



## Amur Leopard Project Update Autumn 2008 season

### Introduction

The Amur leopard is the world's most endangered large cat, with as few as 25 - 35 individuals now surviving in southwest Primorski Krai in the Russian Far East (RFE). This population is in grave danger of extinction due to numerous factors including ongoing development in the region, logging activity, hunters and poachers in the forests, forest fires, inbreeding depression due to low genetic diversity within the remaining leopard population, and the potential for disease transmission from domestic animals.



Camera trap pictures of a wild male Amur Leopard (A.Harrington)

However, a coalition of foreign non-governmental agencies (NGO's) and regional agencies of the Russian Federation are working together to secure a future for this leopard, and WVI is responsible for providing much of the veterinary expertise in the process through the activities of its veterinary director, Dr John Lewis. The future of the Amur leopard rests on vigorous *in situ* conservation activities to protect the existing small population plus an imaginative reintroduction scheme to establish a second population in former leopard habitat in the southern Sikhote-Alin mountain region of Primorski Krai. WVI is committed to providing veterinary support to all aspects of the project, and as a reintroduction process may take up to 15 years or more to achieve measurable results, our commitment is long term.

More detailed information of WVI's involvement with the Amur leopard can be found in our previous reports which can be obtained from WVI on request (see page 5). For the sake of brevity these details will not be repeated here.

In autumn 2008, in addition to the year-round services provided to the European Breeding Programme (EEP)

for the Amur Leopard, Dr Lewis was able to work in the RFE with professional wildlife biologists from the Russian Academy of Sciences Institute of Soil & Biology and Wildlife Conservation Society Russia (WCS-Russia) for two months. The activities undertaken during this visit are reported in this project update.

## **Visit to the Russian Far East on behalf of Wildlife Vets International, September 13<sup>th</sup> to November 12<sup>th</sup>, 2008**

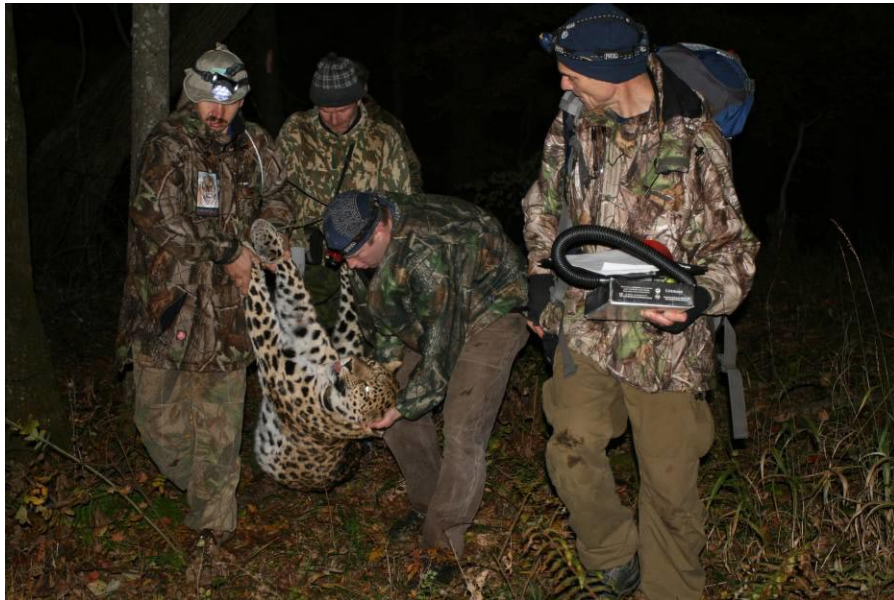
### **The WCS-Russia tiger project in Terney:**

