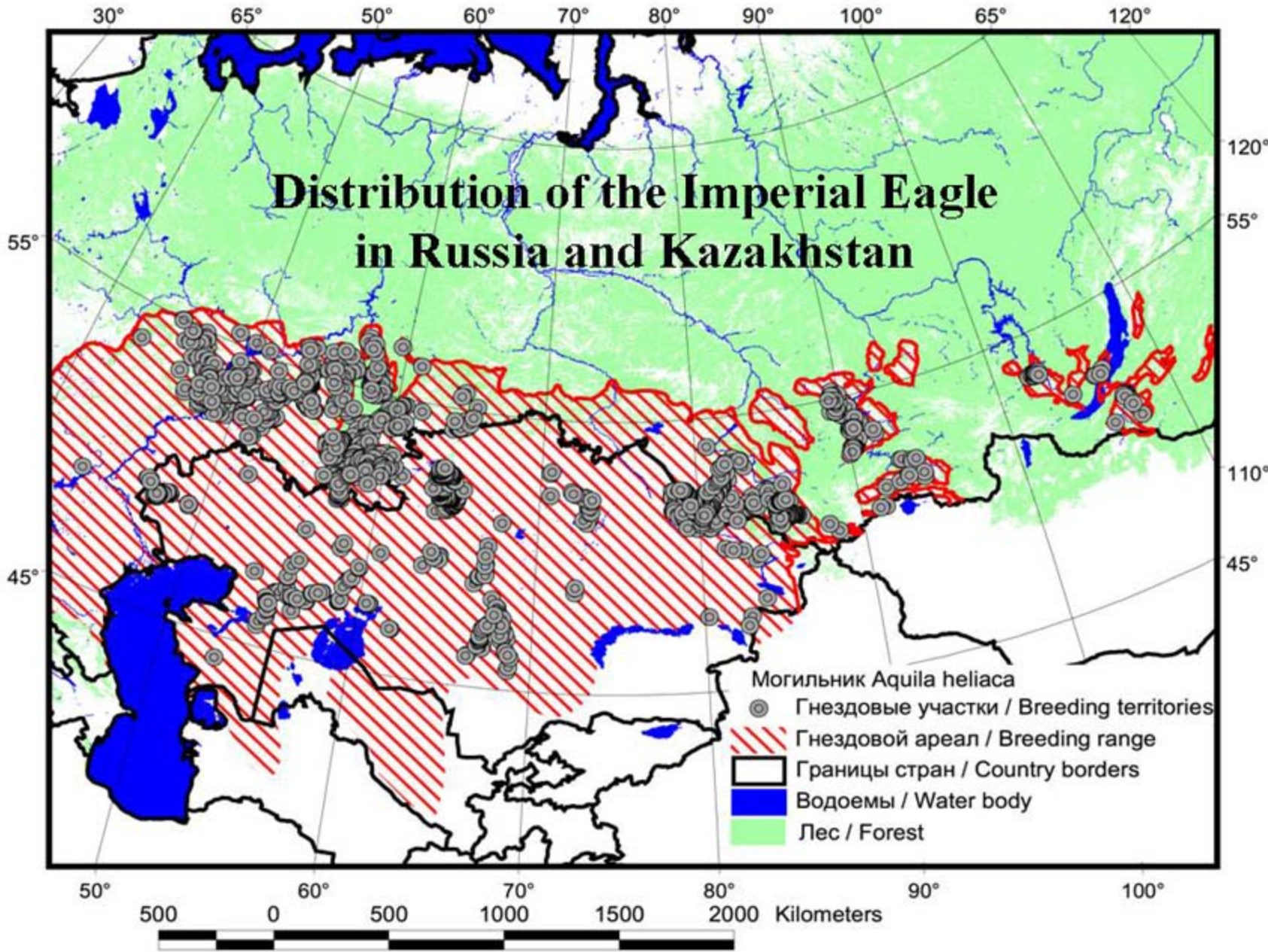


# *Imperial Eagle in Russia and Kazakhstan*



*Igor Karyakin, Elvira Nikolenko, Anatoliy Levin, Andrey Kovalenko*







- Following our research **1000** breeding territories where found **759** nests have been known in Russia.

- And **412** breeding territories with **480** nests have been known in Kazakhstan



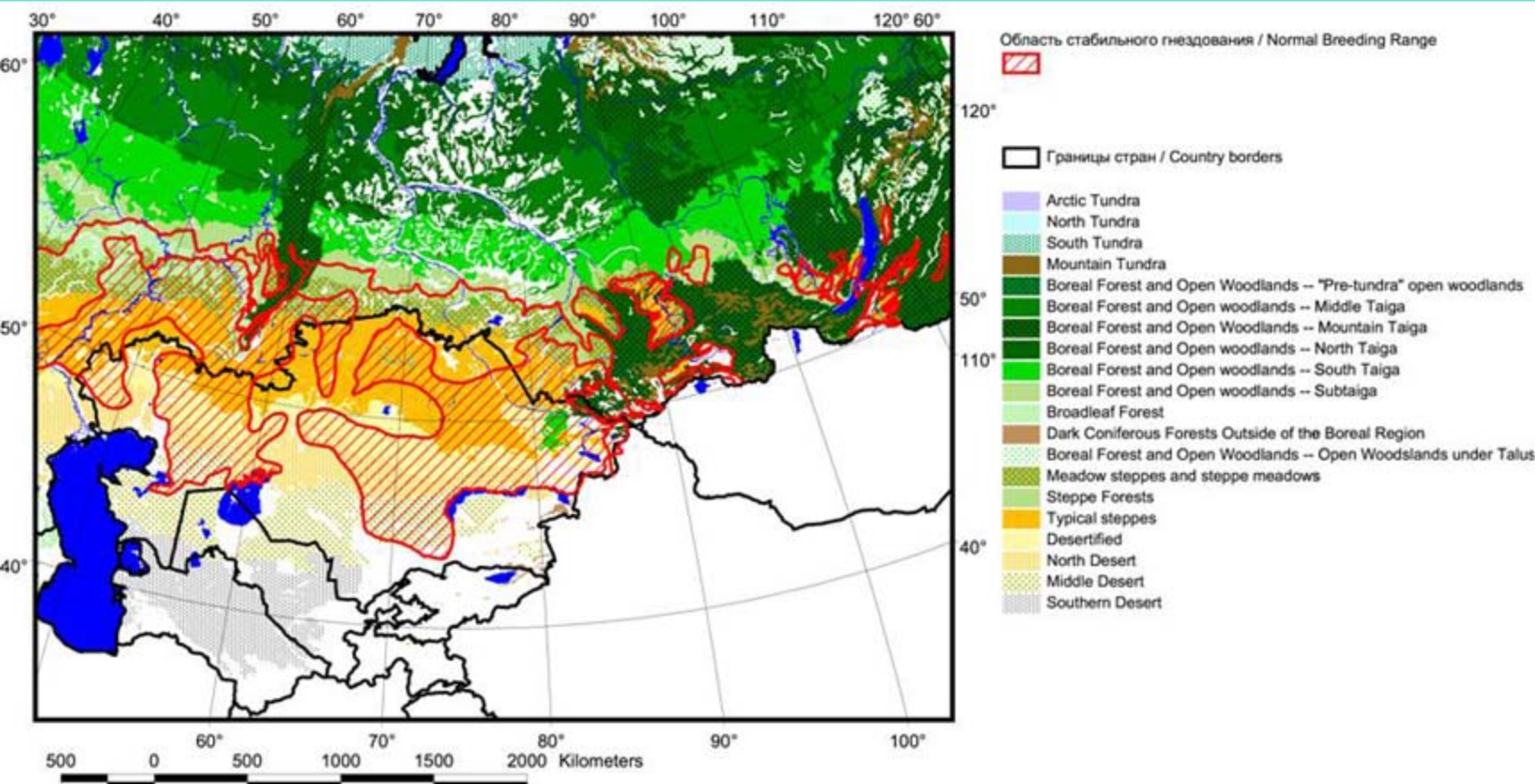


A total of 6500-7500 pairs are estimated to breed in the region under investigation: 3000-3500 pairs – in Russia and 3500-4000 pairs – in Kazakhstan



