



Evaluating Biodiversity Offset Effectiveness based on Land-use change

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with

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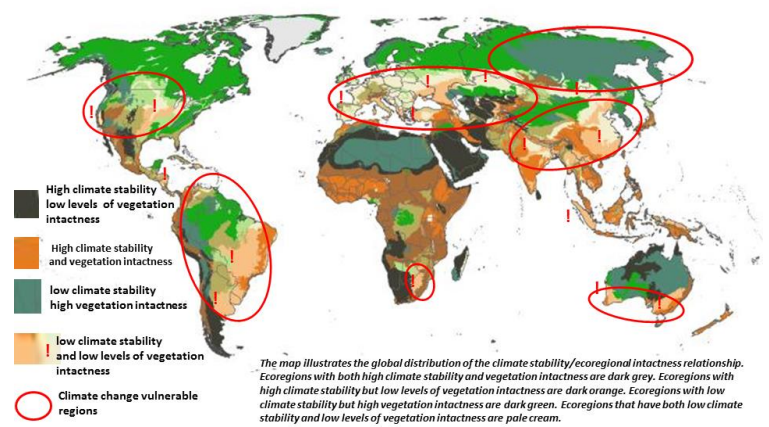
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Further research

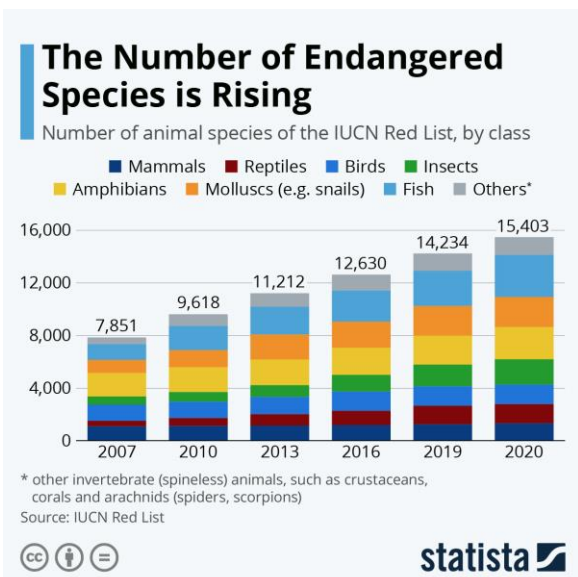
01. Research Background

Ecosystem climate change vulnerability and conservation

Mapping vulnerability and conservation adaptation strategies under climate change James E. M. Watson, Nature Climate Change September 2013

