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# Global exposure of species, protected areas, countries and ecoregions to oil palm plantations

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# Do you consume these products?



# Oil palm plantations threaten biodiversity

## REVIEW ARTICLE

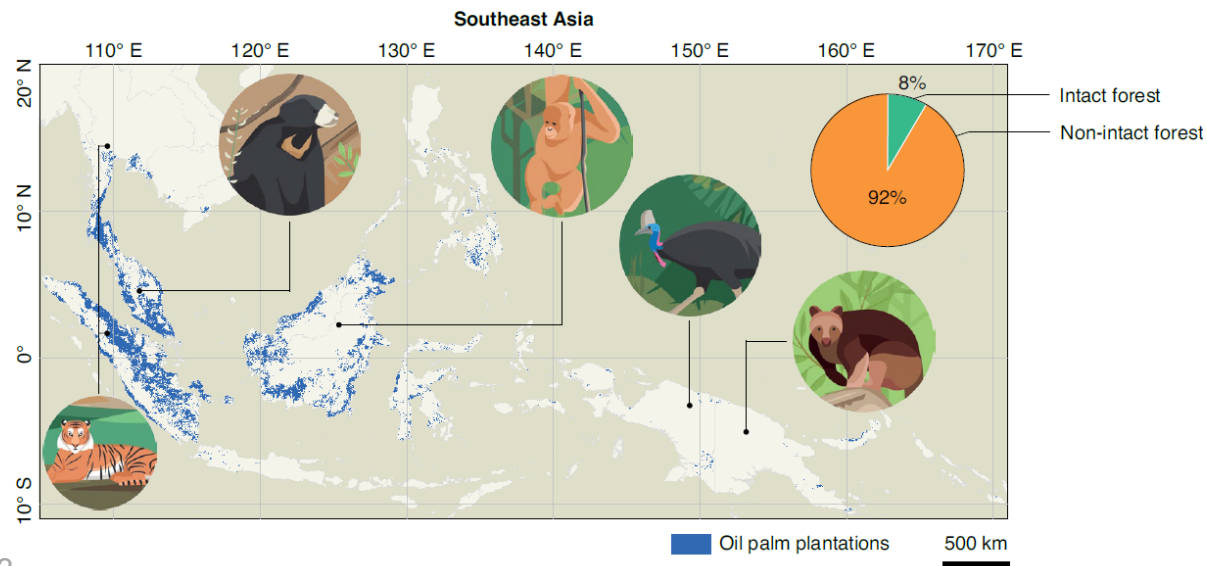
<https://doi.org/10.1038/s41477-020-00813-w>

nature  
plants



## The environmental impacts of palm oil in context

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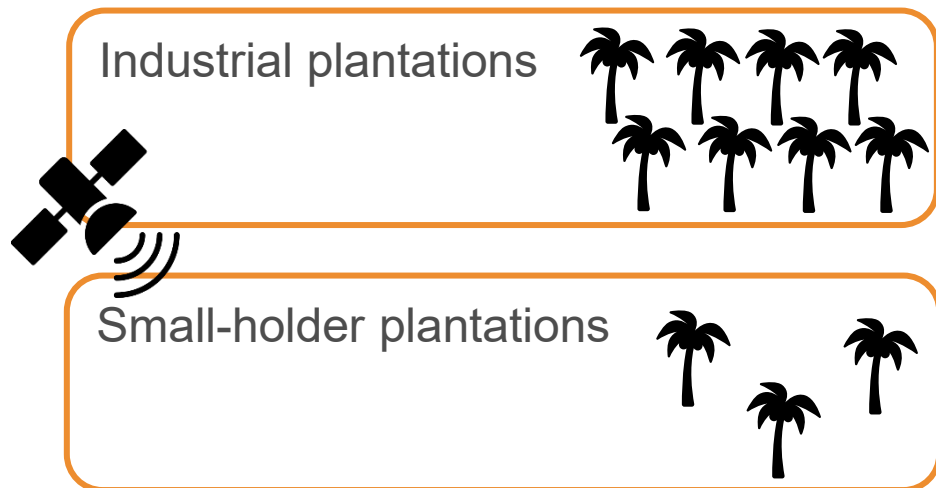