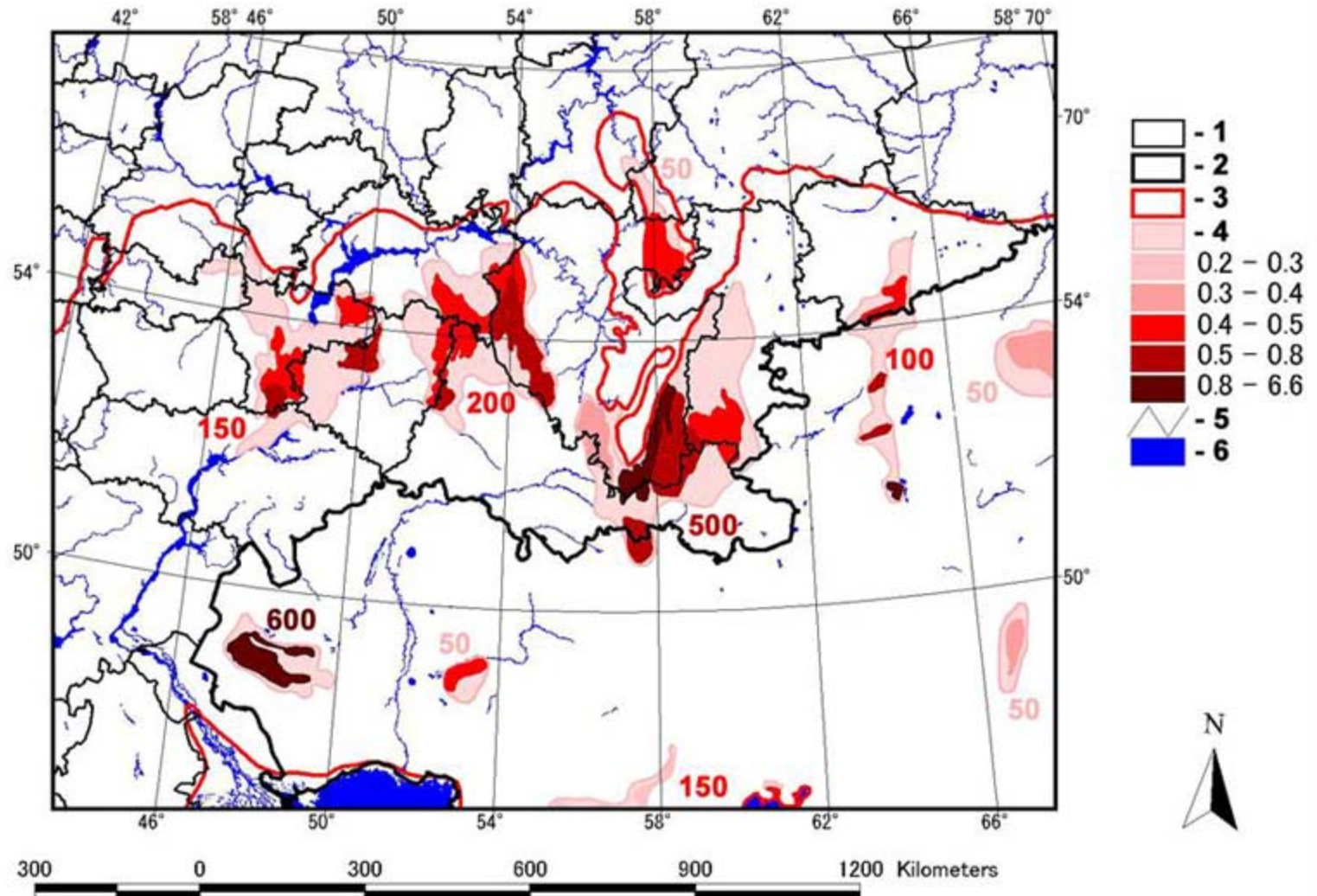


The Imperial Eagle inhabiting such large region breeds from the middle desert zone to subtaiga as in plains as in mountains



