

Quantifying Extinction Risk in Commercial Marine Species



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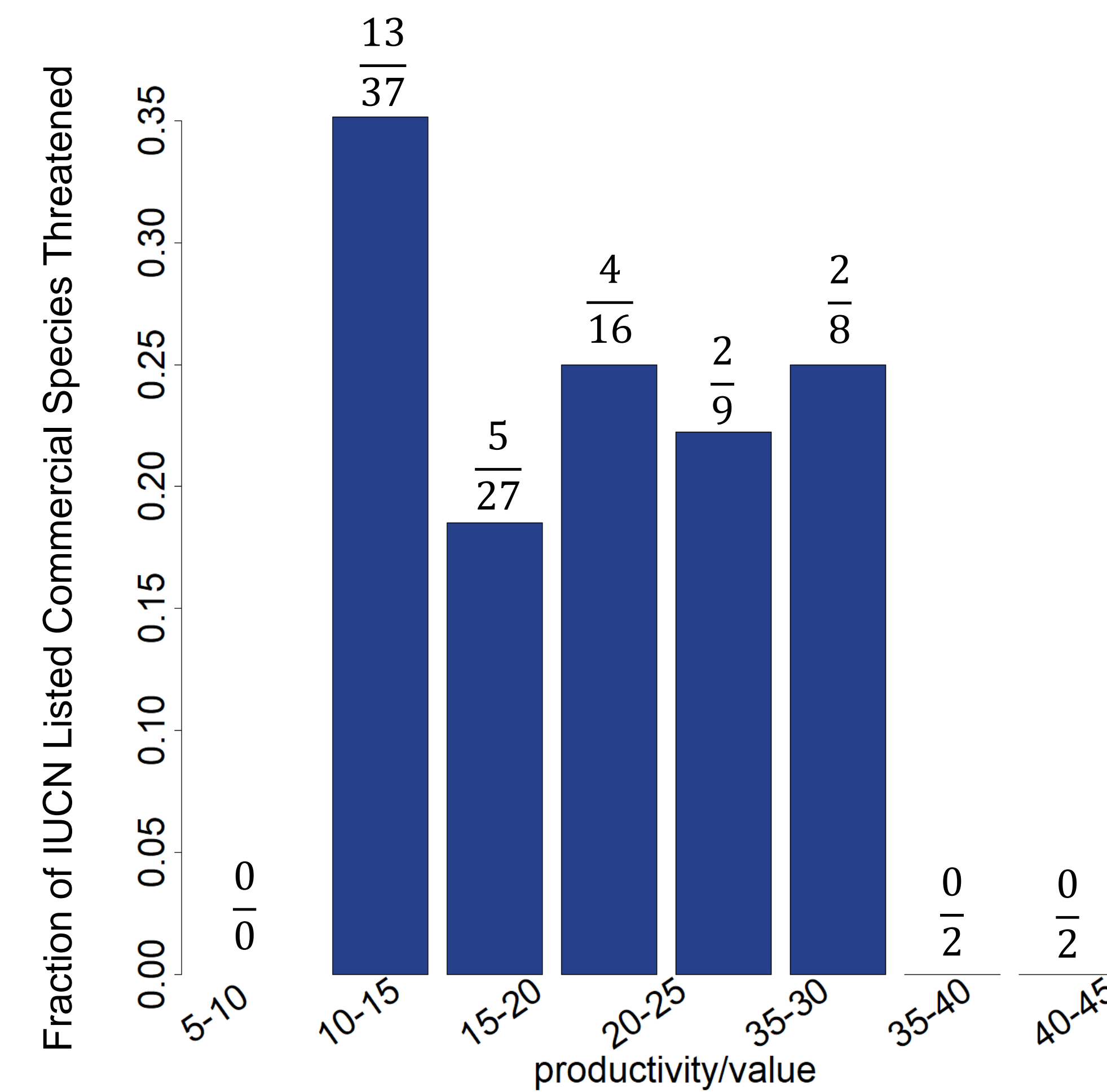
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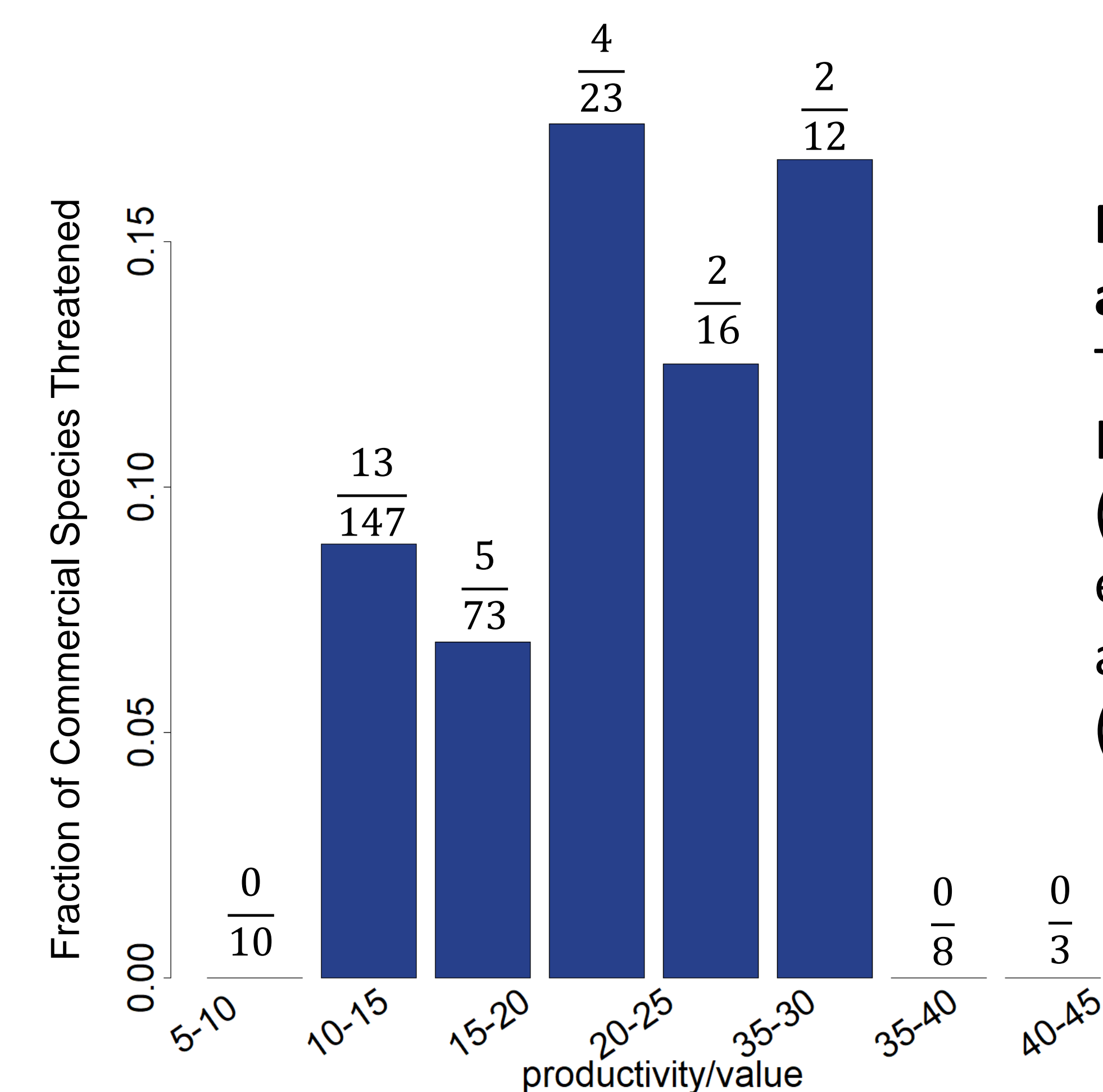


