Review of NEASPEC Amur Tiger and Leopard Project Outcomes

NEASPEC虎豹项目产出回顾

姜广顺

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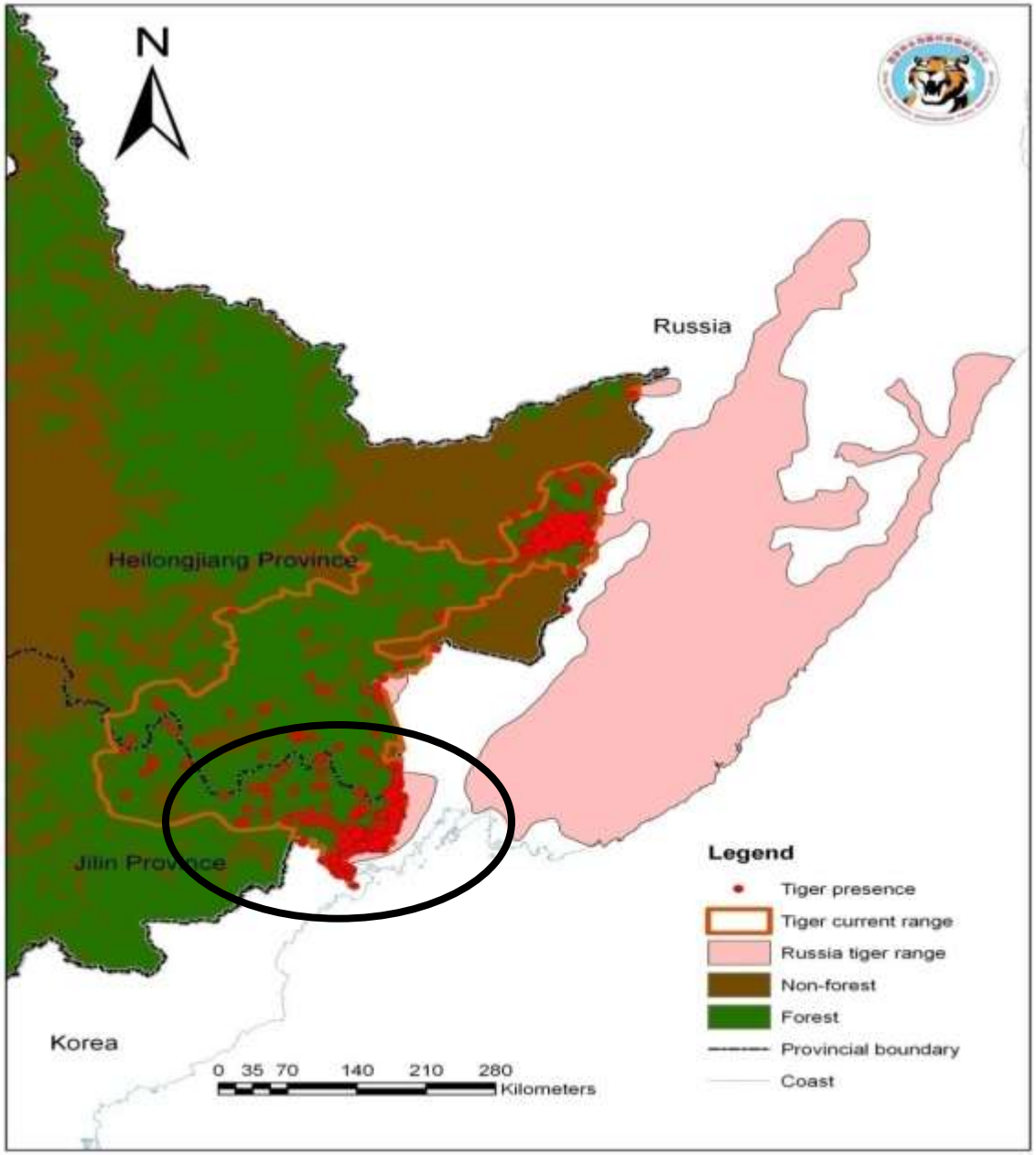
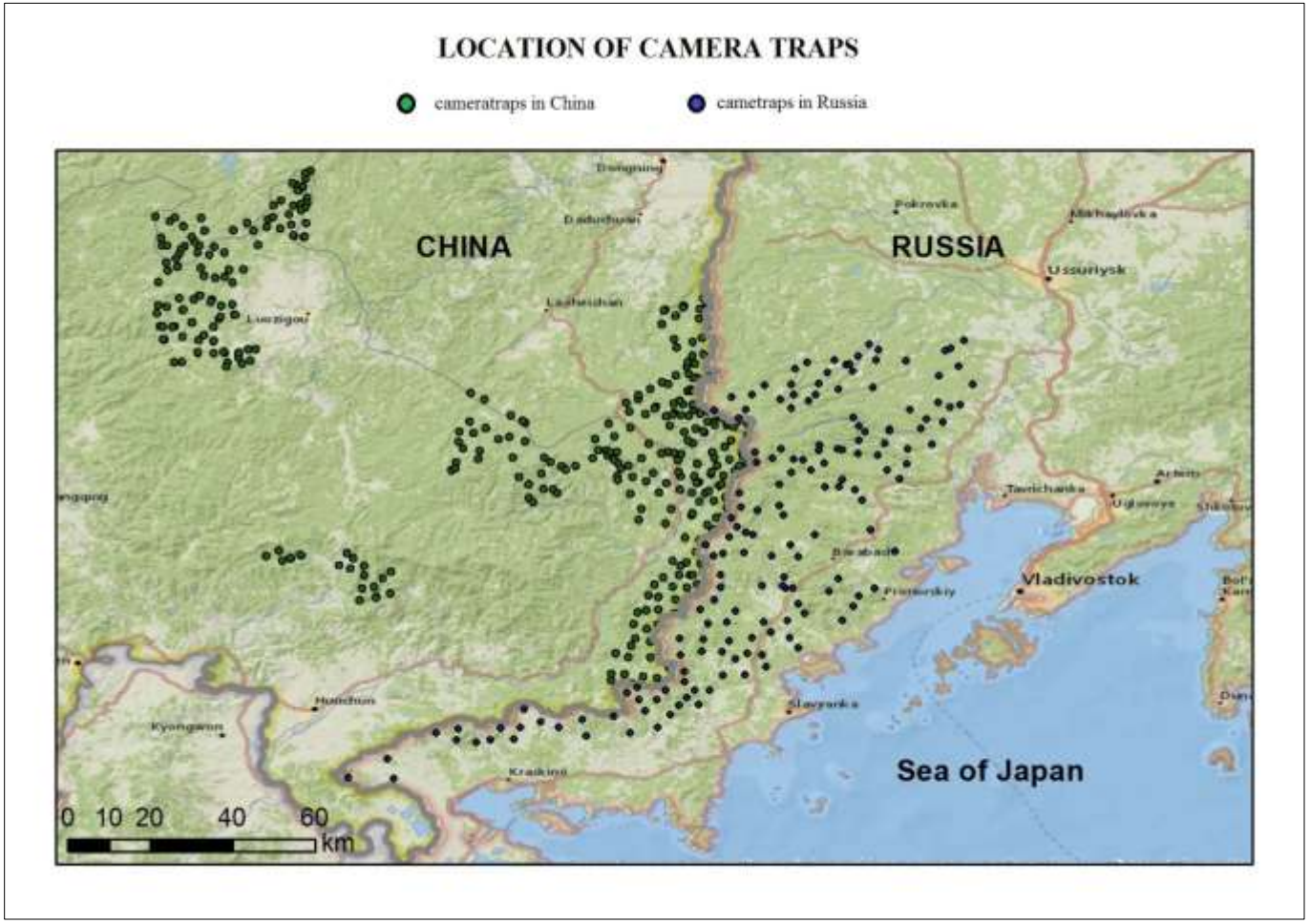


