9.6. 2017
Ecological compensation – Greenwashing or washing-proof green?

Economic insights in ecological compensations

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Habitat Bank of Finland

Project: Biodiversity Now/Habitat Bank

Helsinki Challenge awardee

Pilots biodiversity offsetting

Mediates compensations

Together with actors

Funding: University of Helsinki, SITRA, FS and MoE

PROJECT TEAM

Markku Ollikainen (UH) – leader
Eeva Primmer – Syke
Olli Ojala – Syke
Minna Pekkonen – Syke
Janne Kotiaho – UJ
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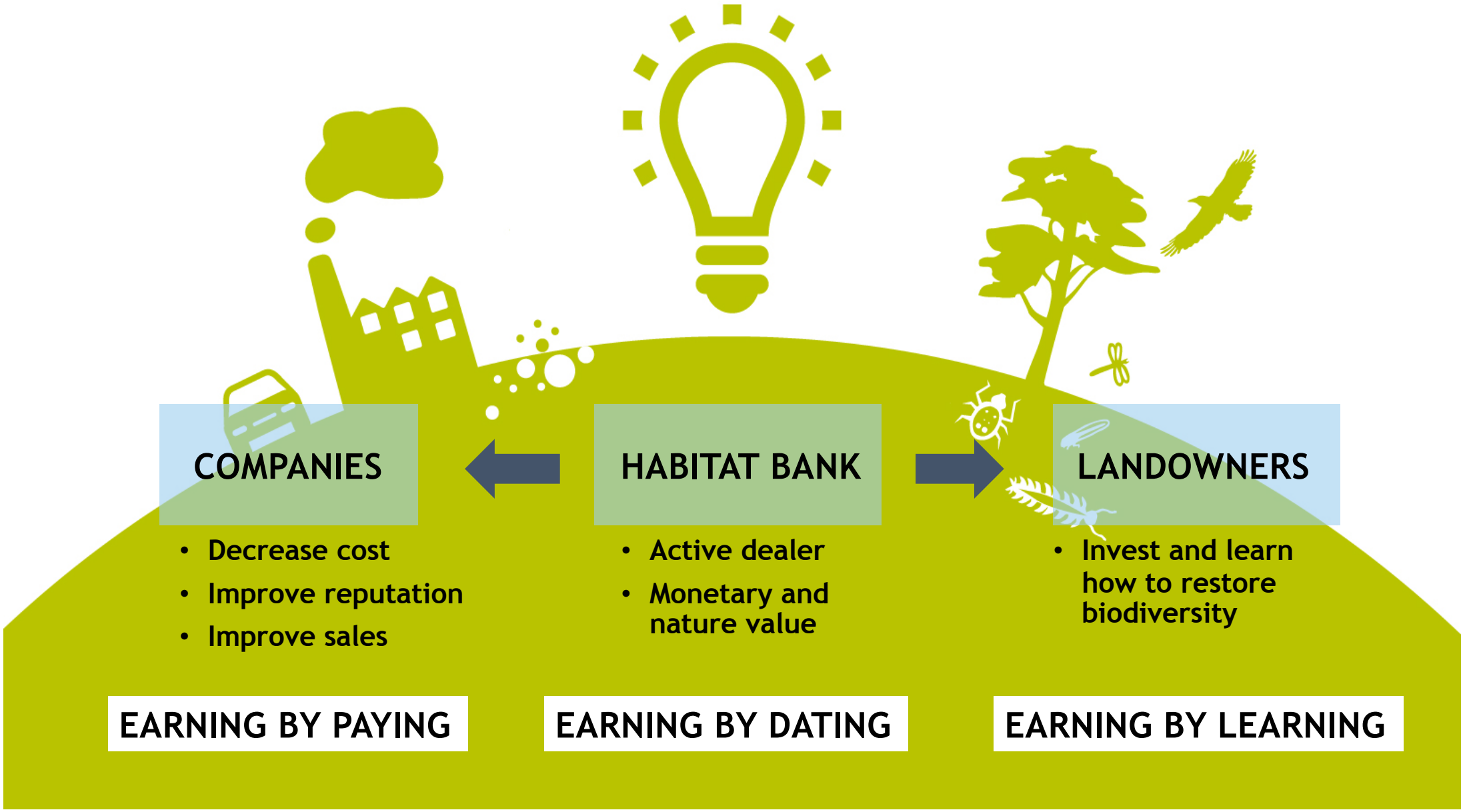
Johanna Kangas - UH


COMPANIES
HABITAT BANK
LANDOWNERS
• Decrease cost
• Improve reputation
• Improve sales
• Active dealer
• Monetary and nature value
• Invest and learn how to restore biodiversity
EARNING BY PAYING
EARNING BY DATING
EARNING BY LEARNING

Research questions

- Are ecological compensations economically feasible?
- Is there enough land for compensations?
- How large would the market be?
- Could Habitat Bank play a constructive role in the market?
- Can markets help to eliminate risks and failures in habitat restoration?

