

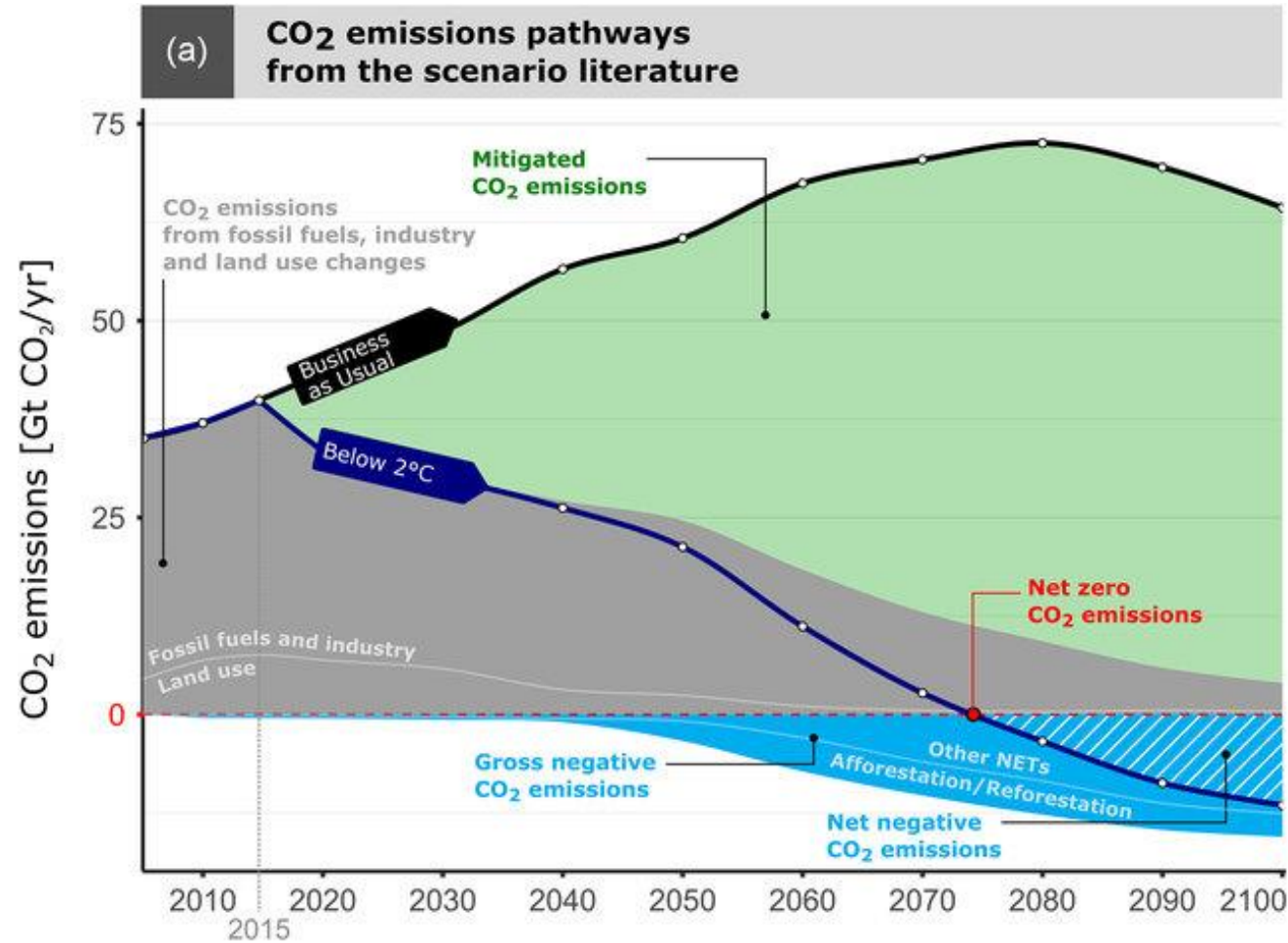


# Animating the Carbon Cycle: How Trophic Rewilding Can Help Mitigate Climate Change

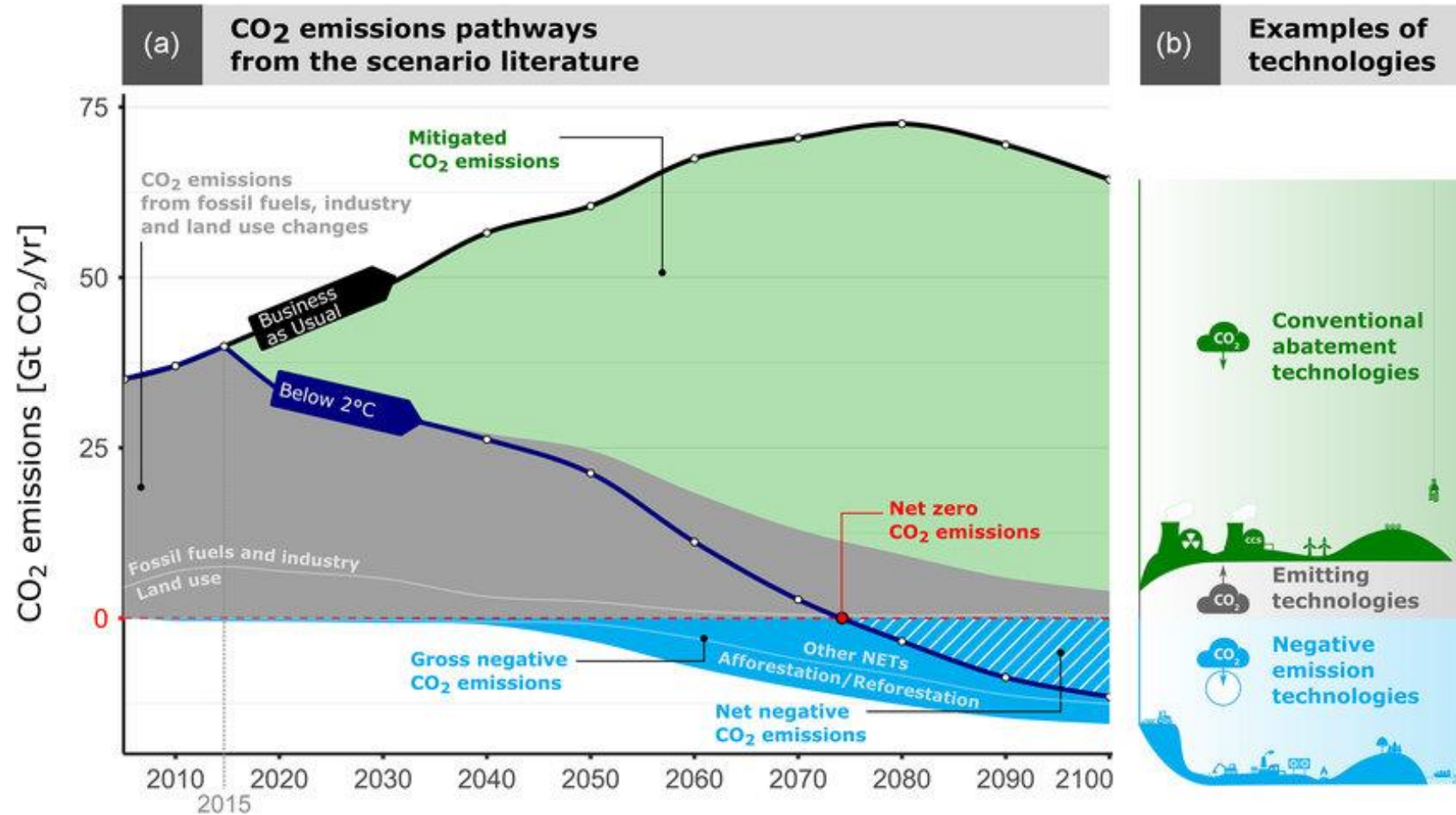
Andrew Tilker

Re:wild





To meet the target of 1.5 degrees that was adopted in the Paris Agreement we need to meet net zero emissions but also 400-500 GtCO<sub>2</sub> negative emissions between 2030 and 2100 -- **or 10-12 GtCO<sub>2</sub> per year.**

