Transboundary scientific research of the Far eastern Leopard and Amur tiger

Methods

1. Camera traps

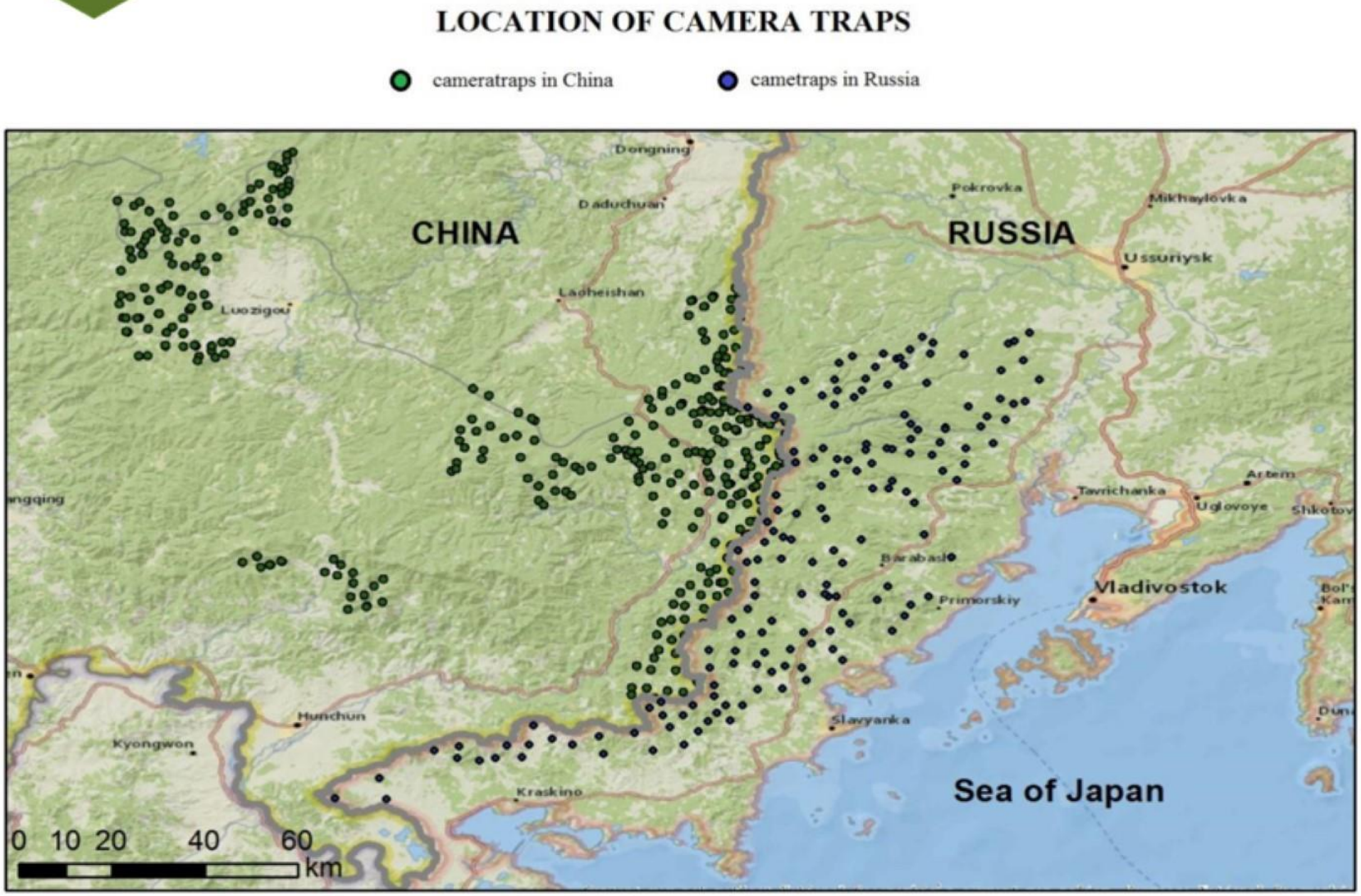
2. Scat collection for genetic

Methods

Camera traps

Study period 2013-2015

Number of cameratrap locations:
China – 317 locations (634 CTP), Russia – 157 locations (314 CTP)

