



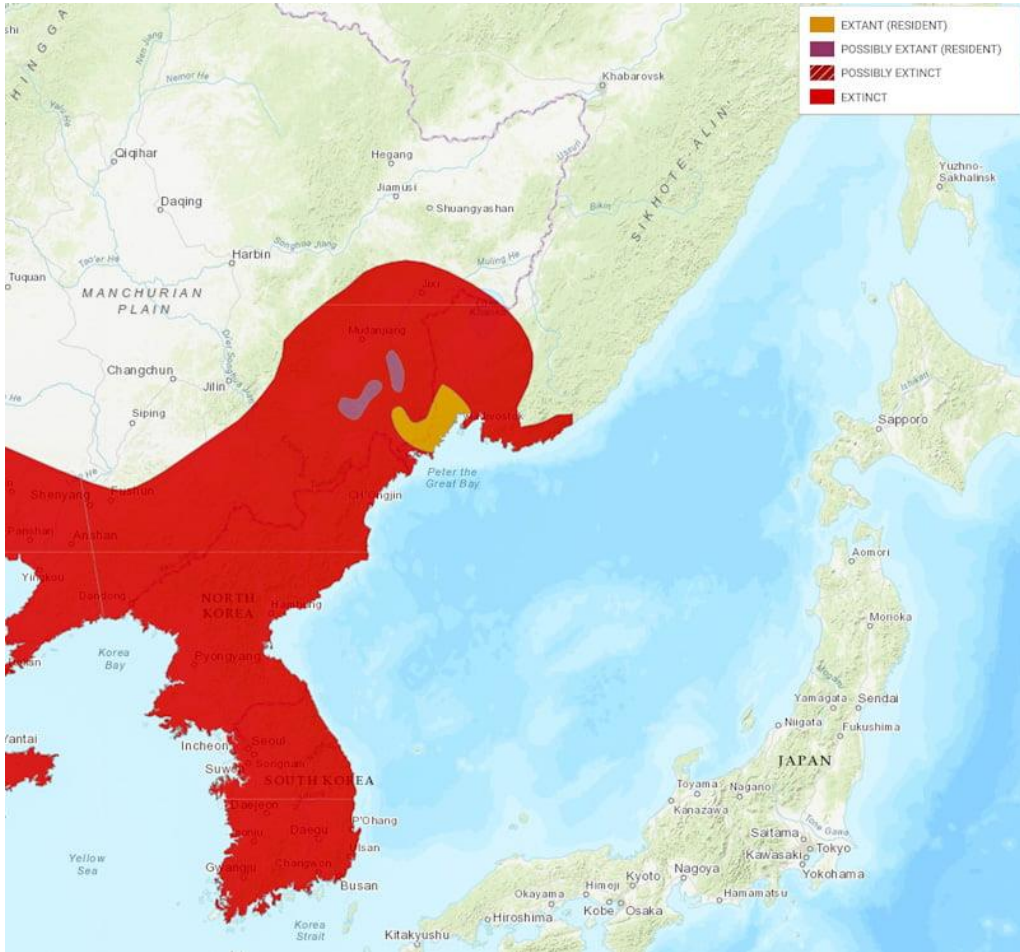
# POTENTIAL HABITAT OF AMUR LEOPARDS IN NORTHEAST ASIA

Jeong Eun (Anyu) Lim

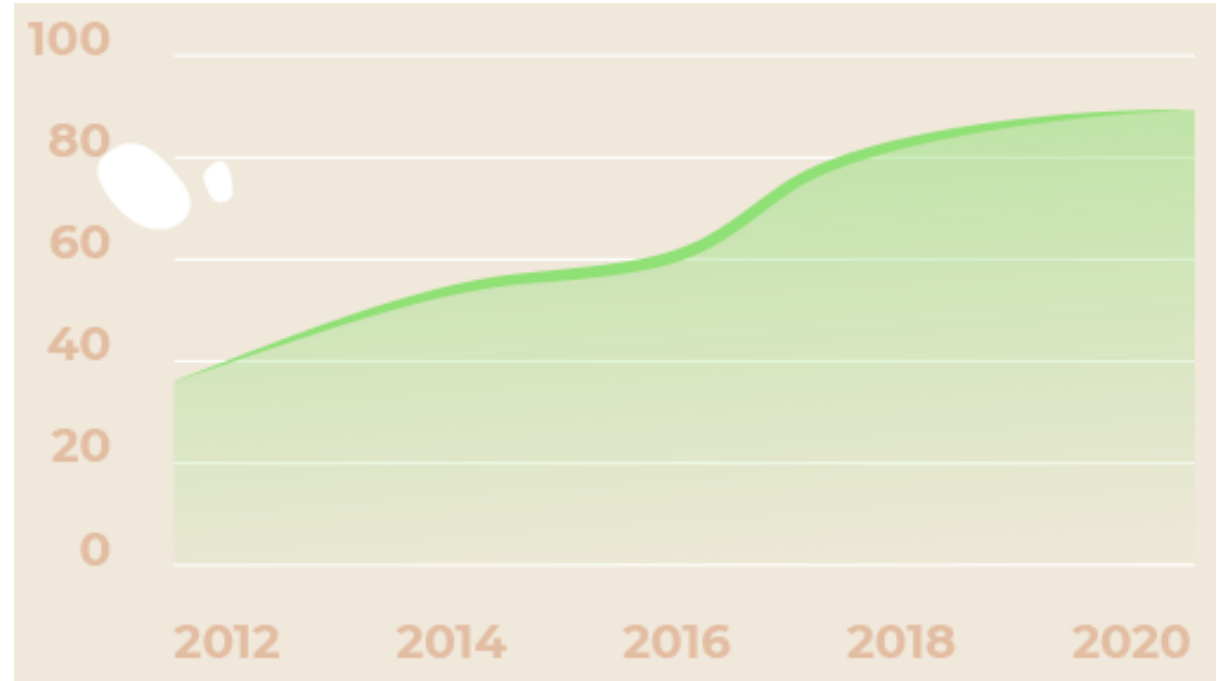
Research Center for Endangered Species

National Institute of Ecology

# BACKGROUND



IUCN Redlist

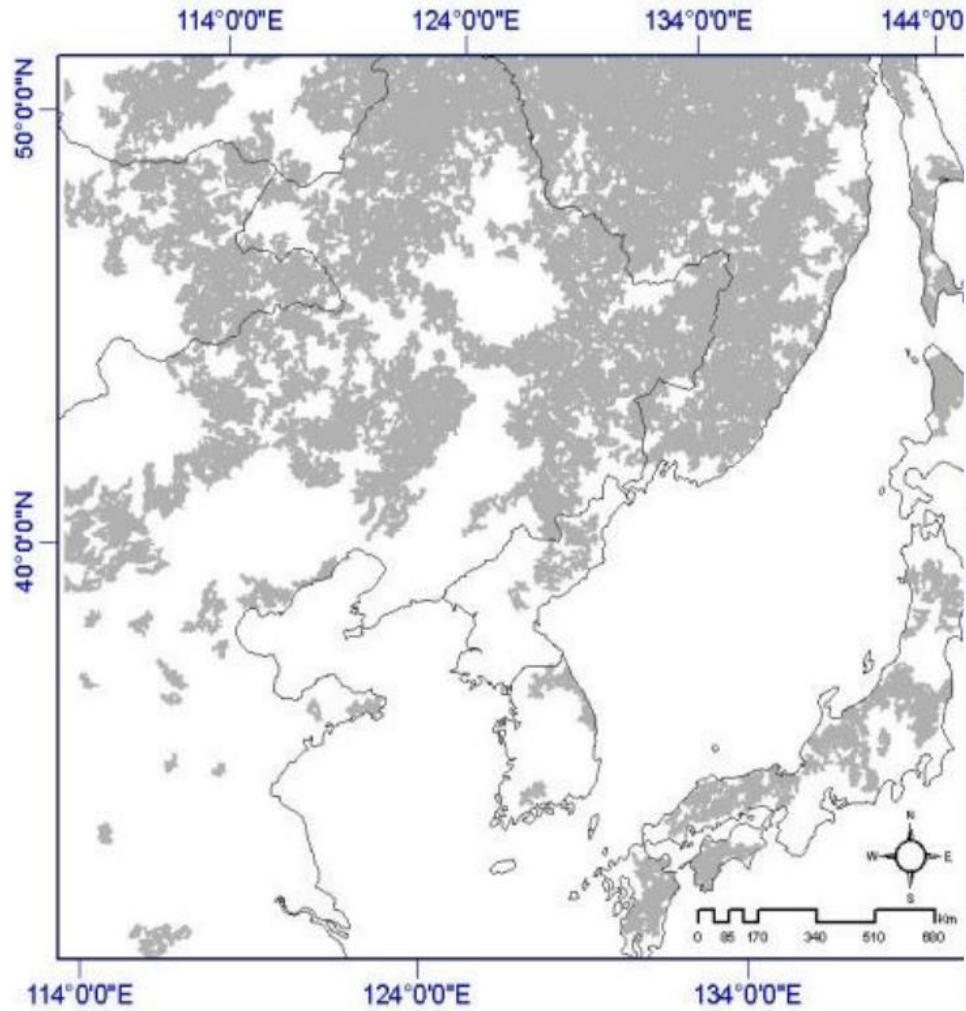


Land of the Leopard National Park