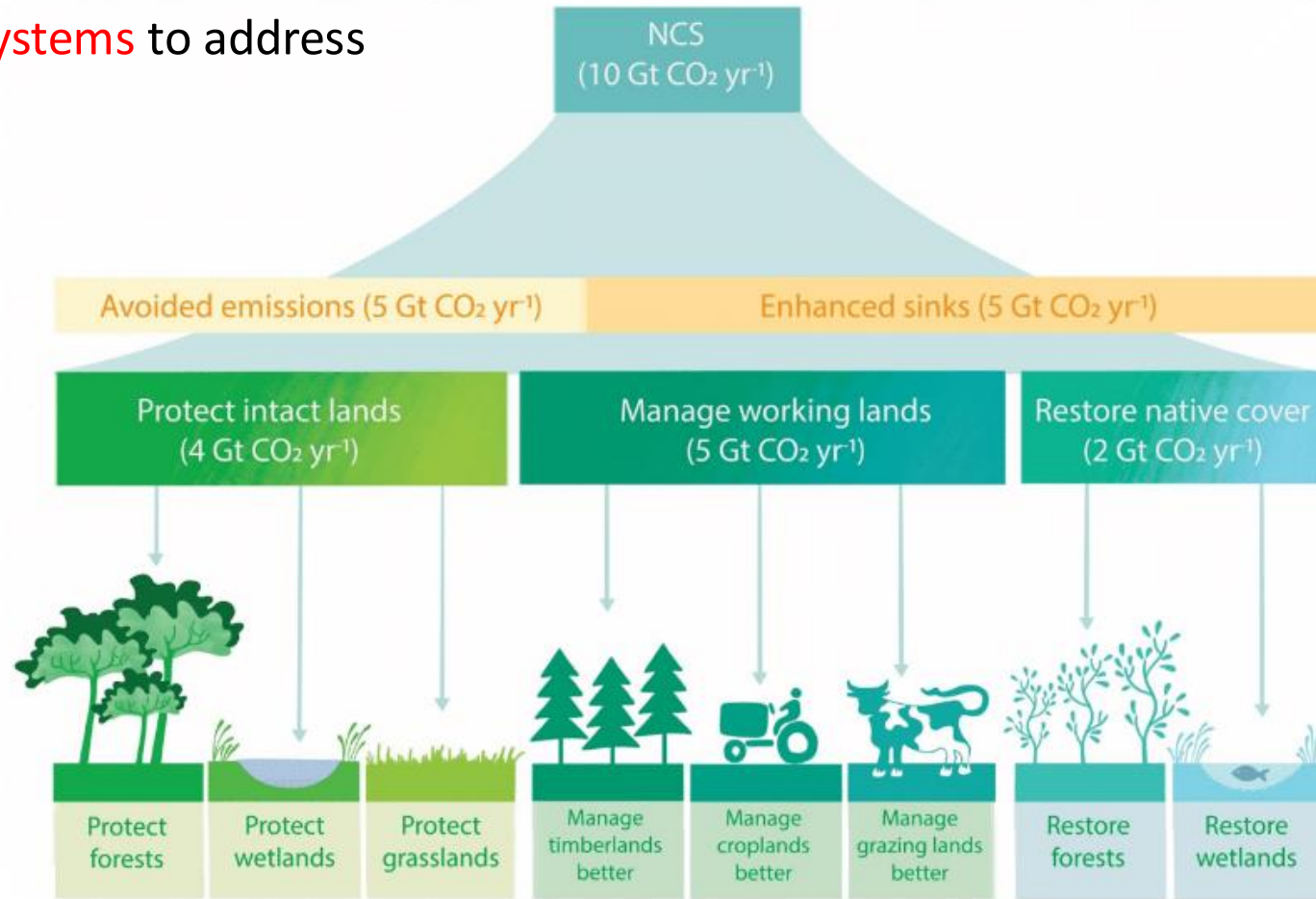


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# Net zero & negative carbon emissions via natural climate solutions (NCS)

One potential solution is to use **biodiversity** and **ecosystems** to address climate change.



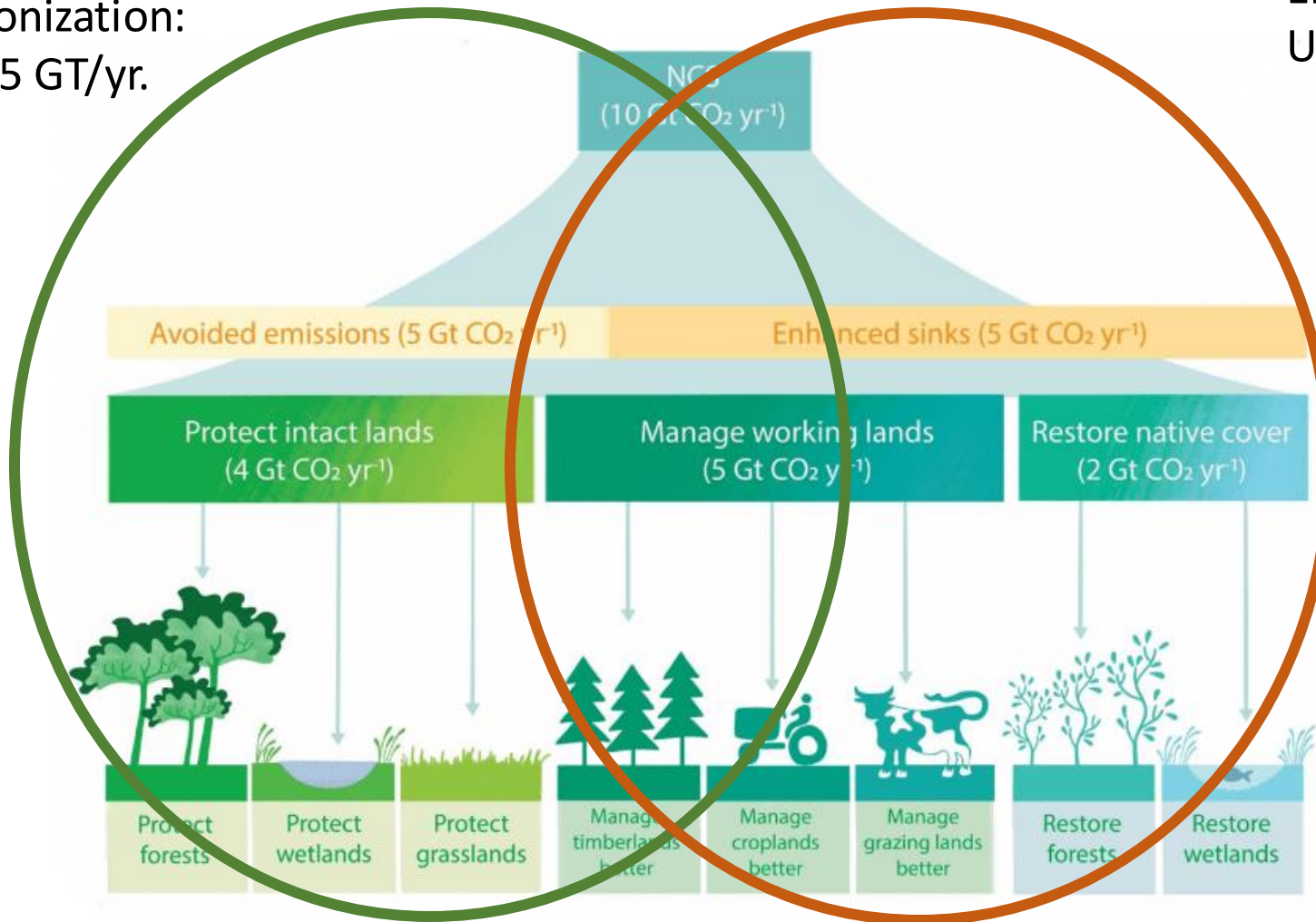
Protect to reduce emissions

Enhance to remove CO<sub>2</sub>

# Net zero & negative carbon emissions via natural climate solutions (NCS)

Part of decarbonization:  
Protecting against 5 GT/yr.