Ecological compensation – spoiler pays principle (SPP) to biodiversity conservation

An analytical and numerical approach

- The analytical model

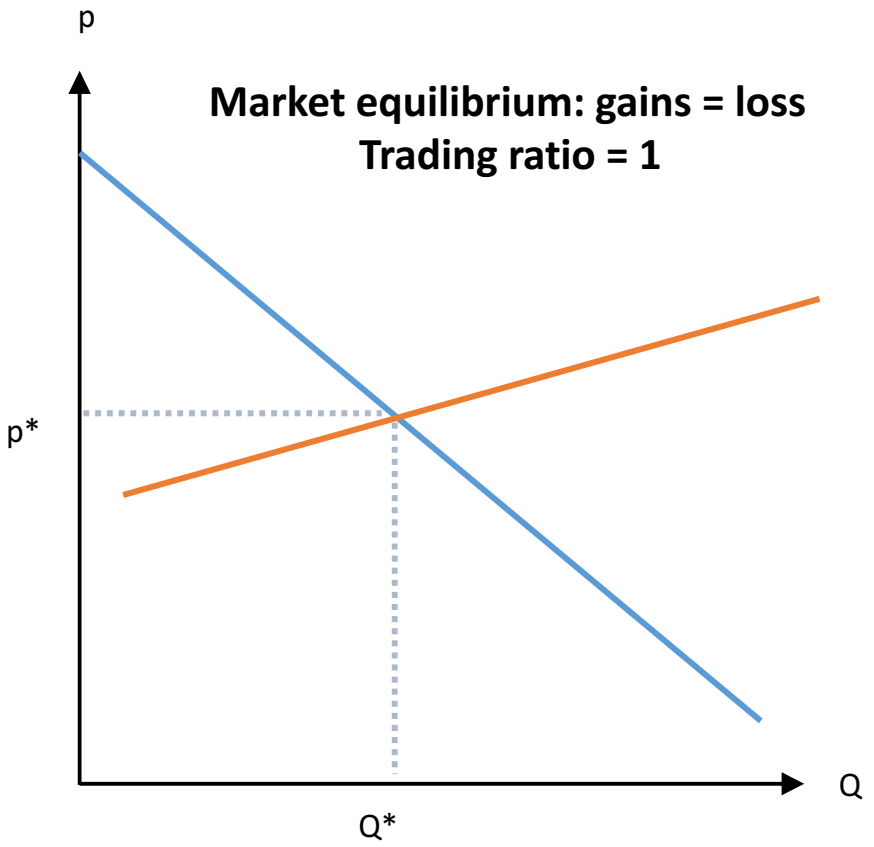
$$\pi = pA(x)f(\tau) - wx - F(j)$$

$$U(q) = aq - \frac{b}{2}q^2 - pq$$

- Empirical model: habitats evolve in a logistic fashion

$$f(\tau) = \frac{L}{1 + e^{-k(t-l_0)}}$$

- Expert survey
  - how will the habitats evolve without restoration and conservation
  - how does uncertainty affect restoration and nature management



