

Biodiversity Loss

Geoffrey Heal
Columbia Business School

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Spix's Macaw

- One remaining Spix's Macaw. When it dies the species will be extinct.
- Have been Spix's macaws in the Amazon for millions of years – far longer than humans
- Population has been below the minimum viable population for decades – making it “waking dead.”

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Spix's Macaw

- Driven to extinction mainly by habitat loss as a result of deforestation

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Lessons from Spix's Macaw

- Many other species are “walking dead” – extinction numbers underestimate the problem
- Most extinctions driven by habitat destruction, some by hunting (e.g. fish, marine birds and animals)
- Extinctions are a gradual process and not an event

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Does it matter?

- The death of the last Spix's Macaw will not be a headline event
- But should it be?

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Does it matter?

- Biodiversity – species diversity – a critical ingredient of ecosystems
- Contributes to resilience, productivity
- Many other ways in which biodiversity contributes to human wellbeing – ecosystem services

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Does it matter?

- Ecosystem services include
 - Agricultural productivity and insurance
 - Climate stabilization
 - Biochemical knowledge

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Value of biodiversity

- Value is in ecosystem services delivered by systems of which biodiversity is part
 - Non-market and not easily valued
 - US OTA estimated value of genetic diversity in crop development in US post WW2 @ \$1 billion per year

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Value of bioprospecting

- Bioprospecting – payments to date only in low tens of millions
- Theory suggests max value of the order of \$9000/ha for hotspots
- Loss of 1 million ha of hotspots annually implies loss of \$9 billion annually

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Value of carbon management

- Carbon sequestration and storage
- IPCC estimates that 25% of CO₂ release in 1990s was from deforestation – release of stored carbon

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Value of carbon management

- Forests may sequester several tons of CO₂/ha/yr. Valued at \$20/ton this is \$40-80/ha/yr
- Applied over 2.7 billion ha this is a massive value – may even exceed total ODA or even ODI

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Value of watersheds

- NYC invested \$1.5 billion in watershed restoration
- Watersheds are valuable public utilities

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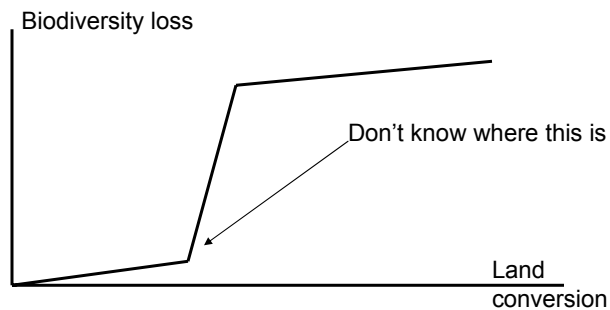
Value of tourism

- In southern Africa alone biodiversity-based tourism probably worth several billions
- Worldwide several times this

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Uncertainties

- Relation between land conversion and biodiversity loss is positive and non-linear



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Uncertainties

- But we don't know where the step is
- Suggests a need for caution
- Uncertainty about value of BD does likewise – could be much greater
- Risk aversion important

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Uncertainties

- “Real option values” from conservation
- Reflect the value of being able to revisit a decisions when more is known

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Timing

- Biodiversity loss is a continuing, possibly accelerating, process
- Losses accumulate with delays
- Because of option values, risk aversion and non-linear responses, losses may mount more than proportionally to delays.

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