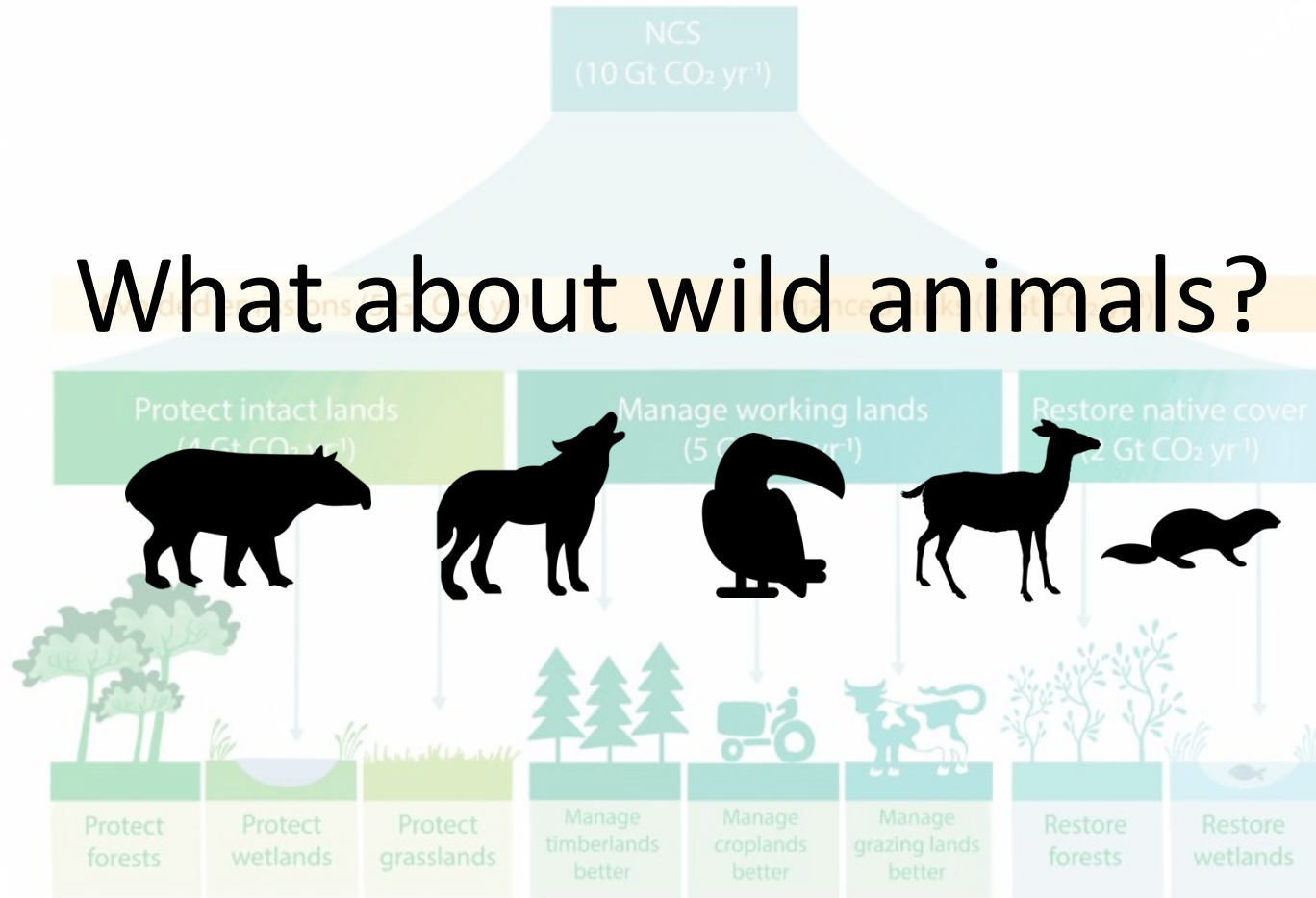
Enhancing sink strength:  
Update of 5 GT/yr.

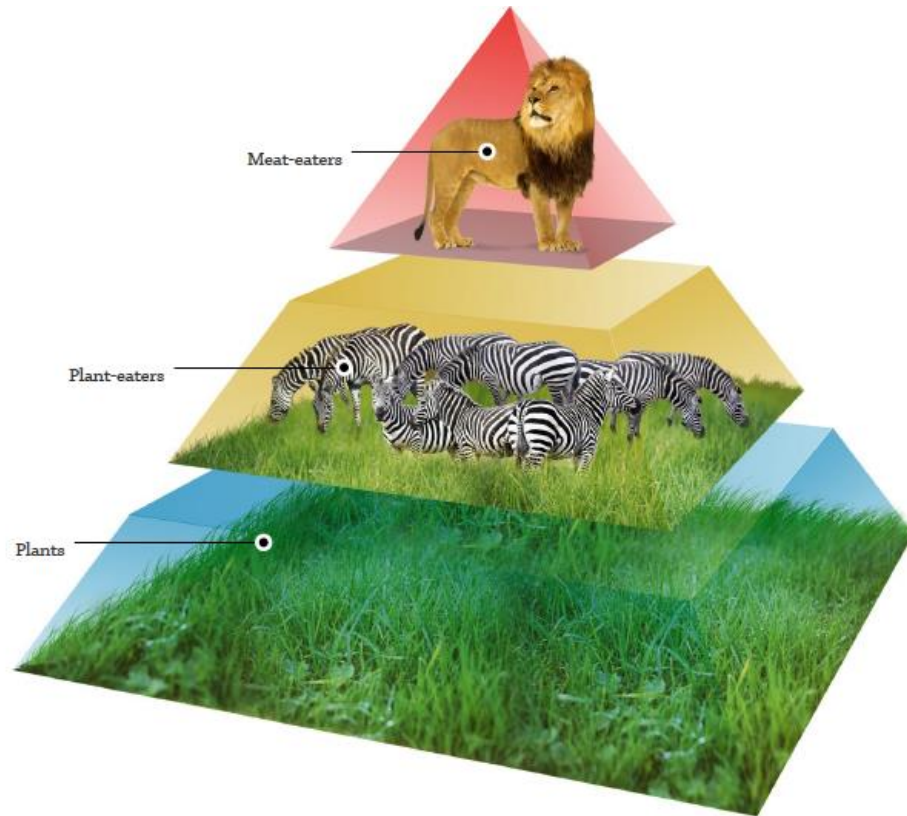


Still have 1-2 Gt CO<sub>2</sub> shortfall

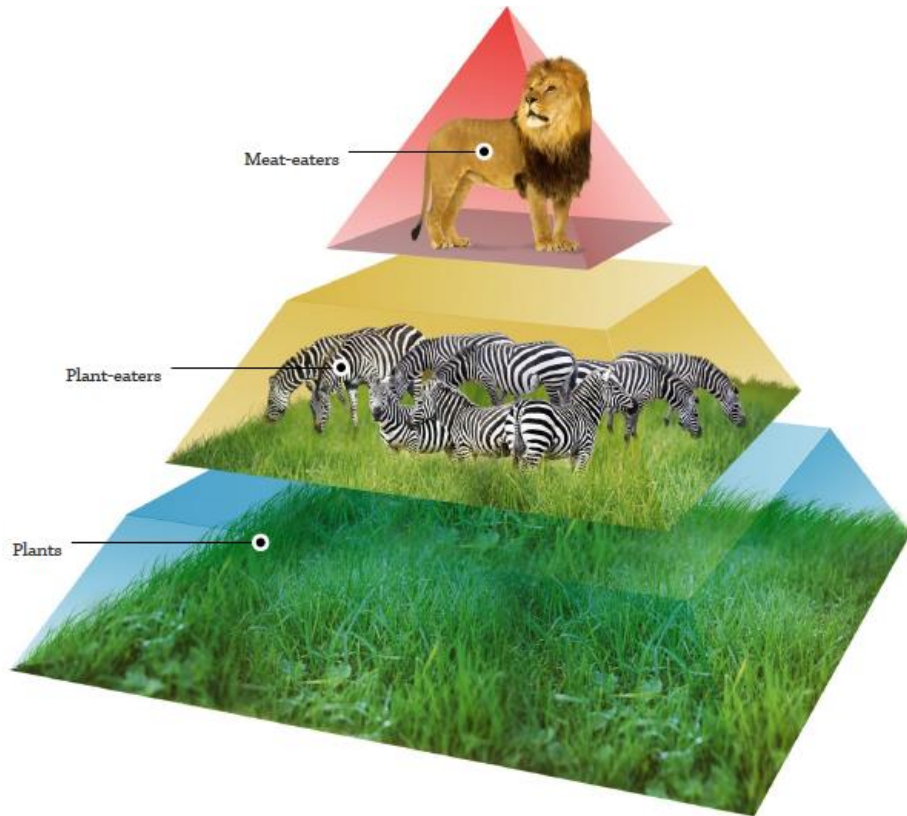
# Net zero & negative carbon emissions via natural-based climate solutions (NCS)

## What about wild animals?

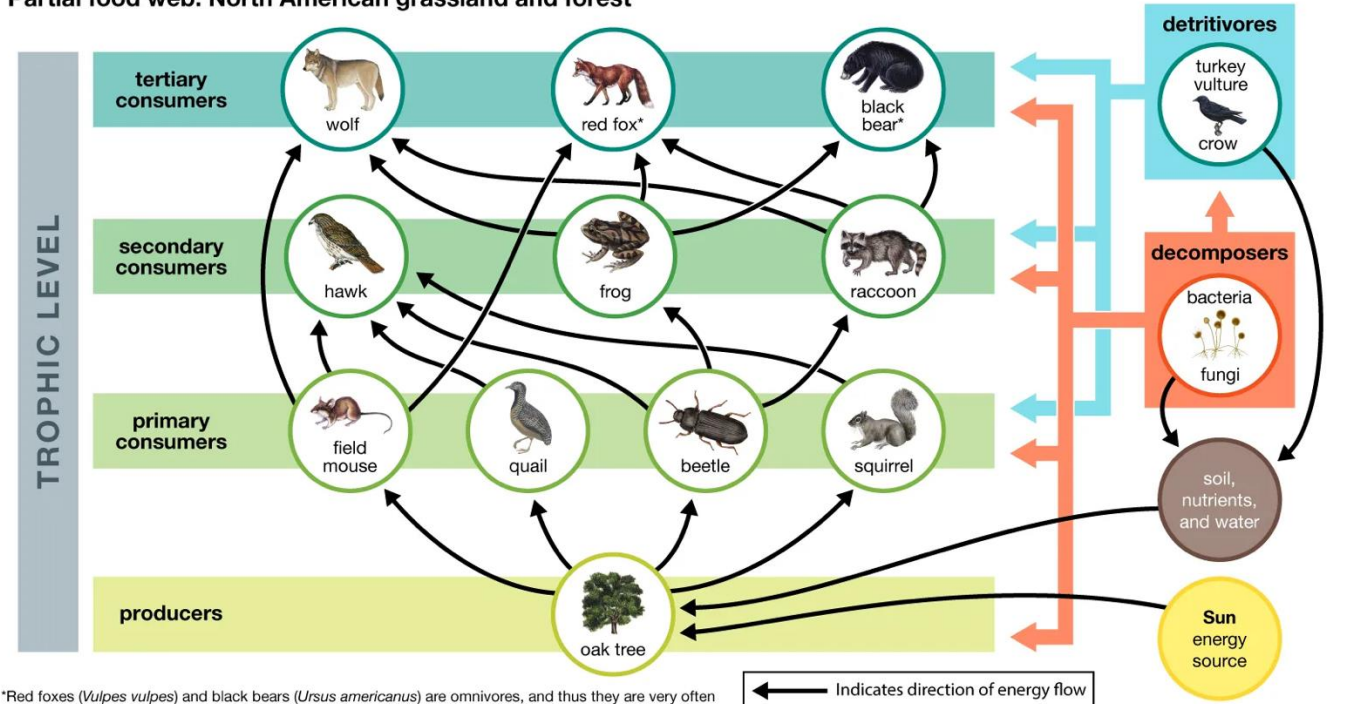




Animals are **presumed to make negligible contributions** to the carbon cycle because of low total biomass (relative to plants).