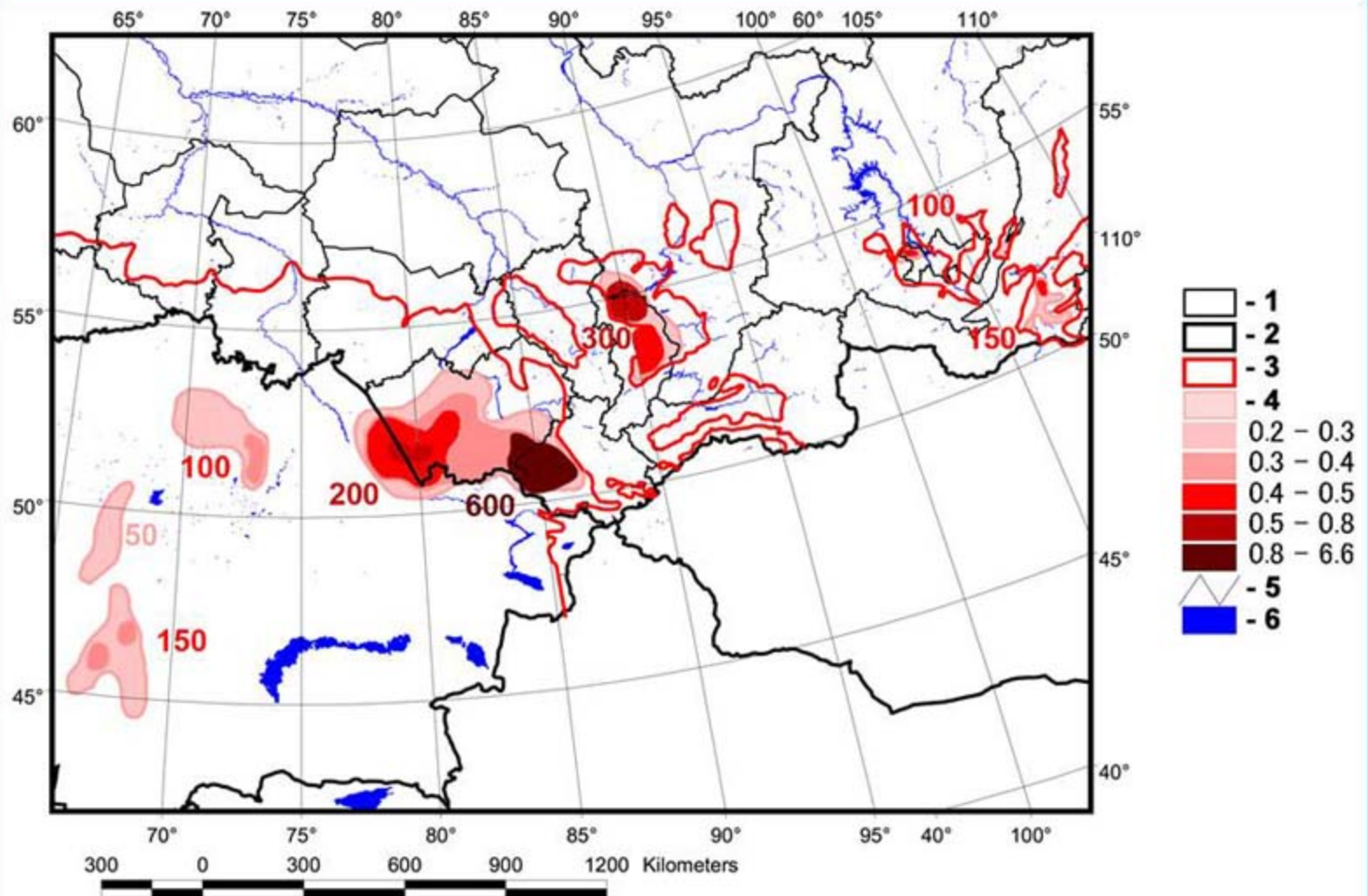


# Numbers of different breeding groups in the Volga-Ural region and Western Kazakhstan





# Numbers of different breeding groups in the Southern Siberia and Eastern Kazakhstan





# Habitats of the Imperial Eagle in Russia





# Excellent habitats in the Volga-Ural region

Priority № 1 –  
hilly landscape

NEST



Priority № 2 –  
pine forest

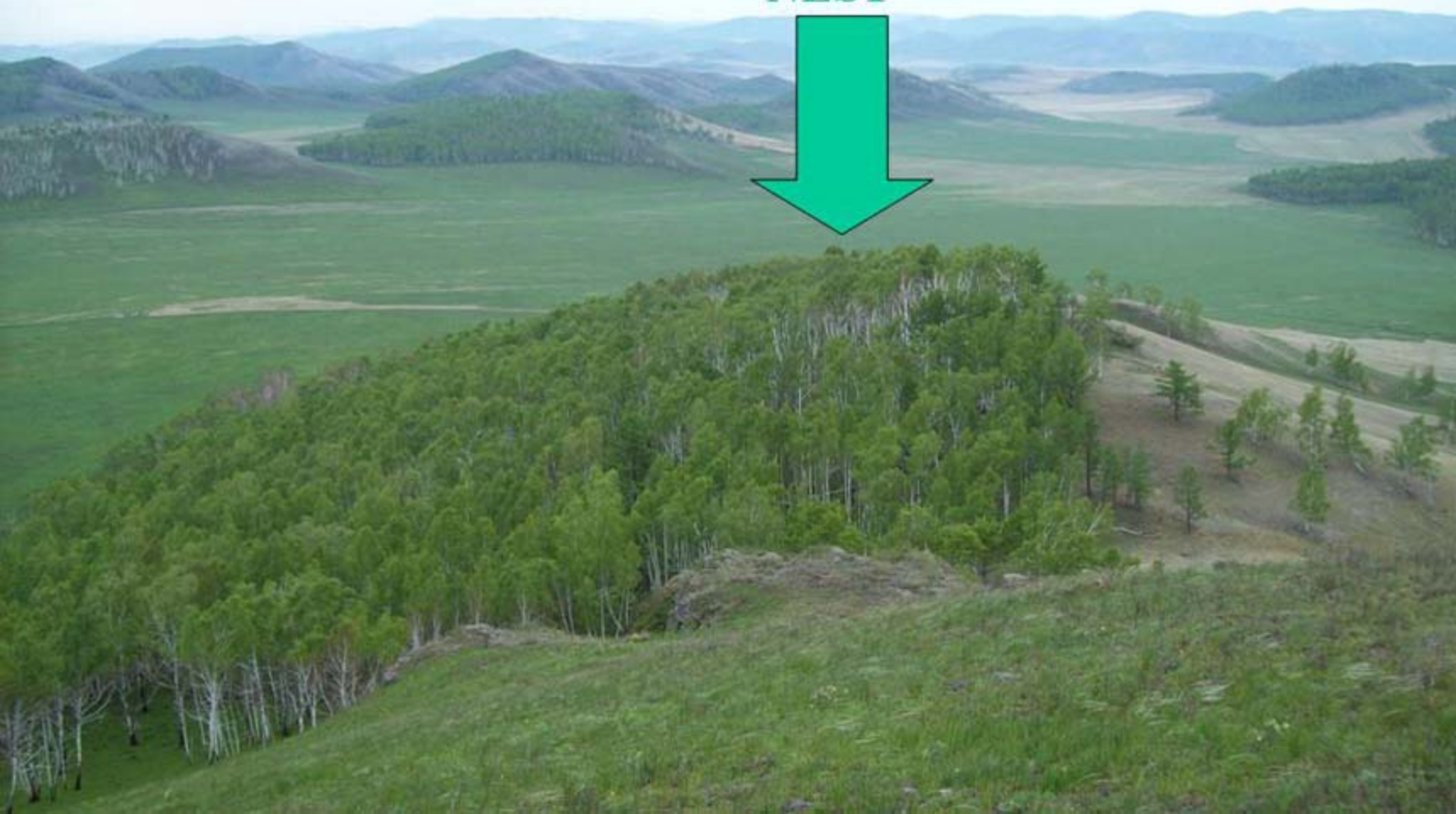




# Excellent habitats in Southern Siberia

Priority № 1 –  
low mountains

Priority № 2 –  
larch forest





Steppe hills



NEST

Different good habitats in the Volga-Ural region



NEST

Plain pine forest



# Different good habitats in, Southern Siberia



Absence of trees suitable for nesting in steppe habitats



# Different good habitats in Southern Siberia



NEST

High mountains covered by forest little steppe  
depressions

# Poor habitats

Small steppe areas on the top of mountains

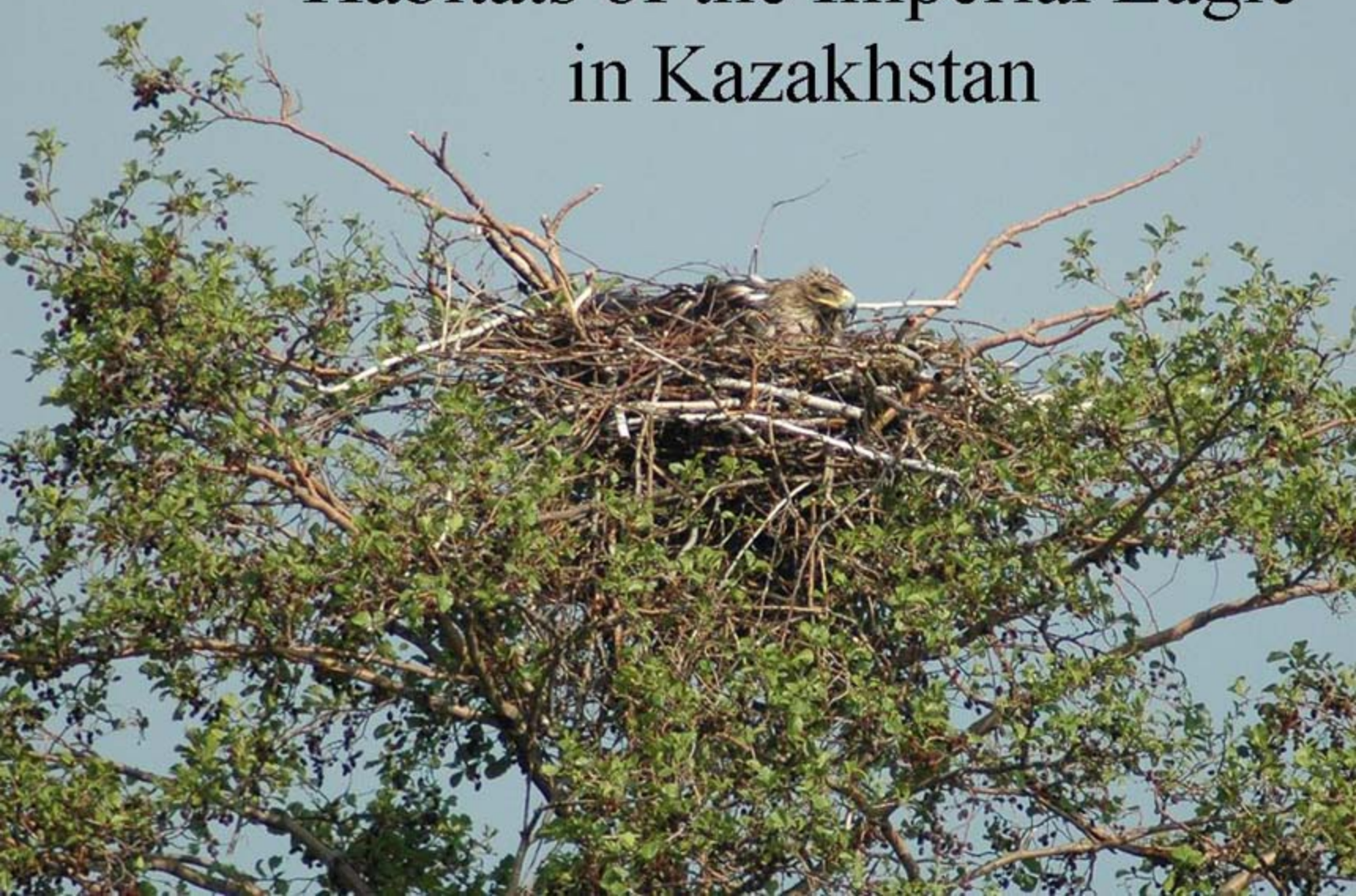


Extensive woodless flat steppes





# Habitats of the Imperial Eagle in Kazakhstan







Excellent habitats – pine forests in different landscapes in steppe-forest, steppe and semi-desert zones





Deciduous forests of low mountains



Good habitats in the steppe zone



Forests along rivers within low mountains

Forests at the edge of sands



Good habitats in deserts



Trees along rivers



# Good habitats in deserts



## Saxaul forests



## Trees along cliff-faces of plateaus



# Poor habitats

Extensive woodless flat steppes and deserts





