

Species Diversity

Genetic Diversity

Ecosystem Diversity



# Role of Biodiversity in the Provision of Ecosystem Services

## Supporting

- Nutrient cycling
- Soil formation
- Primary production

## Provisioning

- Food
- Freshwater
- Wood and fiber
- Fuel

## Regulating

- Climate regulation
- Flood regulation
- Disease regulation
- Water purification

## Cultural

- Aesthetic
- Spiritual
- Educational
- Recreational



# What you will hear in this session

**Non-Market values  
& use in policy**



**Relationship  
between land use &  
ecosystem services**



**Bicultural biodiversity  
planning**



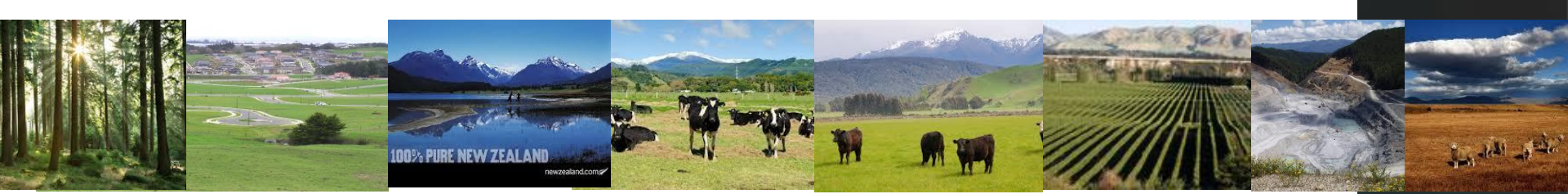
**Ecosystem service  
framework**



**Biodiversity &  
ecosystem services  
in agricultural  
landscapes**



**Biodiversity &  
planted forests**



# Framework for assessing the role of biodiversity in ecosystem services in NZ

Suzie Greenhalgh  
NZ Ecological Society Conference  
November 18, 2015



# Ecosystem services classification

## PROVISIONING

Products obtained from ecosystems

Food & fibre  
Freshwater  
Biomass fuel  
Wildfoods  
Ornamental resources  
Biochemical, natural medicines & pharmaceuticals  
Genetic resources



## REGULATING

Benefits from regulation of ecosystem processes

Air quality regulation  
Climate regulation  
Water regulation  
Erosion control  
Water purification & waste treatment  
Biological control  
Disease regulation  
Pollination  
Natural hazard regulation



## CULTURAL

Non-material benefits obtained from ecosystems

Recreation & ecotourism  
Ethical & spiritual  

- Aesthetic values
- Spiritual & religious values
- Cultural heritage values
- Social relations
- Sense of place
- Cultural diversity

Inspirational & education  

- Inspiration
- Educational values
- Knowledge systems



## SUPPORTING

Services necessary for the production of all other ecosystem services

Nutrient & water cycling  
Primary production (e.g. photosynthesis)