Partial food web: North American grassland and forest

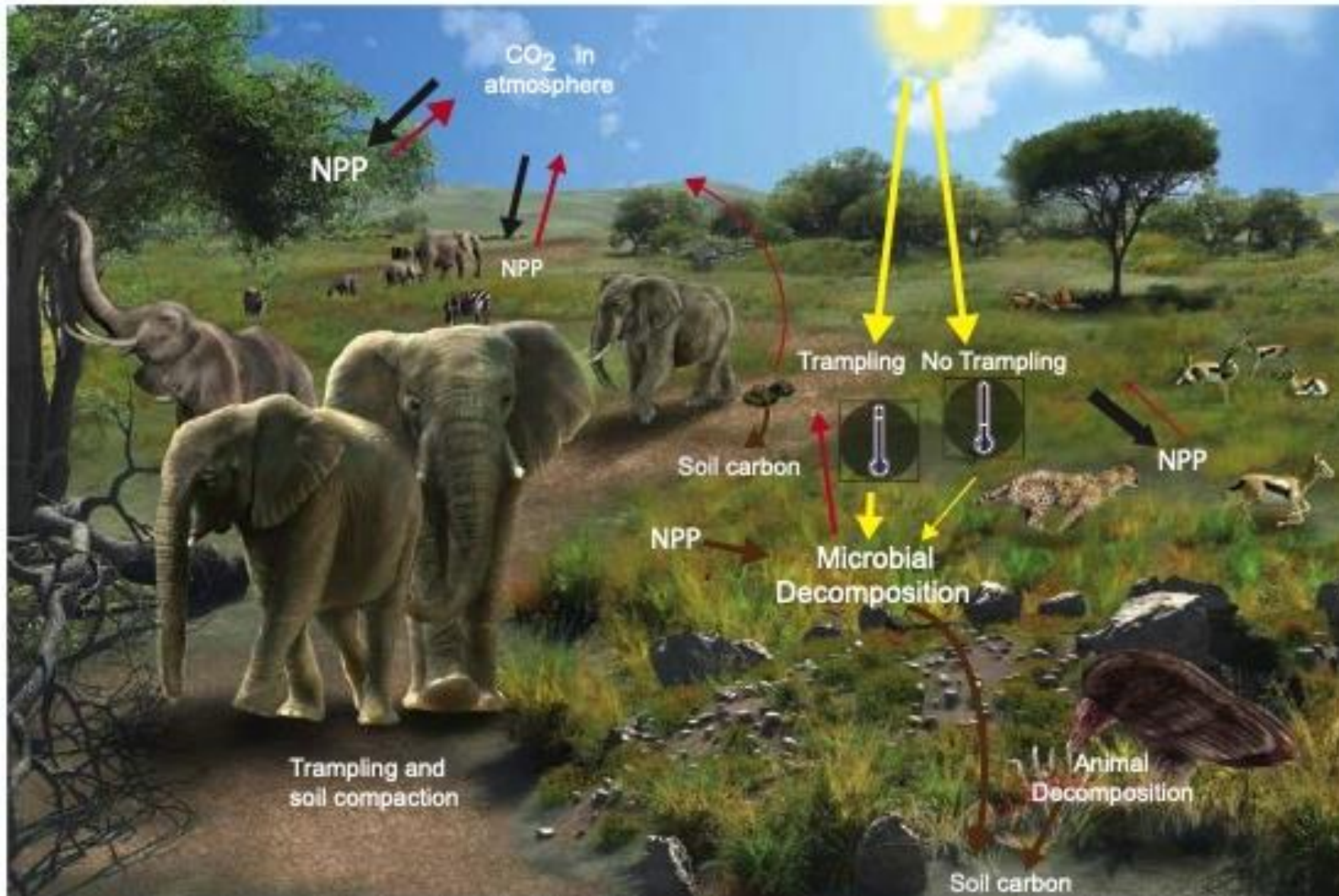


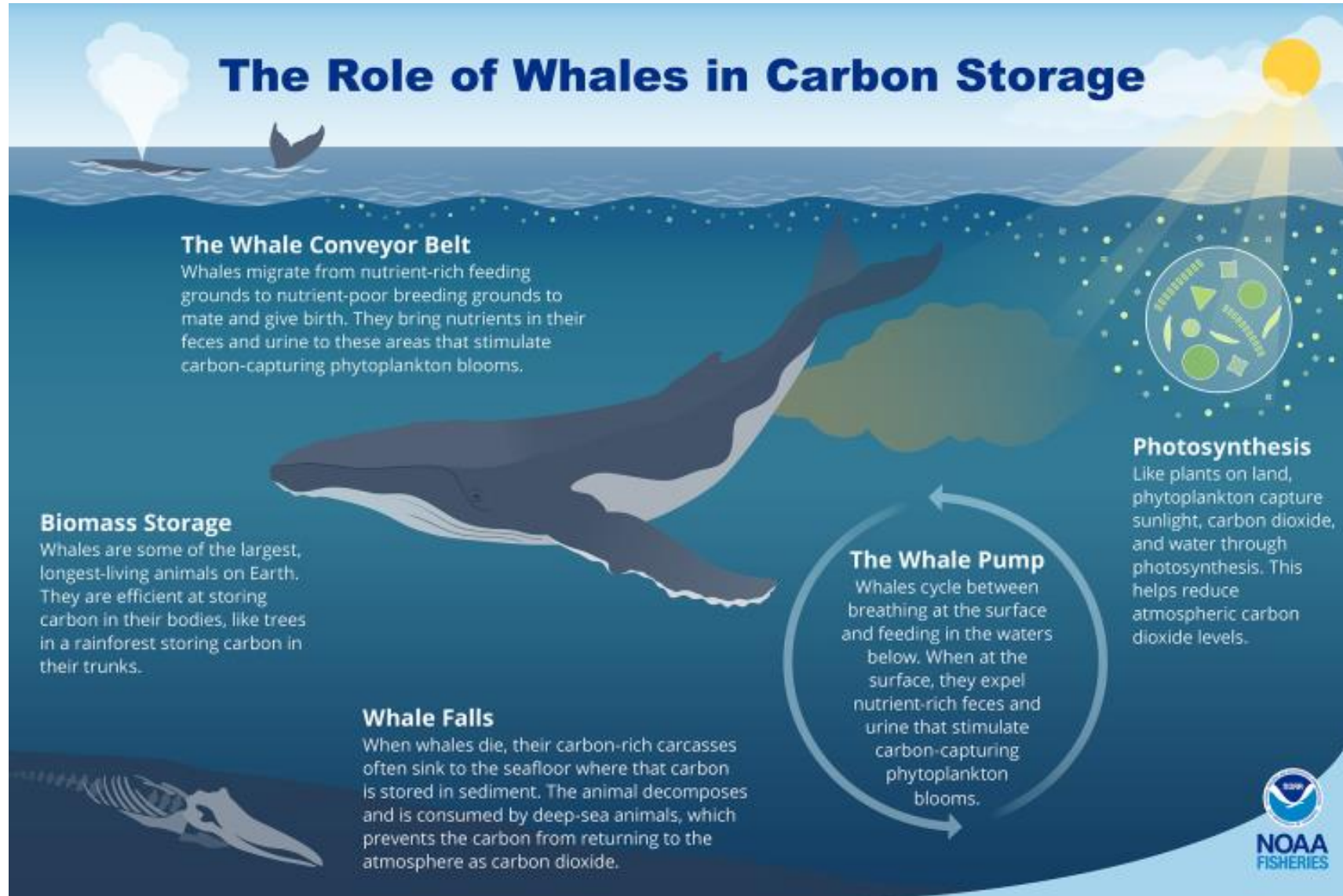
\*Red foxes (*Vulpes vulpes*) and black bears (*Ursus americanus*) are omnivores, and thus they are very often considered to be secondary consumers. However, in this food web they function as tertiary consumers.

