Trade-offs and synergies between biodiversity and ecosystem services

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Ecosystem services and disservices



Ecosystem services and biodiversity



Ecosystem services and disservices

To be a farmer at the forest margin - benefits and problems:

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Income from coffee
Wild plants (spices, ropes etc.)
Close to fire wood
Nectar for honey bees

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Wild animal raiding (baboons and pigs)
More army ants

Ango m.fl. 2014. Balancing ecosystem services and disservices: smallholder farmers' use and management of forest and trees in an agricultural landscape in Southwestern Ethiopia. Ecology & Society 19:30

Benefits and problems by having trees in the agricultural areas

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Shade for coffee, cattle and people
Good for life fences and border markings
Fruit trees

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Can decrease the yield (take space, nutrients, shade)
Hiding place for monkeys

Ango m.fl. 2014. Balancing ecosystem services and disservices: smallholder farmers' use and management of forest and trees in an agricultural landscape in Southwestern Ethiopia. Ecology & Society 19:30

Ecosystem services or disservices – for who?

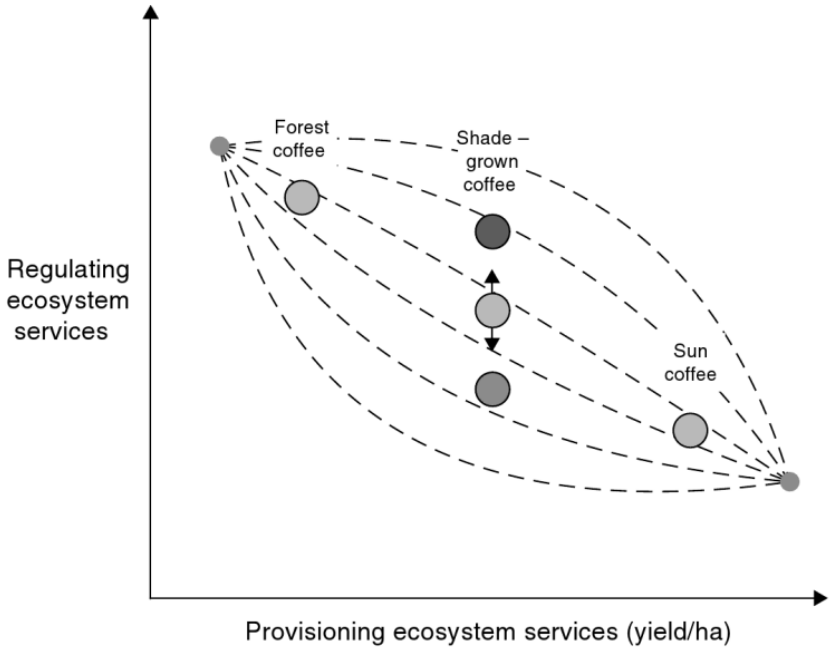


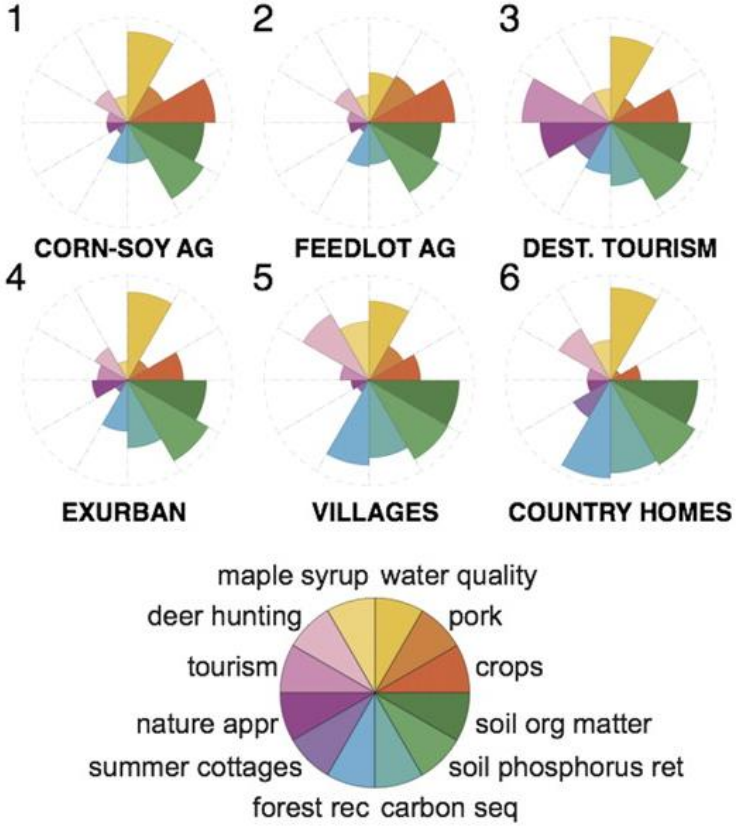


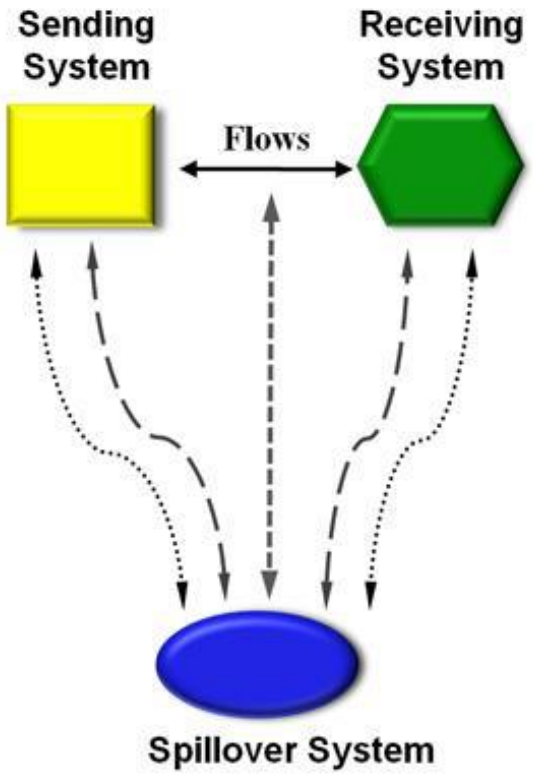




”Trade-offs” and scale effects







Elmqvist et al. 2010. Ecosystem services – Managing trade-offs between provisioning and regulating services. In Valuation of regulating services of ecosystems. Routledge

Raudsepp-Hearne C et al. PNAS 2010;107:5242-5247

Liu et al. 2013. Ecology & Society

Ecosystem services and disservices -
A tool for communication with people on ground

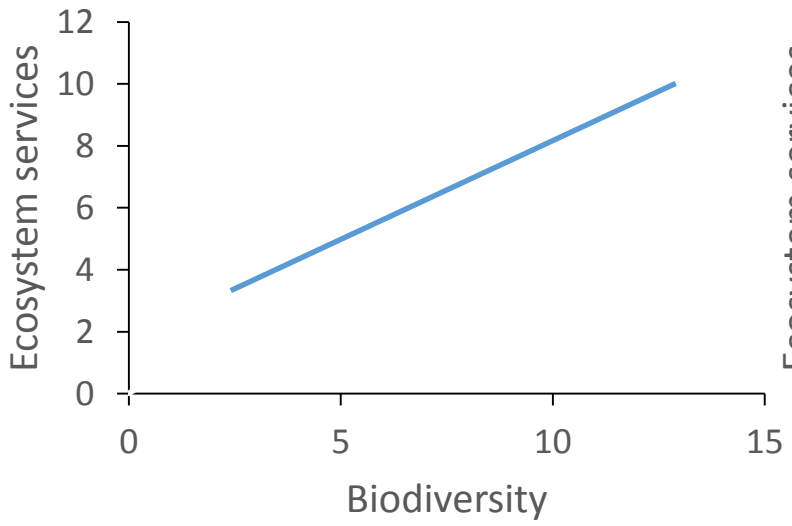
If we work with ecosystem services we must also respect that for example farmers face ecosystem disservices