# In Russia, eagles build their own nests ( $n=747$ ):

- 
- A photograph of a bald eagle perched on its nest, which is constructed from a tangle of dry sticks and branches. The nest is situated within the dense, green needles of a pine tree. The eagle has a white head and neck, a yellow beak, and dark brown feathers on its body. The background shows more of the pine tree and a blurred landscape under a blue sky.
- On coniferous trees (pine, larch) – **78%**
  - On deciduous trees (birch, poplar, aspen, alder, elm) – **22%**



# In Kazakhstan, eagles build their own nests ( $n=392$ ):

- 
- A photograph of a bird of prey, likely a Golden Eagle, perched on a nest constructed from a dense pile of dry sticks and twigs. The nest is situated within the branches of a large, leafless tree. The background shows a clear, pale blue sky. The eagle has dark plumage with a lighter patch on its head and neck.
- On coniferous trees (pine) – 49%
  - On deciduous trees (silverberry, Russian olive, poplar, birch, saxaul, elm, aspen, willow, alder) – 51%





The highest density at the most part of the Imperial Eagle's range in Russia and Kazakhstan is noted for breeding groups nesting on pines and larches

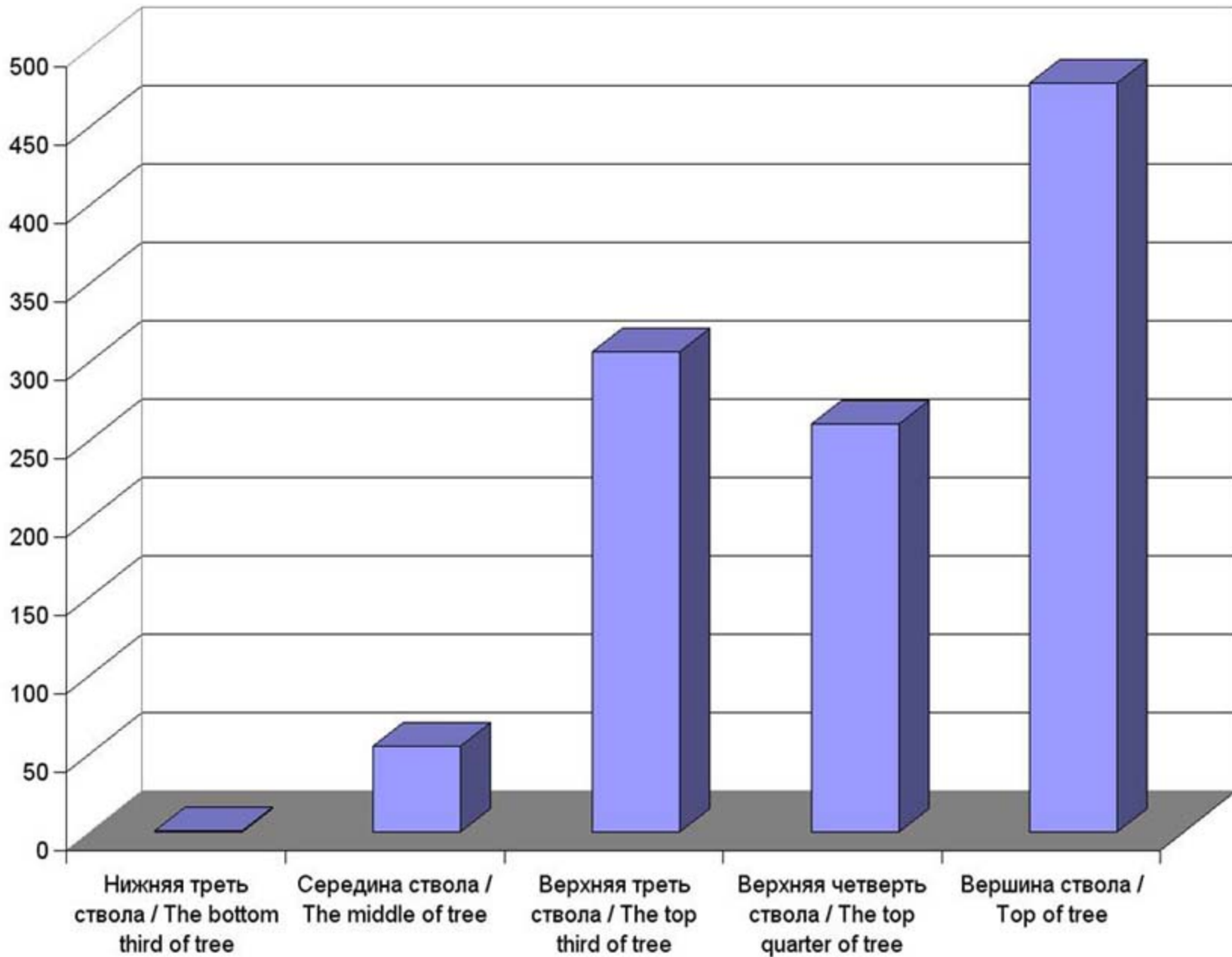




# Nest locations

A photograph of a bird, possibly a frigatebird, sitting on a nest made of sticks and twigs. The nest is located in a tree with dense green foliage. The bird has dark plumage on its body and a lighter, possibly white, head. It is facing right. The background shows more of the tree and some sandy ground at the top right.