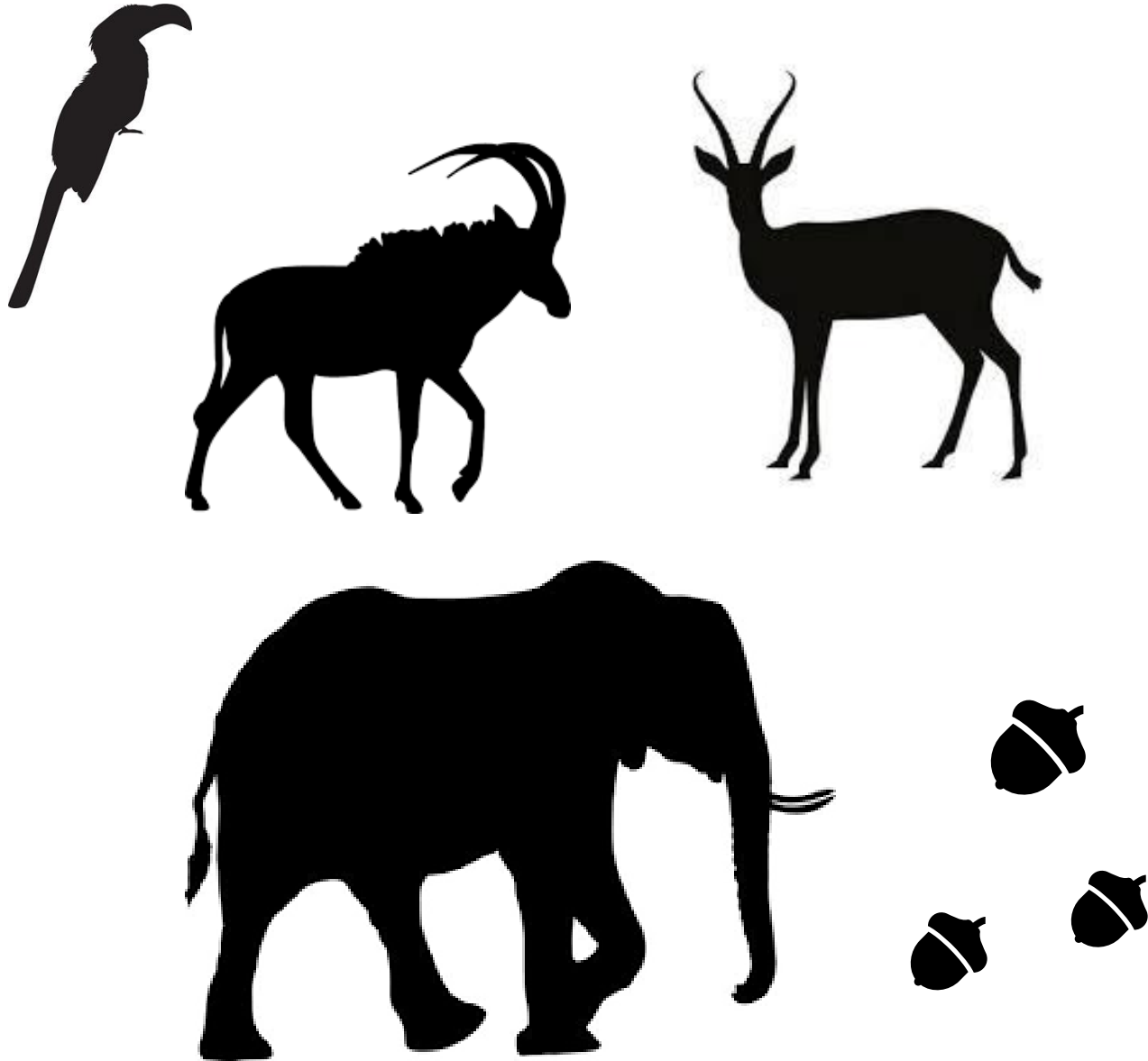
Animals are **presumed to make negligible contributions** to the carbon cycle because of low total biomass (relative to plants).

But animals have **impacts disproportionate to their abundance** by virtue of causing feedbacks through interactions in food webs.

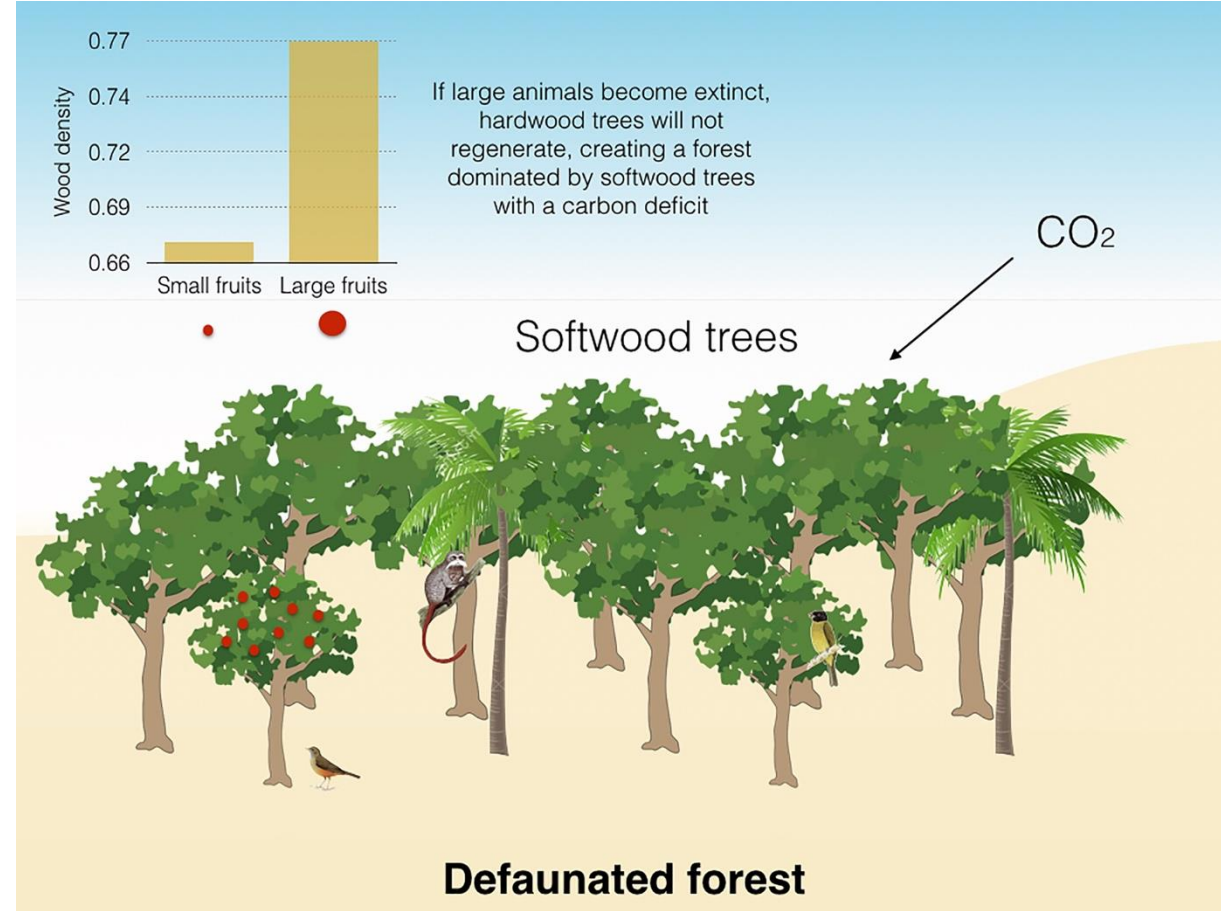
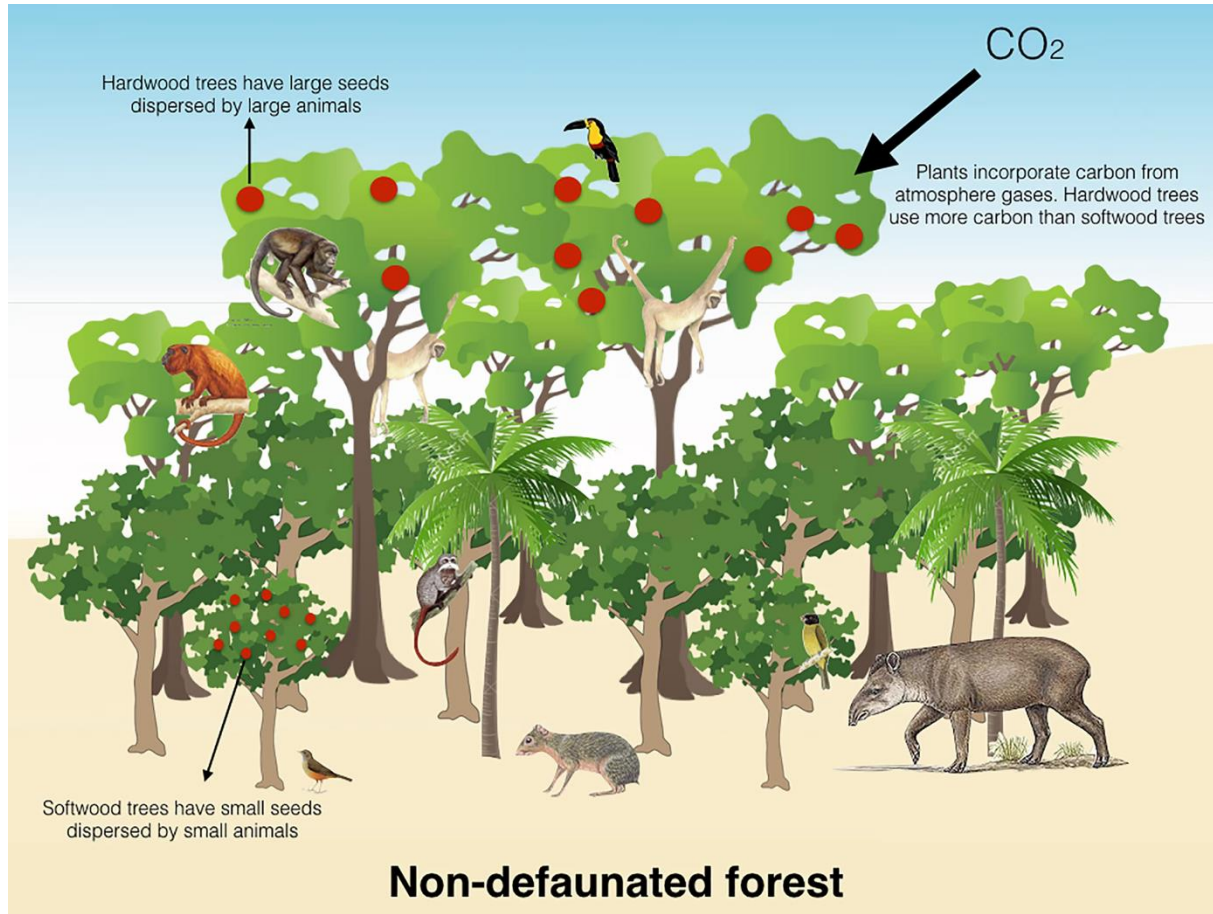
# Animals are dynamic agents in ecosystems