Supply: costs of restoration
Demand: importance of compensations

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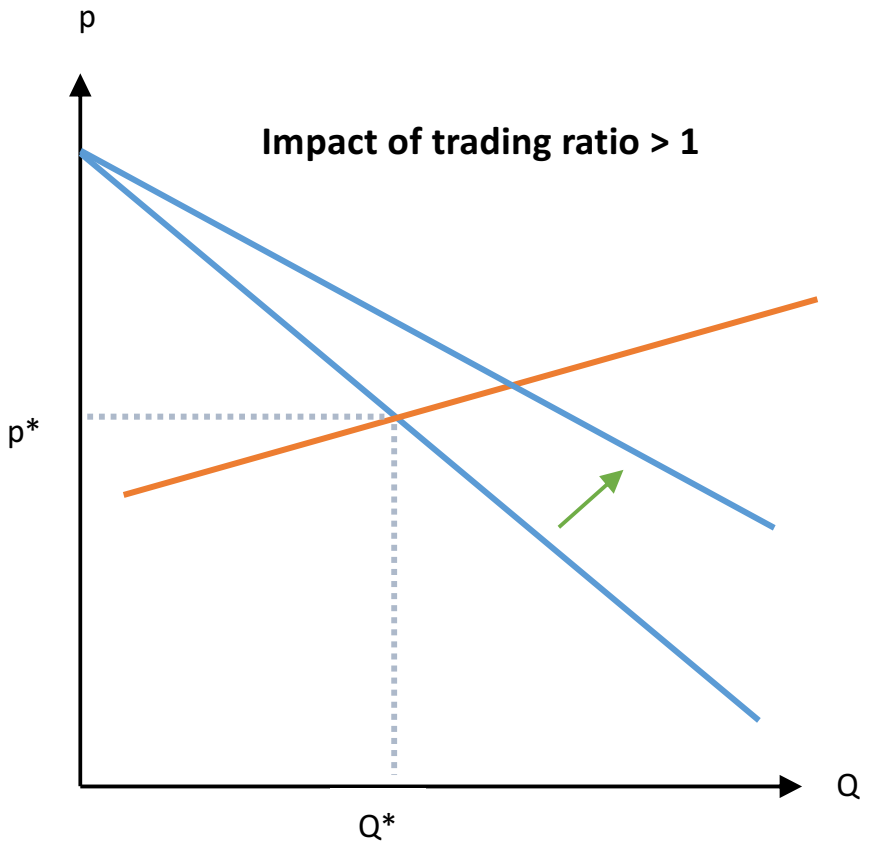

