# Design for Biodiversity: a new approach for ecologically sustainable product design?

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Designers have a moral and ethical obligation to be responsible for their designs, and the social and environmental impacts of their work

Whitely 1993 “Design for society”

The design community has responded to the growing issues around social and environmental issues by developing concepts and frameworks such as eco-design and sustainable design.

These concepts are centred on ideals of acknowledging ecological limits and demonstrating responsibility, and increased contribution to society and the environment

"Cradle to Cradle design…"

Braungart et al. 2007 p1338

"...the transformation of products and their associated material flows such that they form a supportive relationship with ecological systems and future economic growth"

## The feasibility of Cradle to Cradle

Group had broad understanding of the biological/ material processes that underpin sustainability, or the development of sustainable systems

Key informant interviews with 8 scientists given copy of Braungart et al (2007) "Cradle to Cradle design…"

Selected using a non-probability purposive sampling technique

Employed in a senior science position in either a Crown Research Institute or New Zealand University

Key informant interviews are an important qualitative research method in terms of providing insight into issues that cannot often be identified through other research methods

A thematic analysis of the data was conducted to develop explanatory theory based on the emerging themes

Biologist
Materials Scientist
Biotechnologist
Science Strategist
Chemical & Process Scientist
Pharmacology & Active Agent Scientist
Microbiologist Textiles Scientist

## Key informant interview themes

1. What do you understand about the concept of Cradle to Cradle as a proposition for sustainability with respect to science/design?
   - first impressions
   - potential for NZ
   - role of science
   - potential barriers/opportunities

2. What is the role of sustainability in the context of your science field?

3. What materials are important/critical to achieve sustainable products?

4. How do you view the role of scientists/science in adopting a concept like Cradle to Cradle?

## General impressions of C2C framework

"It's an interesting concept… you know so it sounds like the sensible way to go to me…" (Materials Engineer/Scientist)

"I felt the general scope was idealistic. Not to say that it's bad. Just that I wouldn't want to totally adhere to it" (Biotechnologist)

"I think the model's been well thought through but I worry that they tried to apply it in ways that perhaps it doesn't comfortably fit" (Chemical and Process Engineer/Scientist)

## Can we have a positive impact?

"Your impact on the environment, you can't absolutely reduce it to zero… (Biologist)

"Because suggesting you actually know what's positive for the environment… so I think it sounds a very strange thing to think that we can do things for the positive to be honest…" (Materials Engineer/Scientist)

"… some of these things you can probably never measure…" (Microbiologist)

## What to consider when using a new framework

"…they're not simple issues. It's a complex system. And that's what you're talking about here. Sustainability is a complex system…" (Science Strategist)

"… what's the rate limiting step, and it's typically creative people and funding and the identifying need. Creative people on their own without an identified need, aren't going to create what's useful. Needs can be stated, but you need people to make it." (Biotechnologist)

# CONCLUSIONS

Environment is the foundation of sustainability

Dealing with very complex systems

Need for caution when approaching biological nutrients as simple solution to sustainability

Good opportunity for collaboration to address issues of sustainability in a meaningful way

# EXAMPLES

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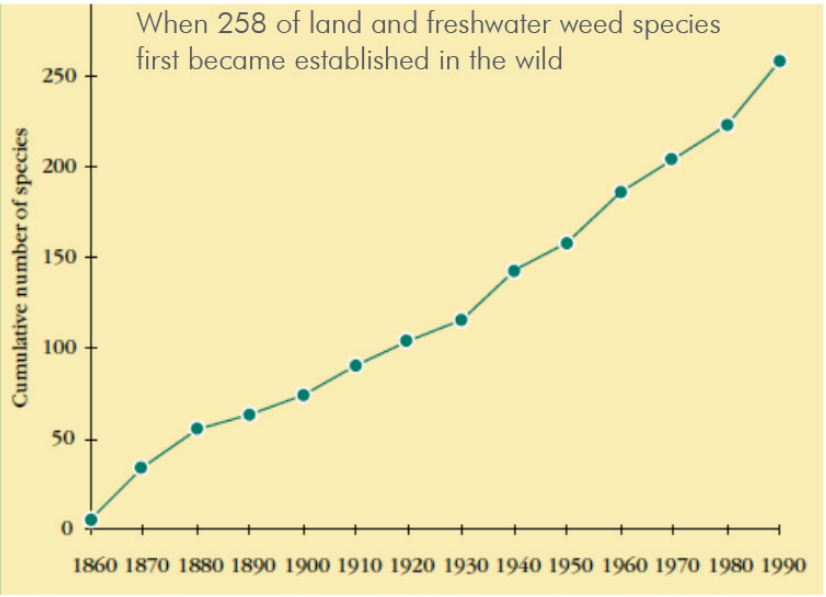