The first 10 days of this year's visit were spent at the Wildlife Conservation Society Russia (WCS-Russia) base in Terney – the home of their long-standing and highly successful tiger conservation project in the Sikote-Ain Zapovednik (reserve). Although the natural range of the Amur tiger extends much further north than that of the leopard and covers a far greater area, the two species co-exist in leopard habitat. Therefore, valuable information relevant to leopard conservation can be gained from an understanding of the behaviour and problems of tigers in the region. From a veterinary standpoint a personal dialogue between the leopard and tiger projects is essential, and it was a great pleasure to meet and talk with the extremely skilled biologists in Terney. The tiger field staff were also keen to discuss aspects of tiger anaesthesia (and that of other species) as they do not have access to experienced wildlife vets – so WVI was able to provide a small amount of theoretical training on this occasion. During the stay in Terney it was also possible to briefly meet with the director and the scientific director of Zapovednik. All these face-to-face meetings will no doubt pay dividends in the future!

### **Leopard trapping:**

For the remainder of this year's visit, Dr Lewis worked with the WCS-Russia/Institute of Soil & Biology field team, camping in a river valley in the Borisovkoe Plateau Zakaznik. Two leopards were caught – and as in previous trapping periods a full medical appraisal of each animal was made and samples taken to investigate their current disease status.

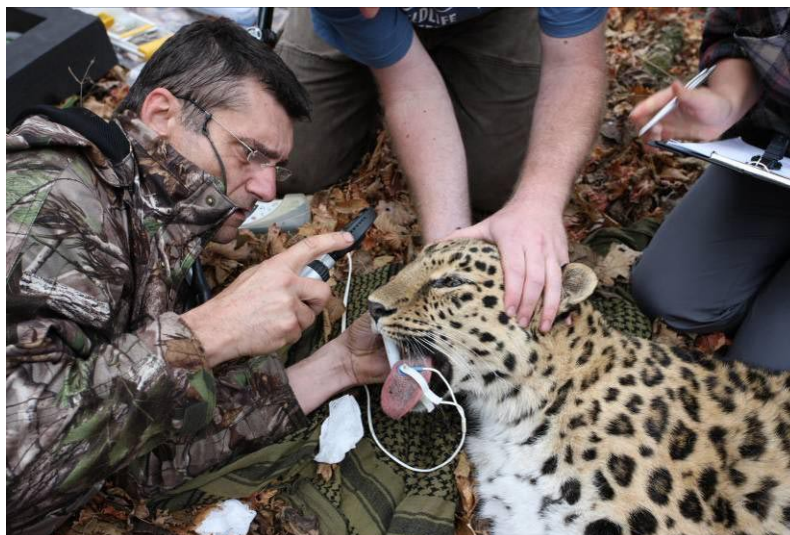
The first leopard was caught on 08-Oct-08 – an adult male in good condition, designated Pp02. This cat had actually been trapped twice before in November 2006 and October 2007, so over a two year period it has been possible to give him an annual check up! It has never been the intention of the team to catch any individual leopard more than once, but recaptures are hardly surprising given the large home range of these cats, and ironically animals that are recaptured can provide extremely valuable veterinary information. For example, by repeatedly examining an individual leopard we can obtain information about how an animal's health changes over time. By comparing antibody profiles taken at different times from the same animal it is possible to get some idea of when and how often certain infectious diseases are encountered by the leopards and when novel infectious agents have been introduced. In the case of Pp02 it was possible to document deterioration in his dental health (a natural process) and gain more information about his cardiac health.



Leopard Pp02 being moved away from the capture site (J.Goodrich)

Previous WVI reports have mentioned the finding of heart murmurs in wild leopards including Pp02, but the exact cause of these abnormal sounds has yet to be determined. The first time Pp02 was captured no murmur was detected; the second time a loud and persistent murmur was heard, and on the third occasion this year only a slight murmur was heard – and that only during the first part of the examination. This variability tends to suggest that the cause of the murmur may be physiological factors unrelated to congenital problems or heart disease, although firm conclusions cannot be drawn from just one cat. High quality electronic recordings were made of the heart sounds and electrical activity in the heart (ECG) and these will be discussed with expert veterinary cardiologists in the near future.