At least 321 species are threatened globally by oil palm plantations, such as:

- The tiger *Panthera tigris* (Endangered)
  - The sun bear *Helarctos malayanus* (Vulnerable)
  - The Bornean orangutan *Pongo pygmaeus* (Critically Endangered)
- Analysis based on text mining
- A spatially-explicit approach is lacking

# Our spatially-explicit approach to the issue

Global map of oil palm plantations  
(Descals et al., 2021):



Global distributions of:

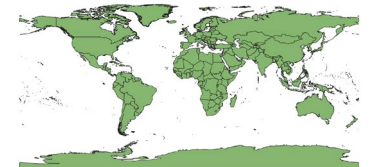
Species  
(IUCN + BirdLife)



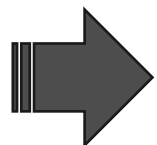
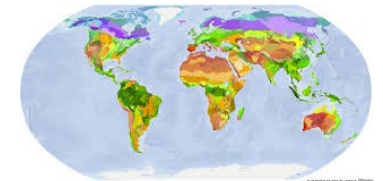
Protected areas  
(Protected Planet)



Countries  
(GISCO)



Ecoregions  
(Dinerstein et al., 2017)



Determining exposure of species, protected areas, countries and ecoregions to oil palm plantations following the workflow described in Jeffe-Bugnoli et al. (2024)

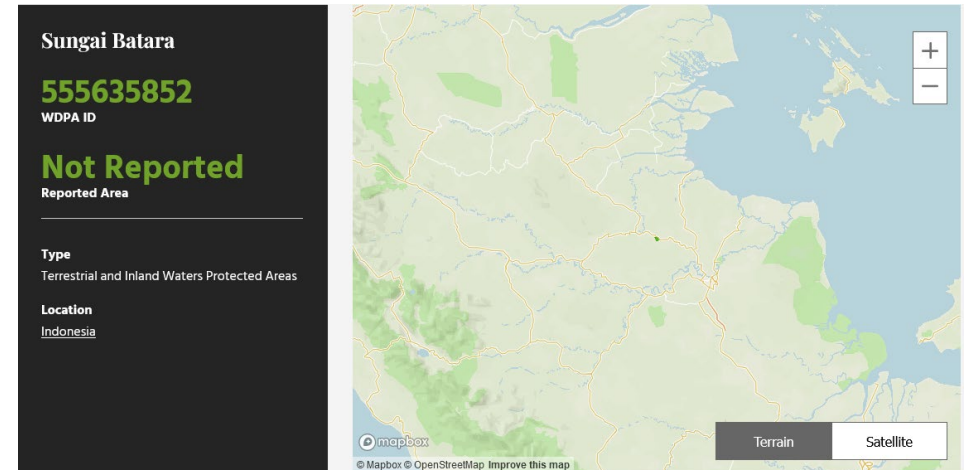
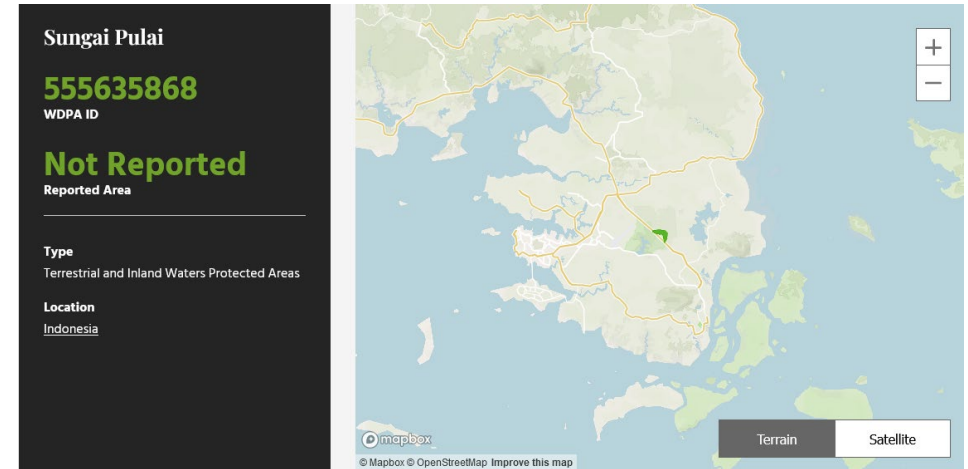
# Species