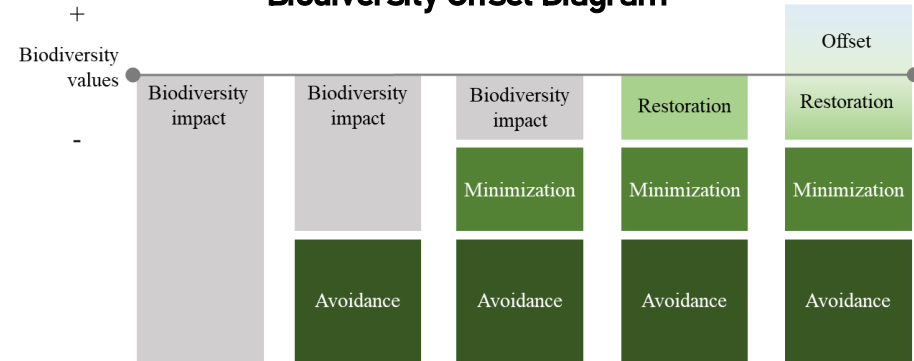


https://www.climateemergencyinstitute.com/ecosystems_and_species

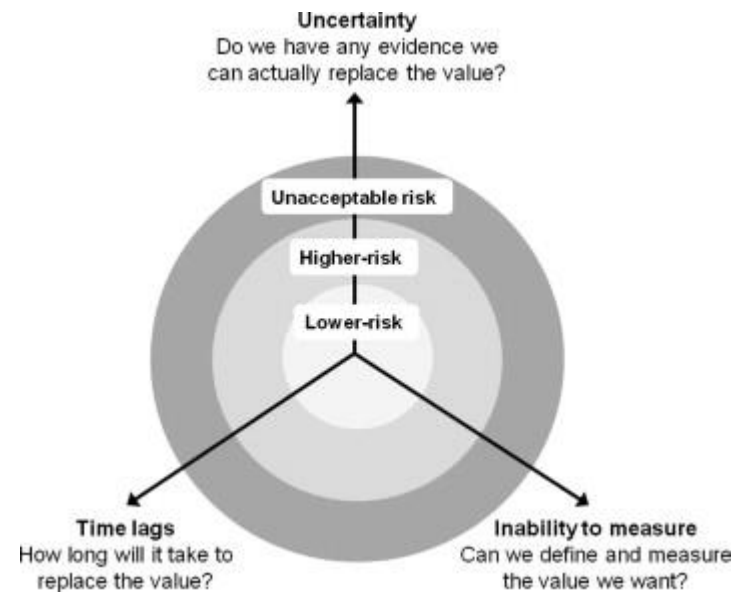


<https://www.statista.com/chart/17122/number-of-threatened-species-red-list/>

Biodiversity Offset Diagram



<https://www.iucn.org/resources/issues-briefs/biodiversity-offsets>, redraw



Maron et al., 2012