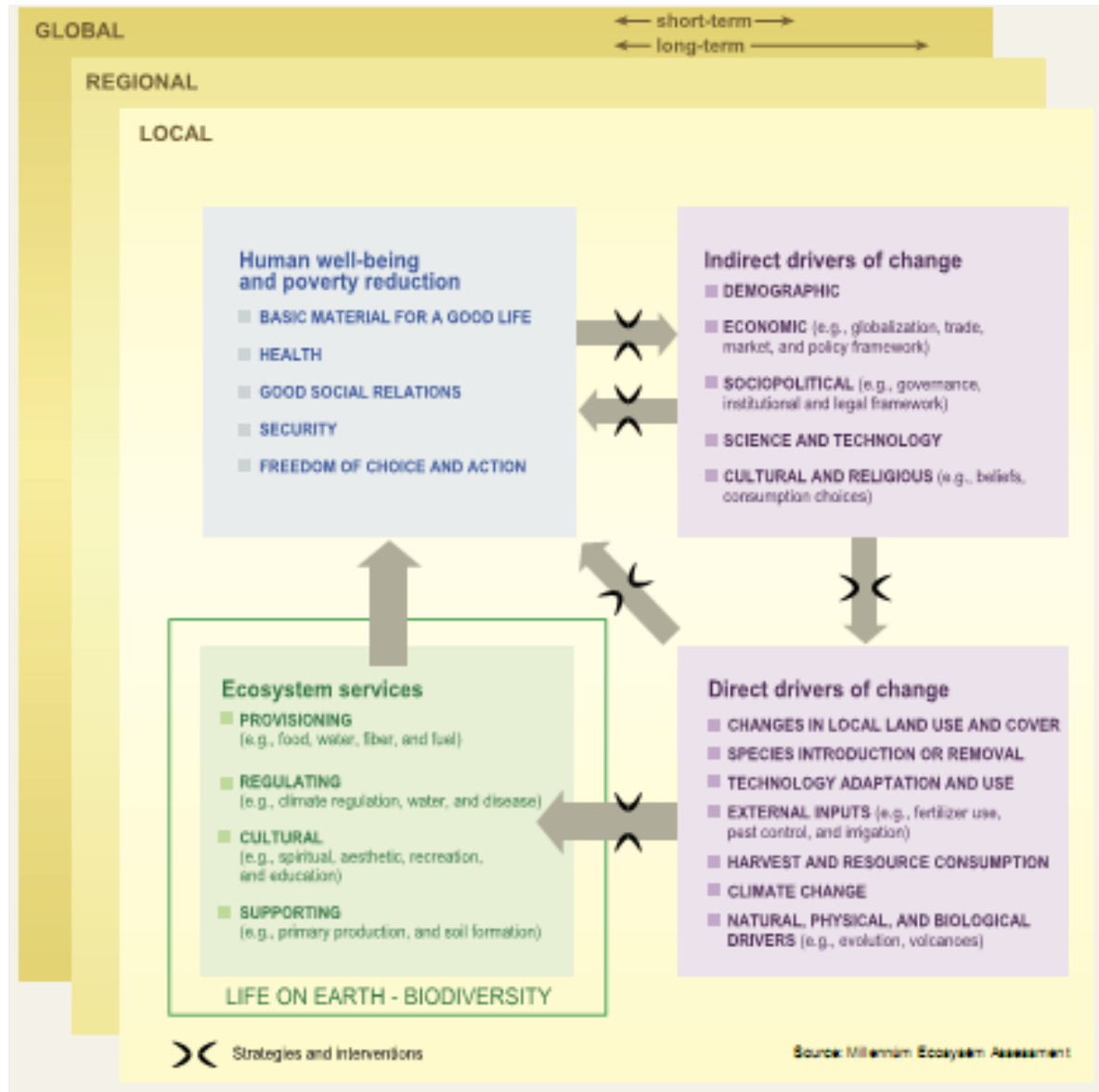
Production of atmospheric oxygen  
Provisioning of habitat

Soil formation & retention





# Biodiversity, Ecosystem Services & Well-being



**“National governments must move beyond a narrow understanding of wealth...ignoring the state of assets like forests or coastal areas – vital natural capital.**

**In the UK we’re reforming our national accounts so that, by 2020, they also reflect our natural wealth.”**

May 2012 - Nick Clegg, Deputy Prime Minister, UK

**“We believe that the current economic model is no longer viable and must give way to a new business paradigm,...**  
**... one that works with nature rather than against it”**

Jochen Zeitz, CEO, Puma Ltd

# Global Perspective

2005

- Millennium Ecosystem Assessment released

2007

- WBCSD launches biodiversity & ecosystem services focus area

2010

- TEEB report published
- Worldbank WAVES project launched

2011

- UK National Ecosystem Assessment published
- UK Natural Capital Committee established