中俄东北虎分布区域图

Distribution map of Amur tiger and leopard in China and Russia.

1. 自动相机监测结果 Results of camera trapping

1.1 研究区域 Study area



2013-2015

Russia:
314 camera traps
157 points

China:
634 camera traps
317 points

1.2 东北虎监测结果 Results of monitoring Amur tiger

2013-2015年中俄自动相机监测到的成年东北虎个体数的最小值
Minimal number of adult tiger individuals captured in 2013-2015 years by camera traps in Russia and China

	Total(adult only)	Female	Male	Unknown sex
Totally in China and Russia	45	20	15	10
in China	22	9	8	5
in Russia	42	18	15	9
Individuals detected in Russia and China	19	8	8	3
in China only	3	1	0	2
in Russia only	24	10	7	7

2013-2015 繁殖母虎数量
Reproductive indexes of Amur tiger in 2013-2015

Number of cubs	2013	2014	2015	Females with cubs
in Russia	0	12	1	T1,T10(CT5), T7, T21
in China	0	5	0	CT3,CT18,CT5(T10)

FRC-ID	Number of encounters			Times cross border	Max distance moved from the state border	
	in China	in Russia	total		in China	in Russia
CT1	21	14	35	10	5	7.9
CT2	8	12	20	4	1.9	17
CT3	5	5	10	2	1.6	2.5
CT4	4	13	17	3	2.7	5.7
CT5	3	2	5	1	36.3	4.4
CT7	8	3	11	5	14.7	3.8
CT8	2	13	15	2	1.9	4.4
CT10	9	2	11	1	259.3	18.9
CT11	2	1	3	1	0.9	2.3
CT12	8	1	9	1	1.6	2.3
CT13	8	11	19	1	1.6	16.2
CT15	1	1	2	1	0.7	4.4
CT16	18	6	24	3	2.9	3.9
CT17	2	7	9	1	4.8	4.4
CT18	1	8	9	2	0.3	4.1
CT21	1	1	2	1	36.3	2.7
CT23	1	3	4	2	0.9	17
CT24	2	1	3	1	39.7	2.7
CT26	1	1	2	1	30.6	15.9
CT28	1	1	2	1	90.3	2.3

Cross-boundary movements of tiger individuals
跨境虎个体

Cross the border many times

Cross the border with kids

Move most inside China and never come back

Born in Russian, live in China

2.2 东北豹监测结果 Results of monitoring Amur leopard

2013-2015年中俄自动相机监测到的成年东北豹个体数的最小值
Minimal number of adult leopard individuals captured in 2013-2015 years by camera traps in Russia and China

	Total(adult only)	Female	Male	Unknown sex
Totally in China and Russia	89	41	37	11
in China	23	9	10	4
in Russia	81	40	34	7
Individuals detected in Russia and China	15	8	7	0
in China only	8	1	3	4