67% of nests were found on the top or the fork under the top of tree ( $n=1102$ )





# On the top of larch on the mountain slope



19%  
 $n=224$



44%  
 $n=224$



At the middle of larch on the mountain slope  
- As an adaptation to the lacking of old trees

34%  
 $n=224$



4%  
 $n=224$



On the top of pine located at the edge of forest  
in the plain landscape





On the top of the highest pine far from the  
edge of forest in the hilly landscape





73%  
 $n=526$





21%  
 $n=526$





At the distance of the edge of forest,  
in the heart of the forest



While a number of trees  
suitable for nesting is  
obviously not enough, the  
adaptation to nest not only on  
the top but inside crown of a  
pine is observed

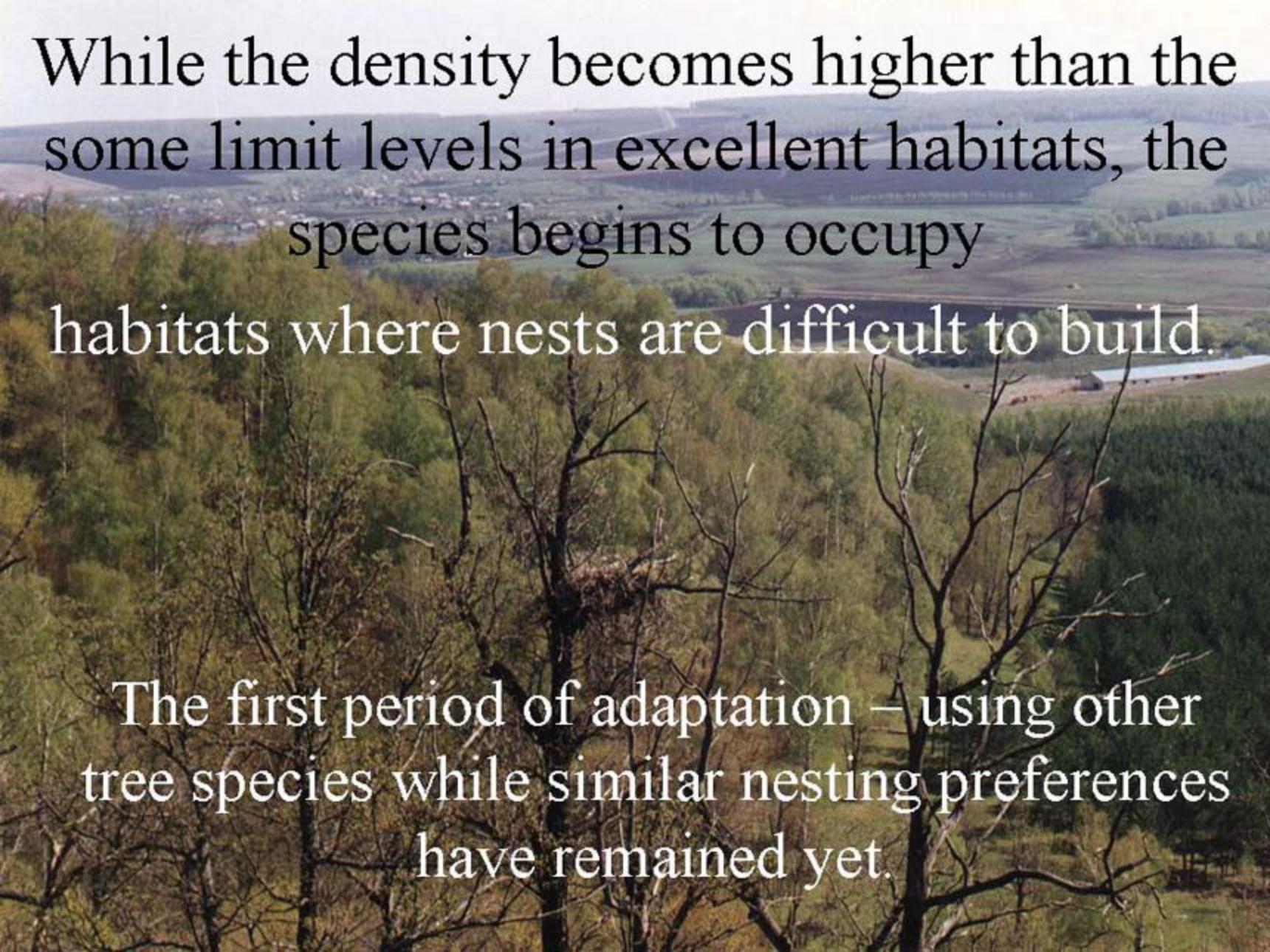
6%

$n=526$



At the edge of pine forest





While the density becomes higher than the  
some limit levels in excellent habitats, the  
species begins to occupy  
habitats where nests are difficult to build.

The first period of adaptation – using other  
tree species while similar nesting preferences  
have remained yet.