- 687 mammal and amphibian species have more than 1% of their range exposed to plantations
- Exposed species are on average more exposed to industrial oil palm plantations (4% of their range) than to small-holder oil palm plantations (2% of their range)
- The most exposed species to oil palm plantations is the **Hagen's Flying Squirrel *Petinomys hageni*** (Data Deficient) with 47% of its range exposed
- Among threatened species, the most exposed species to oil palm plantations is the **Raffles' Banded Langur *Presbytis femoralis*** (Critically Endangered) with 44% of its range exposed



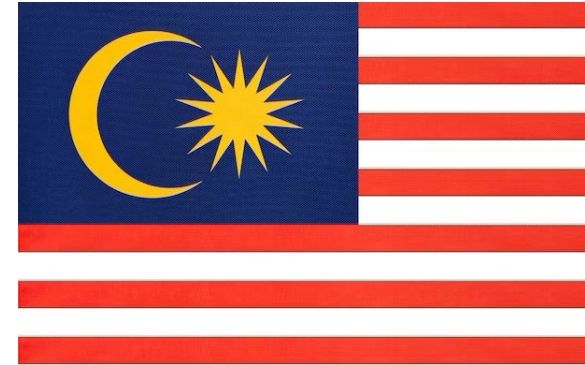
# Protected areas

- 1,134 protected areas are exposed to oil palm plantations
- Exposed protected areas are more exposed to industrial oil palm plantations (60% of their exposed range) than to small-holder oil palm plantations (40% of their exposed range)
- With more than 90% of their range exposed, the two most exposed protected areas to oil palm plantations are the nationally designated parks:
  - ❖ **Sungai Pulai** (Indonesia – category unreported)
  - ❖ **Sungai Batara** (Indonesia – strict nature reserve)



# Countries and ecoregions

- 43 countries are exposed to oil palm plantations
- The most exposed country to oil palm plantations is **Malaysia**, with over 6% of its area exposed
- 198 ecoregions are exposed to oil palm plantations
- **Sumatran freshwater swamp forests** (Indonesia) is the most exposed ecoregion to oil palm plantations, with 29% of its range exposed
- Countries and ecoregions are twice as exposed to industrial oil palm plantations than to small-holder plantations



# Limits

- We used IUCN species' range and not area of habitat/occupancy
- We assessed exposure and not impact
- All the species exposed to oil palm plantations may not be as exposed as we revealed, and whether oil palm plantations are threatening these species is to be confirmed by complementary approaches
- The impacts of alternative oil production scenarios are to be explored



# Future work and key recommendations

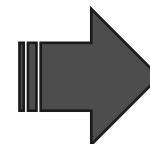
## Future work

1. Extend our approach to birds
2. Move from IUCN species' range to area of habitat/occupancy
3. Carry out sensitivity analyses to better estimate the number of impacted species
4. Explore the impacts of alternative oil production scenarios:
  - Future location of oil palm plantations in a context of replanting in the next decade (Descals et al., 2024)
  - Current location of other vegetal oil plantations

## Key recommendations

Enhance the use of EO to characterise the impact of agricultural commodities on biodiversity by spatially-explicit approaches to:

1. Complement other, non as spatially-explicit approaches (e.g. trade flows, LCA) in monitoring these impacts and communicate them to the general public
2. Optimise land use planning to minimise the impacts of agricultural commodities on biodiversity



Move from deforestation-free to biodiversity risk-free products

# Thank you for your attention!

Any question?

Speak now or...

...contact me at [marine.robuchon@ec.europa.eu](mailto:marine.robuchon@ec.europa.eu)