Background

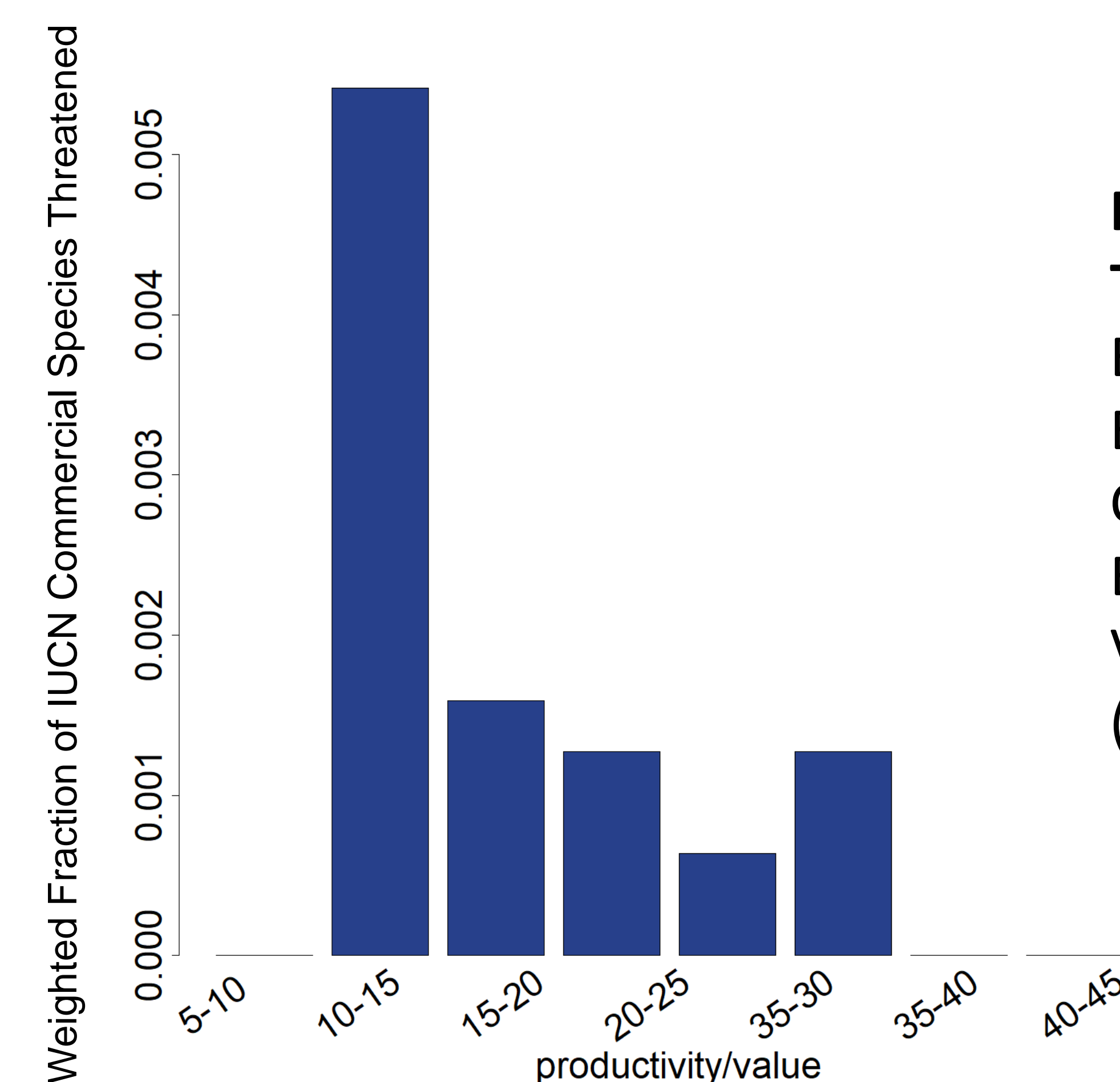
- Species are at risk of extinction as a result of human harvest practices.
- This study aimed to identify if **economic value** (benefit/(cost+subsidy)) and **potential productivity** (maximum sustainable yield, MSY) can be used to predict extinction risk in global commercial marine species.
- The combined factor used was $((\text{cost}+\text{subsidy})/\text{benefit}) \cdot \ln(\text{MSY})$. It has been suggested to be a predictor of harvest behavior.
- Here, we matched data from RAM Legacy and the International Union for Conservation of Nature (IUCN) Red List.



Risk Measure 1: Threatened among IUCN listed stocks
The ratio between stocks of IUCN most threatened status (critically endangered, endangered, and vulnerable) and of any IUCN status (N=118).