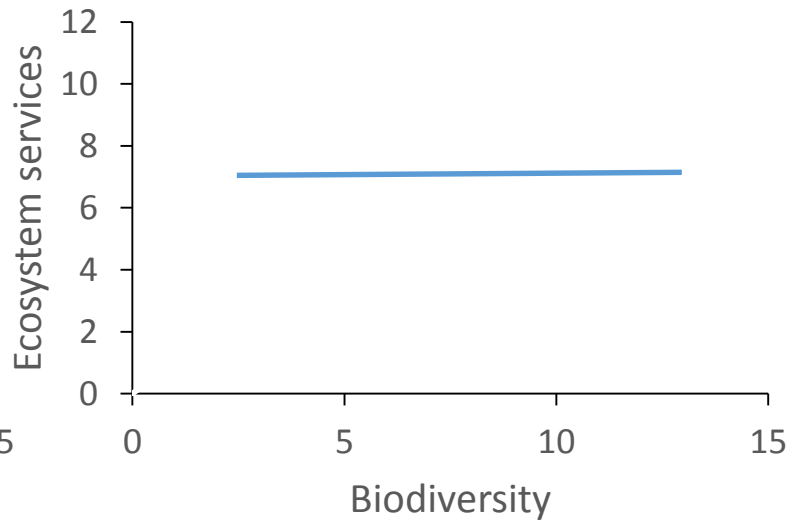
Ecosystem services and biodiversity

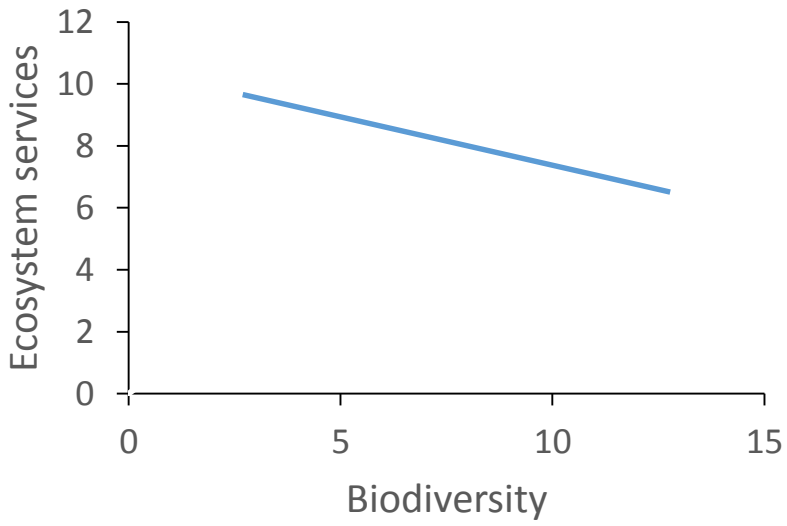
Ekosystem services and ”trade-offs”

Most accept that there is a ”trade-off” between provisioning services and biodiversity

”The landscape-moderated biodiversity *versus* ecosystem service management hypothesis”