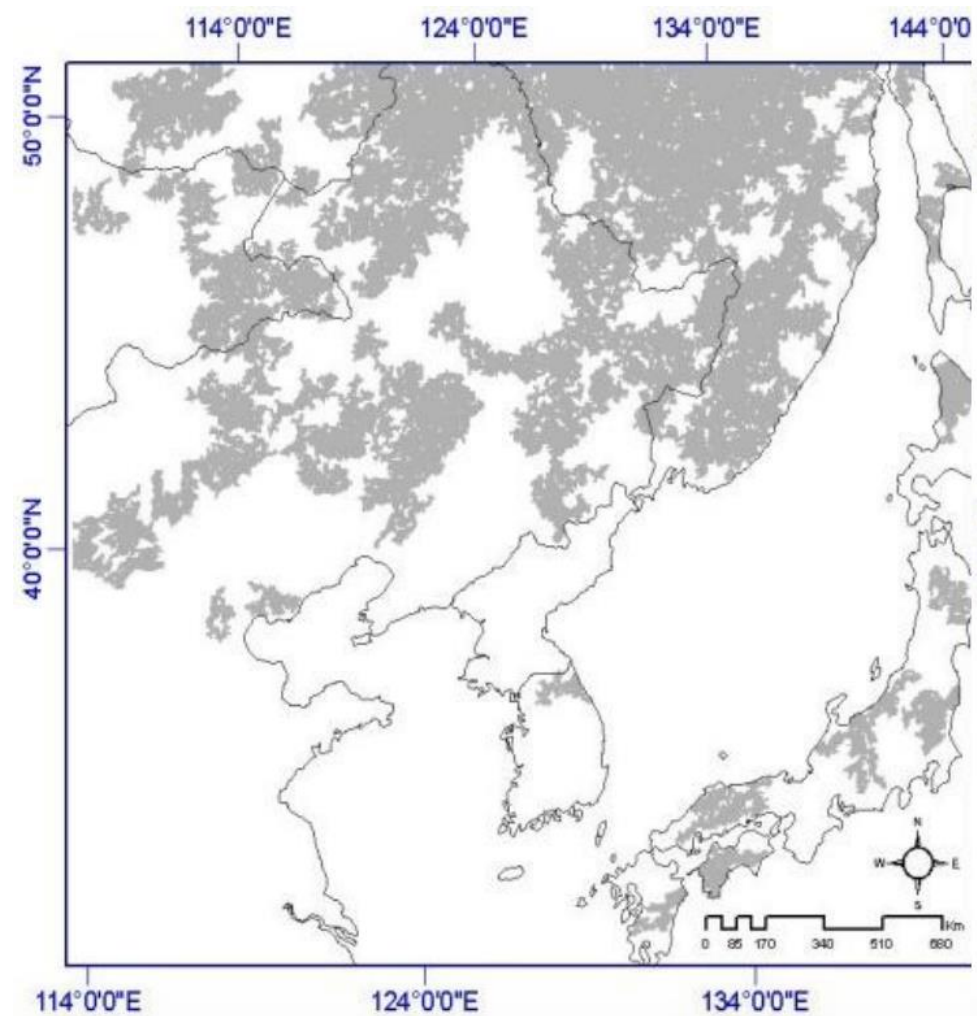


# PREVIOUS STUDIES

Short term prediction



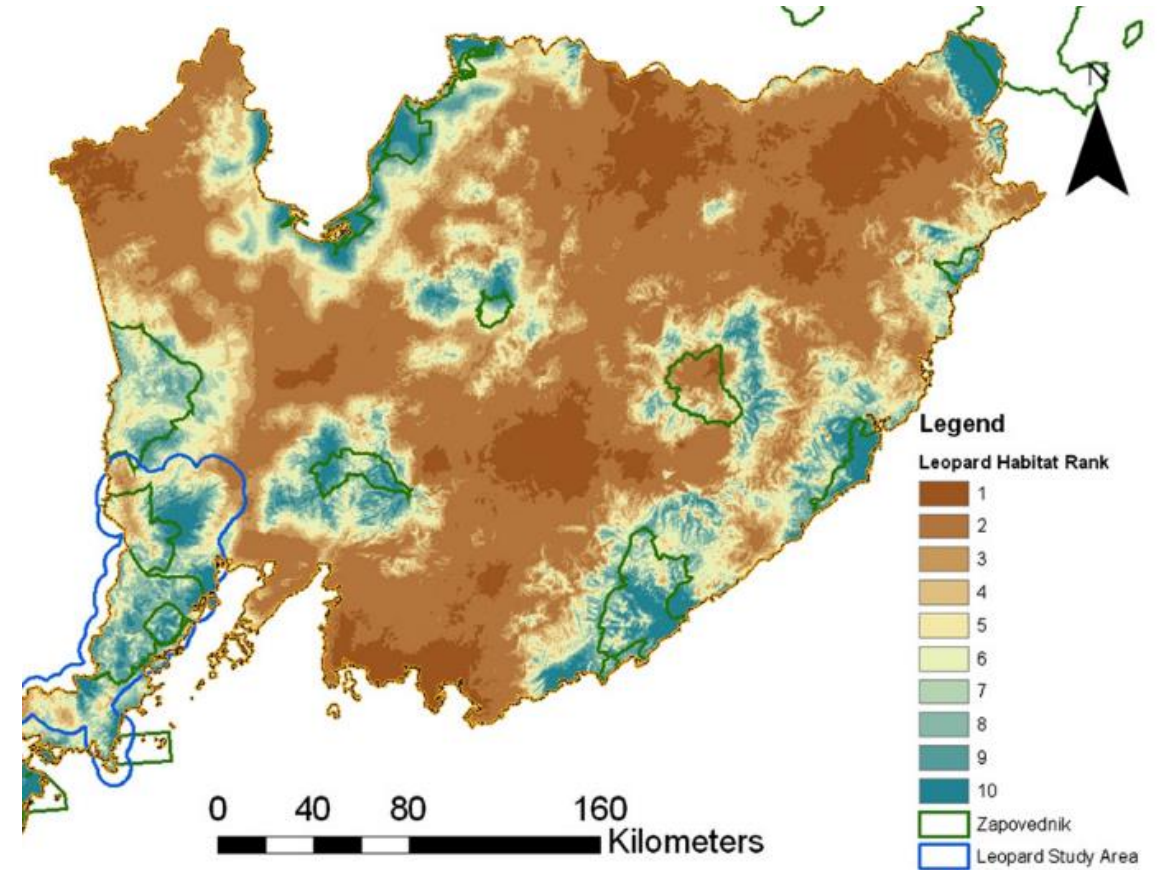
long term prediction



Top Far Eastern leopard RSF for the relative probability of selection at the study area scale in the Russian Far East, Southwest Primorski Krai, 1997–2007. Bold values are significant at  $p = 0.01$ .

