

Classifying the changes in vegetated
Mediterranean coastland of South-eastern Europe
using new approach of remote sensing analysis
for modelling vegetated land change dynamics:
A case-study of Albania, Bosnia and Hercegovina,
Croatia, Montenegro and Slovenia

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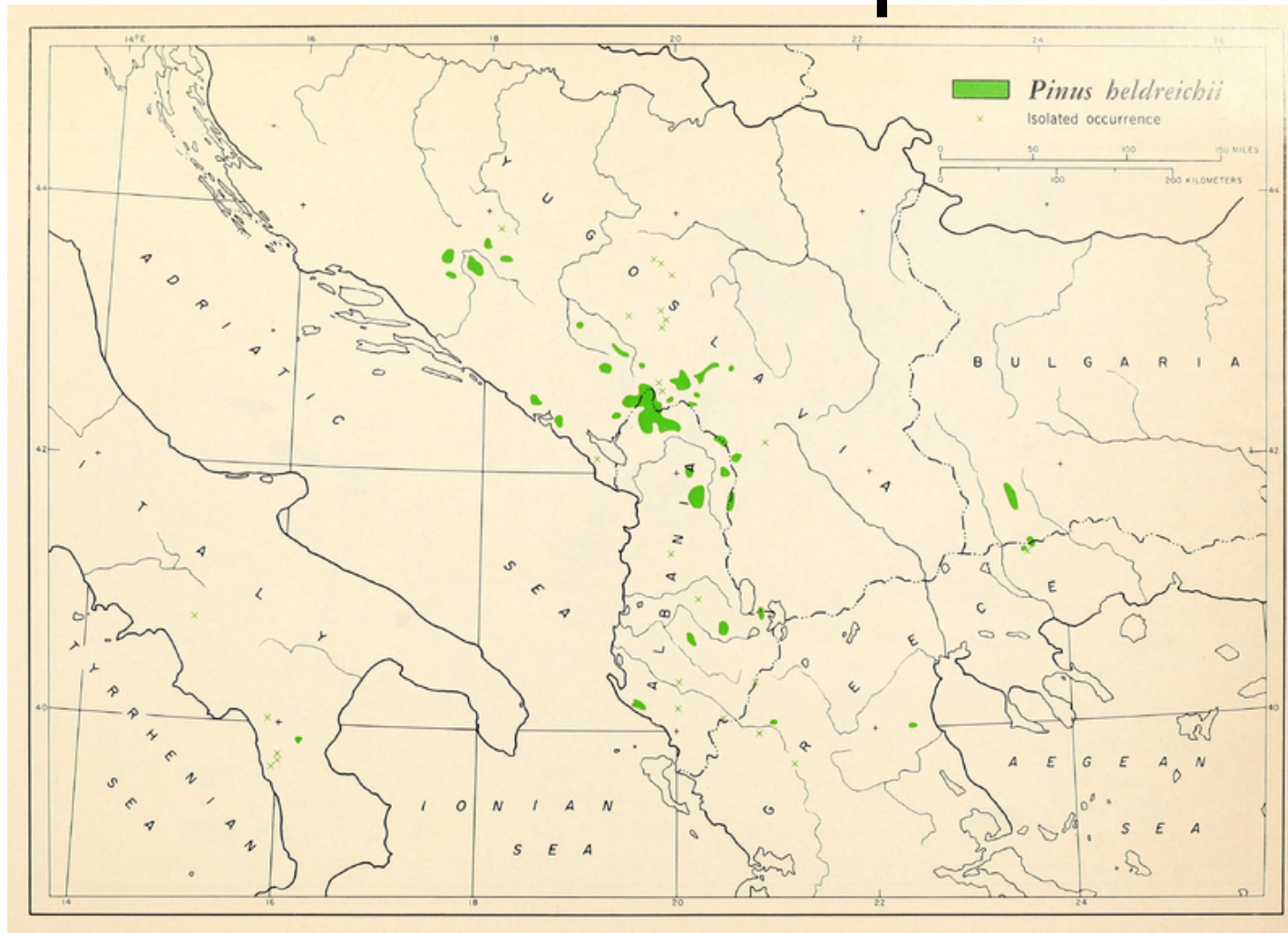


Trees and plants



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Trees and plants



Critchfield, W. B. and Little Elbert L. (Elbert Luther) (1966)
Geographic distribution of the pines of the world /. Washington,
D.C.: U.S. Dept. of Agriculture, Forest Service., Available at:
<https://www.biodiversitylibrary.org/item/133439>.