The second leopard was caught on 18-Oct-08, and this time it was an adult female that had not been captured before. As no mature, reproductively active, female had been caught previously by this team, Pp05 was a very important capture. This cat was in good condition, but also had a heart murmur. Again, high quality electronic recordings were made of the heart sound and electrical activity in the heart (ECG) for future investigation. Digital images of an unusual pigmented area in one eye of this cat were taken for comment by a veterinary ophthalmologist.





Catching just two leopards in a month may not seem a very return for the amount of effort expended. However, when it is considered that only 25 – 35 wild leopards live in an area of approximately 20,000 square kilometres this trip can be considered very successful yet again!

### **Training:**

As veterinary support is considered both necessary and desirable for the long term future of wild Amur leopard populations, WVI considers it essential that local wildlife vets are involved and trained to as high a level as possible. In the RFE this is no easy matter owing to the small number of young Russian veterinary graduates seriously interested in committing to wildlife medicine. However, we are very pleased to announce that Dr Mikhail Goncharuk will now be working with Dr Lewis on all future leopard captures. Dr Goncharuk is already employed part-time by the Zoological Society of London to carry out disease surveillance in prey species in the Lasovsky Sate Nature Reserve (a potential release site for any leopard reintroduction) and has accompanied Dr Lewis on several health assessment training workshops on captive Amur Leopards in Russian zoos. Dr Goncharuk joined the leopard trapping team in early November although unfortunately this time he wasn't able to be involved in any captures. In the future he will be present throughout trapping periods and no doubt he will meet his first wild leopard soon! Dr Goncharuk's time in camp was not wasted and he spent a considerable time with Dr Lewis working through the examination and laboratory procedures employed in wild leopards. Dr Lewis is also able to part-supervise Dr Goncharuk's work in Lasovsky.



Dr Mikhail Goncharuk working with Dr Linda Kerley examining a wild leopard cat in Lasovsky

### **Other matters relating to wild leopards:**

An interim report on the veterinary assessment of wild leopards has now been submitted to the Russian Academy of Sciences Institute of Soil & Biology. An extract is given in Appendix 1 (page 6).

### **Activities relating to the European captive Amur Leopard breeding programme:**

It is crucial that the highest veterinary standards are applied to Amur leopards held in captivity throughout Europe as it is from this population that breeding animals will be selected to provide leopards for release as and when the reintroduction project goes ahead. Although hands-on veterinary assessments of captive leopards continue, much of the necessary work is far less glamorous!

**Veterinary database for Amur Leopards:**

Under supervision by Dr Lewis, the first version of a veterinary database for the captive Amur leopard population has now been completed by Ms. Samantha Earle (see the project update for autumn 2007). This was constructed initially in part fulfilment of Ms Earle's MSc thesis and as such does not quite meet the requirements for managing all the veterinary data available for the captive population. However, this was anticipated at the outset and WVI funds are now available for professional development of the database to the standard required. Ms Earle is to be thanked and congratulated for undertaking this rather tedious task. Through her work on the database and as a budding young field biologist, Ms Earle has been so enthused about the plight of the leopards that she has gained a three month placement with WCS-Russia from February 2009 to work with their leopard field staff in camera trapping, snow tracking and radiotracking wild leopards. She is hoping that this will lead to a PhD in wild leopard biology. WVI is pleased to encourage the next generation of leopard biologists!

**Anaesthesia and cardiac murmurs:**

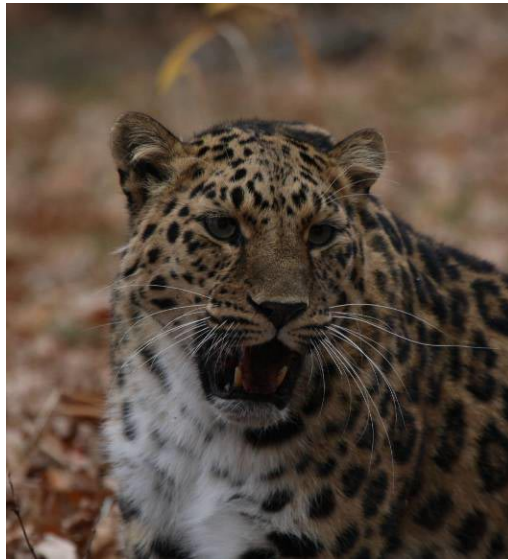
The crucial question of whether anaesthesia *per se* produces heart murmurs in Amur leopards is being addressed by training captive Amur leopards to accept having their hearts listened to and the sounds recorded by Dr Lewis. This is no easy task, but significant progress has been made at Colchester Zoo in the UK where keeping staff (notably Ms. V. Ledbrook) have trained one leopard to an acceptable standard so far. Recordings have been made from this animal and hopefully many other zoos will follow Ms. Ledbrook's lead. Her training technique has been made available to the wider zoo community through a website.