Coefficient	<i>B</i>	SE
Deciduous	<b>-0.95</b>	0.460
Meadows	<b>-0.67</b>	0.272
Shrubs	<b>-0.74</b>	0.222
Korean Pine	<b>0.31</b>	0.121
Agriculture	<b>-1.28</b>	0.478
Ungulate Prey	<b>5.27</b>	0.802
Distance to main roads (km)	<b>0.145</b>	0.015
Snow cover (MODIS)	-0.34	0.204
Hillshade	<b>-0.0027</b>	0.0007
Dist (km) to Zapovednik	<b>-0.053</b>	0.007
Elevation (m)	<b>-0.0036</b>	0.0004
Constant, $\beta_0^a$	<b>-4.94</b>	0.710

<sup>a</sup> The constant ( $\beta_0$ ) includes as the reference categories birch, oak, Korean pine, meadow, and agriculture, which were not significantly different from each other.



(Hebblewhite et al., 2011)

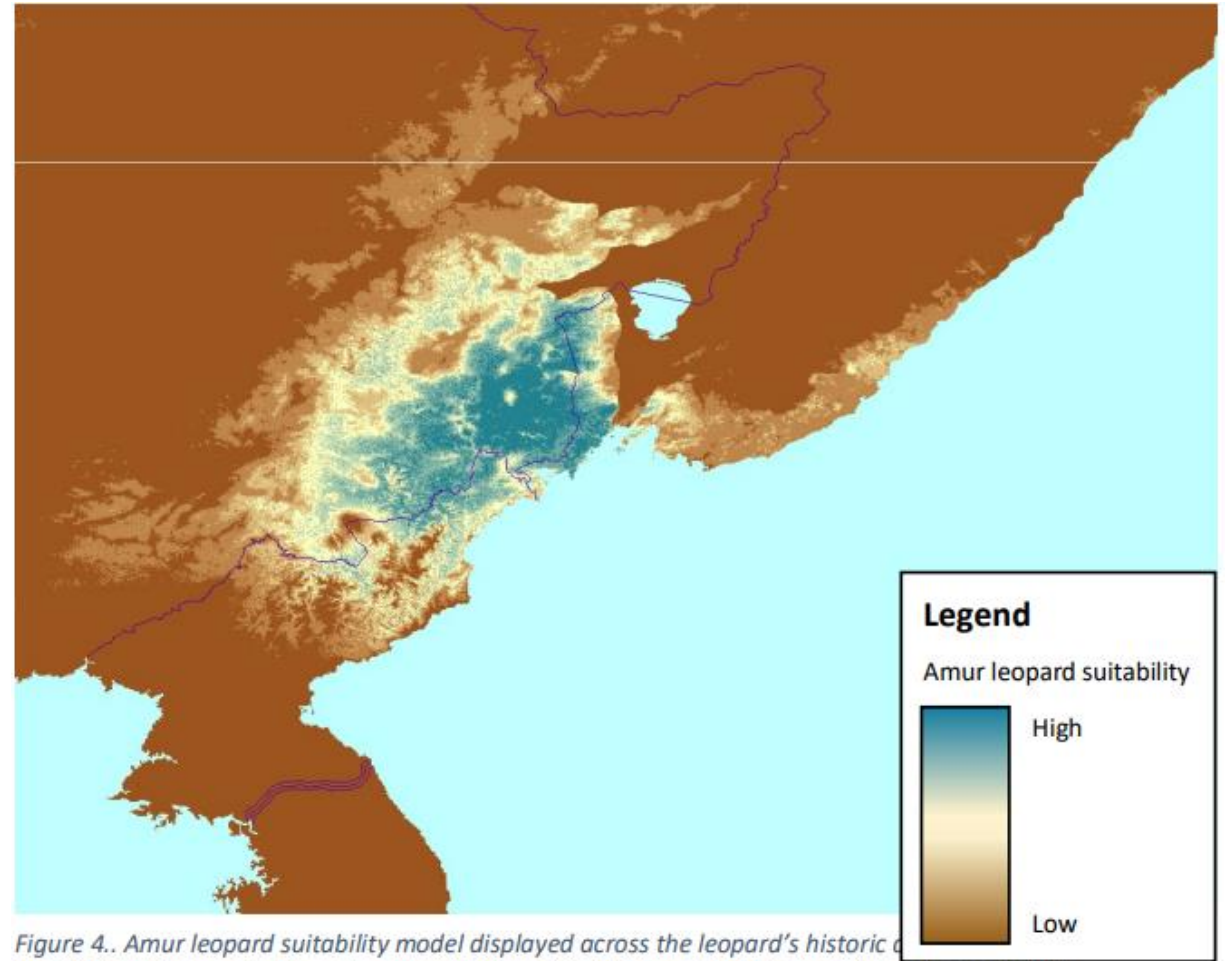
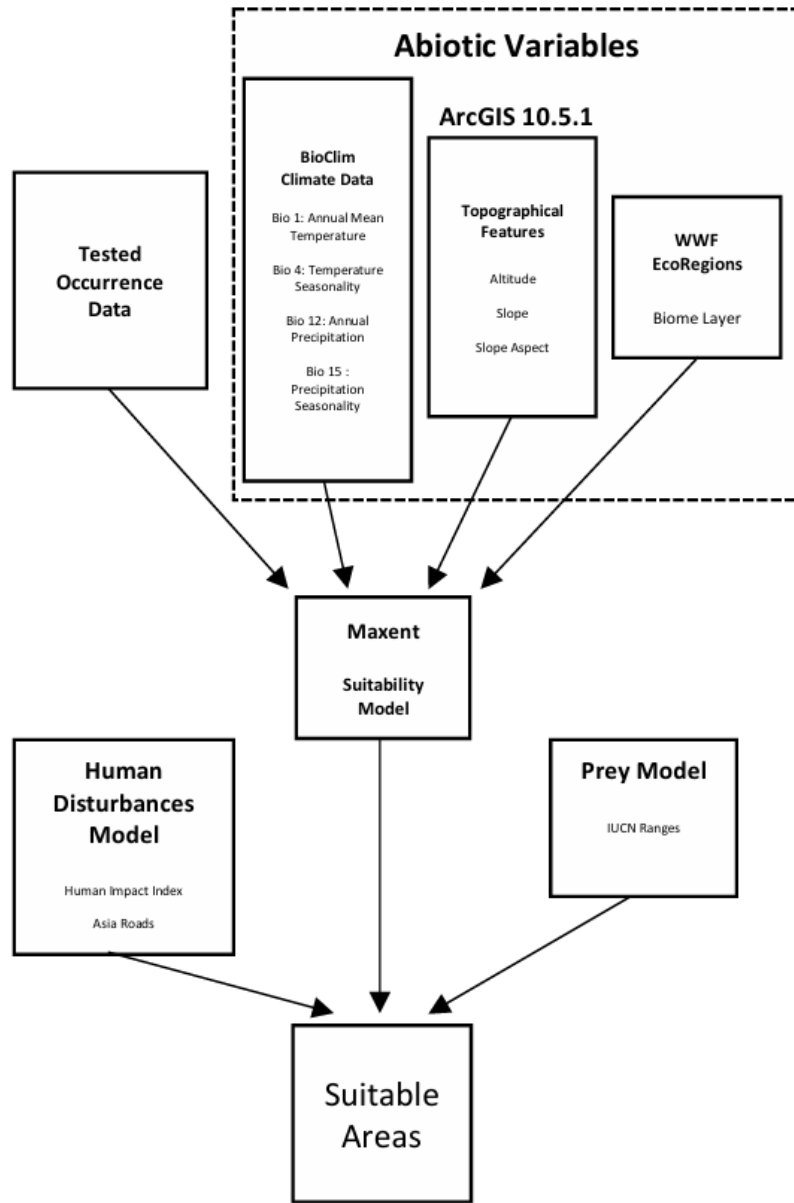
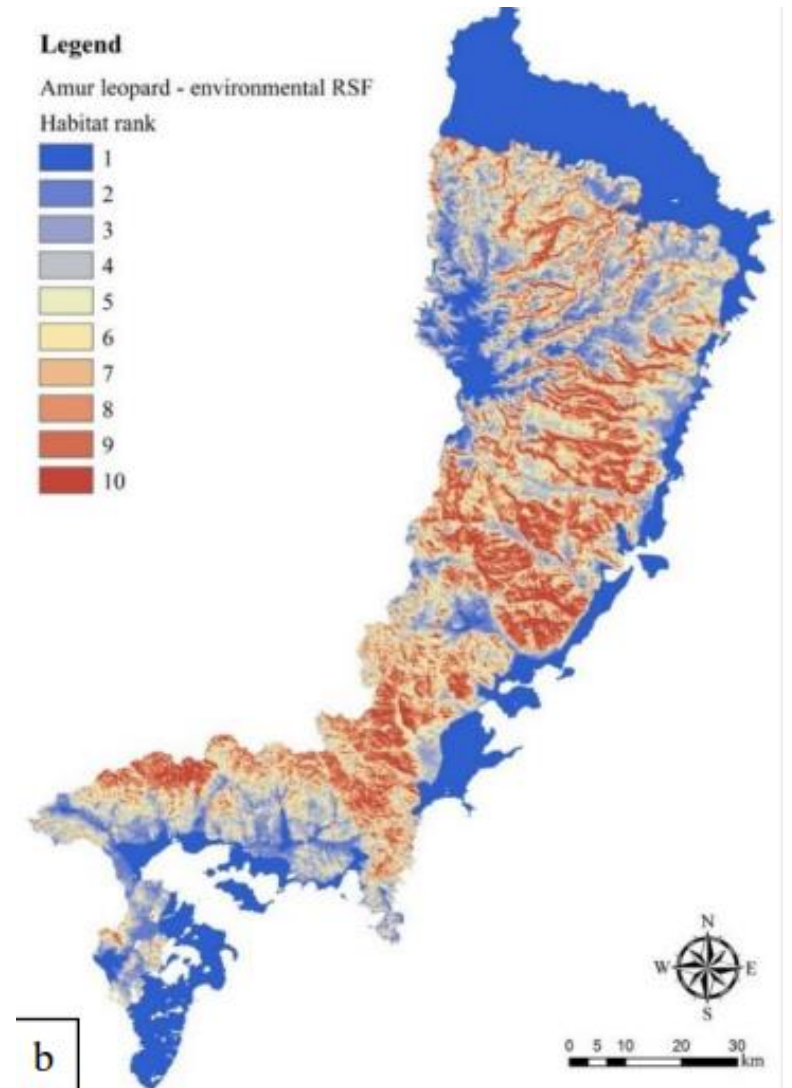