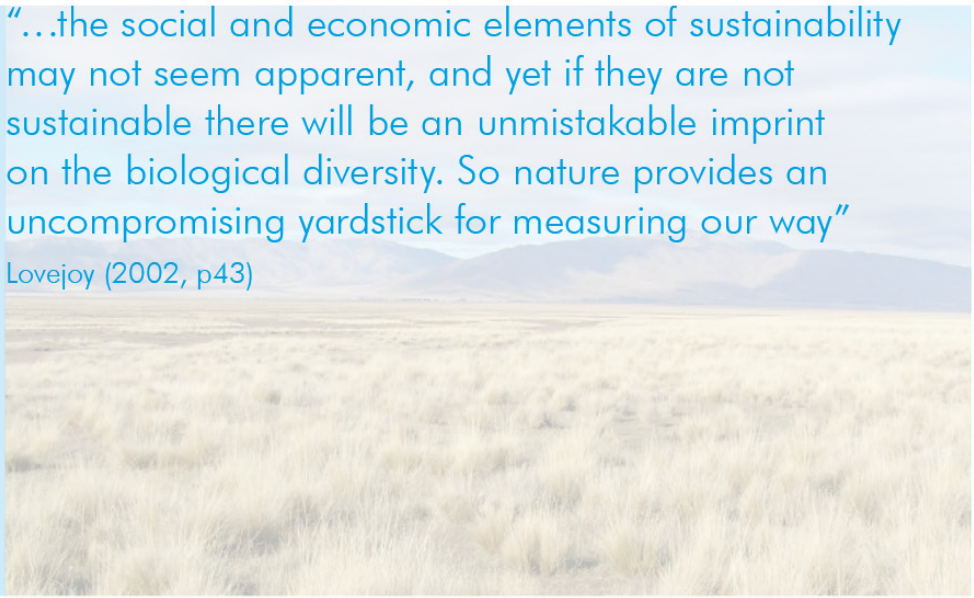

Department of Conservation's Strategic Plan for Managing Invasive Weeds (SPMIW). 2000

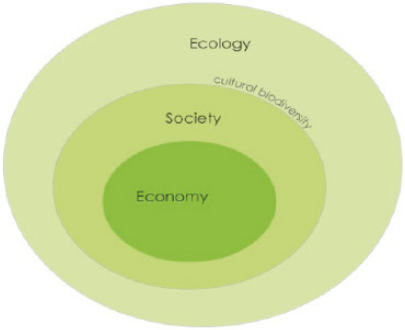
# EXAMPLES

# Design for Biodiversity:
## an ecosystems approach for sustainable product design

"...the social and economic elements of sustainability may not seem apparent, and yet if they are not sustainable there will be an unmistakable imprint on the biological diversity. So nature provides an uncompromising yardstick for measuring our way"

Lovejoy (2002, p43)