Dr J. Lewis  
November 2008

**Previous reports on WVI activities with Amur Leopards**

These reports are all available on request from WVI:

1. Report on Wildlife Vets International activities in the Amur Leopard Project, Russian Far East, October 2006
2. Wildlife Vets International Amur Leopard Project update - Spring 2007
3. Wildlife Vets International Amur Leopard Project update - Autumn 2007



**We would like to thank our sponsors for their generous and continued support of the Amur Leopard Project:**

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### **Appendix 1:**

Extract from:

**“Interim Report on the Health Status of Wild Far Eastern Leopards, Oct-06 – Nov-08”**

**(Report to WCS-Russia and the Russian Academy of Sciences Institute of Soil & Biology)**

It cannot be over-emphasized that to date only an extremely small number of wild leopards have been investigated, and therefore any conclusions drawn from their veterinary screening can only be provisional at best. Furthermore only a relatively limited range of tests have been applied to each animal, although resolution of bureaucratic issues that have delayed the distribution of retained samples to specialist laboratories may soon resolve this issue. If we are to understand the infectious and non-infectious threats to the existing leopard population it is crucial that these studies continue, although given the current wild population size it will never be possible to sample a large number of leopards.

The general physical health of the four leopards caught between October 2006 and November 2008 is judged as good. The degree of dental disease is currently judged as consistent with other large wild felids. No physical evidence of congenital or genetic defects has yet been found, nor have significant viral infections yet been detected. However, the detection of cardiac murmurs in all four animals raises concerns.

Cardiac murmurs can be caused by functional or physiological factors unrelated to heart disease, and as such are not of major concern. In contrast, pathological murmurs may result from congenital lesions or heart disease arising during an individual's life and these may signify potentially serious health issues. The findings in wild leopards so far are not straightforward to interpret, nor is detailed investigation easy under field conditions. Crucially, the information from Pp02 shows that during successive anaesthetic episodes using similar drugs an individual mature leopard can have no detectable murmur, a loud and persistent murmur, or even a detectable murmur at the beginning of the anaesthetic that rapidly diminishes to zero before the examination is concluded. Although complacency is clearly inappropriate, this information tends to argue against the presence of serious congenital or structural defects and suggests that functional or physiological factors may be involved. Murmurs caused by major structural defects in the heart – including some of the most important congenital abnormalities – tend to produce more consistent murmurs. A significant proportion of captive leopards within the EEP and in the North American population also have pansystolic murmurs under anaesthesia, and detailed investigations of a few animals using echocardiography have so far indicated that the abnormal sounds are caused by a variable degree of right and/or left atrio-ventricular valve regurgitation of limited clinical significance. These studies are continuing – both in anaesthetized leopards and more recently in trained conscious leopards in an attempt to understand the impact of anaesthesia.

One other significant development is that a young Russian field veterinarian (Dr Mikhail Goncharuk) will now be working with Dr Lewis and/or Dr Roelke during future capture and medical assessment operations on the Far Eastern leopard. Dr Goncharuk has already worked with Dr Lewis during medical assessments of captive leopards in Russia and he is actively involved in the Zoological Society of London's project to assess the disease status of potential leopard prey species in the Laso area. The long term future of veterinary involvement in conserving wild leopards in the Russian Far East absolutely requires that local expertise is developed, and the addition of Dr Goncharuk to the team is a valuable step forward.