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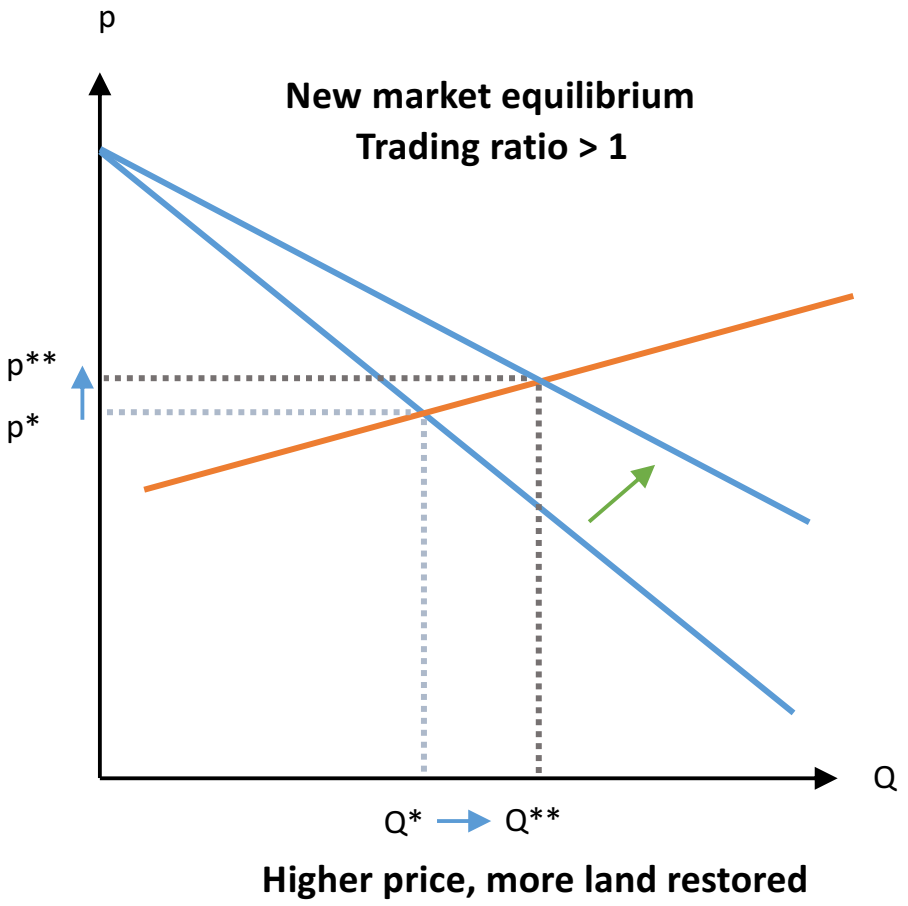
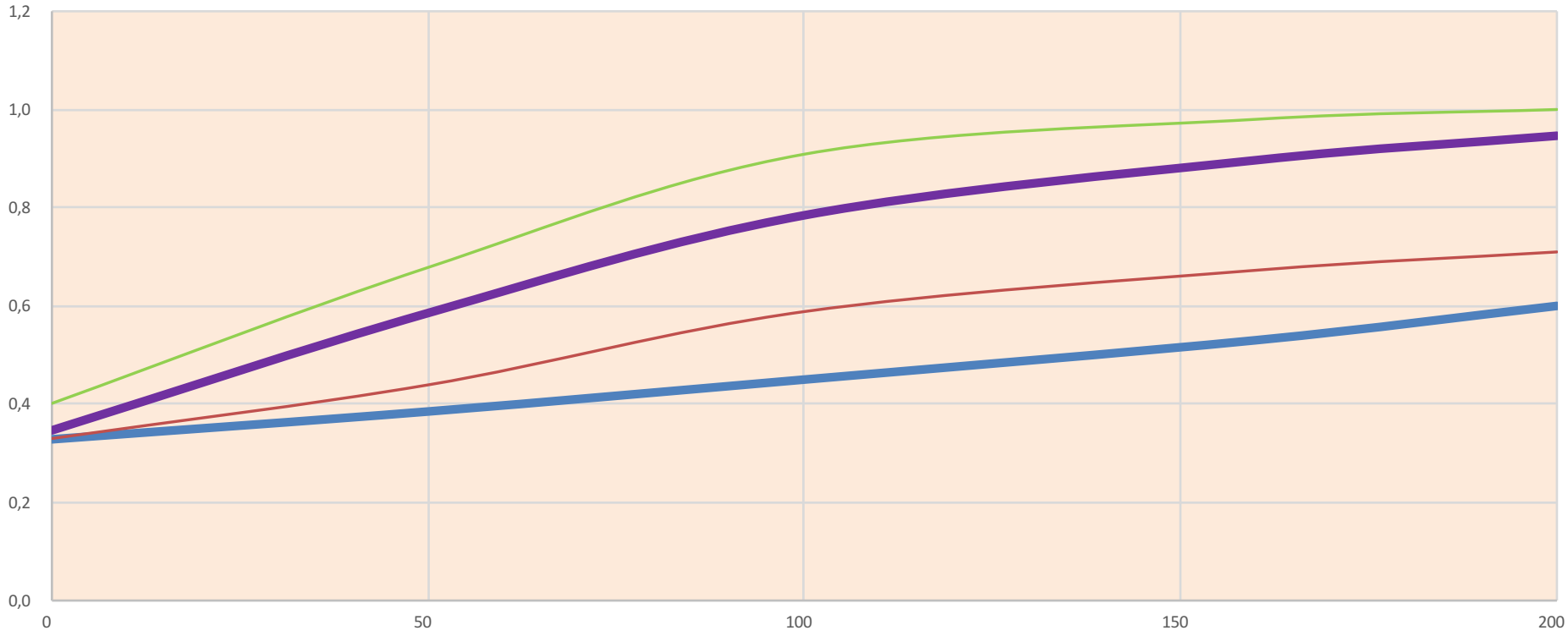