2nd Mediterranean Plant Conservation Week

"Conservation of Mediterranean Plant Diversity: Complementary Approaches and New Perspectives"

Trees and plants



Skanderbeg square, Tirana, 24
October 2018, K. Laze



Why tree and plant conservation in the study region?

- There are endemic and endangered tree and plant species
- Protected by Bern Convention (T-PVS (2002))
- Red list of flora proposed and accepted by IUCN
- Database of tree and plant species in the region

e.g., PLANTLIFE



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Why tree and plant conservation in the study region?

- There are identified IPAs/priority sites for plant conservation (Plantlife International 2005) and (Radford et al. 2011) in:
 - Albania (45); Croatia (88); Montenegro(8); Slovenia (57); Bosnja and Herzegovina (?)



Why tree and plant conservation in the study region?

- IPAs for tree and plants e.g., in Albania
(www.cbd.int)
- IPAs are fully or partly within protected areas
(Radford et al. 2011)



The changes in forest cover

- Where are the changes in forest cover?
- Is there any effect of the changes in forest cover on animal species distribution?



Example

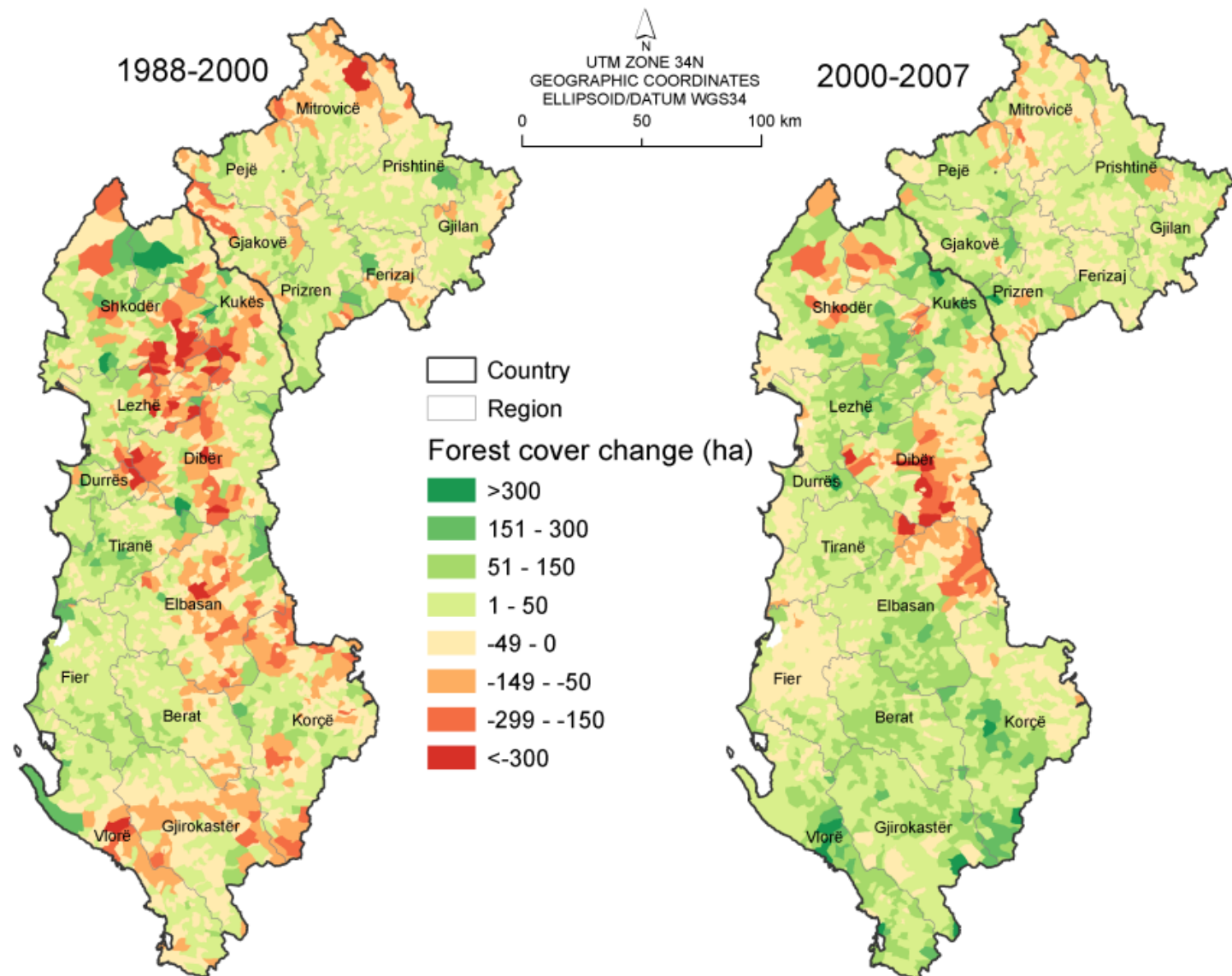
The change of forest cover in the study region:

- Albania



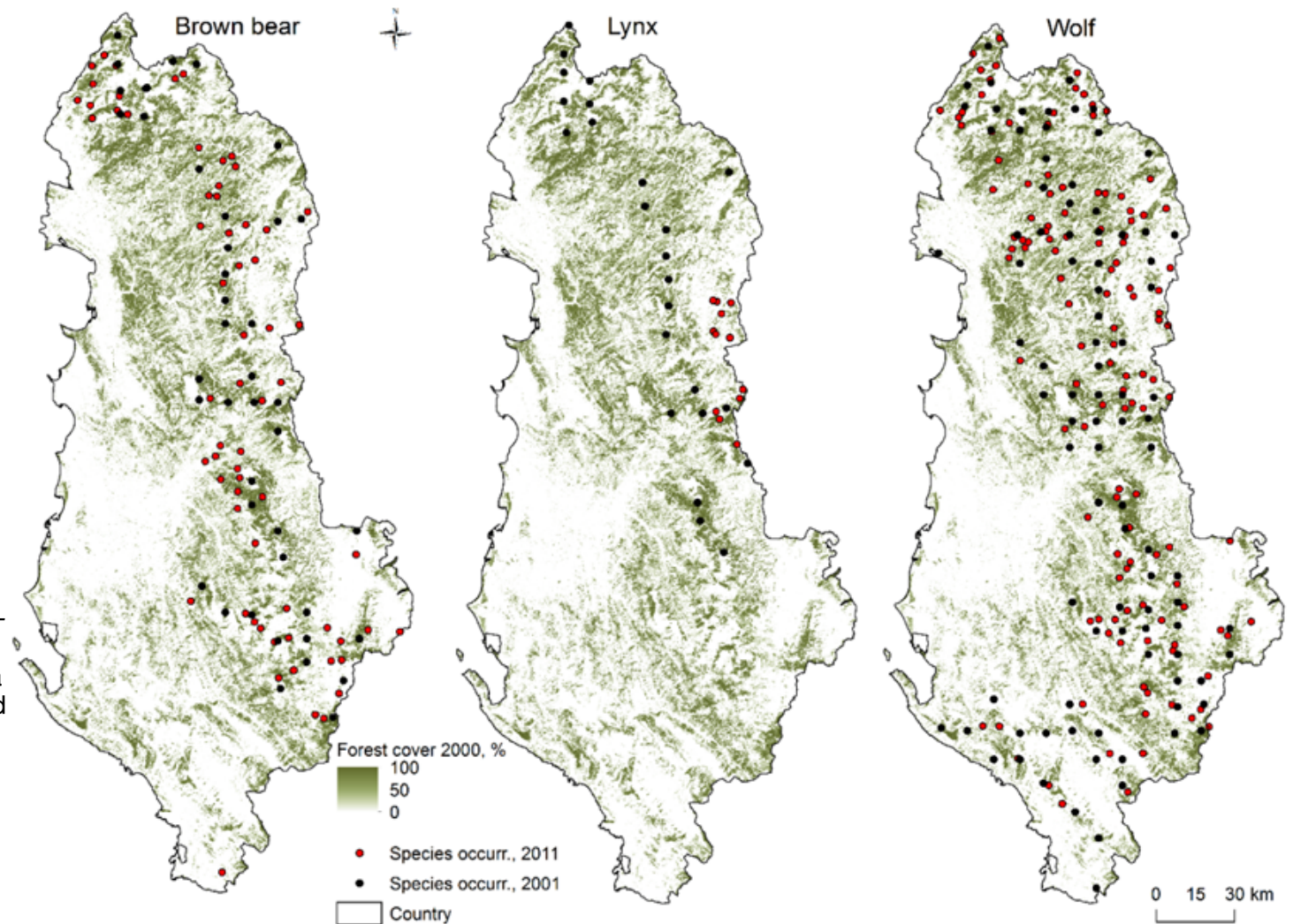
The changes in forest cover are considerable e.g., Albania

Laze, K. (2014) *Identifying and understanding the patterns and processes of forest cover change in Albania and Kosovo in Studies on the Agricultural and Food Sector in Transition Economies.*, (IAMO), Leibniz Institute of Agricultural Development in Transition Economies. *Studies on the Agricultural and Food Sector in Transition Economies.* Halle (Saale): Leibniz Institute of Agricultural Development in Transition Economies (IAMO). Vol. 74. ISBN 978-3-938584-78-1. Available at: http://www.iamo.de/dok/sr_vol74.pdf.