2013-2015 繁殖母豹数量
Reproductive indexes of Amur leopards in 2013-2015

Number of cubs	2013	2014	2015	Females with cubs
in Russia	6	9	7	Leo 1F, Leo 5F, Leo 7F, Leo 16F,Leo 23F, Leo 39F, Leo 55F, Leo 66F, Leo 89F
in China	2	2	0	Leo 4

跨境豹个体

Cross-boundary movements of leopard individuals

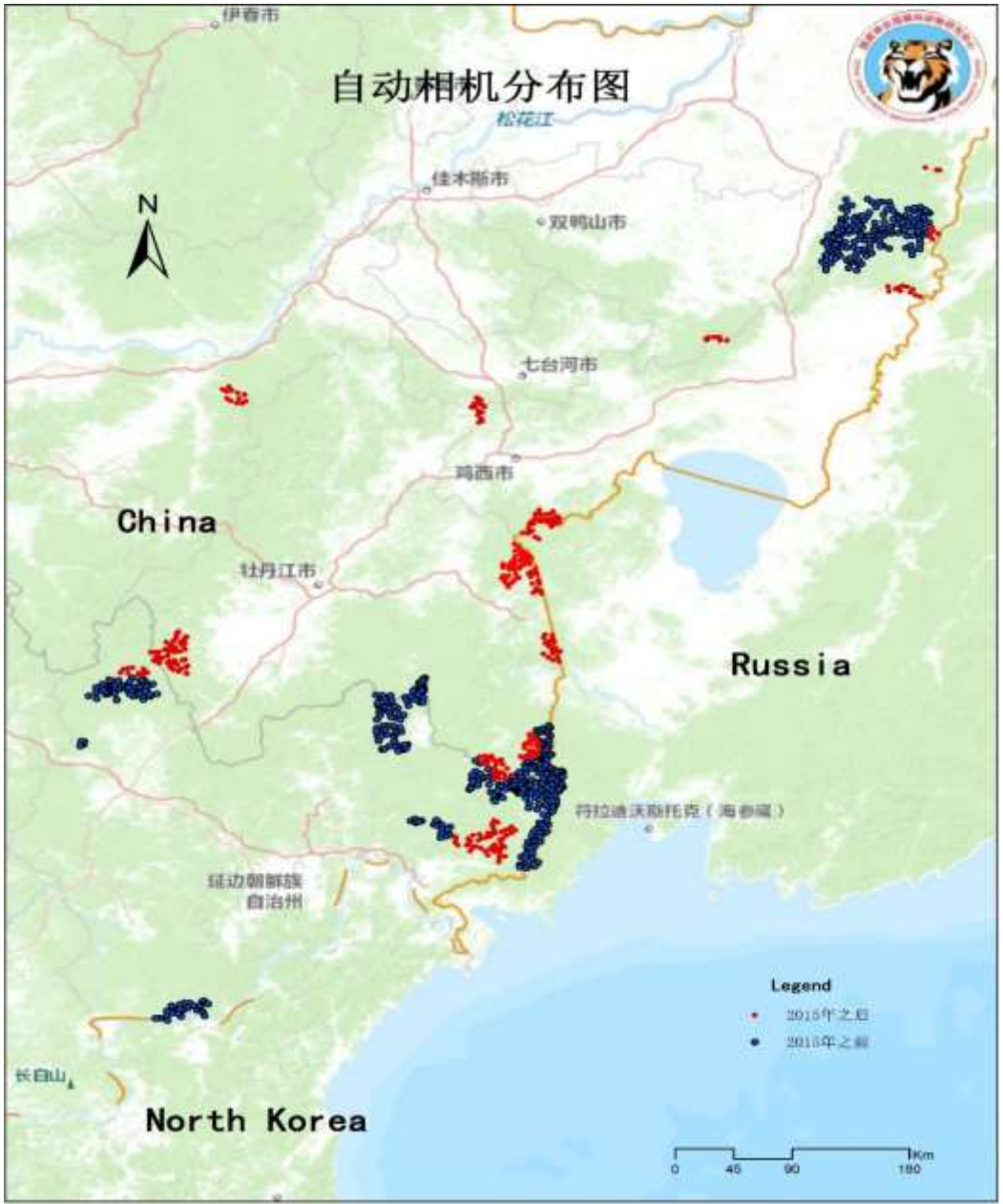
FRC-ID	Number of encounters			Times cross border	Max distance moved from the state border	
	in China	in Russia	total		in China	in Russia
leo 25	2	71	73	4	0.64	8.7
leo 1	44	19	63	10	37.6	4.9
leo 24	1	41	42	2	1.9	7.9
leo 3	10	31	41	9	36.3	5.7
leo 26	1	30	31	2	7.1	15.5
leo 21	1	27	28	2	0.6	7.1
leo 12	10	5	15	5	9.3	5.4
leo 17	2	13	15	1	0.46	3.5
leo 10	6	5	11	1	23.7	4.9
leo 11	3	7	10	1	0.46	6.2
leo 14	3	6	9	1	21.7	2.8
leo 22	1	7	8	2	2.2	6.2
leo 7	2	5	7	1	6.8	27.7
leo 27	1	5	6	2	0.9	14.2
leo 29	1	1	2	1	29.7	7