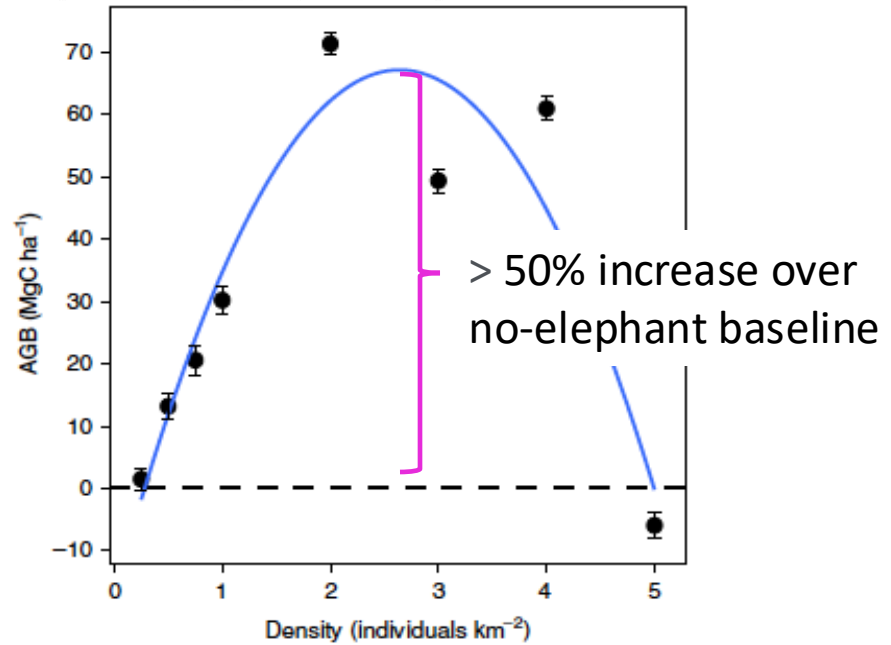
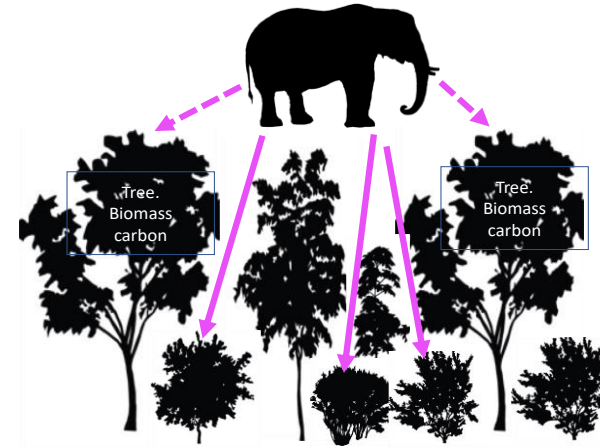
# Frugivores as seed dispersers in forest ecosystems

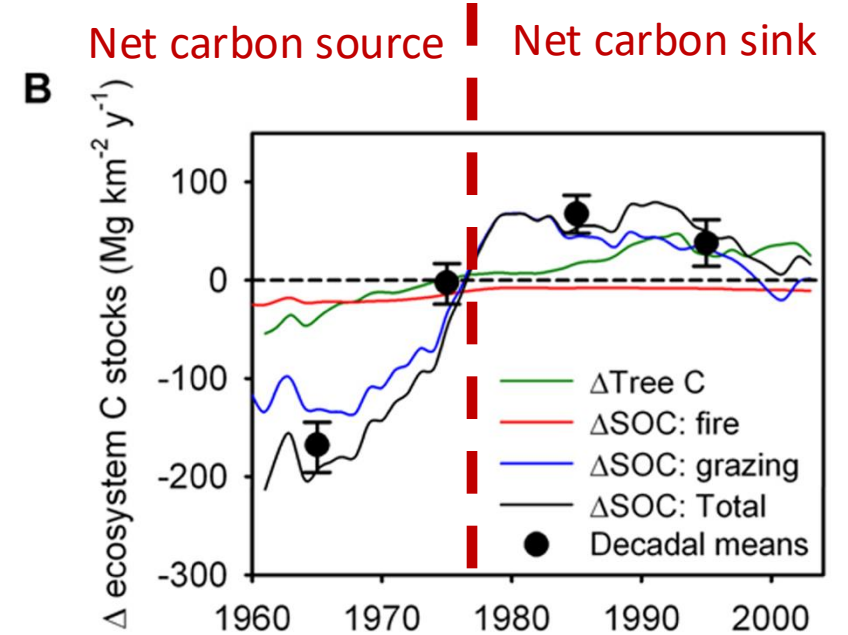
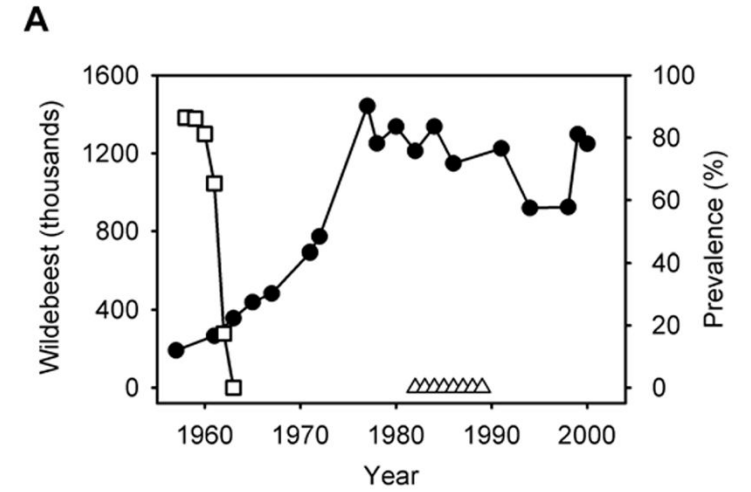