# First variant of adaptation



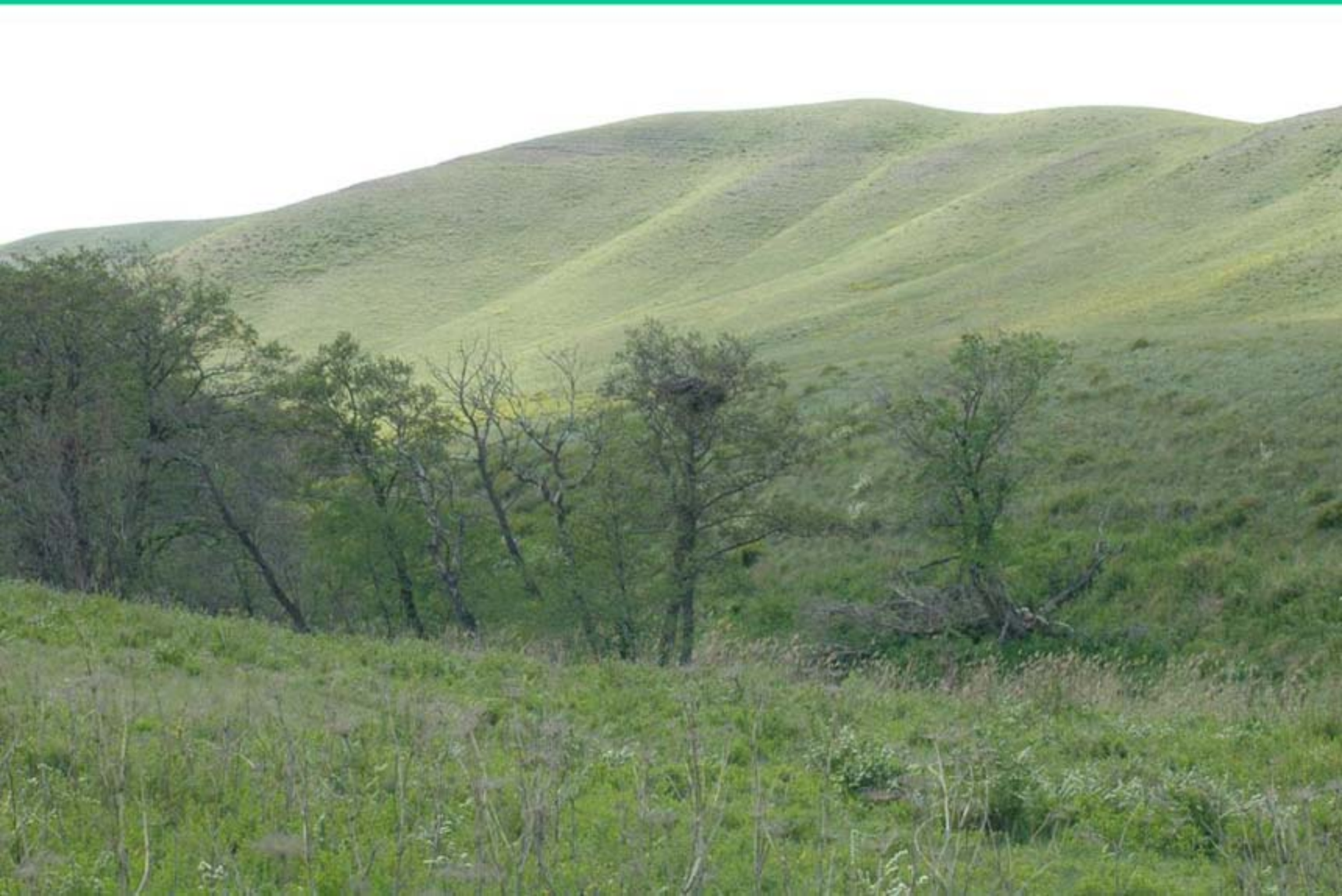


# Second variant of adaptation





# Third variant of adaptation



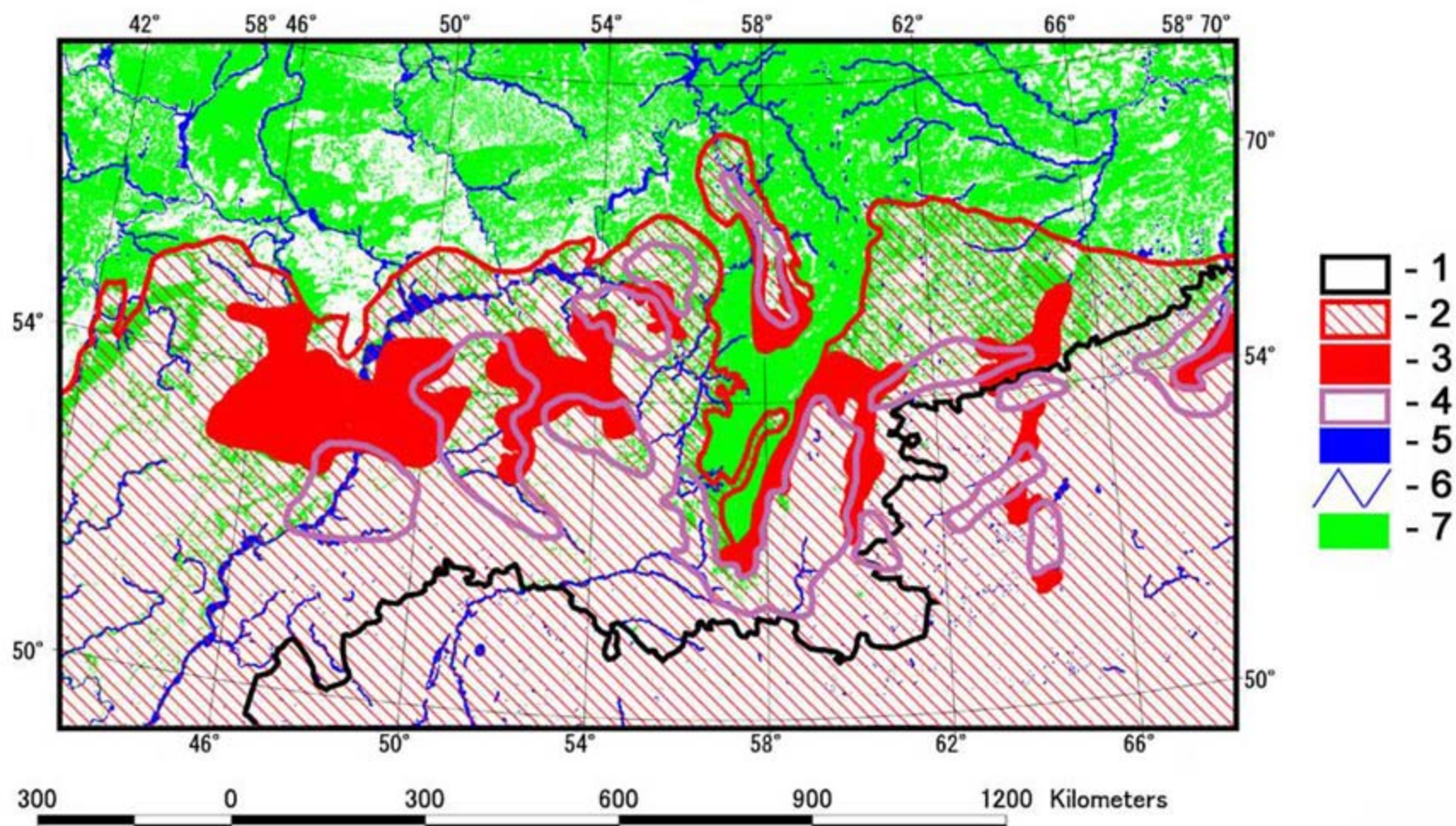


# 4-th variant of adaptation

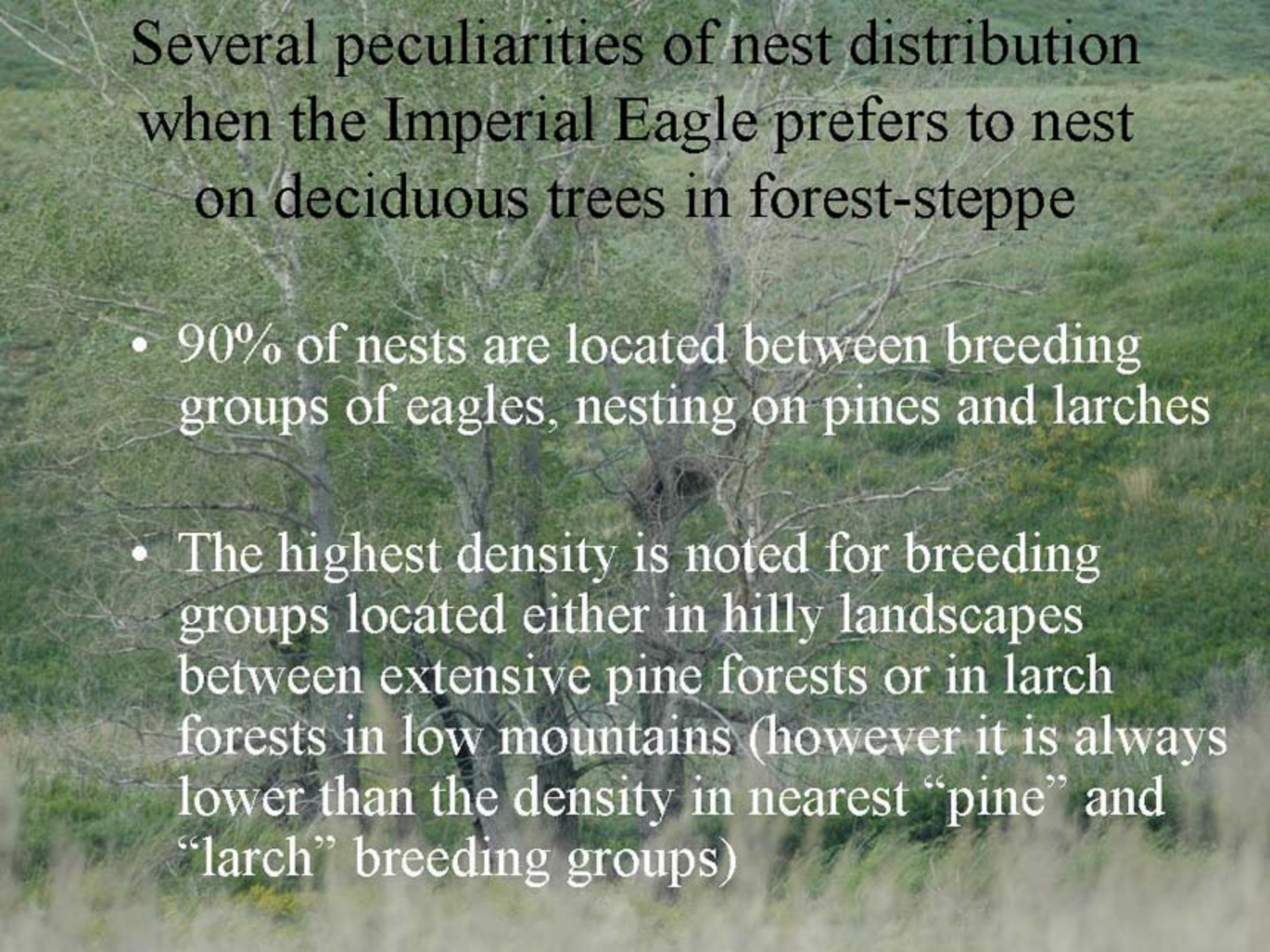