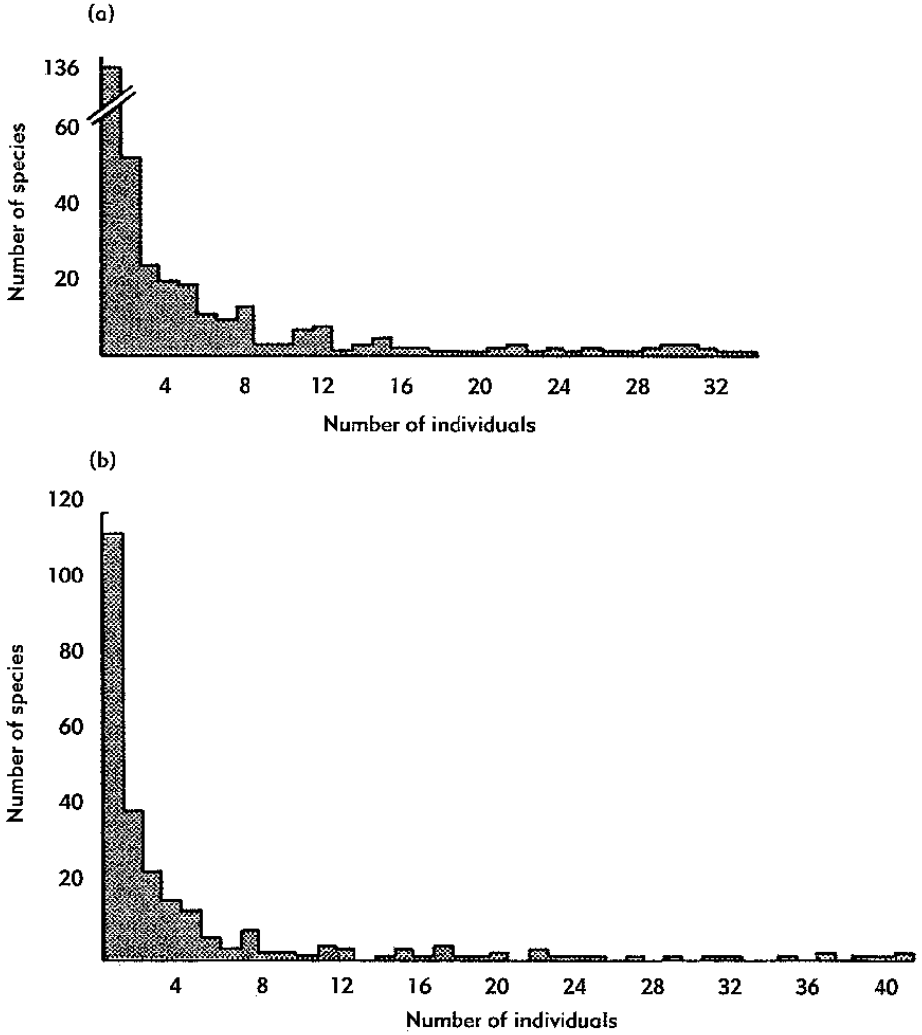






Tscharntke m.fl. 2012. Landscape moderation of biodiversity patterns and processes – eight hypotheses. Biological reviews 87: 661-685

It is common to be uncommon!



Two examples of frequency distributions from Magurran 2004 Chap 2: ”The commonness, and rarity, of species” in ”Measuring biological diversity”, Blackwell

Most individuals belong to few species

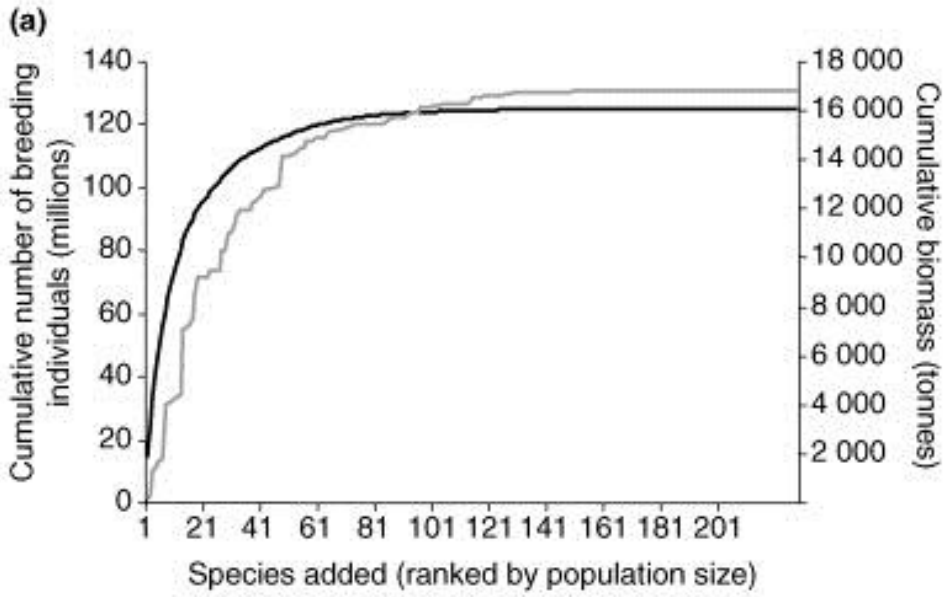
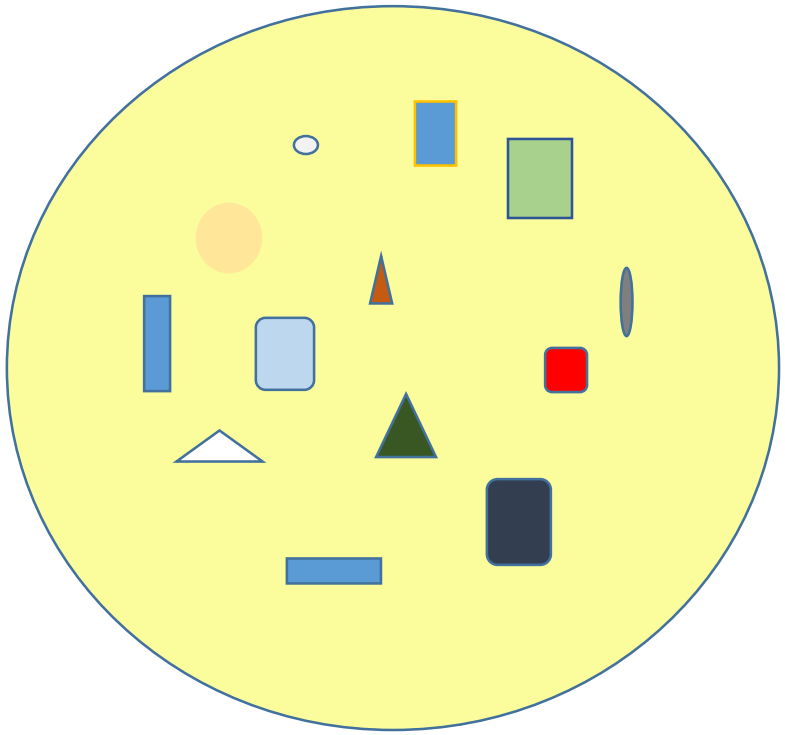


