Wild Tiger Health Centre Information Sheet

Using camera traps to monitor wild tiger health: Examples

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A camera trap (CT) is a device with a trigger or sensor that automatically activates a camera to take a picture or video when an animal is present. The development CT technology over the past few decades has provided a tool for biologists to better understand wild tiger behavior, ecology, population dynamics and health because they allow noninvasive observations of undisturbed animals across large remote areas. Correctly set CTs can generate large collections of tiger photographs from which individual animals can be identified by their unique stripe patterns and monitored over space and time within the limits of survey designs.

In studies of wild tigers where animals are rarely observed, CT photographs can provide baseline information on normal body condition within populations and identify health issues of individuals suspected of having problems. Although most health issues can't be diagnosed accurately without physical examination and diagnostic sampling, this is often impossible or impractical for wild tigers. Even when animals can be captured for examination, recognizing normal relaxed body conditions seen in CT photographs can be useful.

Once an injury or other problem is identified in an individual tiger, its significance and impact on health can be assessed by evidence from repeated CT pictures taken over prolonged periods. In some circumstances this may inform a decision on whether removal from the wild is appropriate or whether simple monitoring is the better course.

However, perhaps the greatest veterinary value of using CTs is in long-term, remote, population health surveillance and the potential to increase understanding of what type(s) of injuries and diseases are significant to wild tigers, and which have little effect on their viability.

Examples of health and disease identified by camera trapping are given below. Examples 1 to 5 were identified during an eleven-year CT population monitoring study of Amur tigers in the Russian Far East (2007-2018) by the Zoological Society of London together with the United Administrations of Lazovsky Zapovednik and Zov Tigra National Park.

Example 1: Normal reproductive status

A lot of information can be gained from photographs on general body condition and reproductive status. This adult female is obviously lactating which is evidence that she has a litter of suckling cubs less than 4 months old.

Photo: Linda Kerley/ZSL-Russia.

Example 2: Loss of light reflection from the tapetum lucidum ("Eye shine")

The tapetum lucidum is essentially a biological mirror behind a cat's retina. It reflects light back through the retina, increasing the light available to the photoreceptors. This improves night vision sensitivity, and accounts for the "eye shine" seen by observers when light is shone into a cat's eyes at night. Damage to a tiger's retina, tapetum lucidum or the light path through its eye can produce a reduction or loss of eye shine.

One female Amur tiger with normal eye shine in both eyes until she was 2.5 years old, was seen to have lost it in her right eye in 2015. Given that this individual's iris remained constricted in the dark, an injury to the cornea or iris is suggested. (Damage to the retina would more likely produce iris dilation in the dark). She disappeared from the survey area in 2016.

Photo: Linda Kerley/ZSL-Russia. 15-Feb-2015

Photo: Linda Kerley/ZSL-Russia. 08-Jul-2015

Example 3: Lack of light reflection from the tapetum lucidum ("Eye shine")

An adult male Amur tiger was first photographed in 2009. His general condition was good, but no eye shine was seen in the left eye. This situation remained the case until he was finally usurped from his territory in 2019 when he was estimated as being 13-14 years old. No precise diagnosis is offered, but trauma to the eye seems likely. Interestingly the eye damage did not appear to affect his viability over a span of 10 years.

Photo: Linda Kerley/ZSL-Russia, 25-Mar-11

Example 4: Swollen elbow.

Seen in December 2012, this adult female Amur tiger has a marked swelling over the right elbow (circled in red). Her condition was good, and the swelling did not appear to affect her mobility. Possible diagnoses include hygroma, haematoma, abscess, tumours etc. The latest picture, taken 3½ years after the first demonstrates that the lesion is non-progressive, and probably a hygroma of little significance. (*Hygromas are fluid-filled sacs that develop as a result of repeated trauma or pressure over a bony prominence*)

Photos: Linda Kerley/ZSL-Russia, December 2012

Photo: Linda Kerley/ZSL-Russia, 11-May-16

Example 5: Short tail.

Photographed in February 2016, this Amur tiger undoubtedly has a short tail. It isn't possible to determine whether this is a congenital lesion (and possibly genetic in origin) or simply a result of trauma. Pictures of related animals would be of interest.

Photo:
Linda Kerley/ZSL-Russia,
04-Mar-16

Example 6: Snare injury to neck.

A potentially life-threatening injury to the neck of this male Sumatran tiger was photographed in Jambi Province, Sumatra in 2002. Unfortunately, the animal was not caught regularly on CT's to follow its' progress.

Photo: ZSL-Indonesia

Example 7: Distal foreleg amputation

This male Sumatran tiger was photographed intermittently between 2014 and 2017 in forested areas of the Bengkulu region of Sumatra. The lower part of its left foreleg is missing – presumed to be a result of a snare injury. The wound has clearly healed well. The good condition of this animal over several years suggests that a tiger missing a front foot can survive without becoming involved in conflict with man or domestic livestock, or being unable to hunt effectively. However, this may be an exceptional case and dependant on low intra-specific competition and good prey densities.

Photo: Debbie Martyr/FFI