# Distribution of breeding groups of the Imperial Eagle with different nesting preferences in the Volga-Ural region





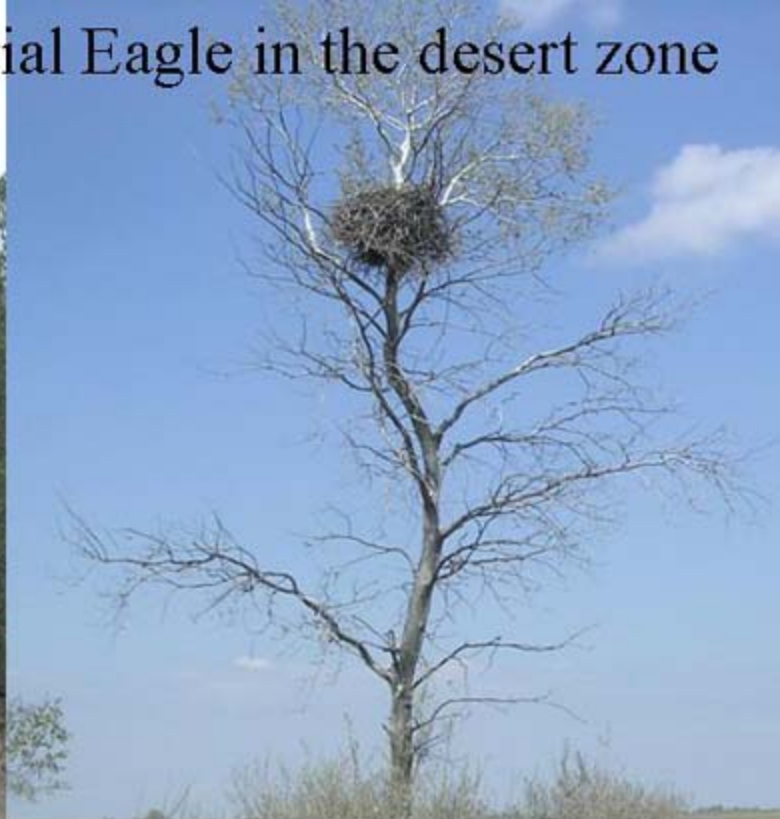
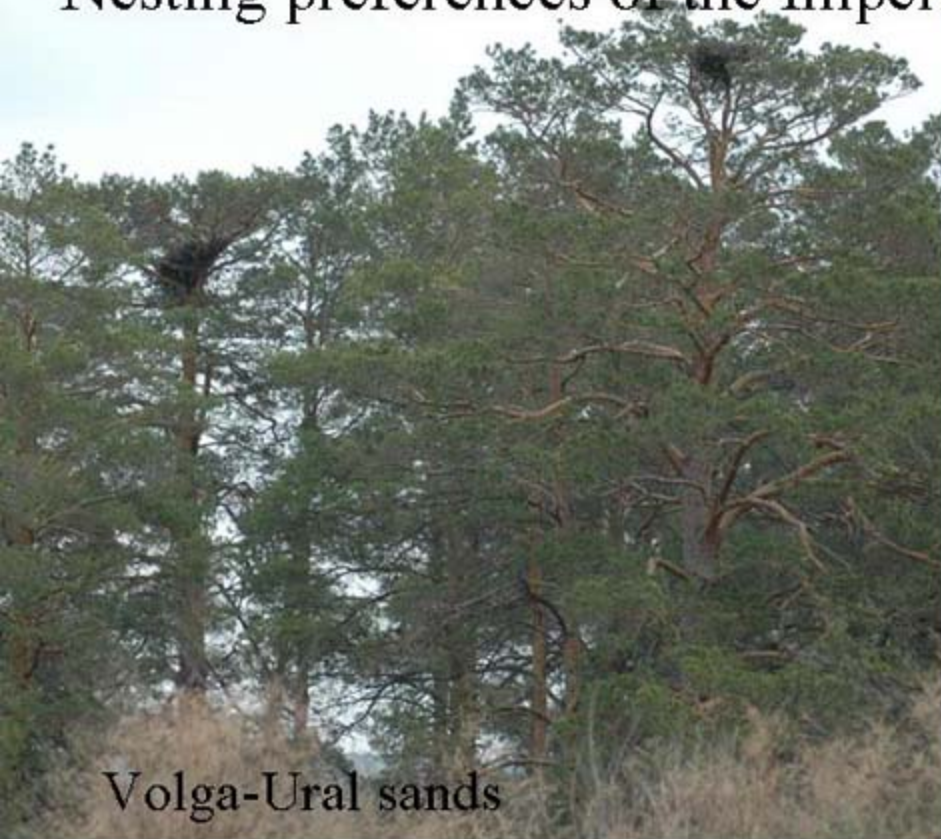