02. Research flow

Flow chart of Project

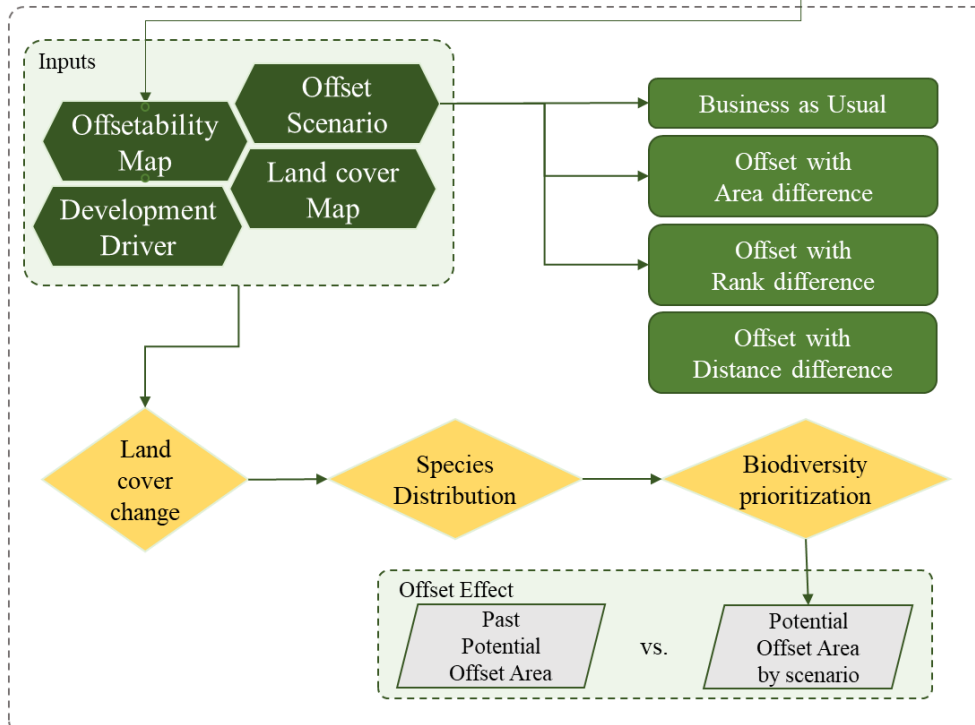
Section 1



Section 2



Section 3



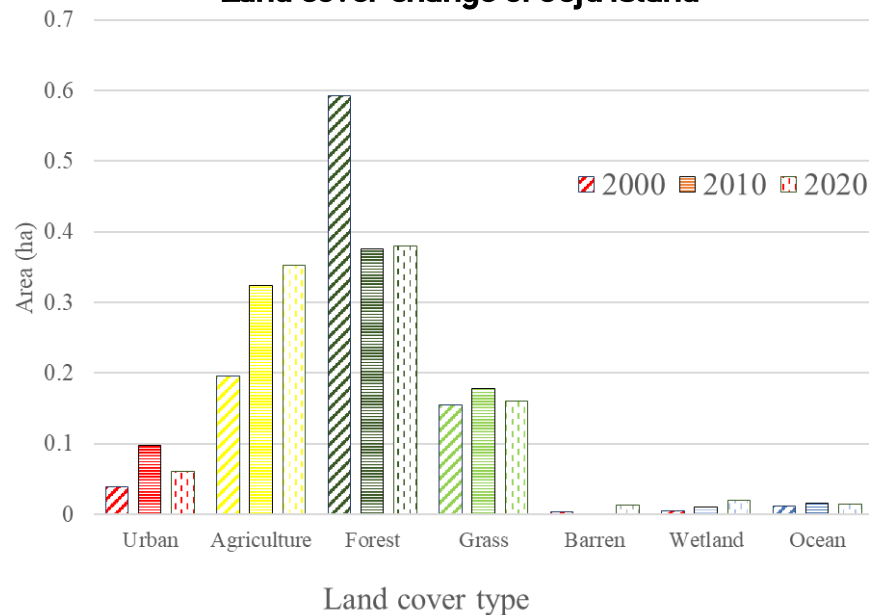
Research Question

1. How can the offset effect be measured?
2. What is the optimal way to place offset?

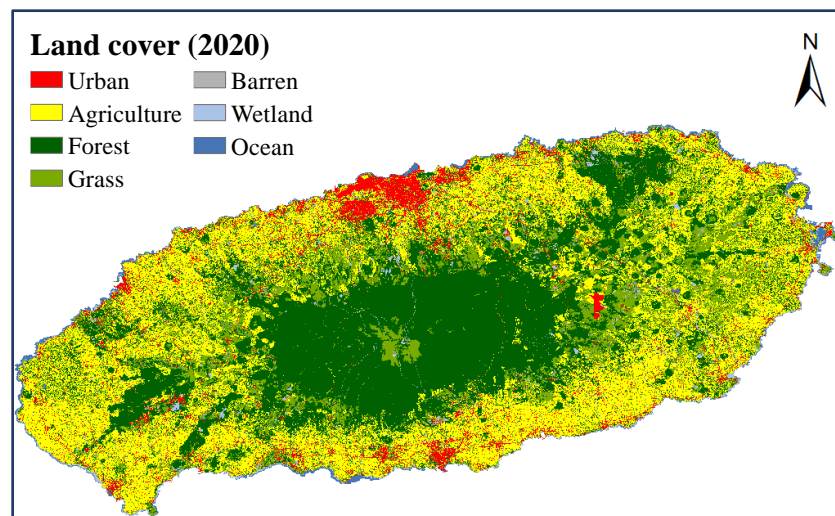
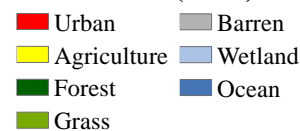
Location of Jeju island