Cross the border many times

Born in Russia, live in China

Move to Russia, never back

2.3 中国东北虎、豹监测进展
Amur tiger and leopard monitoring advance in China



Location of camera traps

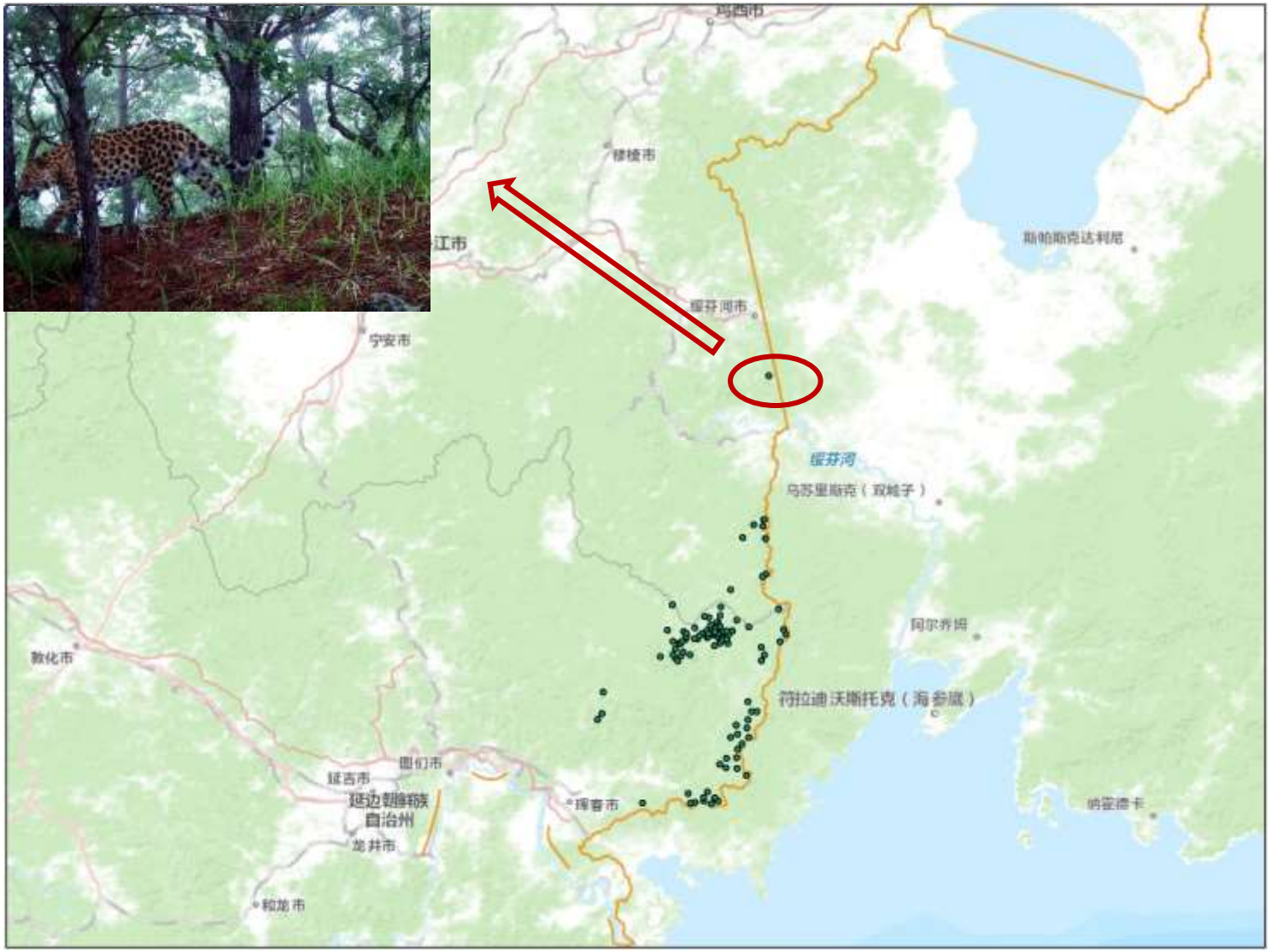
2012-2015

About 4500 km^2
450 camera trap points

2016- now

New about 4500km^2
450 camera trap points

The camera trap locations catching Amur leopard images **(2013-2016)**



The camera trap locations catching Amur tiger images

(2012 - now)

