



PHOTOS BY KEVIN YOUNG, GREG WICHMAN AND DALE DUWALL

## Infrared-Triggered Cameras:

# Digital or 35mm?

**Digital and film cameras were put to the test in a deer-survey experiment, revealing advantages and disadvantages for both.**

By Jason Snavelly

In the last issue of *Quality Whitetails*, I mentioned a cooperative research project between my company, one of our clients and Cuddeback digital/DeerCam. We hoped to gather independent data comparing the performance of infrared-triggered camera systems in digital and 35mm print models in the context of a formal camera survey of whitetails. Many professionals have suggested that the new digital models are the way to go for deer surveys, while many hunters are still weighing the two options before buying another camera. We decided to put them to the test last fall on a private property in Pennsylvania.

Our goal was to determine which camera system gave us the most photographs and ultimately the most accurate survey of a deer herd. We also wanted to determine if more mature bucks are caught with digital units since regular changing of film is unnecessary and human intrusion at camera sites is reduced. We used a total of 12 camera stations (six digital and six film) for a camera density of one per 57 acres. Although this particular project used Cuddeback Digital and DeerCam products, we suspect most of the top-rated cameras on the market would yield similar results.

For this project we selected a property with an extremely high deer density. As a result of the high density, the native habitat on the property has suffered, and productivity is low at 0.55 fawns for every doe. Of the yearling bucks documented during the survey, 50 percent (15 out of 30) possessed spikes instead of branch-antlered racks. Surprisingly, this property boasts a respectable age structure and sex ratio that is rare for any region of the country, let alone Pennsylvania; 33 percent of the bucks on the property are 3 ½ years of age or older, 16 percent are 4 ½ or older, and 9 percent are 5 ½ or older. The estimated adult sex ratio is one buck for every 1.78 does. Our camera survey in October 2004 estimated that we had 55 unique (individual) bucks, 98 does and 54 fawns. Of the 55 unique bucks (1 ½ or older), 40 were branch-antlered while 15 were spikes. Population demographic estimates for the property were derived from infra-



*In a deer-survey study in Pennsylvania, infrared-triggered digital cameras captured twice as many deer on film as 35 mm cameras in the same period of time. Digitals captured four times as many antlered bucks as film cameras.*

red-triggered camera surveys and observation data.

The October camera survey was preceded by four days of prebaiting to ensure that the deer found the stations. Since our client shares our passion for white-tailed deer, he insisted on checking all of the camera stations himself during the survey to refresh bait, batteries and film. We began the survey on October 3 and pulled the last two cameras on October 28, giving each of the 12 camera units at least 14 consecutive survey days (for details on conducting a camera survey, see "Do-it-Yourself Deer Surveys," *Quality Whitetails*, October 2004).

### By the Numbers

After our 14-day survey, we obtained 3,448 photographs of 4,808 deer. We obtained 1,103 buck photos, 1,967 does, 1,090 fawns and 648 unidentifiable deer, which were excluded from the results.

Of the 3,448 photographs, 1,106 (32 percent) were obtained from film cameras while 2,342 (68 percent) were obtained from digital units — digitals took more than twice the number of shots that film cameras took. Of the 1,103 photographs of bucks, 209 (19 percent) were obtained from film cameras while 894 (81 percent) were obtained from digital units — more than four times as many digital images of bucks. Interestingly, two of the six digital camera stations, No. 7 and 8, each captured more buck photographs than all six of the film units combined with 315 and 280 buck photos, respectively.

It has been suggested that mature bucks are more likely to avoid film camera units because of a smell associated with the film. Although we are unable to prove or disprove this theory with these data, we suspect that more buck photos are obtained from digital units for the following reasons:

1. Digital units are operating 24/7, provided they have fresh batteries. No down time results from running out of film.
2. Digital units require less attention since there is no film to check, resulting in reduced human presence and disturbance at the site.
3. Bucks (especially mature bucks) may be more sensitive to shutter and film-winding noises of 35 mm film camera units.