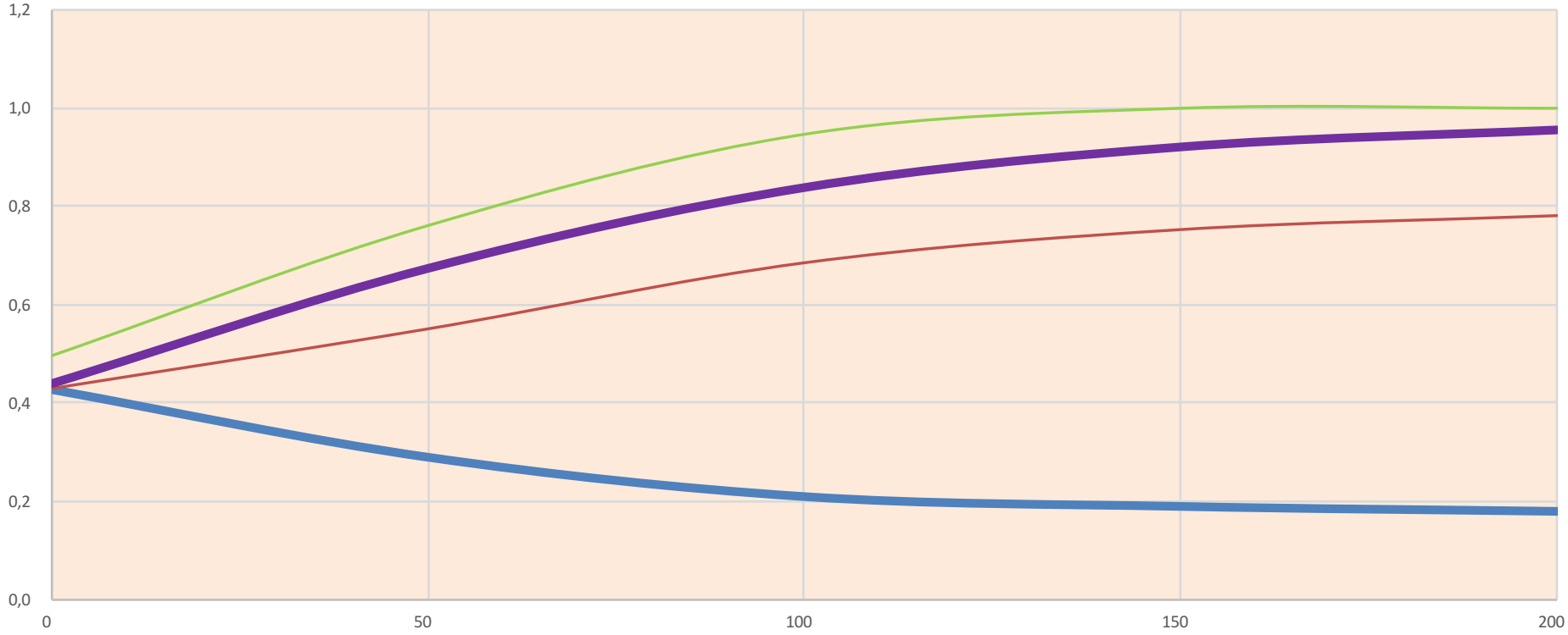
Habitat restoration: pine mires



- State improves if left evolving

- The expected improved from restoration rather small at 50 years

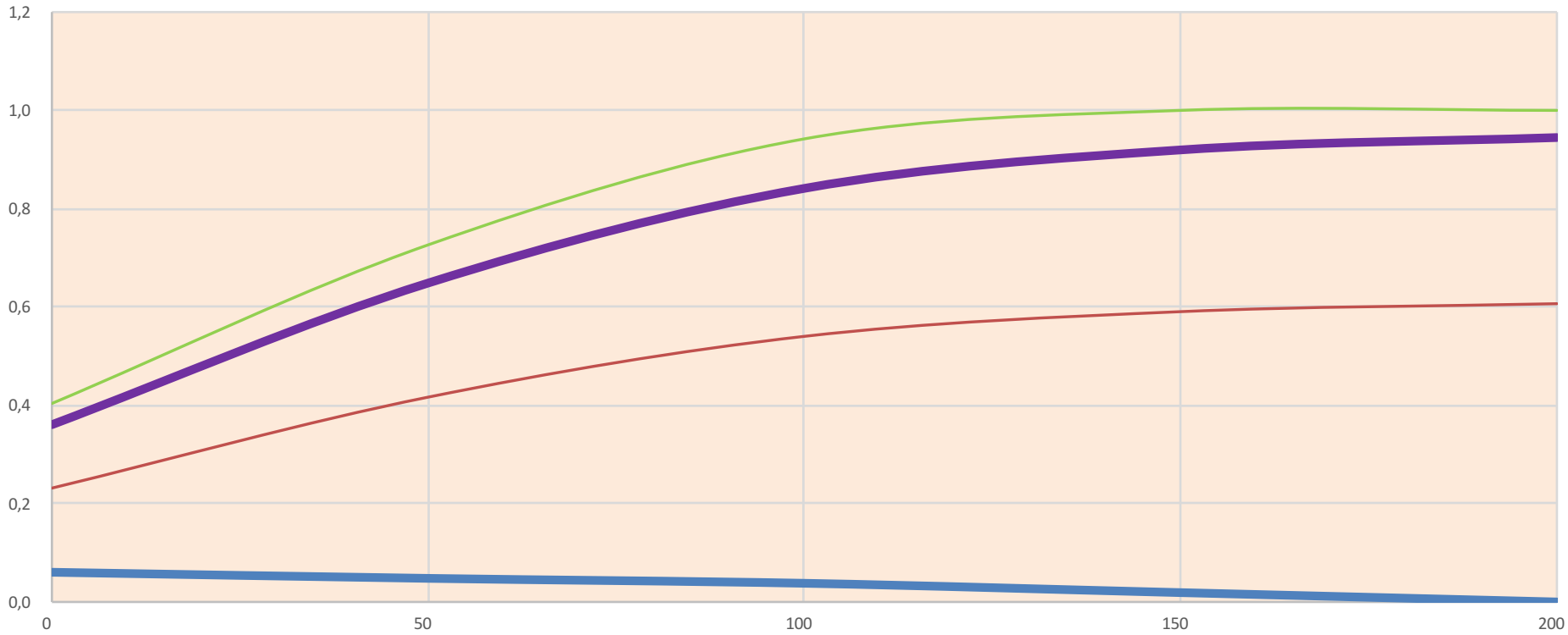
Habitat restoration: herb-rich forests



In the absence of restoration, deterioration over time

Restoration measures efficient

Habitat restoration: rural biotopes



Current state bad and worsening over time

Restoration measures may be effective – spread higher than in others

Potential supply and demand in Finland

	Area of habitat	Restorable area	Land use pressure 2040
Pine mires	193 000	193 000	33 000
Herb-rich forests	377 600	264 000	2 500
Rural biotopes	100 000	30 000	3 300

Sources: expert assessments and literature (ELITE report and Kemppainen & Lehtomaa 2009)

Underestimation of land use pressure, as focuses only on direct change in land use

Equilibrium: liquid (HBF) and non-liquid (no HBF) market

	Trading ratio	Pine mires	Herb-rich forests	Rural biotopes I	Rural biotopes II
Price €/ha	1	3 503	14 309	35 284	34 494
No HBF	1,6	3 667	14 715	35 700	34 918
Profits €/ha	1	109	431	295	354
No HBF	1,6	203	712	568	640
Area in total, ha	1	29 109	1 673	2 138	2 311
No HBF	1,6	44 860	2 514	3 273	3 549

Role of trading ratio (intermediator), HBF
Prices: increase slightly
Profits: increase 65-93 %
Land area: increase 50-54 %

The size of the market
- Turnover 281 (401) million €
- Restored land area 35 000 (53000) ha

Equilibrium: modifications

Role of discounting

Gains ≠ losses ; discounting 15 years, 3% interest rate						