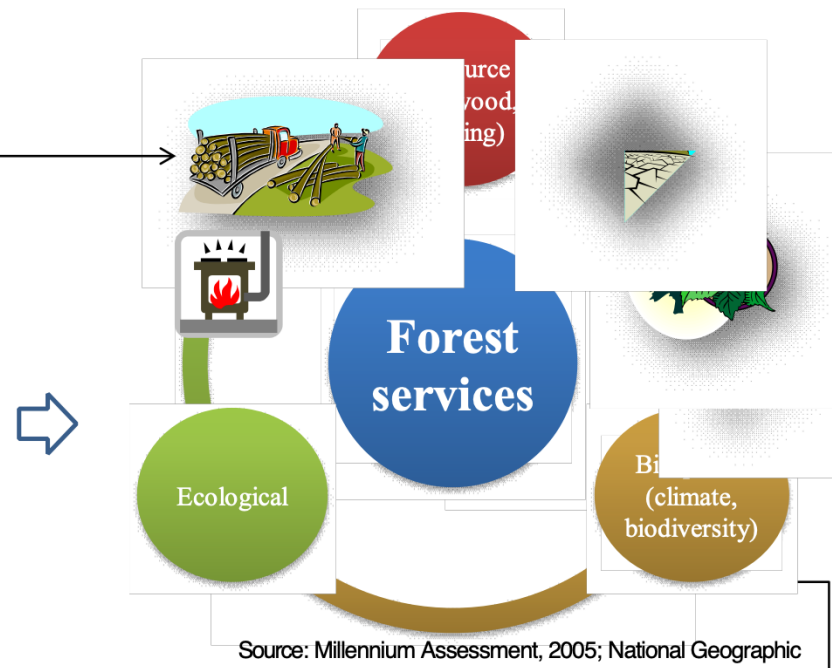
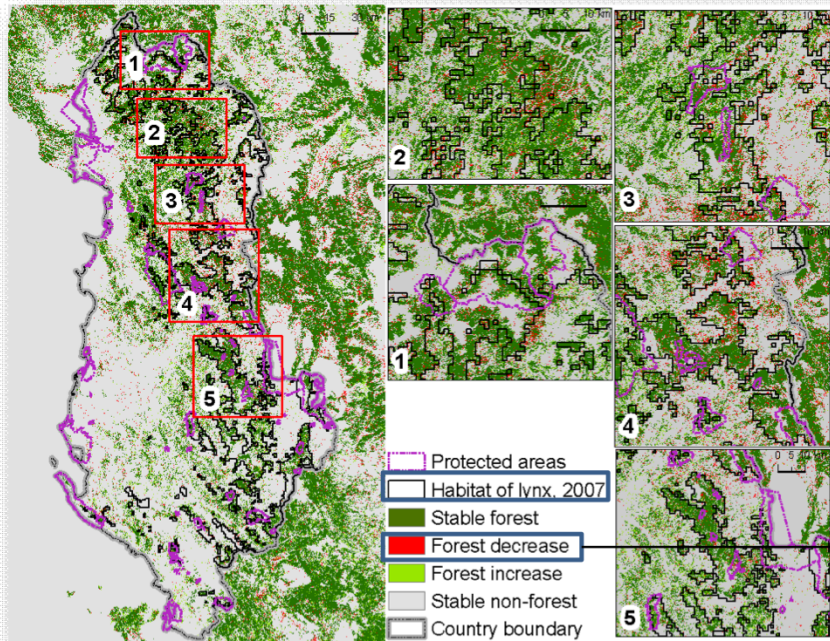
Brown bear, lynx and wolf distributions in forested Mediterranean climate areas

European Commission (2012) *Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe. Part 1*. Edited by Petra Kaczensky, Guillaume Chapron, Manuela von Arx, Djuro Huber, Henrik Andrén, and J. Linnell. Available at: http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/task_1_part1_statusofcineurope.pdf (Accessed: 25 February 2016).