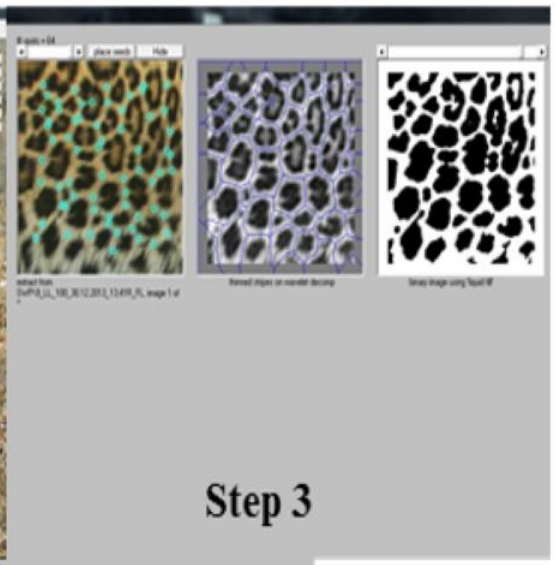


Individual identification due to unique rosettes (stripe) pattern

Unique Amur leopard pattern of spots.

Asymmetrical spot pattern on left and right sides of the Amur leopard (one of the images has been reflected).

Individual comparison using ExtractCompare software



Joint cameratrap data analysis
Vladivostok, January 2016

Initial data provided by the parties (FRC – feline research center, LL – Land of the Leopard) in the form of leopard and tiger images – at least one image of left and right side of the animal

leopards

	ADULTS			CUBS			totally
	LR	only L	only R	LR	only L	only R	
FRC	18	0	5	1	0	0	24
LL	76	2	4	5	6	2	95

tigers

	ADULTS			CUBS			totally
	LR	only L	only R	LR	only L	only R	
FRC	19	3	1	0	1	3	27
LL	37	3	3	1	6	0	50

RESULTS: LEOPARDS
Minimal number of individuals registered in 2013-2015 period

	Adults totally	Female	Male	Unknow sex	Cubs
Totally in China and Russia	89	41	37	11	21 cubs of 10 females
in China	23	9	10	4	2 cubs of 1 female
in Russia	81	40	34	7	19 cubs of 9 females
Individuals detected in Russia and China	**15**	**8**	**7**	**0**	**0**
in China only	8	1	3	4	2 cubs of 1 female
in Russia only	66	32	27	7	21 cubs of 10 females

! This number is not the size of population since all these animals were captured during 3 years – very long time when individuals were born and dead and migrated.

RESULTS: LEOPARDS
Cross-border movements

15 leopards – 17% from total number – crossed the state border during 2013-2015 period

Both females (8 individuals) and males (7 individuals) crossed the border

Individuals crossed the border from 1 to 10 times

Maximum distance moved from the border varied
from 0.46 to 37.6 in China
from 2.8 to 27.7 in Russia

Young individuals dispersing to China

Leo 81Un = leo 29

08.30.2014 07:54

In Russia

In China

04.30.2015 17:01

Young individuals dispersing to China

Leo 9F = leo 10

In Russia Nov-Dec 2013

In China seen in 2014

RESULTS: TIGERS
Minimal number of individuals registered in 2013-2015 period

	Adults totally	Female	Male	Unknow sex	Cubs
Totally in China and Russia	45	20	15	10	16 cubs of 6 females
in China	22	9	8	5	5 cubs of 3 females
in Russia	42	18	15	9	13 cubs of 4 females
Individuals detected in Russia and China	**19**	**8**	**8**	**3**	**2**
in China only	3	1	0	2	3
in Russia only	24	10	7	7	11

! This number is not the size of population since all these animals were captured during 3 years – very long time when individuals were born and dead and migrated.

RESULTS: TIGERS
Cross-border movements

19 adult tiger individuals – 42% of total number – crossed the state border during 2013-2015 period

