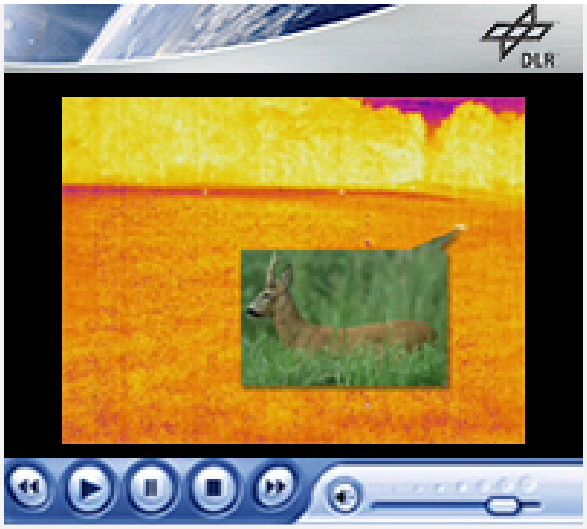
Press releases 2008

"Wildlife Rescue" - DLR leads the way in wildlife protection in agriculture

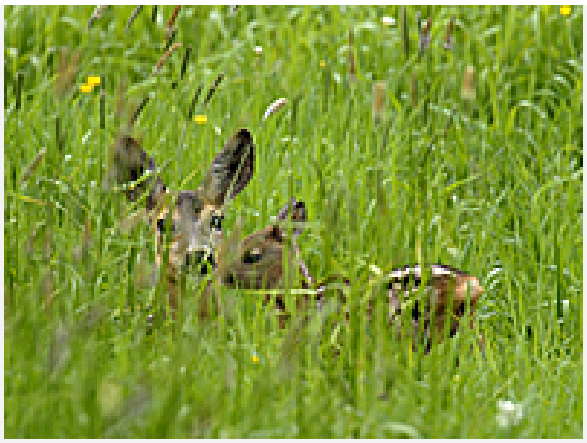
9 May 2008



Video: An infrared camera observes wild animals

Fawns, leverets, and ground-nesting birds hide in tall grass. This can be a dangerous place to hide when farmers are mowing the pastures. Many wild animals are injured or killed by mower cutters. The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), working with partners from research and industry, has developed new sensor systems which are able to detect the presence of animals at an early stage. From mid-May, these detection methods are put to the test as part of the "Wildretter" ("Wildlife Rescue") project. The video demonstrates how the animals are detected.

The threat to wild animals is greatest in spring. From mid-May to late June, for instance, the fawns are born in the tall grass, just when the pastures are mowed for the first time. During this period, scientists of the DLR Remote Sensing Technology Institute (DLR-Institut für Methodik der Fernerkundung) want to test new sensor systems and methods which they have developed for detecting wild animals. The investigations form part of the "Wildretter" project, which is supported by the "Microsystems 2004-2009" ("Mikrosysteme 2004-2009") framework programme of the German Federal Ministry of Education and Research (Bundesministeriums für Bildung und Forschung; BMBF). During the three years of the project, a prototype of a wildlife detection system for mowing machines will be developed. Infrared camera, colour video camera, and microwave radar are the technologies which will be tested in order to find the most suitable detection method. New signal and image processing methods will be developed. DLR's partners in this project will be the medium-sized enterprise ISA, the Fachbereich Höchstfrequenztechnik of the Technische Universität (TU) München, CLAAS Saulgau GmbH, manufacturer of agricultural machinery, and the Institut für Agrartechnik of the Universität Hohenheim.



Danger lurks in the tall grass

Animals under threat in the tall grass

Ever since machines have been used in crop cultivation and tillage, wild animals are confronted with a threat they cannot cope with. Today's mowing machines have working widths of up to 14 metres, and working speeds of 15 to 20 kilometres per hour. From the cab of the large machines, the driver is unable to recognise wild animals in the dense grass cover, or is only able to do so at the very last moment, when it is already too late to stop the machine. But it's not just mower cutters which injure and kill the animals: harrows and chopping tools destroy breeding nests. The number of wild animals injured or killed in the German agricultural sector every year is about 500 000, with new-born fawns being most at risk: about 100 000 of them die every year. This also pose a danger to agriculture: Most of the cut grass is ensiled and fed to cattle and horses. If parts of the carcasses end up in the fodder, they can cause lethal poisoning (botulism).

Remote sensing for animal protection and species conservation

Decades of experience have shown that reliable protection is only possible when the animals are detected at an early stage. The human eye, and even a hound's nose, is unable to detect the animals in the grass thicket. Sensors and methods for remote sensing and pattern recognition are far more effective in this case. In this case the animals are not spotted from an airplane or even from space. However, the sensor systems which are placed at the edge of the field and the data analysis methods are similar to the ones used in remote sensing.

Possible ways to use remote sensing sensor technology for preserving wildlife

An infrared camera for monitoring wildlife

For many years, DLR has been leading the way in developing methods for this purpose. An infrared detection device with a monitoring width of six metres has been on the market since 1999. It was developed at DLR, in cooperation with the Lehrstuhl für Elektrische Messtechnik of the TU München and the medium-sized enterprise ISA, and it is sold in Germany, Austria, and Switzerland. With this device, a person on foot can search the pastures before mowing begins. Many thousands of fawns have since found and saved. However, the method is not suitable for use in mowing machines. This is because mowing takes place while the sun is high in the sky, and the pasture is therefore quite warm. Under

these conditions, the detection device does not just respond to the presence of wild animals, but also to warm spots in the pasture.

DLR researchers, in cooperation with ISA and the Fachbereich Höchstfrequenztechnik of the TU München, have developed new approaches to solving this problem. The researchers developed a prototype of a microwave radar system, which at a 24 Gigahertz operating frequency can detect fawns on the basis of the high water content of the animal body.

An eye on pasture and forest

Another approach was developed at DLR and investigated in cooperation with the German Federal Agricultural Research Centre (Bundesforschungsanstalt für Landwirtschaft; FAL). In this approach, infrared cameras observe the pastures continuously for several days before mowing starts. From the resulting footage it can be established if animals have entered the pasture without leaving it again, and where they are now. The video clip on this page (in the right-hand column) was recorded during these investigations. Several detailed questions were explored together with the Schweizerische Hochschule für Landwirtschaft SHL and the Swiss Bundesamt für Umwelt, Wald und Landschaft BUWAL, as well as the Wageningen Universiteit en Researchcentrum and the Natuur-technologisch Onderzoeks Bureau NATOB of the Netherlands.

The Landesjagdverband Bayern (BJV) is an associate partner in the "Wildretter" project; it has been supporting the project for many years already. The German Federal Ministry of Food, Agriculture and Consumer Protection (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz; BMELV), the BMBF and the BJV have played an important role in realising this project.

Related Contacts

Dorothee Bürkle
German Aerospace Center
Corporate Communications, Editor, Energy
Tel: +49 2203 601-3492
Fax: +49 2203 601-3249
E-Mail: Dorothee.Buerkle@dlr.de

Dr.-Ing. Peter Haschberger
German Aerospace Center (DLR)
Remote Sensing Technology Institute, Experimental Methods
Tel: +49 8153 28-1336
Fax: +49 8153 28-1337
E-Mail: Peter.Haschberger@dlr.de

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