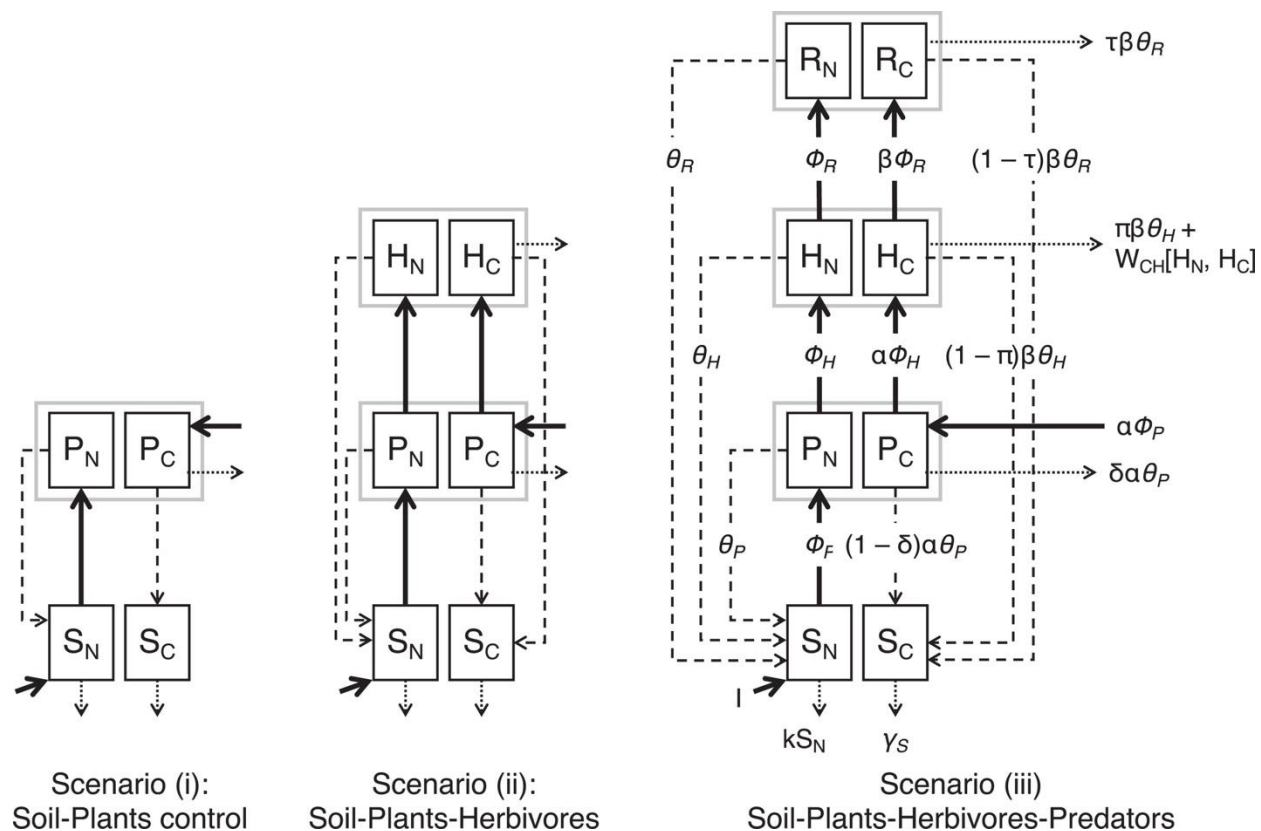
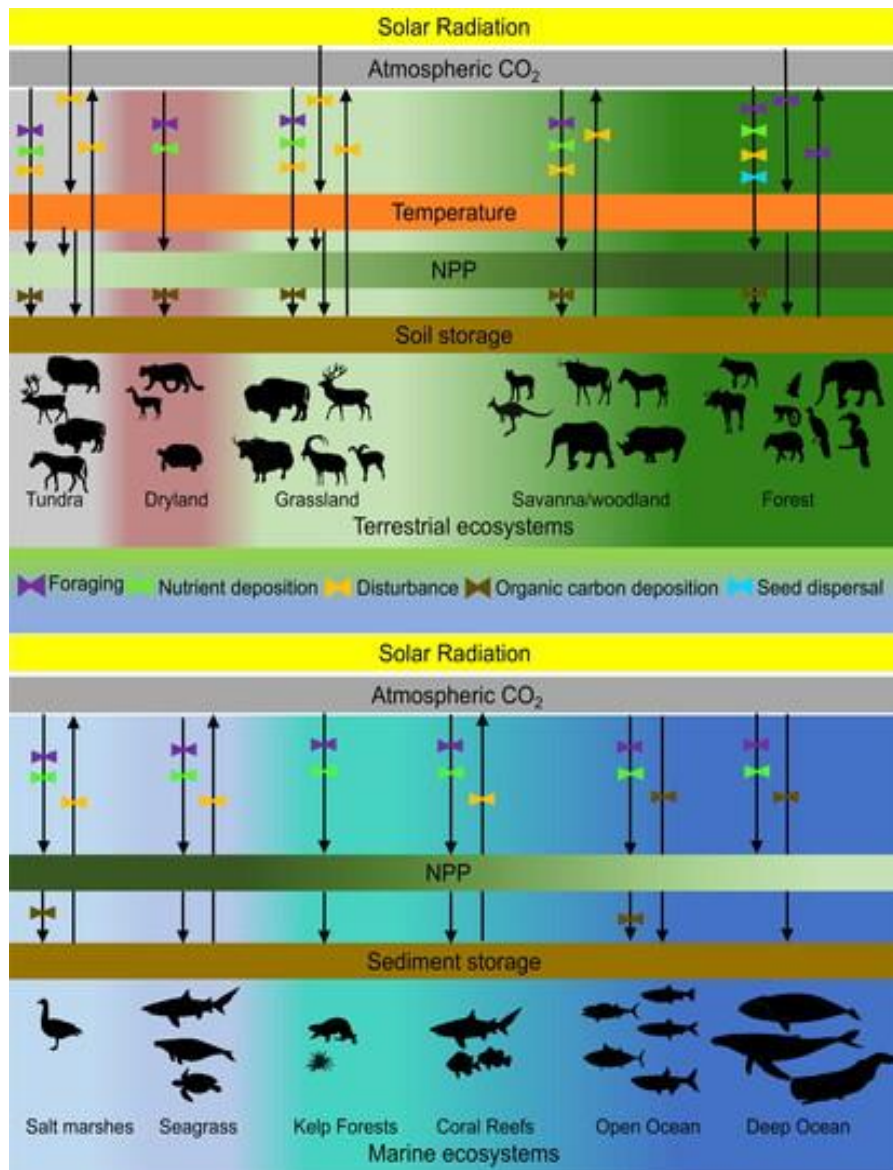
# Rewilding elephant populations can thin forests to enhance Congo Basin tree carbon biomass

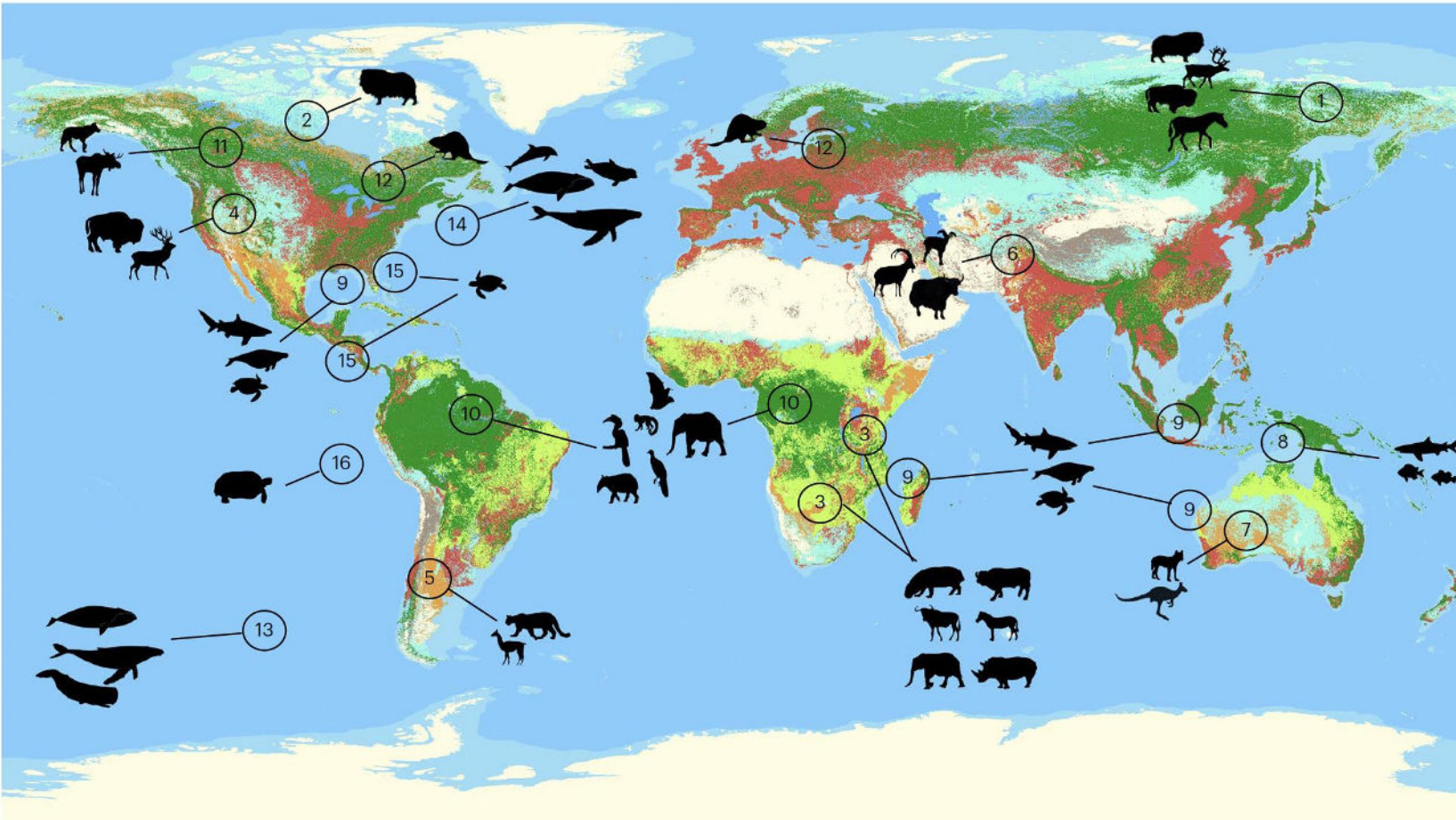


<https://earthbound.report/2015/03/26/the-elephant-gardeners-of-the-african-forest/>