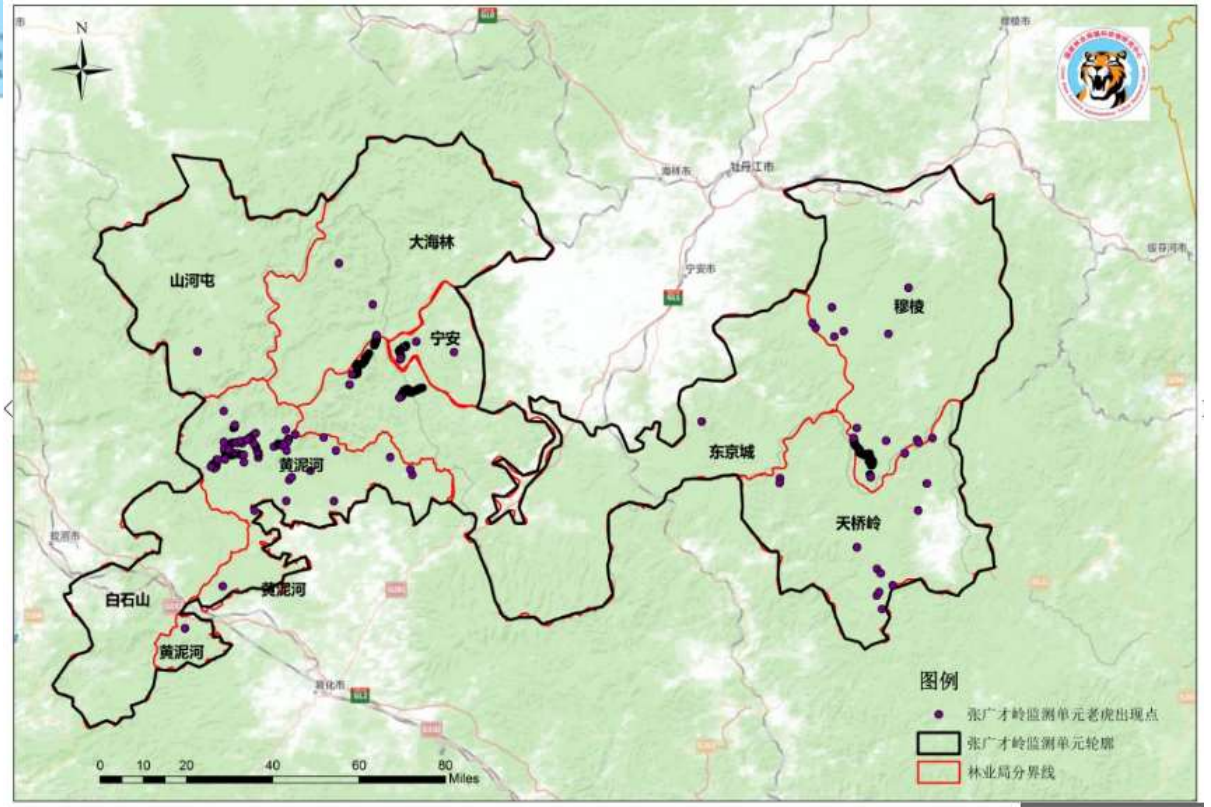
Monitoring results in Zhangguangcailing and Western Laoyeling（2014-2016)

No 3 Female 4
2015.2.8
2015.11.11
2015.12.19

No 3 Male

No1 Male

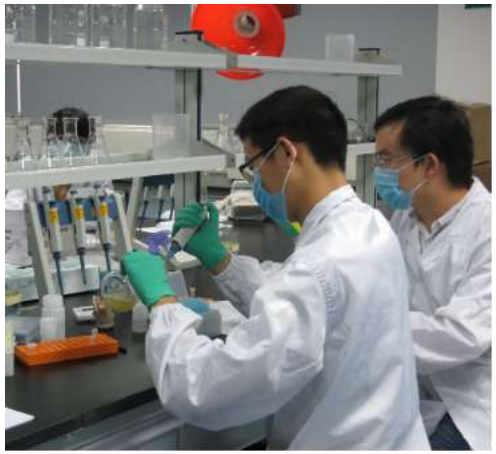
No 2 Male



2. DNA监测结果 Results of DNA analysis

2.1 方法和样本 Methods and samples

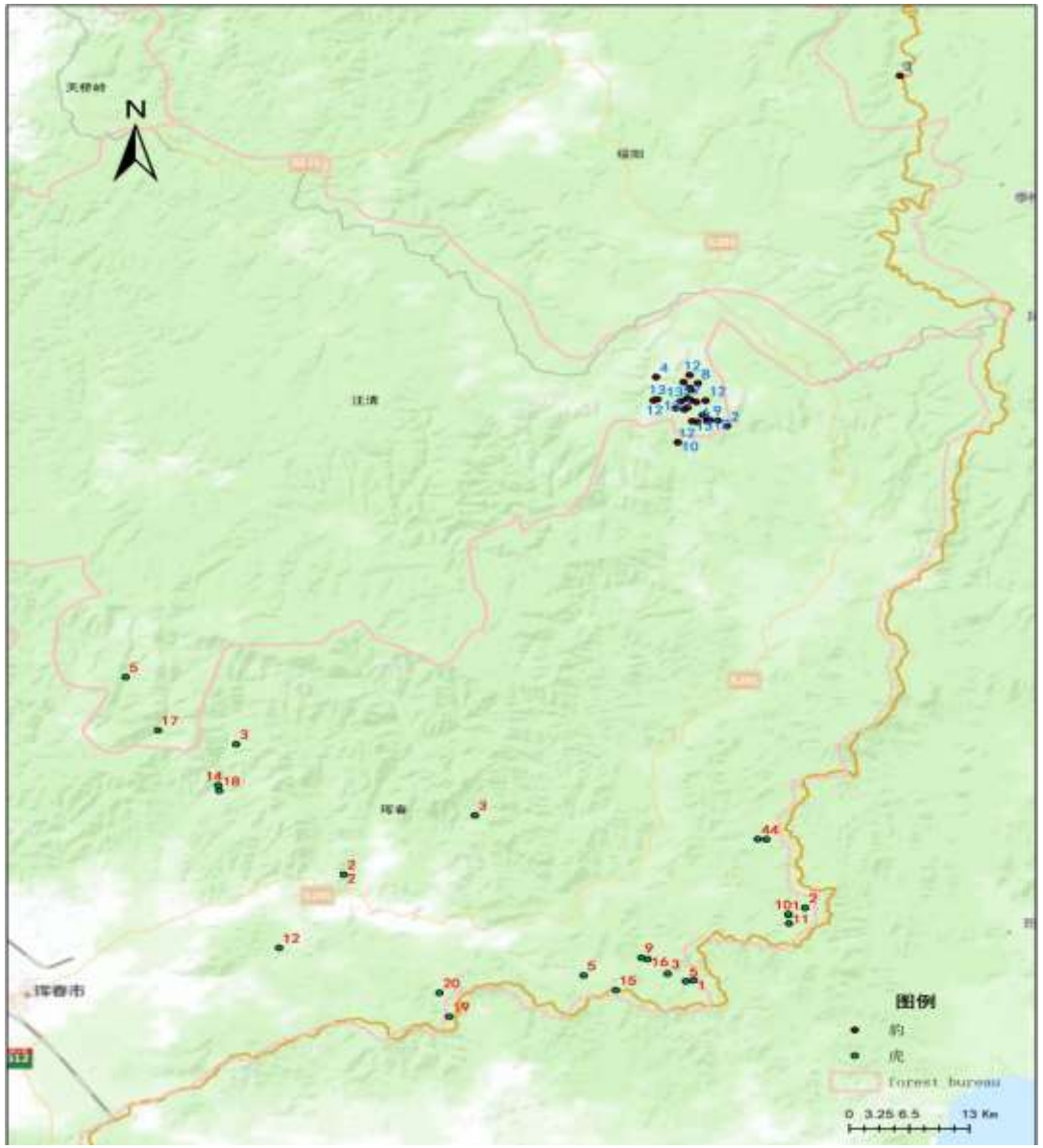
DNA提取 →	物种确定 →	个体识别 →	性别确定
Extracting DNA	**Identify the species**	**Individual identification**	**Sex identification**
试剂盒提取 QIAamp DNA Stool Mini Kit	Pta-CbF /Pta-CbR Ppo-CbF / Ppo-CbR	用multiplex方法 11个微卫星位点 amplify 11 microsatellite	P1-5EZ /P2-3EZ Y53-3E /Y53-3F