Land cover change of Jeju island



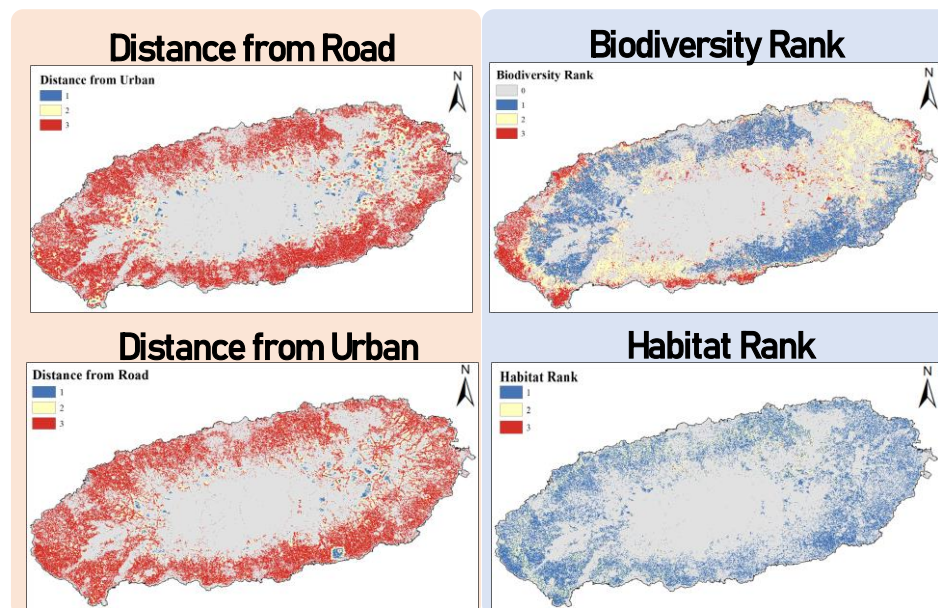
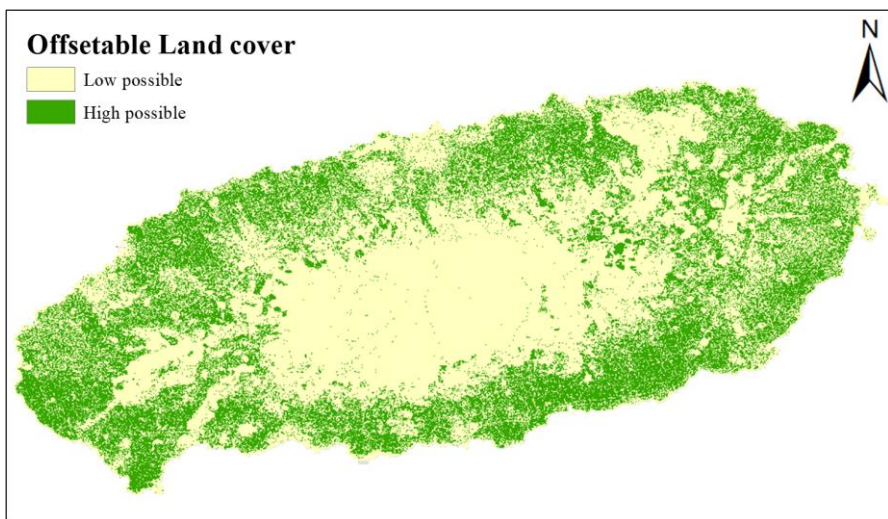
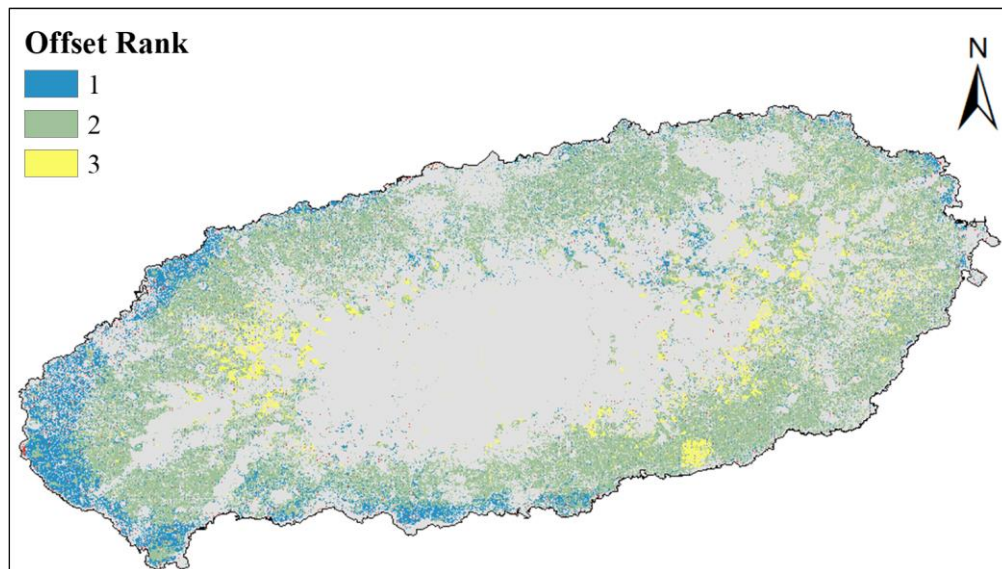
Land cover (2020)