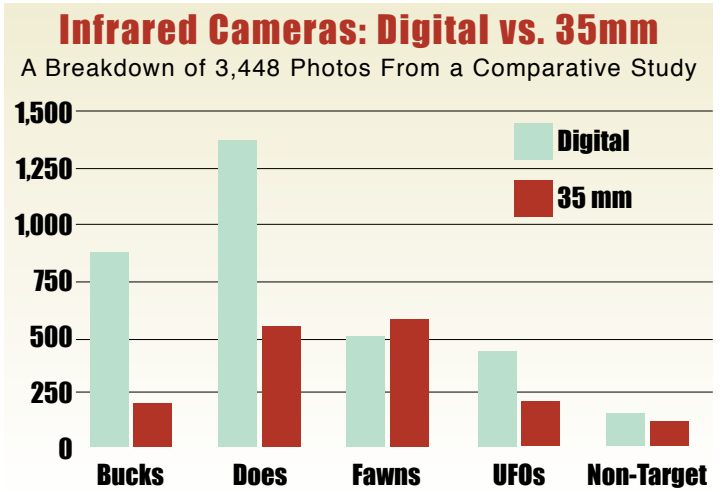
Though the number of digital photographs of bucks and does far surpassed the number of photographs obtained from film cameras, we obtained more fawn photographs from film cameras (585) than we did from digital units (505). Although not a significant difference, these results may suggest that film cameras are visited slightly less often by older deer for one reason or another. Fawns, however, seemingly less cautious, did not hesitate to visit our film camera stations. This study needs to be replicated to investigate this theory.

### UFOs, Non-Targets and False Events

Another goal of this project was to determine any major differences in the numbers of unidentifiable deer (UFOs), non-target animal photographs or false events. In camera surveys conducted by our company, we require at least two observers to look at each picture. In the event that both observers could not positively identify a particular deer as a buck, doe or fawn, it was labeled unidentifiable or “UFO.” We ended up with 648 unidentifiable deer, 205 from film photographs (18.54 percent of film photographs) and 443 from digital photographs (18.92 percent of digital photographs). When considering the proportion of photographs obtained from each type of unit, the numbers of UFOs are very similar.

The number of non-target animal photographs differed slightly and should be investigated further. Film camera units yielded 134 (12 percent of film photographs) while digital units resulted in 163 photographs (7 percent of digital photographs). For this particular survey, bears and raccoons comprised 96 percent of non-target animals. Photographs that contained deer and non-target animals (usually raccoons) were not considered non-target photographs. If identifiable, all deer in these photographs were counted for the survey.

There were also no major differences in the number of false events between the two types of units. If observers studied a picture and could not determine a reason for camera activation, it was determined to be a false event. Film cameras resulted in 13 false events (1.2 percent of film photographs) and digital units



yielded 30 (1.3 percent of digital photographs).

No matter how you slice the pie on photographs of UFOs, non-target animals and false events, it is much easier and cheaper to simply delete them from digital flashcards. When dealing with film camera units, UFOs, non-target animals and false events not only waste film but add to your photo-finishing bill.

### Camera Reactions

In the December 2004 issue of *Quality Whitetails*, we discussed “flash fright.” True flash fright — a deer being disturbed by the flash after having its picture taken — is not observable. Deer caught springing away from the camera in a photograph could not possibly be reacting to the flash, which is synchronized to the opening of the shutter. By the time a deer could begin to react to the flash, the photograph has been taken. However, deer seen reacting in photographs could be responding to the mechanical noises (auto focus, film advance, shutter mechanism, etc.) that occur before the picture is taken.

After observing 4,808 deer in the survey, we can report that only seven displayed any type of negative reaction to the camera. The only buck that showed an adverse reaction to the camera was a 4-point yearling. We ended up with 19 photographs of him before and after his “negative experience” with the camera.

### Advantages & Disadvantages

Our client agreed with all of our recorded advantages and disadvantages of the two camera types. He reported that, initially, film cameras were less complicated to operate than the new digital models. However, once you get over the learning curve using the new technology, the advantages of digital infrared-triggered camera units clearly outweigh the disadvantages. He was especially satisfied with the digitals because he did not have to constantly change the film and take it to the lab, ultimately saving time and money. I am sure you can imagine the work involved in monitoring 12 camera stations on a daily basis (ensuring proper operation and refreshing bait and film). Our client told me, “I wouldn’t even consider a film camera since I’ve used the digitals.” So much for that learning curve.

Perhaps the most crucial disadvantage of 35 mm film camera systems is that spent rolls of film result in missed photo opportunities until you are able to replace the film. It is our experience that most film is burned in the evening and at night. This is not the best time for our cameras to be out of commission. Missing

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such opportunities is detrimental to the accuracy of our deer surveys as well as our scouting.