2012

- Intergovernmental Platform on Biodiversity and Ecosystem Services established

2015

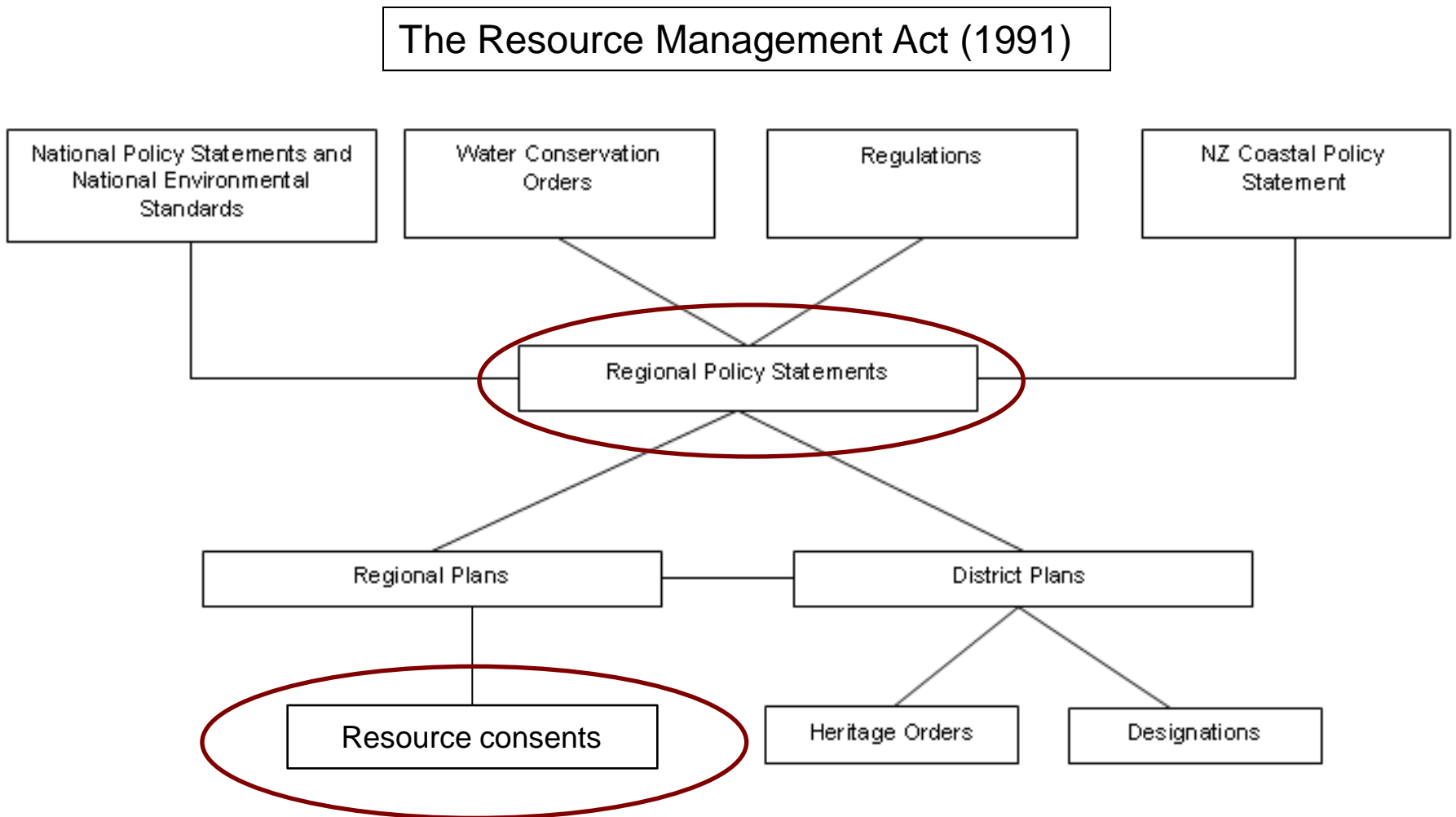
- White House (US) announce that all federal decisions must consider ecosystem services



# Where is NZ at?



# Ecosystem Services in Policy: New Zealand's RMA Framework



# Ecosystem services & regional councils – RPS review

Region	Document
Auckland	Auckland Plan 2012
Waikato	Proposed Regional Policy Statement (November 2012)
Wellington	Proposed Regional Policy Statement 2010
Canterbury	Regional Policy Statement 2013
Southland	Proposed Regional Policy Statement 2012

# Example: Waikato Regional Council

## Proposed Waikato Regional Policy Statement Decisions

- Issue 1.1:

*Declining quality & quantity of natural & physical resources impacts their life-supporting capacity, reduces intrinsic values & **ecosystem services** & in general reduces our ability to provide for our well-being.*

- Objective 3.7:

*The range of **ecosystem services** associated with natural resources are recognized & maintained or enhanced to enable on-going contribution to regional well-being.*

Environment Waikato Policy Series 2010/13

Proposed Waikato Regional  
Policy Statement  
(November 2010)

www.govt.nz  
ISSN : 1174-7234

Environment  
Waikato  
REGIONAL COUNCIL



# Business: Action on ecosystems services



Businesses impact on ecosystems & ecosystem services



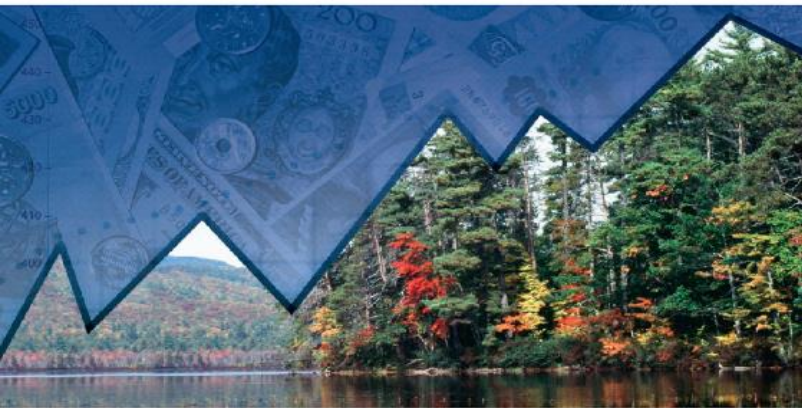
Ecosystem change creates business **risks** & **opportunities**



Businesses rely and depend on ecosystems & ecosystem services

# Corporate Ecosystem Services Review (ESR)

## THE CORPORATE ECOSYSTEM SERVICES REVIEW



**Guidelines for Identifying Business Risks  
and Opportunities Arising from Ecosystem Change**

Version 1.0

- A step by step methodology for identifying ecosystem service risks & opportunities
- Used by over 300 companies world wide, including in Australia
- Equal focus on dependencies and impact
- First application in NZ: Zespri