1. Biodiversity Offset area in Jeju

Offset Criteria

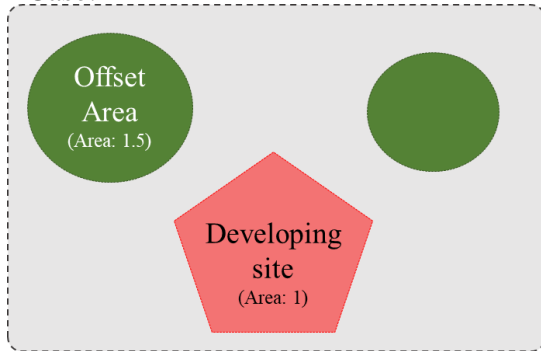
1. Offset should be better to be close to the developing area
2. Offsetable land cover is agriculture and barren
3. Close to the developed area has high value
4. Place where species used to live in past but not now has high value



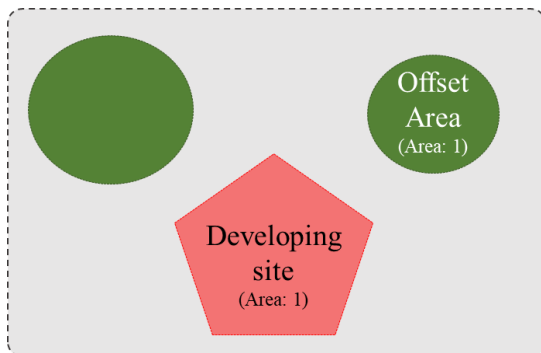
2. Land-use change prediction scenario

Offset Scenario (Area)

Case: A1

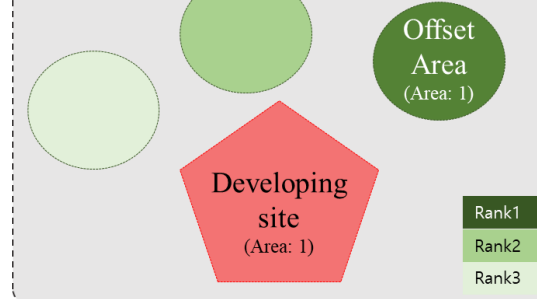


Case: A2

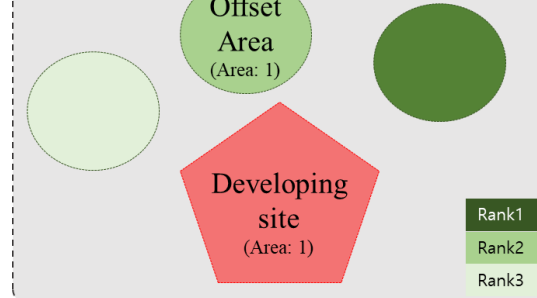


Offset Scenario (Rank)