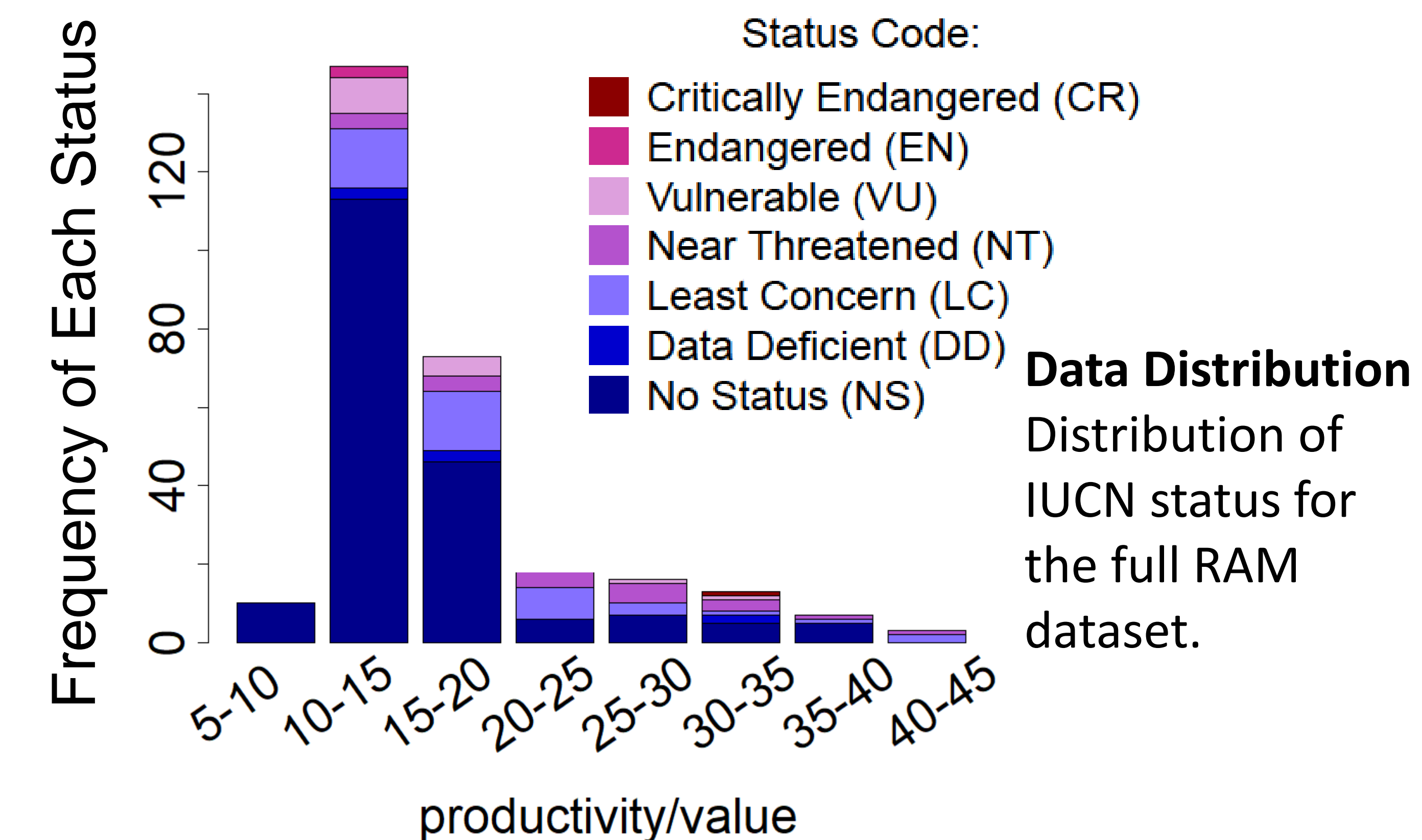
Risk Measure 2: Threatened among all commercial stocks
The ratio between stocks of IUCN most threatened status (critically endangered, endangered, and vulnerable) and of the full RAM dataset (N=628).