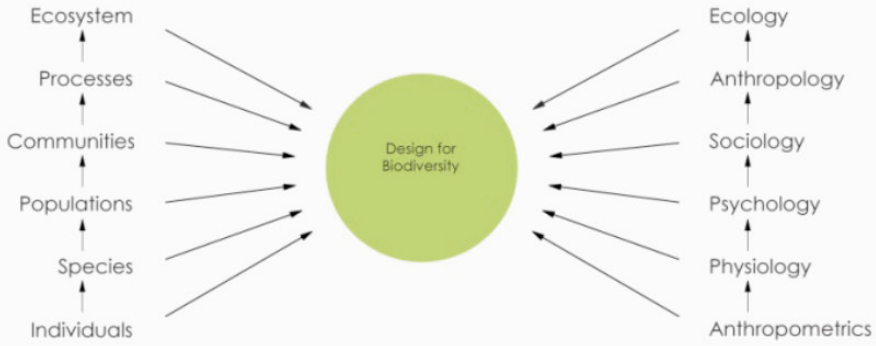




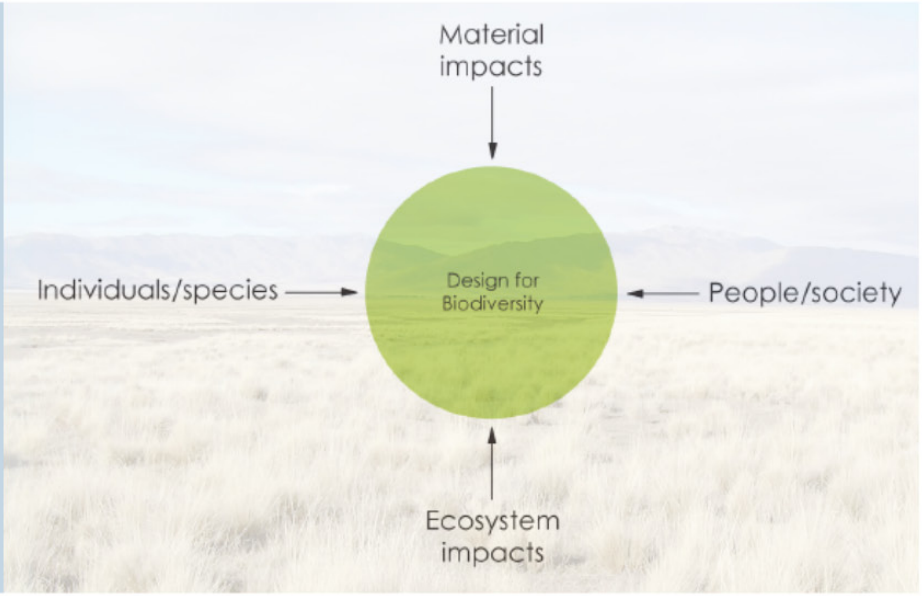

Strong sustainability

## Design for Biodiversity: hierarchy of complexity

(Hierarchy of complexity adapted from Moggridge 2007)

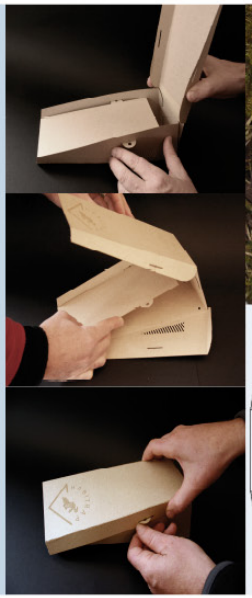


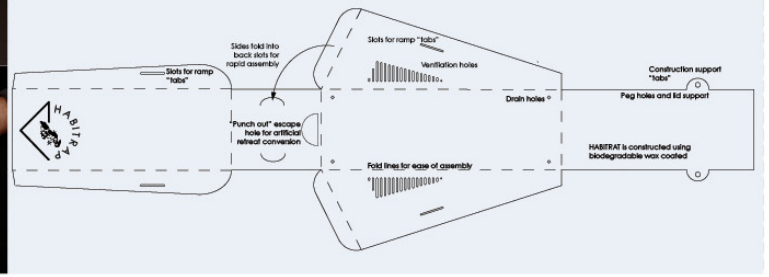
# Design for Biodiversity framework



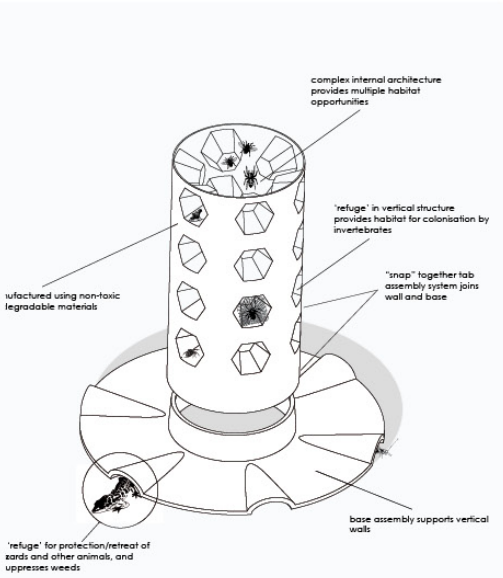
# EXAMPLES
## weta home

# EXAMPLES
## lizard trap





# EXAMPLES
## tree shelter



## CONCLUSION

Ecosystems are the basis of human consumption

Ecological understanding is vital to engage in sound and rigorous debate around issues of sustainability

Specialised designer with new modes of design process thinking is required to help negotiate current and future challenges

Designers having greater levels of ecological literacy

Greater collaboration between designers and scientists

Design for Biodiversity- help to think beyond eco-design and and see connection between people and ecosystems