From a consumer standpoint, perhaps the biggest disadvantage is the higher upfront costs associated with digital units. Currently, digital units are slightly more expensive than older film models, depending on the manufacturer. As with any new digital technology, these prices will likely decline. At any rate, your higher initial investment will pay off in a very short time. Film and film development bills add up quickly when using film units. In fact, for this particular survey we spent \$114.05 on film and \$589.10 on developing. It is more difficult to place a value on the fuel and time spent transporting all of your rolls of film to a photo lab to be developed. The other disadvantage of digital camera units is that digital photographs are not as easy to compare side-by-side. Therefore, if possible, we recommend printing out all of your unique buck photographs to make comparisons easier when conducting a survey.

### Survey Costs

We estimated cost by first comparing the initial costs associated with each unit. QDMA members can obtain both of the camera models we used at a discounted price (\$375 for digital, \$175 for 35 mm) direct from the QDMA.

We prefer to use the services of a one-hour photo lab to avoid losing our film or photographs when having them sent off. Although one-hour development can be more expensive, it is difficult to place a cost on losing several rolls of film from your survey (trust me). When film is lost, surveys must be extended, resulting in additional labor and film costs. When conducting surveys, lost time is more critical than the associated costs of extending the survey.

To get one digital camera up and running costs approximately \$431.80. This includes the initial purchase of the unit (\$375), a one-time flashcard reader expense of \$21.03, a one-time expense for a 128 MB flashcard of \$30.61, and four D-cell batteries at \$5.16. Many people opt for a 256 MB (\$42) or 512 MB (\$61) flashcard to hold more photographs. The manufacturer of the units we tested reports that a 128 MB card holds approximately 400 images, a 256 MB card should hold 800 images, and a 512 MB card can store up to 1,600 images. Prices of the flashcard readers can vary with some multicard readers closer to \$30.

Film cameras cost approximately \$183.84 (excluding film

## Advantages & Disadvantages of Digital & 35mm Infrared Cameras

### Digital Advantages

- No “down time” as a result of running out of film.
- Fewer man hours required to keep camera in operation.
- Fewer “check-ups” required and thus less human intrusion.
- Sharper images.
- Photos are easier to share via email.
- Flashcards store up to 1,600 images, depending on card size.
- Buck identification by antler configuration is easier with magnification tools on your computer screen.
- No time spent driving to a photo lab.
- In-the-field photograph retrieval is possible with a portable TV, camcorder or camera phone.

### Digital Disadvantages

- Higher upfront costs for purchase of unit, flashcards and PC card reader.
- Photos must be printed for side-by-side comparison.

### 35mm Advantages

- Side-by-side photo comparison is easy.

### Film Camera Disadvantages

- Miss photo opportunities after 24 or 36 exposures.
- Requires more man hours to keep film refreshed.
- More time in the field, more intrusion.
- Seemingly poorer quality images.
- Must scan or have photos put on a CD at the photo lab to share them via email, which results in loss of image quality.
- Requires more time and money to take film to the photo lab for development and to purchase fresh film.

development) to get to operation mode. Costs of film (approximately \$2.23/roll), batteries (\$6.61), and development vary depending on supplier and quantity purchased. One-hour development for 4x6 singles (24 exposures) is roughly \$6 while doubles cost around \$8.50. For this survey we obtained doubles.

Ultimately, although there are more upfront costs associated with the digital units, it does not take long for the tables to turn with film and film development costs. We spent approximately \$2,590 to acquire and operate six digital cameras for the survey. We spent approximately \$1,806 to acquire and operate six film cameras, and \$703 of this amount represented film and developing. Assuming we would spend this much again on film and developing to run subsequent surveys, it would only take one more camera survey with these units to “break even” on costs between digital and film cameras. For the third survey, the digital cameras would begin paying for themselves.

Using the numbers presented here, if you purchased one 35 mm film camera, you would only have to use and develop 25 to 30 rolls of 24-exposure film to achieve the same expense of acquiring one digital unit. These comparisons, of course, say nothing of the cost of gas and the time involved in getting film developed.

Our overall thoughts on this comparison are that digital infrared-triggered camera units are more cost effective, less intrusive and provide more accurate results whether you are scouting your favorite stand location or conducting a survey. Ultimately, digital infrared-triggered camera units save you time and money in the long run, and they stand guard much longer for you while you are going about your daily (and nightly) routines. For these reasons, we give this new equipment two thumbs up.



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