Several peculiarities of nest distribution when the Imperial Eagle prefers to nest on deciduous trees in forest-steppe

- 90% of nests are located between breeding groups of eagles, nesting on pines and larches
- The highest density is noted for breeding groups located either in hilly landscapes between extensive pine forests or in larch forests in low mountains (however it is always lower than the density in nearest “pine” and “larch” breeding groups)



# Nesting preferences of the Imperial Eagle in the desert zone







Ustyurt Plateau



Ulutau Mountains





The type of nest location on the top of trees absolutely prevails. It would confirm that the type of nest location in the middle part of tree crown is secondary





Spreading  
through  
forest-lines in  
the steppe  
zone eagles  
prefer to build  
their own  
nests on the  
top of trees





Using electric poles is the most extreme adaptation





- Now the nesting on electric poles is surveyed at edges of large breeding groups in arid zones and expands both to the north and south

**Now, 3,5% ( $n=1182$ ) of nests are located on electric poles in Russia and Kazakhstan**





- The average clutch size is  $2,1 \pm 0,54$  eggs ( $n=71$ ; range 1 – 3 eggs)







**We found 2 eggs in 70% of surveyed clutches**









Clutches containing 3 eggs  
(20% of nests,  $n=71$ )  
were recorded for pairs  
breeding near large colonies  
of sousliks, which are the  
main preys of eagles





**The average brood size is  $1,6 \pm 0,60$  chicks per successful nest ( $n=248$ ; range 1-3 chicks)**





The most successful every year  
breeding pairs have generally 2  
chicks – 47% of broods ( $n=248$ )





**Only 6% of broods contain three chicks.  
And broods with 3 chicks generally noted for pairs  
which clutches perish more often**








**The brood with 1 chick is often (40% of findings)  
the result of death of second chick from starvation**







**Monitoring plots in the South Ural  
and Altai we have got following  
results**

A photograph of a brown eagle perched on a pine branch, looking down. The eagle has dark brown plumage with lighter patches on its wings. The background shows a dense pine forest with green needles and brown cones.

**Successful breeding was noted in 83% of  
records ( $n=46$ ), and the average number of  
fledglings was  $1,39 \pm 0,83$  per occupied nest**



- **The highest density and breeding success were recorded in territories intensively used for cattle grazing**





Sousliks are the main preys in the  
Imperial Eagle's diet



Eating grass cattle promote from one hand good conditions for souslik  
number increasing and from another hand create more comfortable  
conditions for eagle hunting



Numbers of cattle were decreased on 29 749 thousands of heads (53%), horses – on 1 million of heads (40%), pigs – on 22 607 thousands of heads (60%), sheep and goats – on 43 423 thousands of heads (75%) in Russia since 1990 to 2000. Also the number of cattle has fallen in 2 times in Russia since 2000 to 2008.

Thus populations of sousliks have declined in extensive territories of forest-steppe and steppe zones of Russia to 2008.



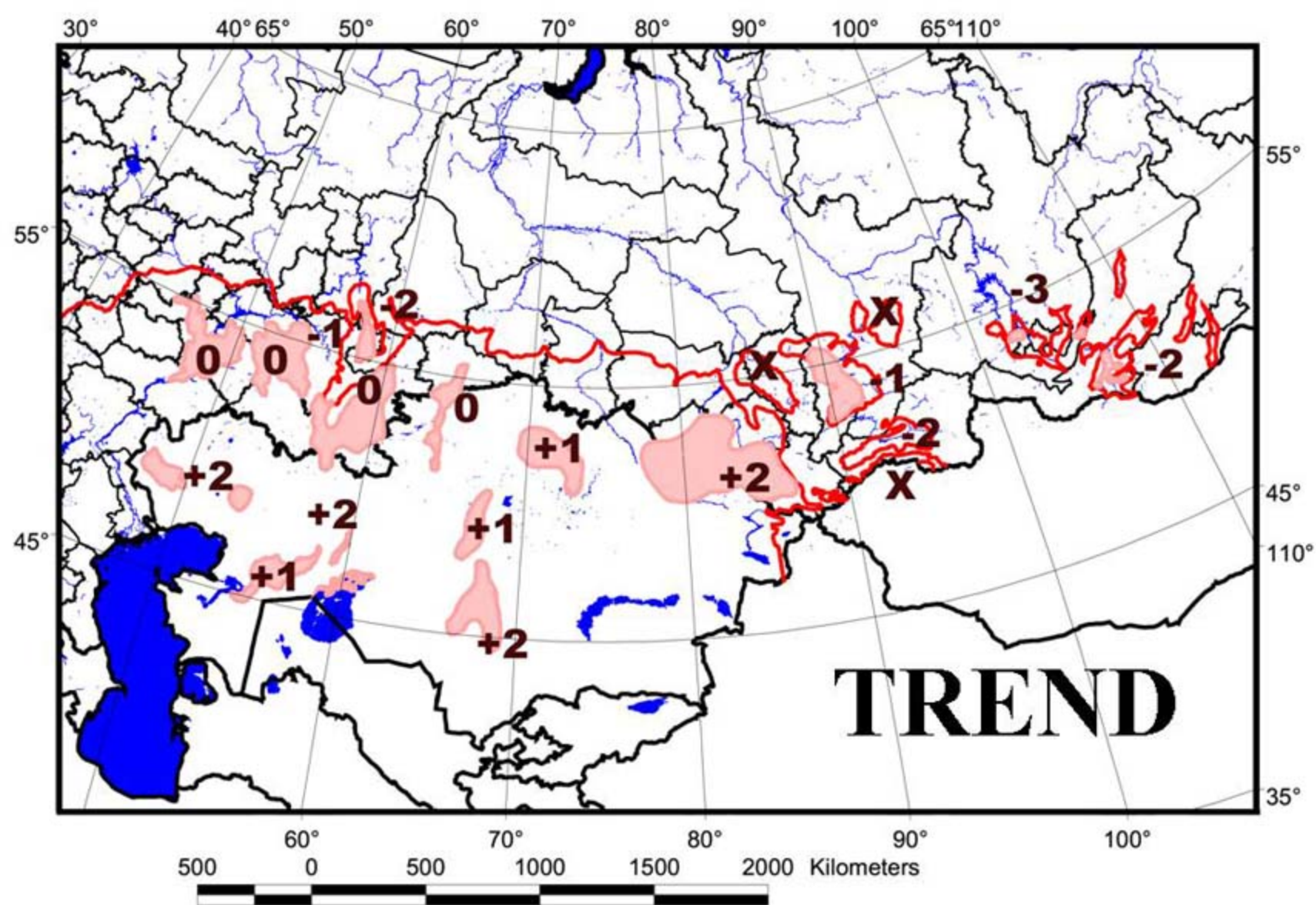
And numbers of Imperial Eagles have stopped to increase in the forest-steppe zone in Russia to 2008, and we note the certain decreasing at the eastern and northern edges of range and stable number in the center of forest-steppe zone from the Volga to the Ob'



As opposed to Russia a number of Imperial Eagle in Kazakhstan is observed to increase with high rates in semi-deserts and deserts within the Yellow Souslik range. Also inhabiting electric poles and saxaul forests in clay semi-deserts Imperial Eagles force out Steppe Eagles inhabiting those territories earlier









**Thank you!**