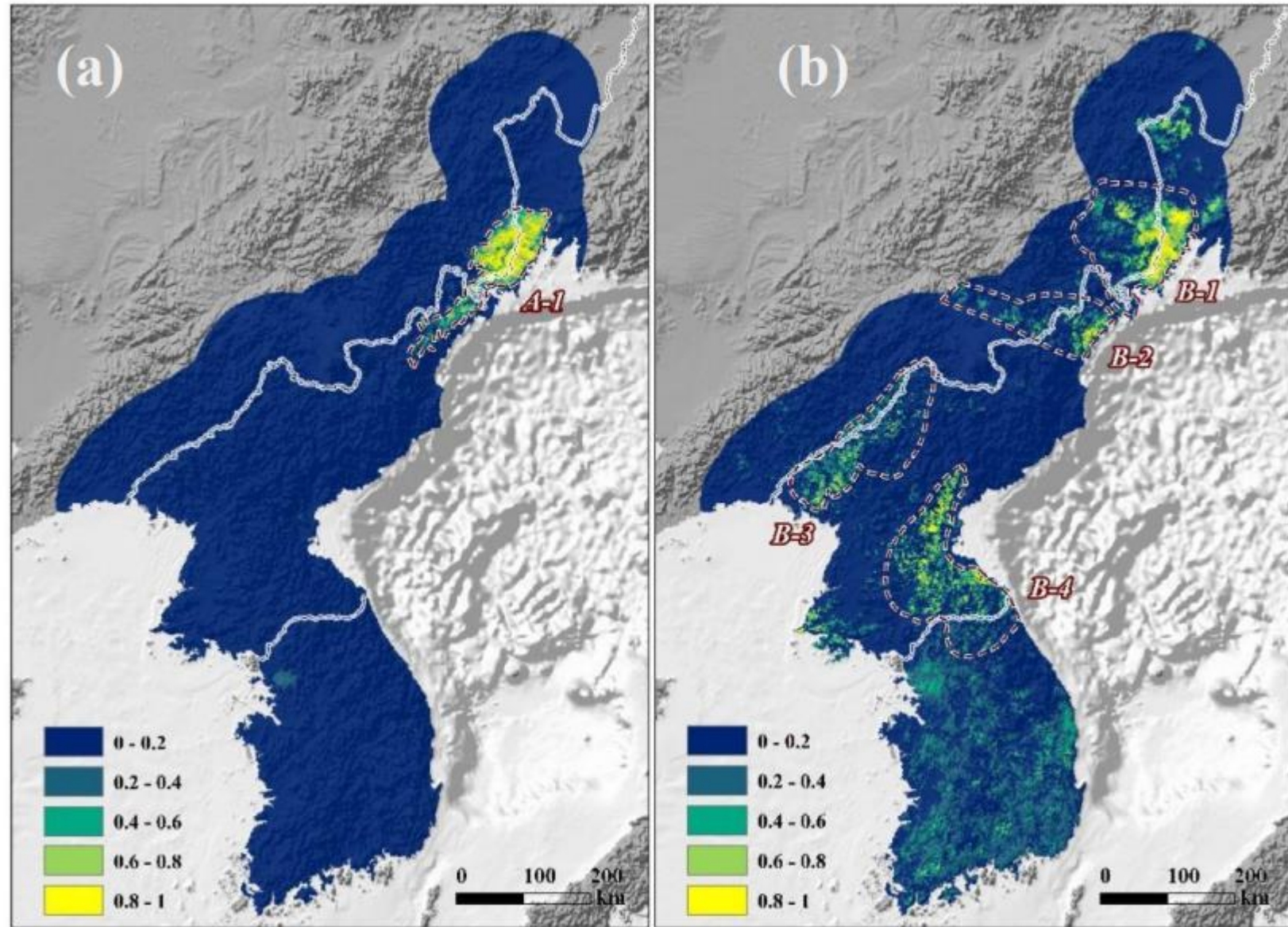
Figure 4.. Amur leopard suitability model displayed across the leopard's historic range. The areas displayed in blue represent those of the highest suitability. The areas displayed in purple lines represent those of the IUCN Ranges.