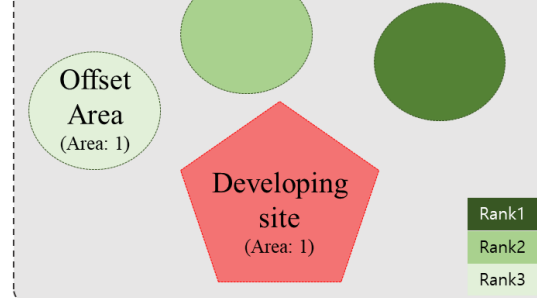
Case: R1



Case: R2

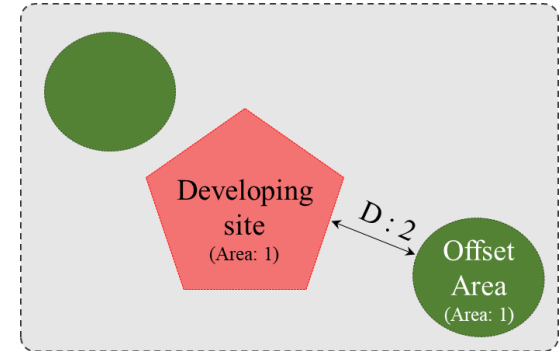


Case: R3

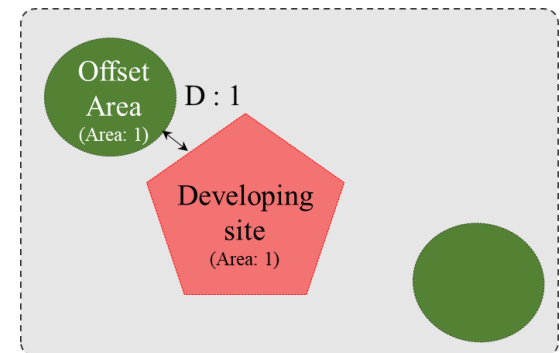


Offset Scenario (distance)