Mapping of species data: Kuenda Laze

Observed socioeconomic conditions changed
Forest changed
Habitat changed

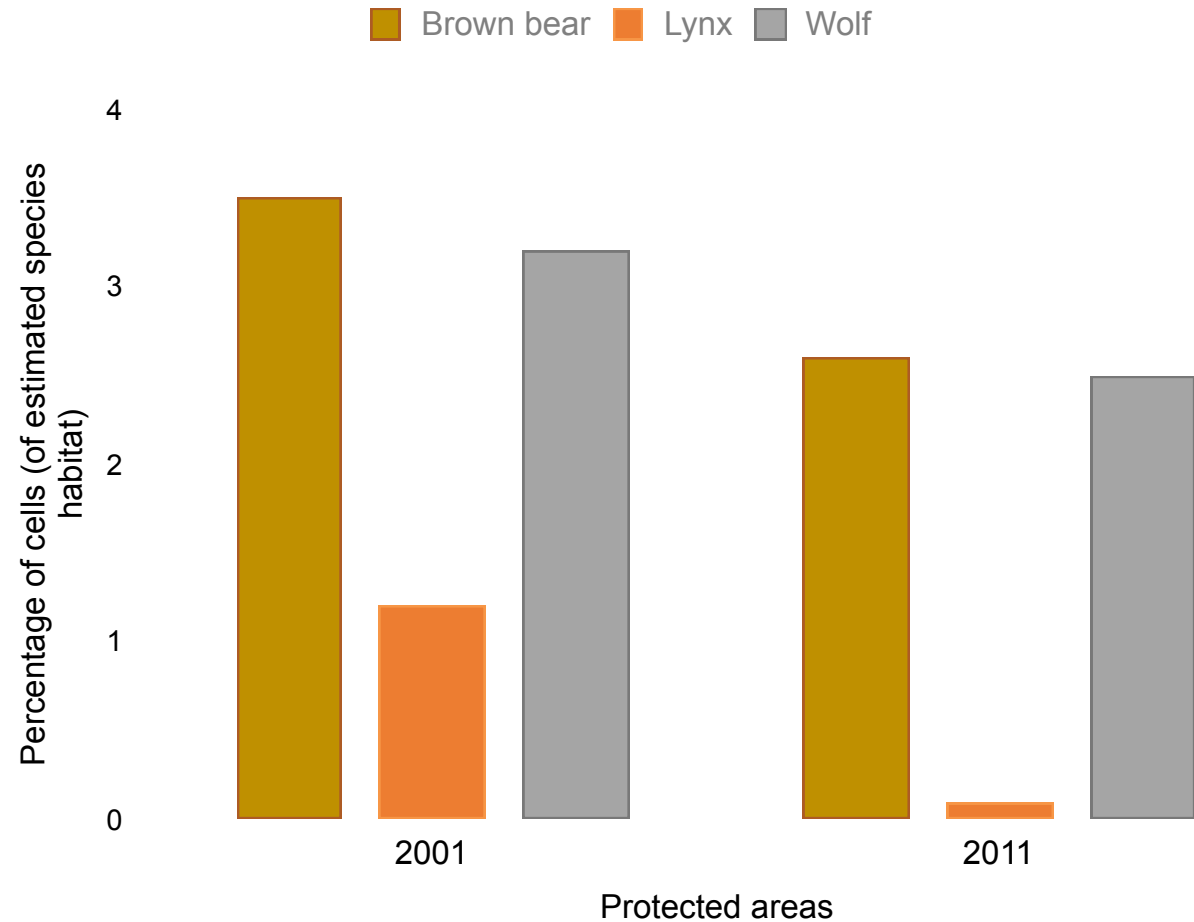


Can the changes in forest cover affect species habitat?