(Gardener, 2020)

Variable	Units	Assumption	Source
Elevation	meters	Large-scale proxy for vegetation cover types and human disturbance	SRTM DEM, NASA
Slope	degrees	Travel costs and escape cover	SRTM DEM, NASA
Hill shade	relative units	Proxy for snow cover	SRTM DEM, NASA
Ruggedness	relative units	Escape cover	SRTM DEM, NASA
Snow cover	percent	Food availability (ungulates) and travel costs (ungulates and predators)	MODIS Snow Cover Daily L3 Global 500m Grid, NASA
Distance to river	meters	Proxy for distance to valleys as movement corridors	GIS
Percent tree cover	percent	Landscape openness, wildfire frequency and risk	MODIS Vegetation Continuous Fields Yearly L3 Global 250m, NASA
Vegetation cover type	categories	Availability of hard mast and other potential food sources for ungulates	Ermoshin et al. 2011
Distance to settlement	meters	Human disturbance	GIS
Distance to primary road	meters	Human disturbance, risk of road collisions	GIS
Road density	km/km <sup>2</sup>	Human disturbance and increased area accessibility	GIS
Distance to protected area	meters	Human disturbance	GIS



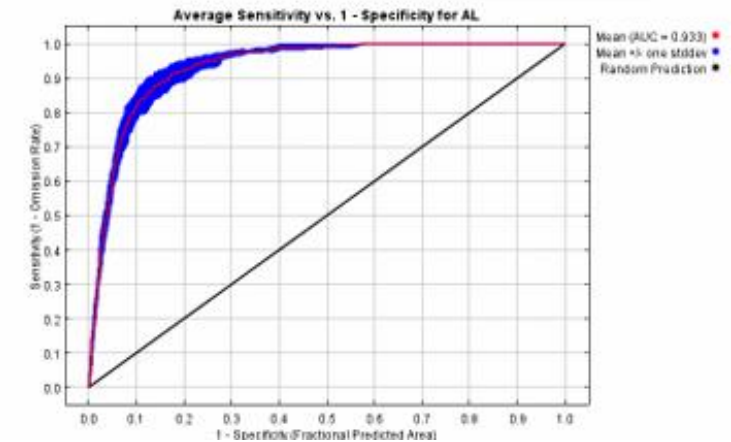
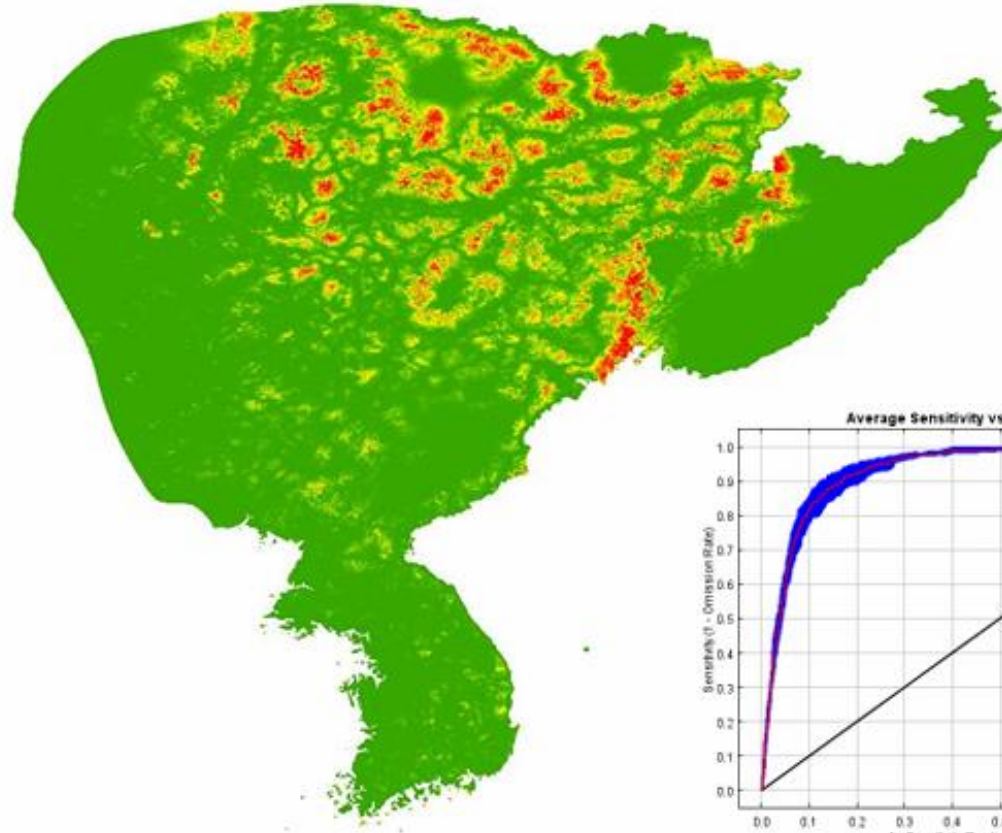
(Matiukhina, 2020)



(Li, 2024)

# FIRST TRIAL(2022-1)

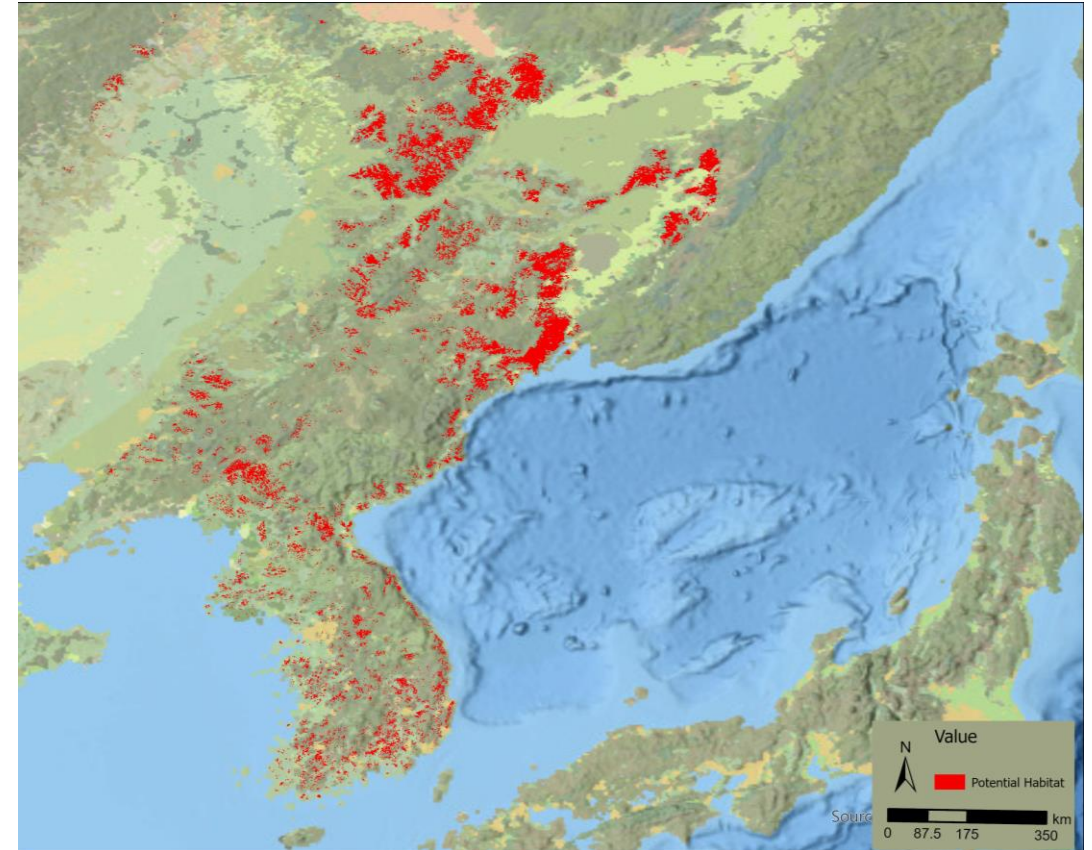
	2022(Maxent)
NDSI	X
NBR	O
Landcover	ESRI Land Cover
Coniferous forest	X
DEM	O
Aspect	X
Slope	X
Hillshade	X
D_water	O
Road	Distance
Light pollution	X
Temperature	X