Risk Measure 3: Weighting by Threat Level
Extinct=5/5,
Extinct in Wild=4/5,
Critically Endangered=3/5,
Endangered=2/5,
Vulnerable=1/5
(N=628)

Conclusions

- A new extinction risk database coupling economic and ecological data was developed
- Species with very different economic and ecological characteristics can have similar extinction risk, though it depends on risk measures.
- Future work will include quantitative analyses and testing economic and ecological extinction models



Acknowledgments

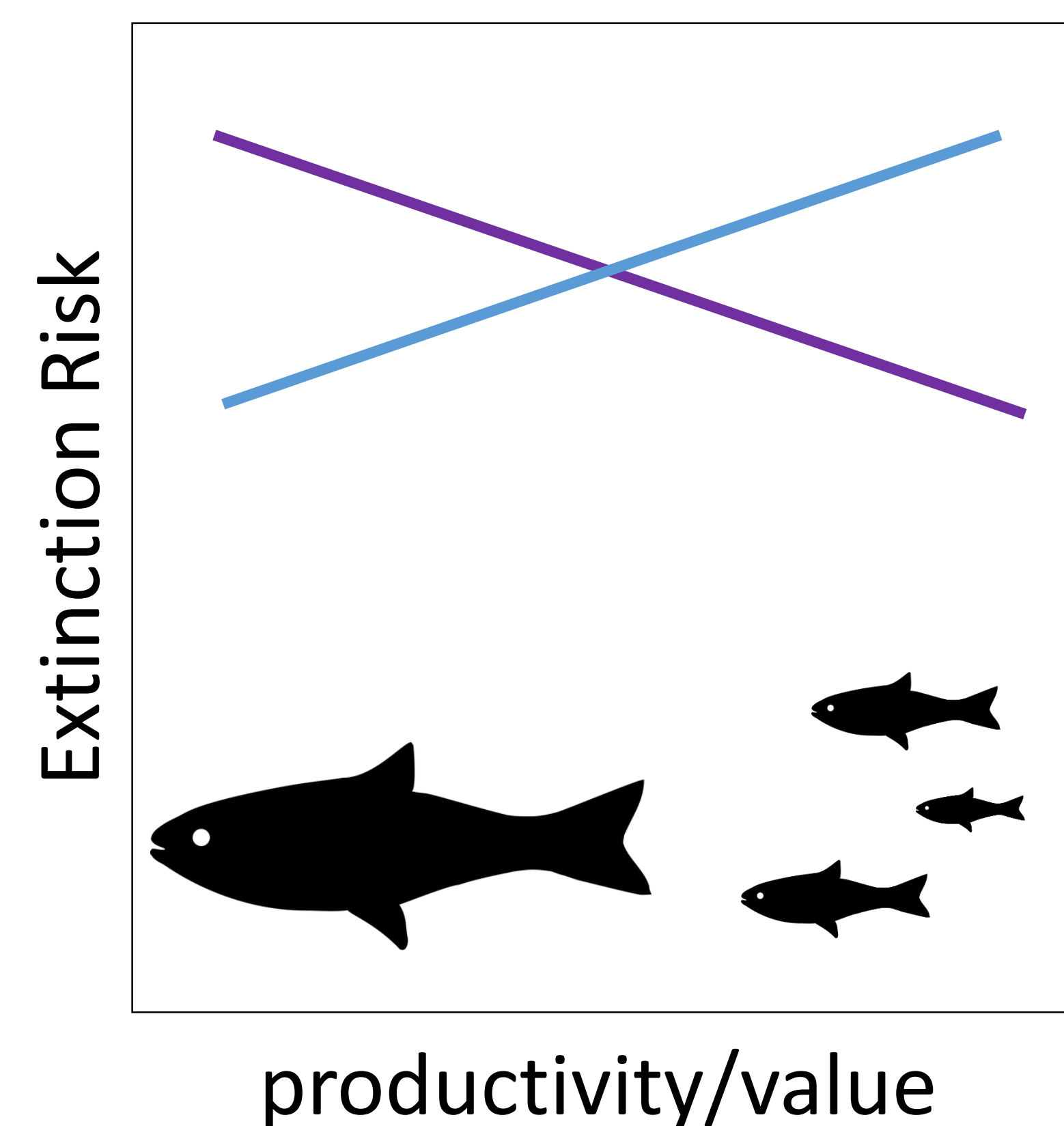
Thanks to Pinsky lab, Rutgers, NSF, RAM Legacy, IUCN

References:

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Questions

Does extinction risk **increase**¹ or **decrease**² with productivity/value?



Data

- RAM Legacy: MSY, region, stock list
- IUCN Red List: threat status
- Lam et. al³: economic value, (cost+subsidy/benefit)