Figure I Cumulative contribution of progressively rarer species to (a) total number of individuals and biomass, for birds in Britain.

Gaston et al. 2008. Commonness, population depletion and conservation biology. TREEE 23: 14-19

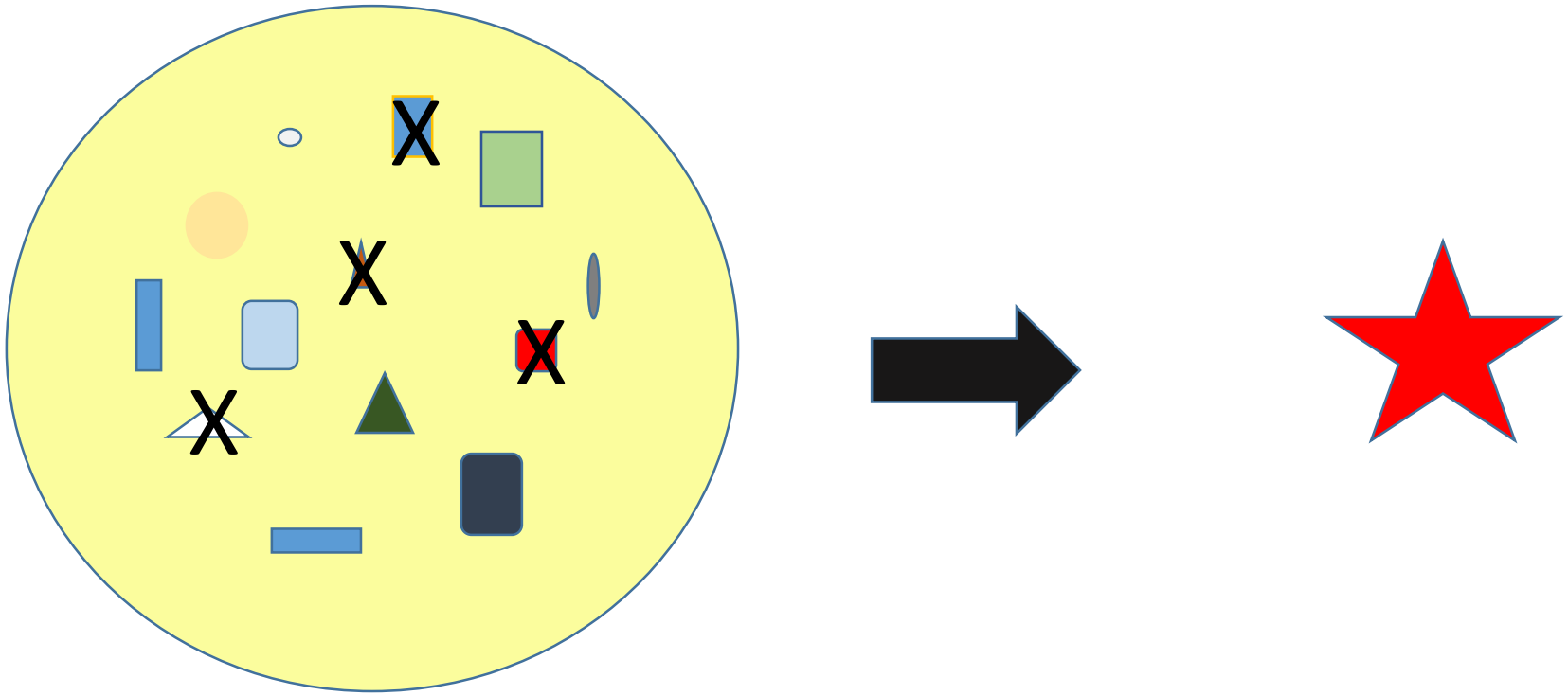
Diversity of species/traits



Ecosystem services

Diversity of species/traits

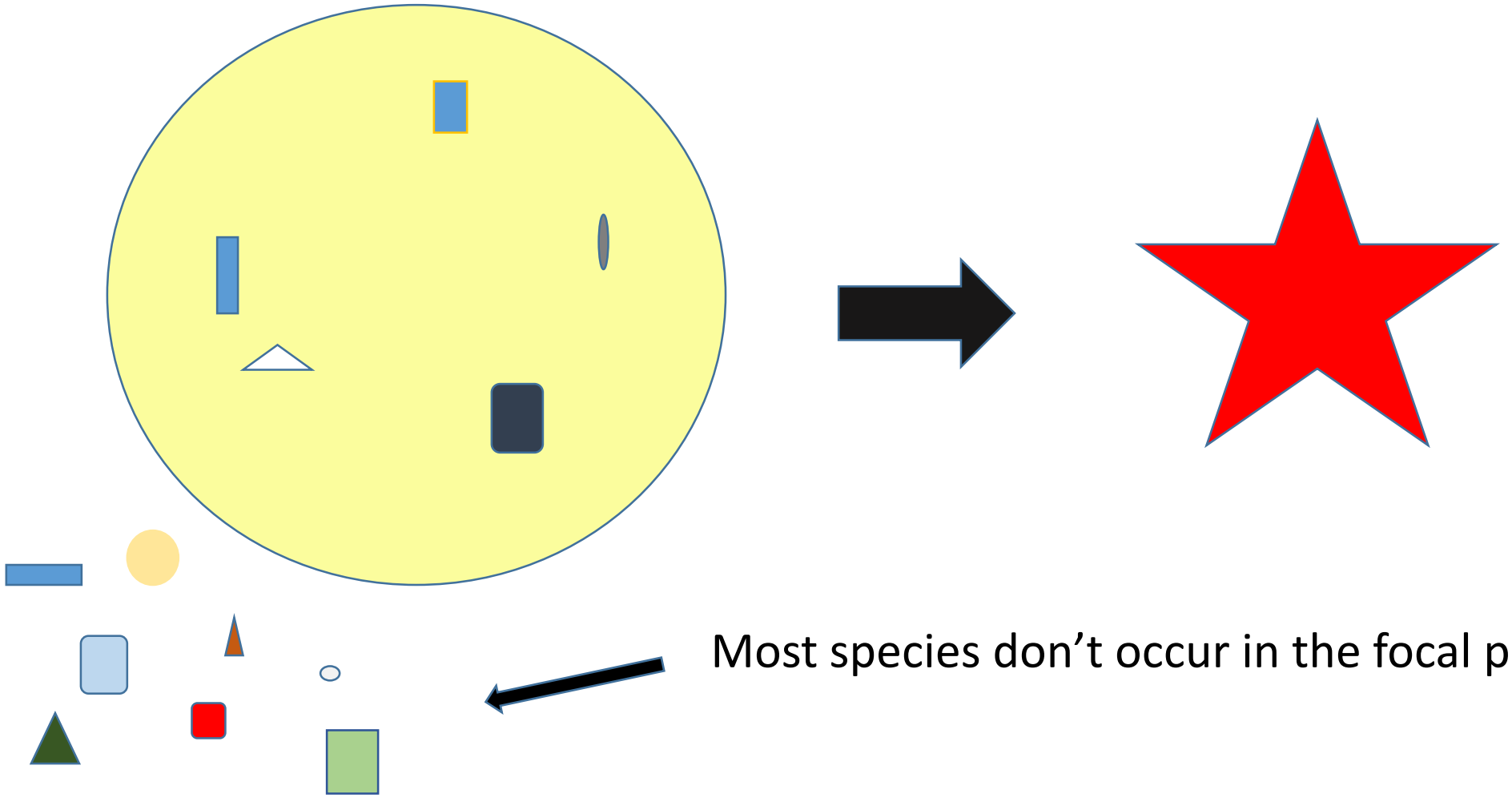
Ecosystem services



How many can you remove without chaning the response?

Diversity of species/traits

Ecosystem services



Most species don’t occur in the focal place!

To think over and investigate:

When can we find synergies between management for ecosystem services and conservaton of biodiversity (including threatened/rare species)?

To what extent to we get positive effects on ecosystem services by management for conservation of biodiversity?

Ecosystem services and biodiversity



Most species are rare!

Ecosystem services and disservices



A tool to discuss with people that also experience negative effects from nature!