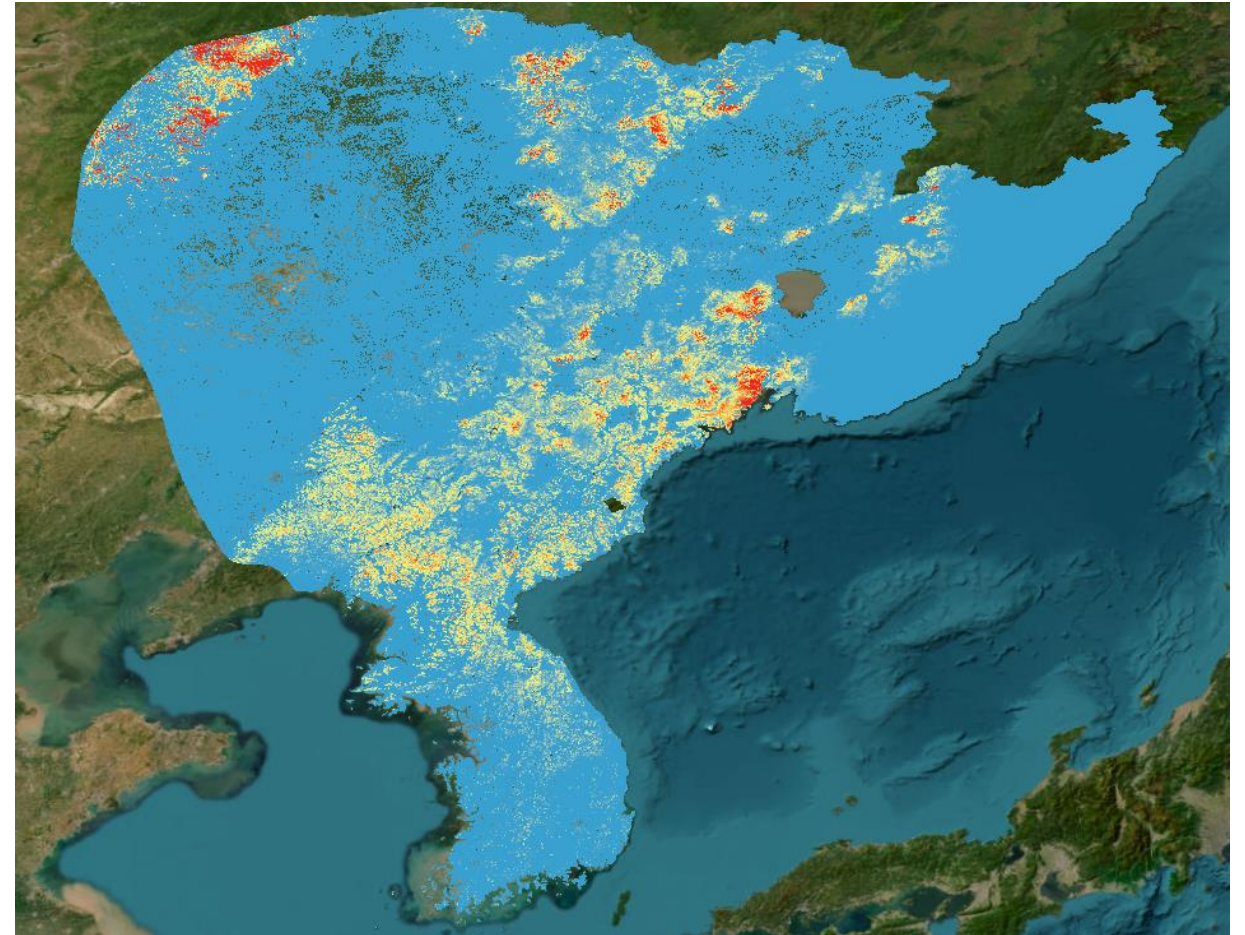
# SECOND TRIAL(2022-2)

	2022(ESDM)
NDSI	O
NBR	O
Landcover	Dynamic World
Coniferous forest	X
DEM	O
Aspect	O
Slope	O
Hillshade	O
D_water	O
Road	Distance
Light pollution	X
Temperature	X



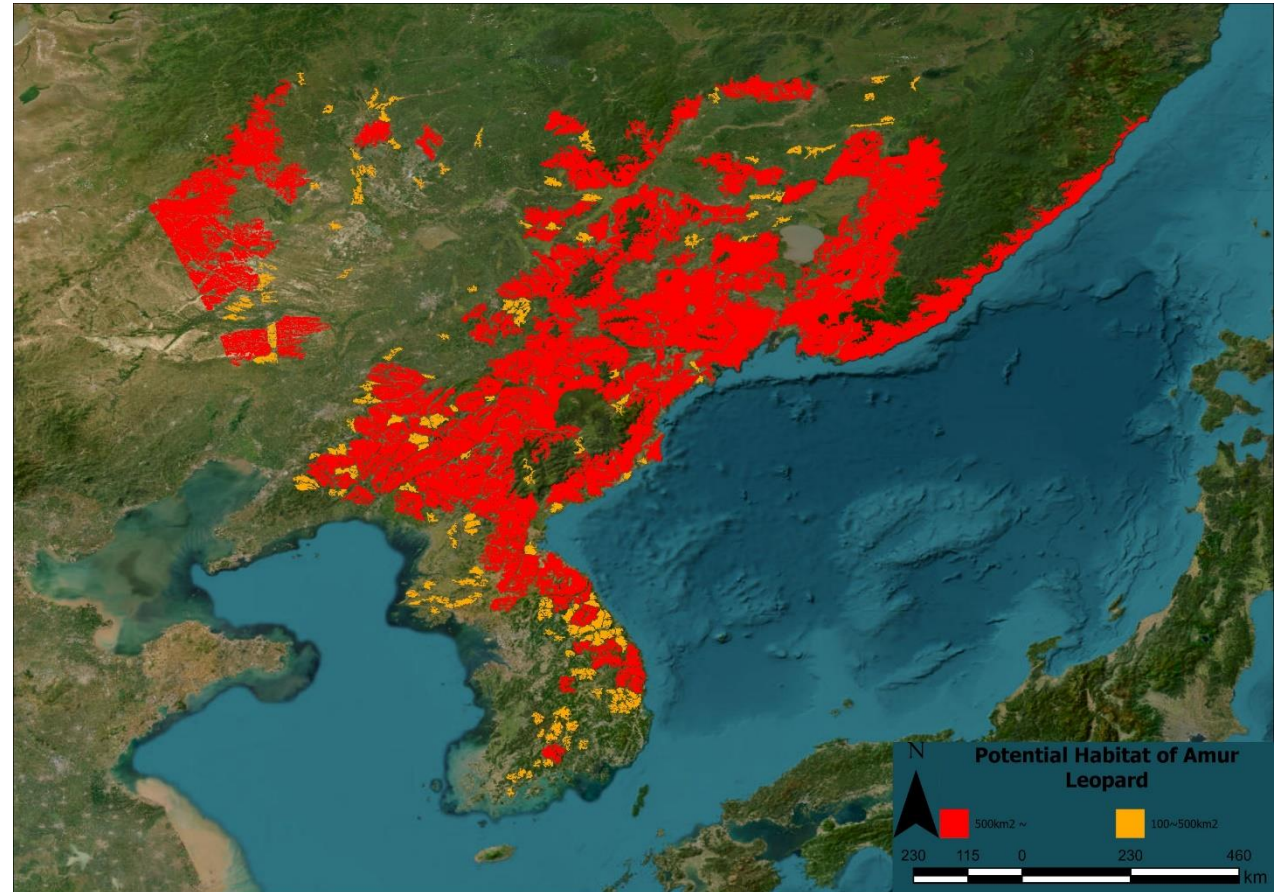
# THIRD TRIAL(2023-1)

	2023 (ESDM)
<b>NDSI</b>	O
<b>NBR</b>	O
<b>Landcover</b>	ESA
<b>Coniferous forest</b>	O
<b>DEM</b>	X
<b>Aspect</b>	X
<b>Slope</b>	X
<b>Hillshade</b>	X
<b>D_water</b>	X
<b>Road</b>	Gravitational Distance Model
<b>Light pollution</b>	O
<b>Temperature</b>	X