Zheng-Ting Zou , Olga V.Uphyrkina,Pavel Fomenko ,**Shu-Jin Luo**.The development and application of a multiplex short tandem repeat(STR)system for identifying subspecies ,individual and sex in tiger.Integrative Zoology, 2015,10: 376-388.

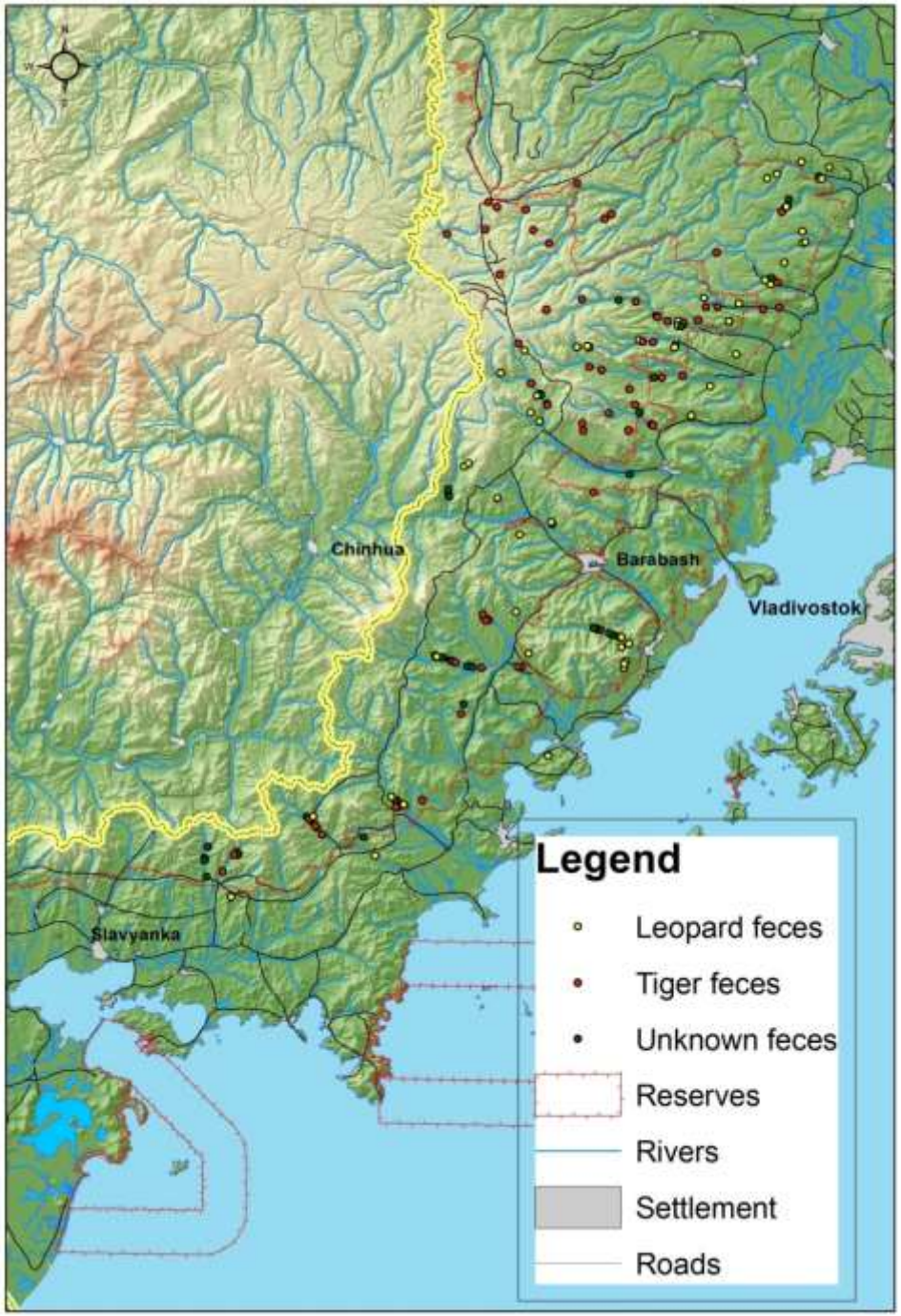
2013-2015 东北虎、豹粪可用DNA样本
2013-2015 China Amur tiger and leopards' avaliable DNA samples