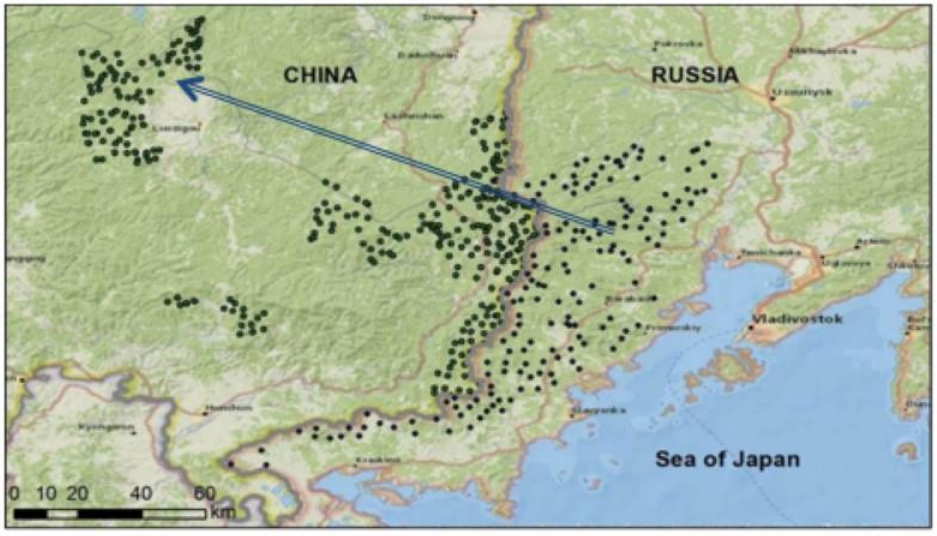
Both females (8 individuals) and males (7 individuals) crossed the border

Individuals crossed the border from 1 to 10 times

Maximum distance moved from the border varied
from 0.3 to 259.3 in China
from 2.3 to 18.9 in Russia

RESULTS: TIGERS
Cross-border movements

Russia 15.03.2014

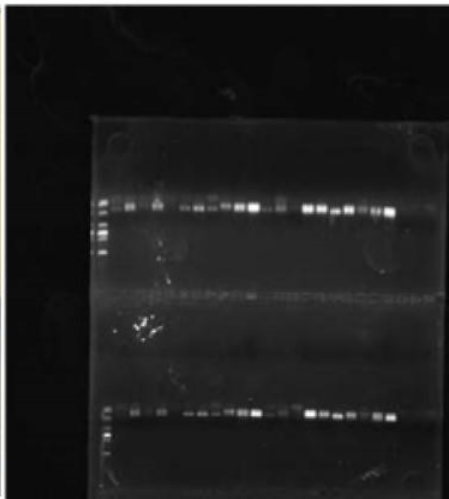


China 2014-2015
Max 259 km from the border

Methods

Scat collection

And genetic analysis



Minimal number of Amur tiger individuals captured by DNA analysis in China (2013-2015) and the Russian Federation (2015)

	Collected samples	Positive samples	Selected genotypes	Identified individuals	Gender
China	103	93	22	15	5 Female; 9 Male; 1 unknown
Russian Federation	78	65	18	9	5 Female; 4 Male

Minimal number of Amur Leopards individuals captured by DNA analysis in China (2013-2015) and the Russian Federation (2015)

	Collected samples	Positive samples	Selected genotypes	Identified individuals	Gender
China	104	78	15	10	1 Female; 6 Male; 3 unknown
Russian Federation	86	56	23	17	2 Female; 13 Male

CONCLUSION

- The conducted analysis showed that 17% of all Amur leopards and 42% of all Amur tigers captured by cameratraps in Russia and China during the period from 2013 to 2015 were registered in both countries.

- Both males and females, adult and young individuals, and even females with cubs crossed the border. Cross-border movements are not limited.

- Camera trapping could be a better monitoring methodology than molecular genetic analysis for understanding the cross-border movement of the Amur tiger and leopard.

- 42% of Amur tigers and 17% of Amur leopards captured by camera trapping in this study showed transborder movement, while molecular genetic analysis found only 1 Amur tiger and 1 Amur leopard crossing the border between China and the Russian Federation.

CONCLUSION

- Although one of the goals of molecular genetic analysis was to estimate genetic diversity and cross-border movement of two species, it was not feasible to achieve that goal due to insufficient number of samples for lab analysis Sino-Russian border fence or human disturbance between Changbai Mountains and the Land of Leopard National Park do not appear to be a serious obstacle for the movement of the Amur tiger and leopard.

- High density of Amur tigers and leopards live in the core areas of the Sino-Russian border, and they frequently cross the border. Thus, well-developed joint Sino-Russian monitoring activities should continue for efficient conservation of the concerned species. It is strongly recommended to diffuse such dense population out of the core area.]