

Wildlife video images

How does it work?

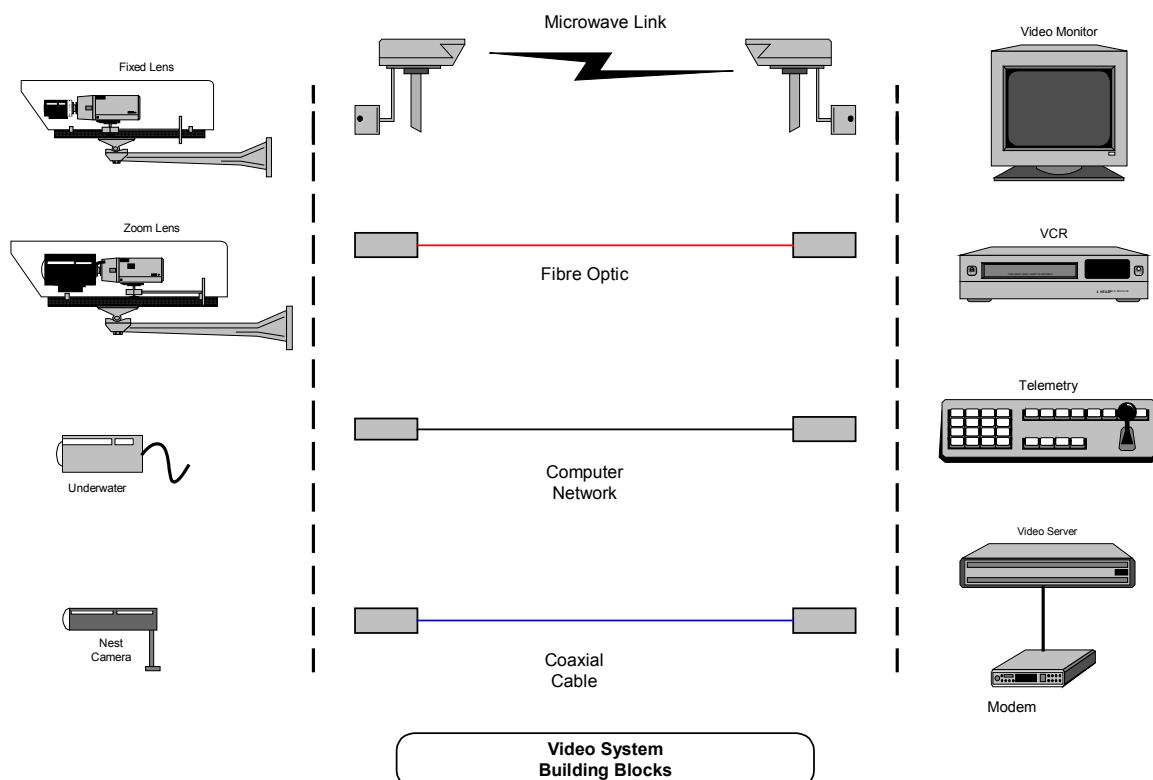
A question often asked of the Forestry Commission's Radio Branch is "How did you get the pictures to the visitor centre?"

This simple question hides a complex and sometimes frustrating task by virtue of the unpredictable nature of many wildlife species.

Let's look at the Red Kites at Rockingham project that has been running for many years and has recently featured in the BBC's 2006 Springwatch program. Over time this project has encompassed many of the techniques described below as the kites have moved location each breeding season and sometimes during nest building.

The project, in common with all Forestry Commission wildlife video-monitoring starts from the premise that the animal's welfare is paramount and that, were required, all relevant permissions are obtained from statutory bodies such as English Nature. Additionally a wildlife expert such as a Forestry Commission Wildlife Ranger supervises all installations and acts as the wildlife's advocate in any planning.

The basic elements of a wildlife video monitoring system would be as below.