国家 Nation	物种 Species	采集样本数 Collect sample	可用样本 Positive samples	全部位点扩增成功样本 Selected genotypes
中国 China	Amur leopard	104	78	18
	Amur tiger	103	93	24
俄罗斯 Russia	Amur leopard	57	56	24
	Amur tiger	49	65	24
	Unknown	29		



The sample locations of Amur tigers and leopards in China (2013-2015)
中国虎豹样本分布图
2013-2015

Amur leopard	104
Amur tiger	103



俄罗斯2015年调查
Russia route census in 2015

Amur leopard	57
Amur tiger	49

2.2 DNA检测结果 Results of DNA Analysis

中俄DNA检测结果
Sino-Russian DNA test results

	Amur tiger	Amur leopard
Totally in China and Russia	28	23
in China	17(1♀16♂1UN)	9(1♀7♂1UN)
in Russia	12(1♀11♂)	16(1♀15♂)
Individuals detected in Russia and China	0	2
in China only	17	7
in Russia only	12	14

DNA监测的缺点：样本覆盖区域小，样本采样保存要求高。
The weakness of DNA test monitoring: covering small area and high requirement of sample collection and conservation.

3. 后续成果产出 Continued Outcomes

1) 项目研究报告

《FINAL REPORT OF THE NEASPEC PROJECT “STUDY ON TRANSBORDER MOVEMENT OF AMUR TIGERS AND AMUR LEOPARDS USING CAMERA TRAPPING AND MOLECULAR GENETIC ANALYSIS”》

FINAL REPORT OF THE NEASPEC PROJECT “STUDY ON TRANSBORDER MOVEMENT OF AMUR TIGERS AND AMUR LEOPARDS USING CAMERA TRAPPING AND MOLECULAR GENETIC ANALYSIS”

Authors: Shevtsova Elena[1*], Guangshun Jiang[2*], Vitkalova Anna[1], Jiayin Gu[2], Jinzhe Qi[2], , Marina Igorevna Chaika[3], Valentin Yurievich Guskov[3], Meng Wang[2], Yao Ning[2], Kostyria Alexey[3,4], Darman Yurii [4].

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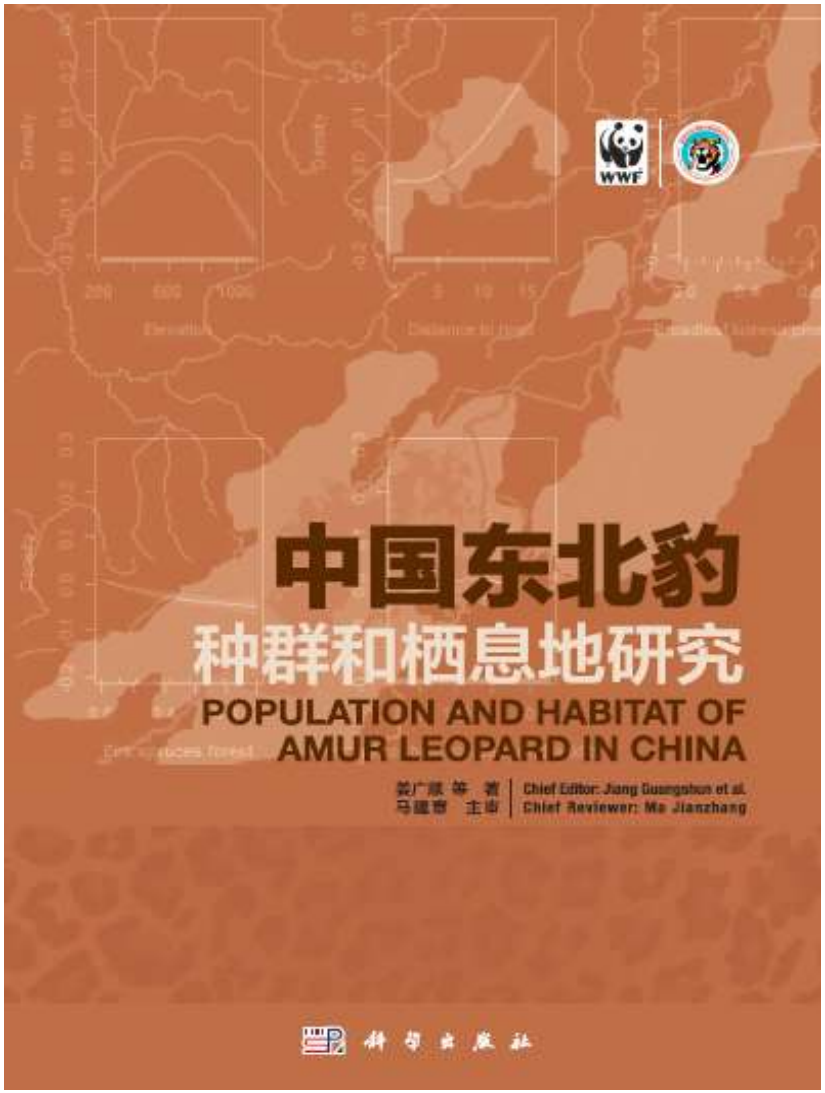
Vladivostok – Harbin, 2015