Case: D1

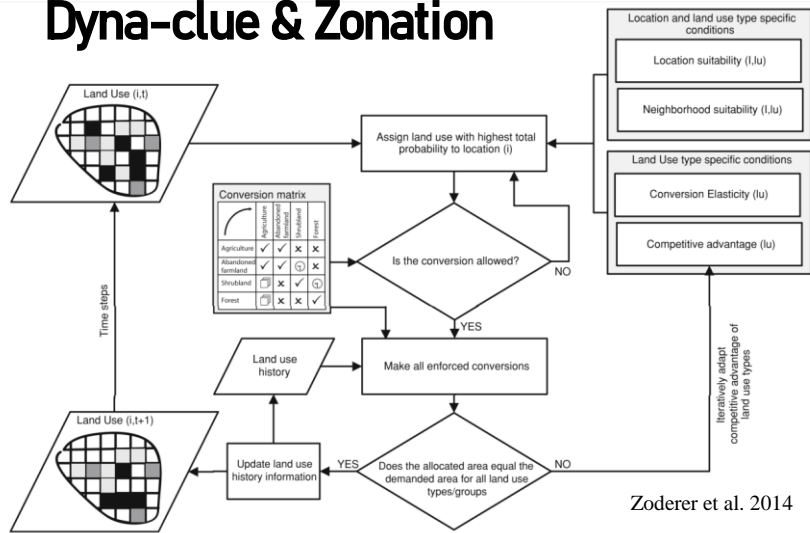


Case: D2

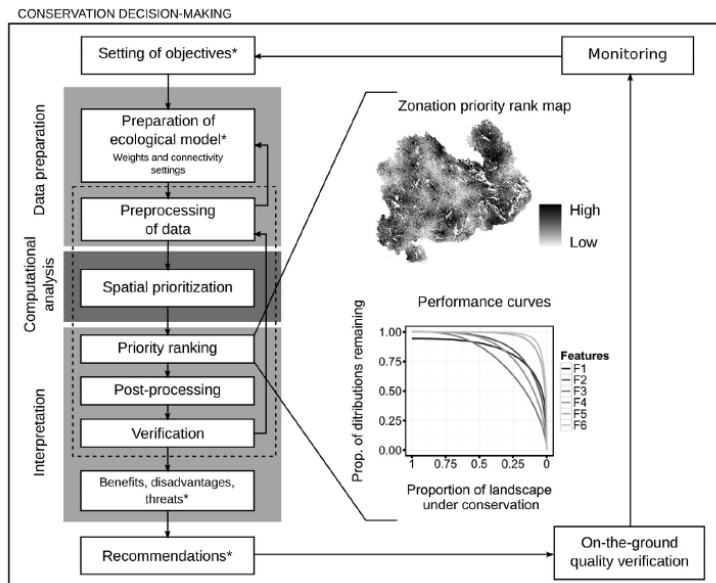


1. Land cover change prediction & Biodiversity Rank

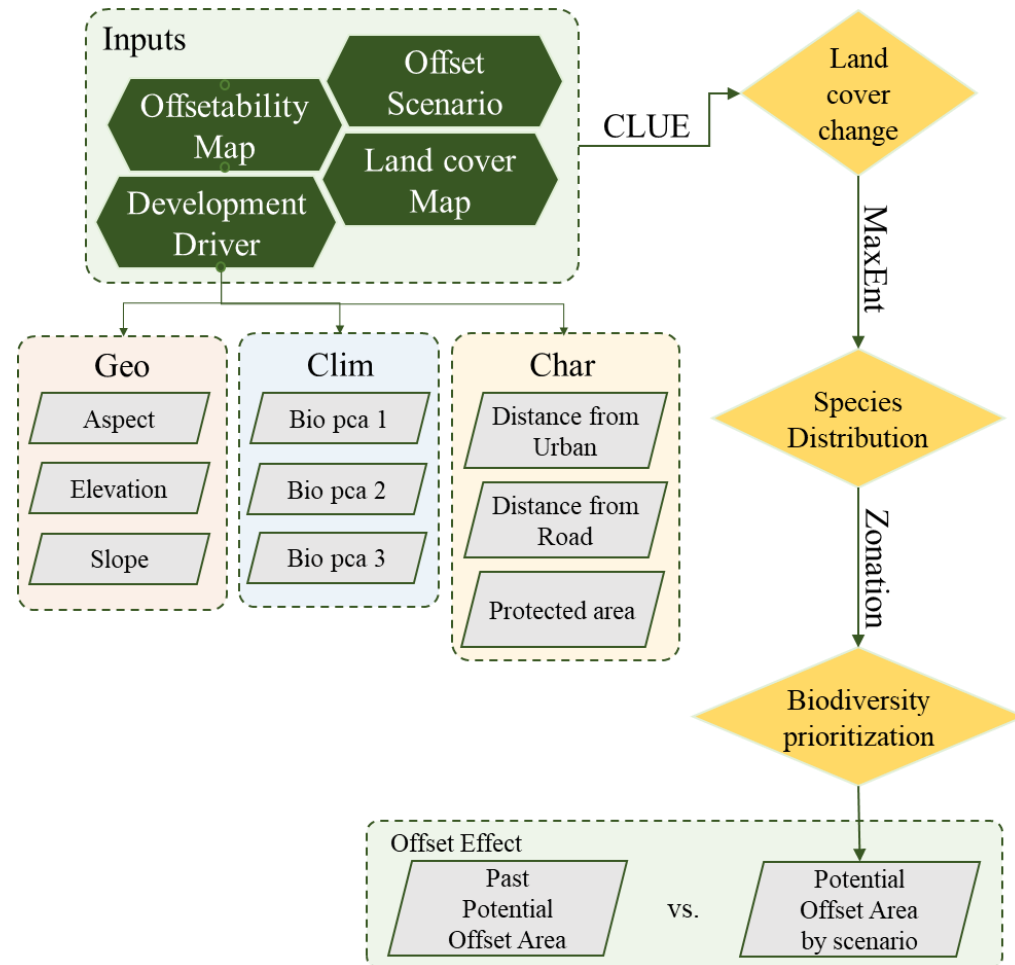
Dyna-clue & Zonation



Zoderer et al. 2014



Lehtomaki et al. 2013



Lehtomäki J., Moilanen A. (2013) Methods and workflow for spatial conservation prioritization using Zonation, *Environmental Modelling & Software* 47 (2013) 128-137

Zoderer B. (2014) , Mapping and analysing current and future land use change and ecosystem service provision in Croatia, Research project - Master in Earth science and Economics

Martine Maron, Richard J. Hobbs, Atte Moilanen, Jeffrey W. Matthews, Kimberly Christie, Toby A. Gardner, David A. Keith, David B. Lindenmayer, Clive A. McAlpine, Faustian bargains? Restoration realities in the context of biodiversity offset policies, *Biological Conservation*, 155 (2012) 141-148

https://www.climateemergencyinstitute.com/ecosystems_and_species

<https://www.statista.com/chart/17122/number-of-threatened-species-red-list/>

This research is pointing out the importance of considering landscape pattern and size while applying biodiversity offset. Also, the result will support the political decision for offsetting development impact to improve overall biodiversity. This work was conducted with the support of the Korea Environment Industry & Technology Institute (KEITI) through its Urban Ecological Health Promotion Technology Development Project, and funded by the Korea Ministry of Environment (MOE) (2020002770003).