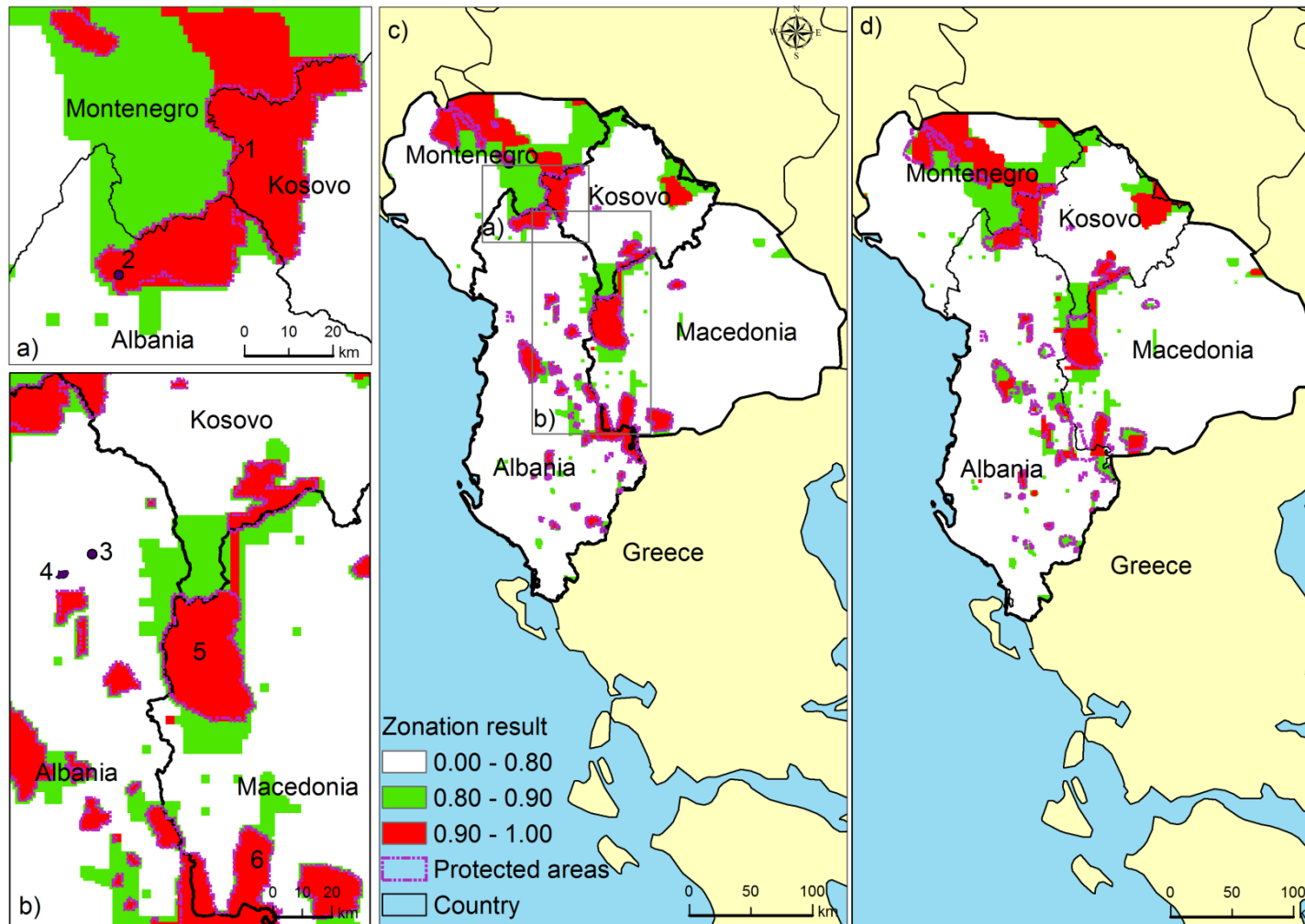
Yes !

There are effects of the changes in forest cover on species distribution e.g., large-carnivores in Albania

Laze, K. (2018). Distribution of *Ursus arctos*, *Lynx lynx martinoi* and *Canis lupus lupus* in relation to Spatial and Temporal Changes in Albanian Forests, (under review).



Lynx lynx martinoi subspecies (CR) potential conservation



Laze, K. and Gordon, A. (2016) 'Incorporating natural and human factors in habitat modelling and spatial prioritisation for the Lynx lynx martinoi', Web Ecology, 16(1). doi: 10.5194/we-16-17-2016.

Why this (new) research?

- Need for new and updated data and analysis
- Need for studying temporal and spatial changes:
 - the changes in natural-vegetated land
 - urban-vegetated land
 - agriculture-vegetated land use for the entire study region



Why this research?

- This research will fill in the gap in:
 - spatial data, land use change studies
 - new method in reducing errors of data of the changes in vegetated land cover



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Why this research?

- The research objectives are to:
 - identify the changes of the vegetated land, separating natural vegetation from urban vegetation, vegetated-agricultural land
 - potentially derive a vegetated land variable as a biodiversity metrics in the study region for:



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Why this research?

