguish bucks from does and does from fawns. However, identifying individual bucks based on antler morphology would be difficult with the low end digital units. The low end video provided interesting insights into the behavioral attributes as well as providing images of deer from several angles, which combined with the behavioral variation assist in identification of individual bucks. However, the video system also requires the greatest amount of time to view and classify the images. A major advantage of the digital and video camera is that the variable cost of operation is essentially zero. The importance of defining your objective for using wildlife surveillance cameras before choosing a system will be discussed. A brief overview of 22 passive 35 mm systems, 6 passive digital, and 3 video systems will be presented. Unique uses of wildlife surveillance cameras will also be presented.

Notes:

INFORMATION MANAGEMENT: STORAGE AND RETRIEVAL

JEFFREY SORELLE, Computer Specialist, Texas Cooperative Extension, 7887 U.S. Highway 87 North, San Angelo, TX 76901-9714.

Abstract: Remote-sensing cameras can be used to collect data, and a lot of it, on a variety of wildlife-related behaviors. This session demonstrates simple methods using Microsoft's Excel spreadsheet to help the wildlife manager calculate, analyze, and categorize field data obtained from remote-sensing cameras. With a few simple built-in Excel functions, spreadsheets can be created easily to better organize, analyze, display, and report their data. This session will be comprised of two parts. The first part will illustrate how to use Excel to create data collection forms and how to use the spreadsheet to do calculations and analyze the data. The second part will demonstrate Excel as a limited database for categorizing pictures taken at remote sensing locations. This session will also show how to retrieve this information for summary or reporting use.

Notes:

Saturday Morning Field Session Notes on various units	
Active 35 mm units **(Ben Koerth)**	
Passive 35 mm units **(Dr. Harry Jacobson)**	
Video units **(Dr. James Kroll)**	
“Build your own” units **(Ken Cearley)**	

PARTIAL LIST OF SOURCES FOR WILDLIFE SURVEILLANCE CAMERAS

August, 2002

Name of unit	*Type of unit*[1]	*Telephone*	*Website*
Buckshot35	Passive, 35mm	800-284-9005	www.deercams.com www.buckshot35.com
CamTrakker	Passive, 35mm digital	800-654-8498	www.camtrakker.com
DeerCam	Passive, 35mm	800-527-0305	www.nontypicalinc.com www.deercam.com
Fieldcam	Passive, active, video	281-474-1388	www.fieldcam.com
Game Cam	Passive, 35mm	800-653-3334	www.moultriefeeders.com
GameScout	Passive, 35mm	334-863-2002	www.gametronix.com
Game-Vu	Passive, digital	218-825-0733	www.gamevu.com www.naturevisioninc.com
Hawk-Eye Jr.	Passive, 35mm	229-883-4706	www.game-country.com
Jesse's Hunting Page	Do-it-yourself		www.jesseshuntingpage.com
Phantom Hunter	Passive, 35mm	877-769-4119	www.phantomhunter.com
Photo Hunter	Passive, 35mm	651-738-0925	www.trailtimer.com
Photoscout	Passive, 35mm, video	800-758-2346	www.highlandersports.com
Photo Trapper	Controllers, sensors		www.phototrap.com
Sandpiper Technologies	Active, passive video	209-239-7460	www.sandpipertech.com
ScoutCam	Passive, 35mm	920-540-3336	www.scoutcam.com
Scoutpro	Passive, 35mm, digital		www.dreamwater.org/sport/scoutpro/

Sources (con't)

Stealth Cam	Passive, 35mm	800-929-6244	www.bossbuck.com
Stump Cam	Passive, 35mm	903-376-9629	www.stumpcam.com
TrailMAC	Passive, 35mm, digital	866-222-2849	www.trailsenseengineering.com
TrailMaster	Active, passive, 35mm, video	800-544-5415	www.trailmaster.com
Tree-Spy	Passive, active, digital, video	912-458-9333	www.treespy.com
Trophyview	Passive, video	800-256-0221	www.trophyview.com www.wildlifecameras.com
Wildlife Pro	Passive, 35mm, digital	800-647-5368	www.forestry-suppliers.com
WoodsWatcher	Passive, 35mm	888-756-3553	www.woodswatcher.com

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[1]Active or passive indicates sensing mechanism; cameras are 35mm, digital, or video.

* Internet searches may reveal additional sources and vendors. This list is provided for informational purposes only and does not imply recommendation or endorsement.

For more information:

These abstracts and many of the handouts are available online at *http://texnat.tamu.edu*.
For a listing of related symposia proceedings go to the "library" at the TEXNAT website. Additional wildlife-related publications available through Texas A&M University are located at *http://wildlife.tamu.edu*.

We extend our appreciation to the

Commercial Exhibitors

(list as of 20 August 2002)

Buckshot 35
Furhman Diversified
Stumpcam
The PhotoTrapper
TrailMaster
Trail Timer
Wildlife Surveillance Systems