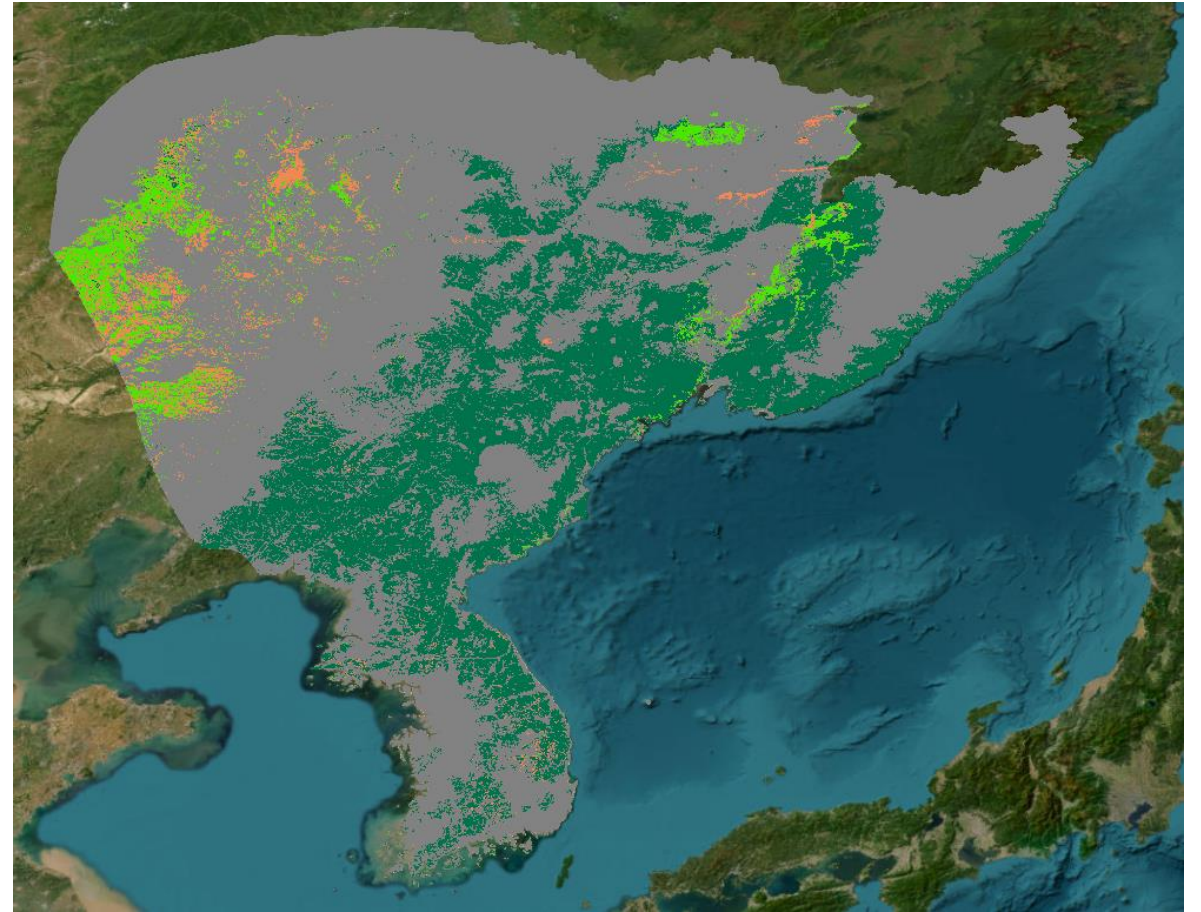
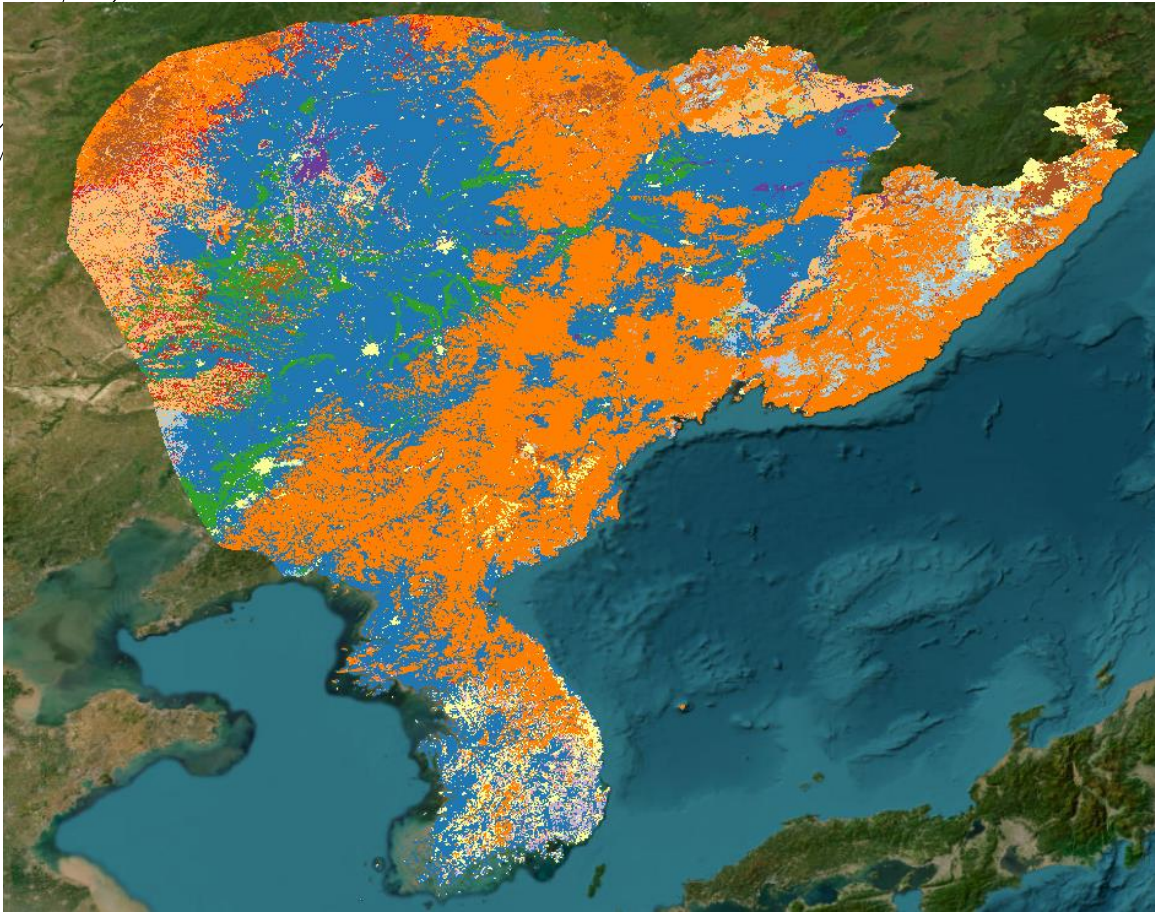


# FORTH TRIAL(2023-2)

	2023
NDSI	X
NBR	X
Landcover	ESA
Coniferous forest	X
DEM	X
Aspect	X
Slope	X
Hillshade	X
D_water	X
Road	Highways and Primary roads
Light pollution	0
Temperature	0