- Reduce tree and plant data uncertainty
- Increase the accuracy of water-land interface vegetation data
- Produce new results about the distribution of trees and **plants** in the study region



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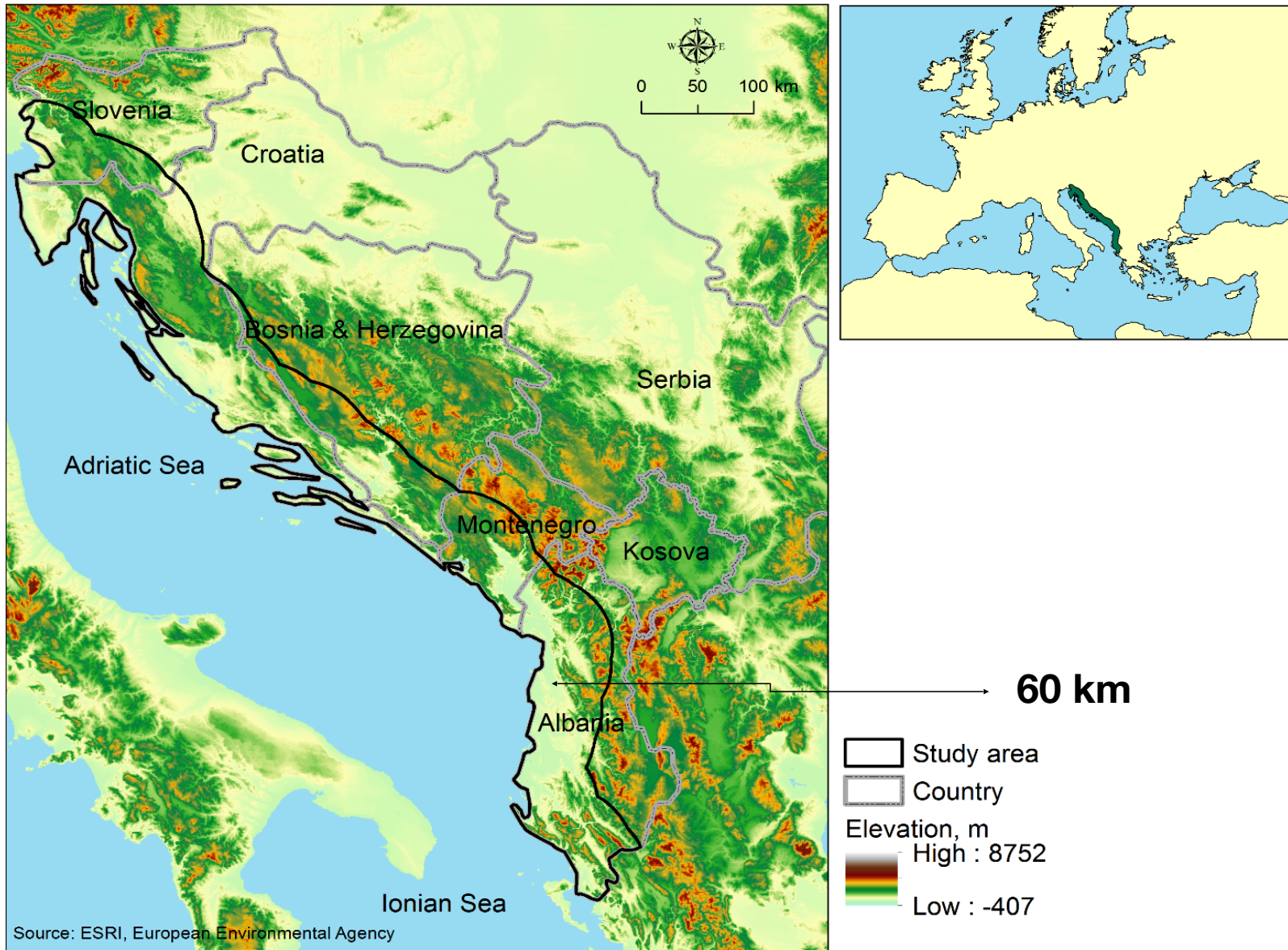
Why this research?