2）《中国东北豹种群和栖息地研究》（中国科学出版社出版）姜广顺等 主编（2016）(printed in both English and Chinese)



3）《 中国东北虎和东北豹保护行动计划 （2016-2025） （草案）》已经编制完成，并提交国家林业局。

<Amur tiger and Amur leopard conservation plan (2016-2025)> has been drafted and submitted to SFA.

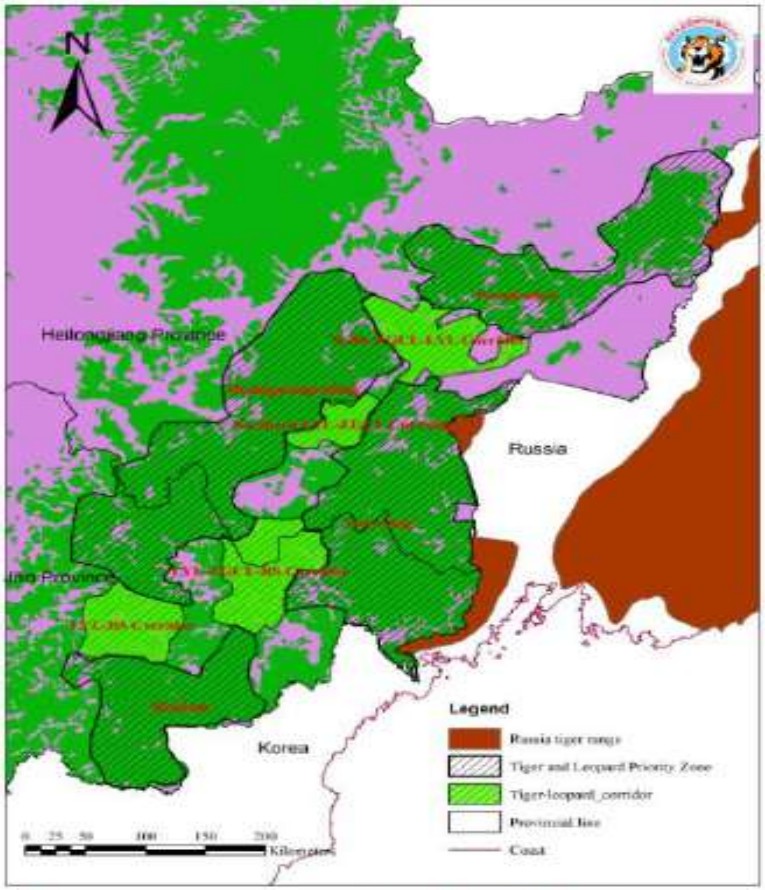


图 3 东北虎和东北豹保护行动实施区域规划 注：Wandashan, 完达山; Laoyeling, 老爷岭; Zhangguangcailing, 张广才岭和 Baishan, 白山;

4. 发现和建议 New findings and suggestions

1、长白山区中俄边境两侧东北虎豹来往频繁，该区东北虎种群急需和俄罗斯北部大种群建立联系，以避免种群崩溃；

The transboundary movements of Amur tigers and leopards are frequent on the Sino-Russian border of Changbai mountain;

2、东北虎、豹有强烈往内陆扩散的趋势，但是扩散受阻；

Amur tigers and leopards have a strong demand to move inside China further, but many obstacles are on their diffusion way;

3、关注东北虎的同时，也要时刻关注东北豹的种群发展，因为它更濒危！

Pay great attention to Amur leopards which are much more endangered than Amur tiger !

4、在大型猫科动物监测中，自动相机监测有监测区域面积大，区域内监测点均匀，全天工作等优势，监测到的动物数量要比DNA监测等方法多，但是在监测对象分布区边缘（栖息地面积大，动物数量少），多种监测方法一起使用，较为有效；

Camera trapping can capture more individuals than other monitoring methods, because of bigger monitoring area, all-weather monitoring, but in the edge habitat of big cats, multiple methods should be used for effective monitoring.

5、中俄统一的自动相机和遗传监测技术手段技术标准、信息分享机制、联合解决栖息地保护中廊道的建设、反盗猎等问题急需继续深入的合作。

Sino-Russia unified camera trap and DNA genetic analysis method standards, information sharing mechanism, jointly resolve corridor across Sino-Russia border areas, anti-poaching etc need further cooperation.

5.讨论 Discussions (in this afternoon)

Some recommendations on Amur tiger and leopard conservation research cooperation

Guangshun Jiang Prof./Executive director

Feline Research Center of Chinese SFA

28 Nov. 2016

谢谢大家！

Thanks!