Estate agents will tell you that location is everything when choosing a home, red kites are no different to humans. Kites nest in remote locations that are normally away from human habitation hence the main difficulty in providing pictures becomes apparent, "how do you get the images from the remote location".

Depending on topography and obstacles, there are many transmission methods including cable, fibre optics or radio.

A video transmission path consisting of high quality coaxial cable can yield a usable picture at distances of up to 800m without amplification and if deployed with a "power over coaxial" device for camera power a system based on cable would provide a maintenance free installation. As previously noted the kites have moved each breeding season hence this option has to absorb the risk that the cable installation and investment is redundant at the end of each year.

For greater distances, or bridging highways, the use of a "line of sight" licence exempt microwave radio link can provide images from nests up to 15 km away. Line of sight means that if the receiver is obscured from the transmitter by a hill, tree or other obstruction then there is no video transmission path. To overcome this, two radio links can be combined in multiple hops to go around the obstruction, this is often known as a dog leg. Another option is to combine both radio and cable links to provide the video transmission path.

Where there is no local mains power near the nest end of the link providing power for the transmitter and camera is now a major consideration.

Using transmitting and camera equipment designed to operate on 12v dc, the simplest option to deploy is a rechargeable battery. However due to the high current drain and frequent recharging required, this option is possibly the most expensive to implement due to health & safety issues and man power requirements.

Where possible a power supply consisting of either solar power or wind generators is preferred over the battery option. Deep in a forest environment it is not always possible to locate the power generating equipment near to the nest site. To overcome this a small generating site can be located in the best position for energy production and power routed to the camera.

A side effect of using a radio link is that for the transmitter antenna to be visible by the receiver its location is generally in a good position for energy production. This side effect allows for the "power over coaxial" technique described previously to be deployed at the remote site.

Powering the transmitter and camera during darkness or when the visitor centre is not open is not required hence savings can be made in the on-site energy requirements if they are switched off during these times by remote timers.

It is important to note that for health & safety reasons no external equipment is directly powered by 240v ac.

A critical element of the project is camera reliability. Once the kites have nested there are only a few occasions when it is possible to repair the camera, these times are of a short duration when the Wildlife Rangers perform bird health checks and wing tagging.

For some species there are no second chances and a failed camera can not be replaced. A solution to this is to install second backup camera.

The image quality of a modern CCTV camera surpasses that of a VHS recorder and, if a camera specifically designed for external use is installed, these offer acceptable performance at an affordable price with reliability.

For the kite installation a camera with a local remote control was chosen such that the image view could be enlarged as the chicks develop. Other options exist to remotely control the camera from the visitor centre via telemetry.

While discussing camera's it is worth noting that to monitor badgers and other nocturnal species a camera with infra-red emitters can be used and that an underwater camera can offer a fantastic view of fish such as salmon but that's another story!

Hearing the cry of the chicks as they wait to be fed offers another insight into the life of the kites. Using similar equipment to other Forestry Commission sites a microphone has been installed on the nest with the sound relayed over the video transmission link to the visitor centre monitors.

At the visitor centre the images take a parallel path, one path takes the images directly to the display monitors for viewing by the public and the other to a DVD recorder where they are recorded and compiled into a highlights video.

Integrating the kite images into the Forestry Commission web site is achieved by the use of a dedicated video server that resides on the Commission's internal computer network. This server updates an ftp site every 15 seconds from which the external web site is updated every 30 seconds. Our partners, English Nature and RSPB link the images in their web pages.

The above gives a brief overview of the techniques and considerations employed by the Forestry Commission when obtaining wildlife images, there are of course other technologies used such as fibre optic cables, mobile phones and, although not live, time shift recording at the remote location.

Addressing the original question "How did you get the pictures to the visitor centre?" this could be answered as "the practice of industry standards and equipment applied to applications they were never designed to satisfy in a forest environment".

Please explore the Forestry Commission web site and its links to wildlife sites or better still go and see the live images.