- Study area: 61637 km square
 - 41 percent of the entire study region
 - Countries: Albania, Croatia, Bosnia and Hercegovina, Montenegro and Slovenia



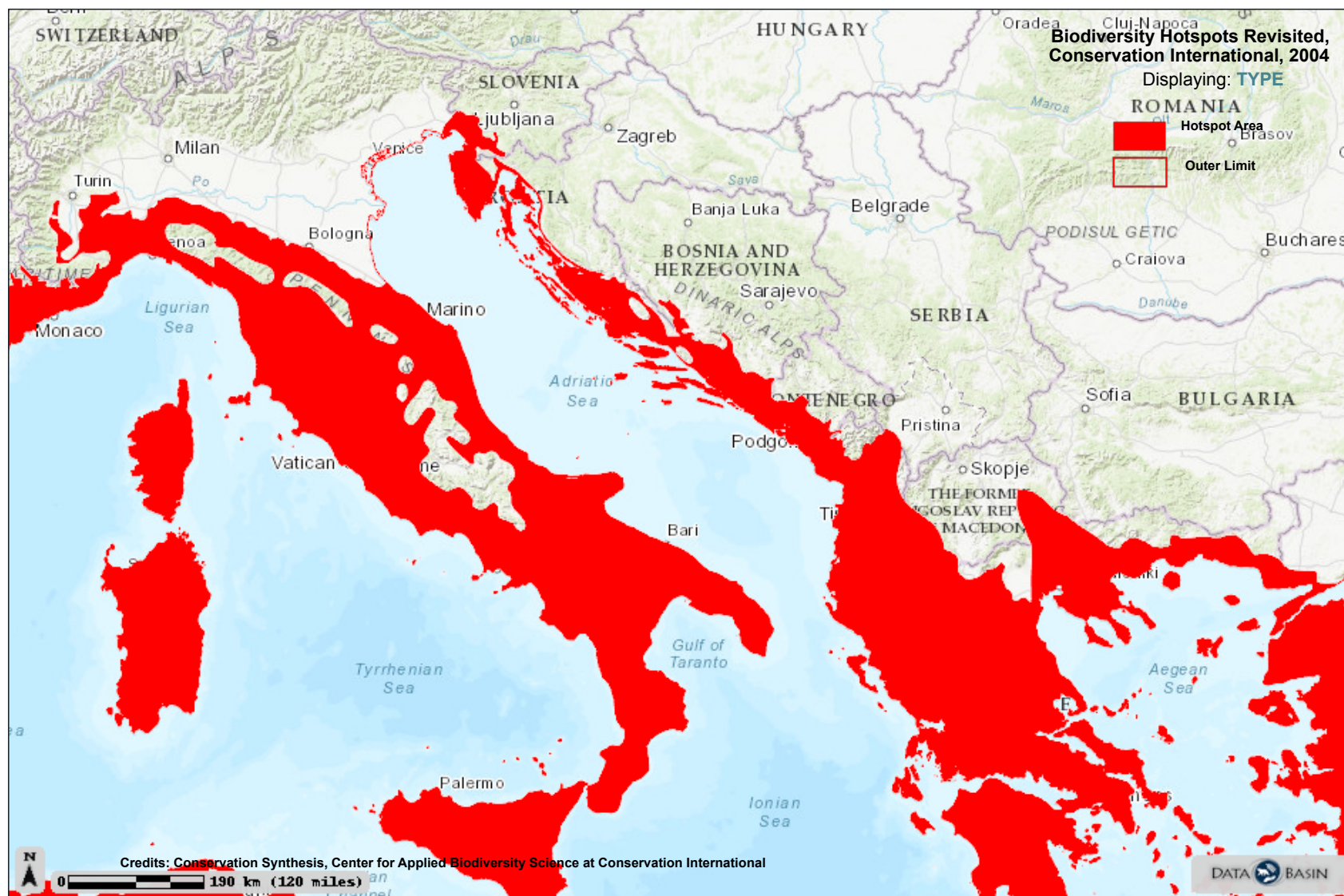
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The study area

- Five countries changed:
 - socialism to post-socialism regime
 - institutions
 - nature resource management and conservation
 - Increased Illegal logging (Albania)
 - Old trees loss: *Fagus spp.*, *Quercus spp.*, tree cover loss



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Supported by:

Methodological approach

- Search for plant data at IUCN or other databases
- CCI 2nd Global land cover user workshop
European Space Agency (ESA) Climate Change
<http://maps.elie.ucl.ac.be/CCI/viewer>, Webinar, 24 September 2018
- “63 Implementation and applications of the IUCN Red List of Ecosystems” Webinar, 23 October 2018
- Early Adopters Call of European Space Agency



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Supported by:

Methodological approach

- Collection of data of high resolution from remotes sensing images
- Analyzing and mapping data using new method for error in data processed:
 - E.g. Support Vector Machine (SVM) and Conditional Random Field (CRF)



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Thank you for your attention!