	damage	gain	trading ratio HBF	trading ratio no HBF	price	Land area
Pine mires	0,3	0,1	3	**4,7**	4 353	110 855
Herb-rich forests	0,3	0,2	1,5	**2,3**	15 131	3 375
Rural biotopes I	0,3	0,6	0,5	**0,8**	35 137	1 736
Rural biotopes II	0,3	0,6	0,5	**0,8**	34 344	1 875

Trading ratios increase by 53-60 %
Prices increase by 1-9 %
Land area: increase by 42-57 %
Pine mires: HBF helps by 35 000 ha

Land areas
56 % of pine mires restored for compensations

Risks and the intermediary

- Intermediary cannot sale offsets from failed restoration investment
  - The intermediary allocates this risk premium in the market

- **How great is the risk?**
  - Monte Carlo simulations: in all habitats, 10 % of the restored sites fail
  - Economic risks: greatest in rural biotopes
  - Site area risks; pine mires (2900 ha and 170-210 ha in others)

- Size of risk premium: 350-3528 euros/ha
  - Risk premium increases equilibrium prices about 10 %

Conclusions

- Market size could be considerable and profitable to landowners
  - Is there enough land for compensations – yes, there is
  - Offset prices of pine mires are much lower than those of other habitats - a risk that demand for compensations channels predominantly to them

- Intermediary can really needed to make market liquid

Nature benefits

  - Decreases time delay between loss and restoration
  - Helps to safeguard against failures in habitat restoration
  - Facilitates true (not failed) compensations

Market benefits

  - Decreases transaction costs
  - Alleviates economic risks of buyers

Habitat Bank – not that bad idea!