# LANDCOVER(ESA CCI)



## LIGHT POLLUTION



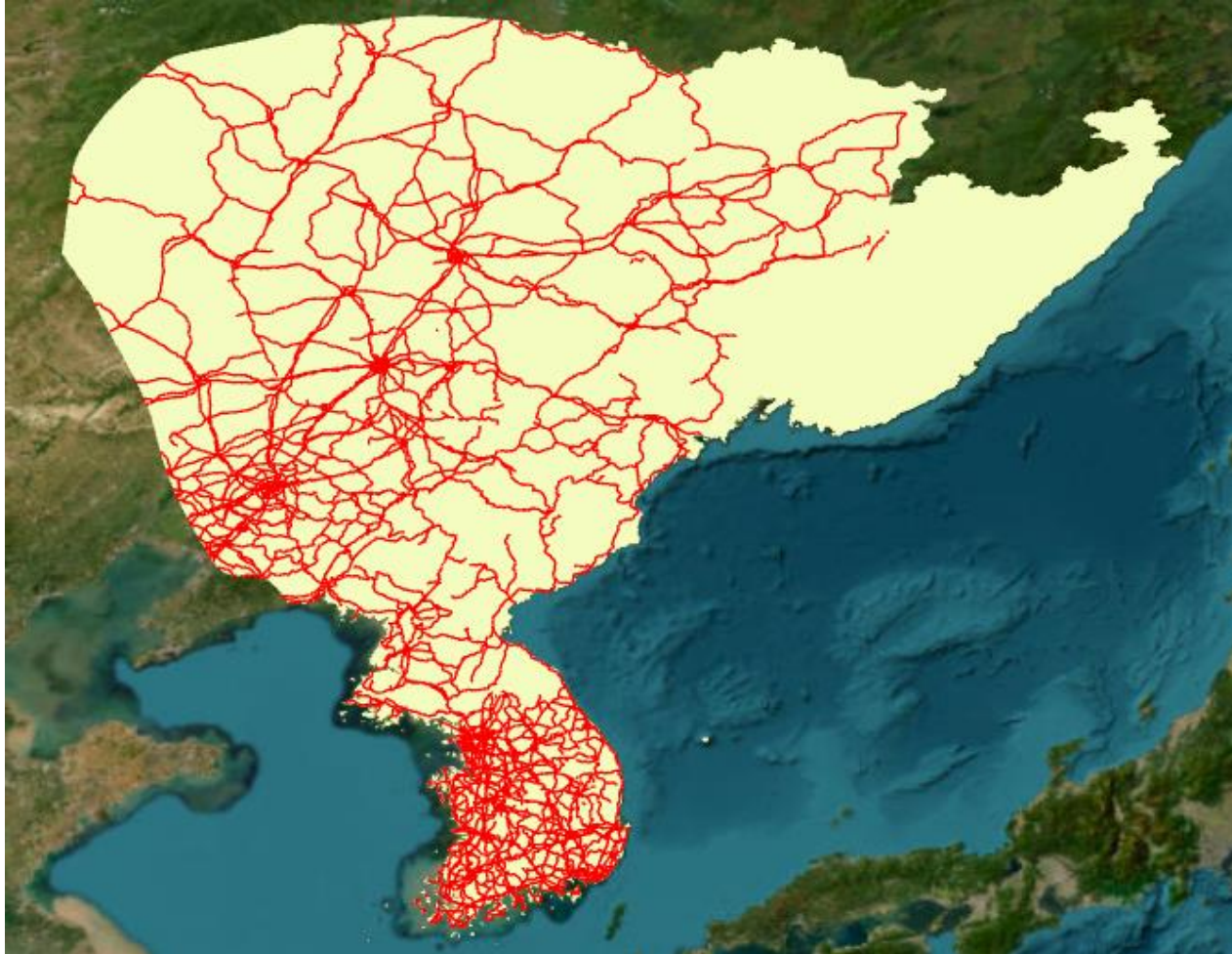
## AVERAGE TEMPERATURE

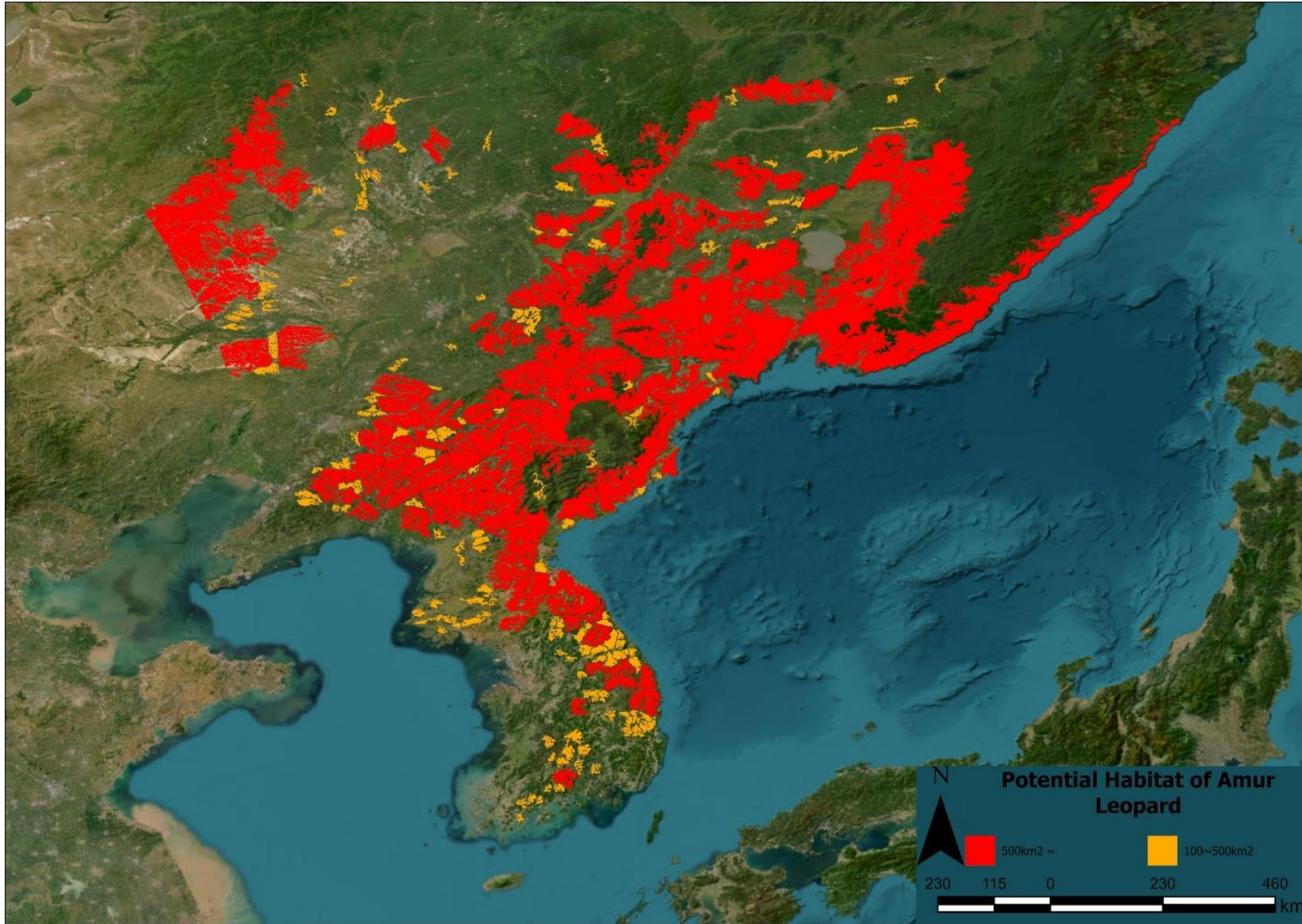
1.5 °C (JINZHE QI ET AL. 2015)



# ROADS

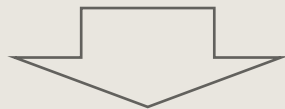
(WORLDBANK - GLOBIO 2018)





# NEXT STEP?

- Update NDSI
- Reclassify Landcover
- Apply different weight



- Suggest ecological corridors





# THANK YOU

Any questions & suggestions to  
[anya@nie.re.kr](mailto:anya@nie.re.kr)