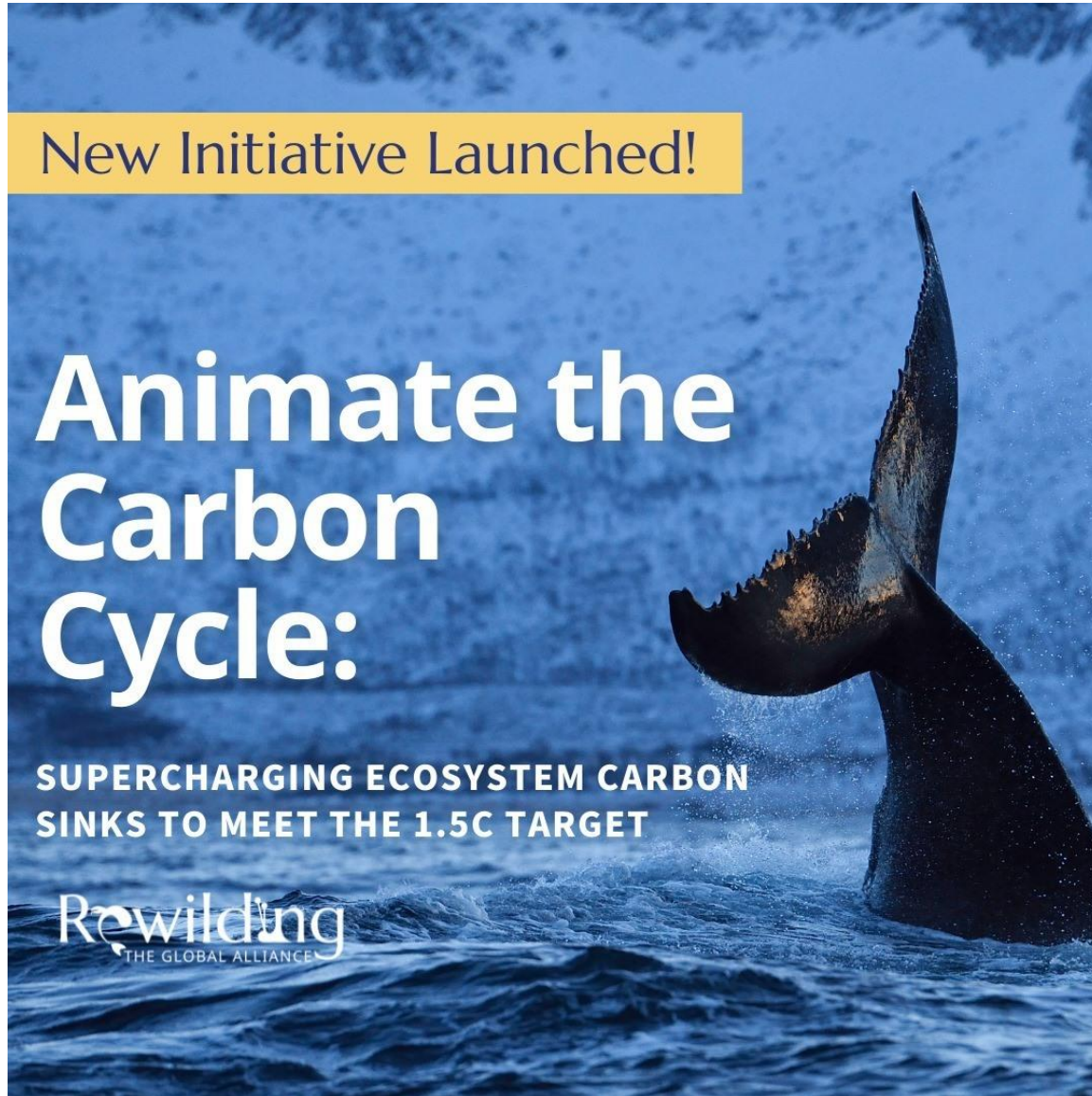








Species	Ecosystem type	Spatial extent (km <sup>2</sup> )	Additional ecosystem CO <sub>2</sub> uptake (GtCO <sub>2</sub> yr <sup>-1</sup> )
Enhanced sinks and avoided emissions by protecting species			
Wildebeest	Savannah	2.5×10 <sup>4</sup>	0.0044±0.001
Sea otter	Coastal kelp forest	1.2×10 <sup>4</sup>	0.0052±0.0025
Grey wolf	Boreal forest	1.9×10 <sup>6</sup>	0.260±0.134
Tiger, black-tipped reef and lemon sharks	Coral reefs	2.1×10 <sup>3</sup>	0.00074±0.00037
Muskox	Arctic wet meadows	4.8×10 <sup>5</sup>	0.030±0.015
Fish	Marine pelagic and inshore	3.0×10 <sup>8</sup>	5.50±4.40
Subtotal			5.80
Enhanced sinks by restoring species			
African forest elephant	Tropical forest	5.4×10 <sup>5</sup>	0.013±0.007
Bison	Tall and shortgrass prairie	4×10 <sup>5</sup>	0.595±0.275
Baleen whales	Southern Ocean	7.9×10 <sup>6</sup>	0.00062±0.0001
Subtotal			0.608
<b>Total</b>			<b>6.41</b>



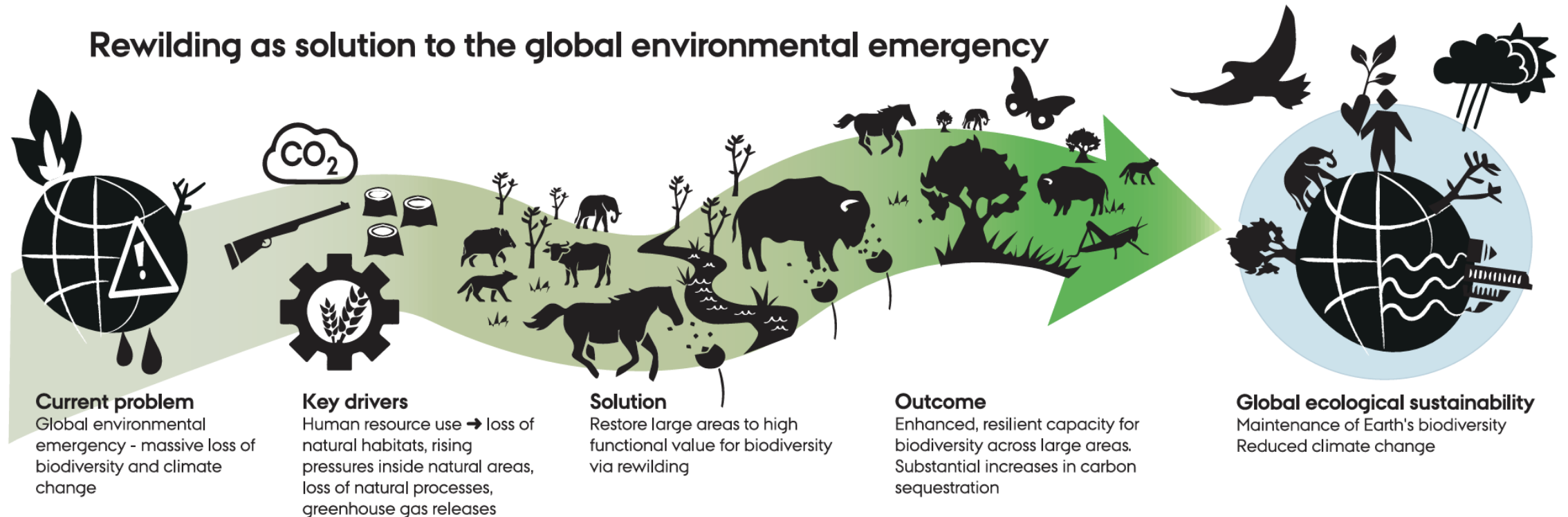
Species are key to healthy ecosystems and therefore maximizing carbon storage globally.

We need a **change in mindset** that sees species not as unwitting victims of climate change, but as **active agents** in the story.

Species recovery and trophic rewilding are **necessary to meet the 1.5 degree target.**

Rewilding offers vast potential to fight climate change under a nature-based solutions framework.

## Rewilding as solution to the global environmental emergency





Thank you!

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Global Rewilding Alliance: <https://globalrewilding.earth>