# ESR Steps

## 1. Select the scope

Choose boundary within which to conduct ESR:

- Business Unit
- Product
- Market
- Landholdings
- Customers
- Suppliers

## 2. Identify priority ecosystem services

Systematically evaluate the degree of a company's dependence & impact on 20+ ecosystem services

## 3. Analyze trends in priority services

Research & evaluate conditions & trends in the priority ecosystem services, & drivers of these trends

## 4. Identify business risks & opportunities

Identify & evaluate business risks & opportunities that might arise due to the trends in these priority ecosystem services

## 5. Develop strategies

Outline strategies for minimizing risks & maximizing opportunities through internal changes, sector or stakeholder engagement, policy-maker engagement



Landcare Research  
Manaaki Whenua

Sustainable  
Business Council  
wbcsd New Zealand partner to the world business council for sustainable development



Contact

URS



*We had never done anything (ESR) of this nature .....it was a 'leap of faith', an opportunity presented to us....surprised at the amount of information we've got out of it and what it might mean going forward.*  
- Allyn Glaysher, AFL

*We are unanimous that .... ESR provides for stakeholder engagement, plus the different "lens" through which to view our operations & ....pull previously disparate information & streams of work together, has been invaluable.*  
- Nicholas Robinson, GM Corporate Affairs, Contact

*.....introduced a new language of ecosystem services to our planners and engineers and helped build a business case for developing...capability in green infrastructure & ecosystem services assessment.*  
- Mark Drury, CEO, URS New Zealand

*....ESR process is an essential tool for developing a business in an ecologically sustainable way.*  
- Georgina Langdale, founder & director, Archeus

## What the companies said

*... ecosystem services approach....quickly leads to thinking about the supply chain & ecosystem dependencies, impacts, risks and opportunities beyond the manufacturing process.*  
- Nic Bishop, Fonterra



## Ballantrae Non Chemical

Risk Chemical Data				Risk Chemical Data			
Field No.	Area (hectares)	Chemical	Product Name	Field No.	Area (hectares)	Chemical	Product Name
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Farmlet	
Conventional 1	Light Grey
Conventional 2	Light Blue
Non - Chemical 1	Green
Non - Chemical 2	Orange

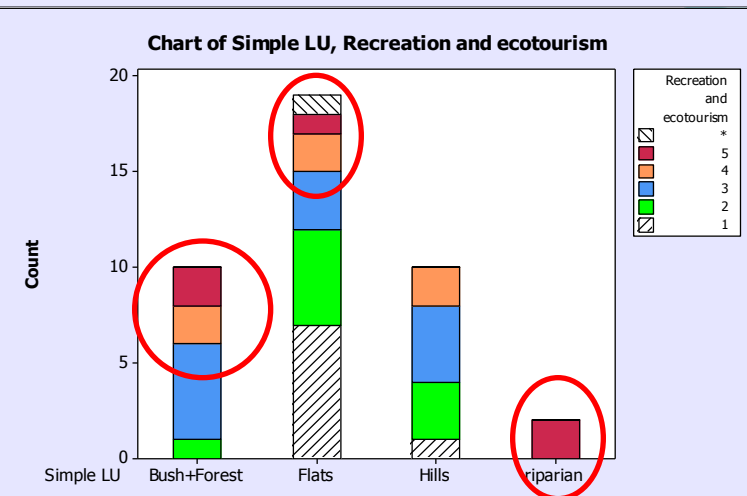
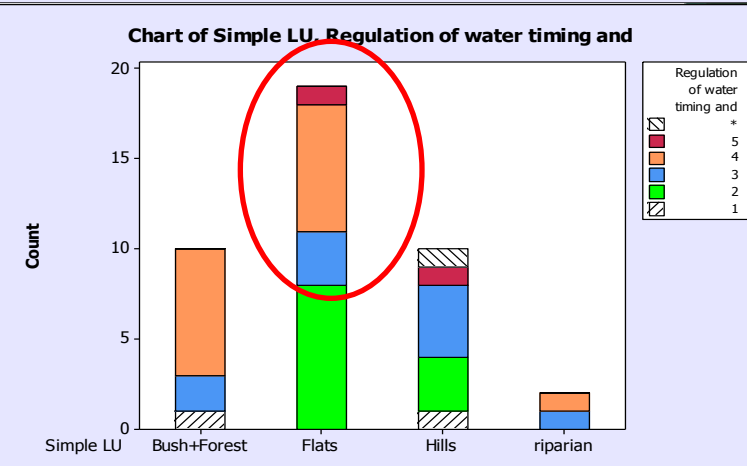
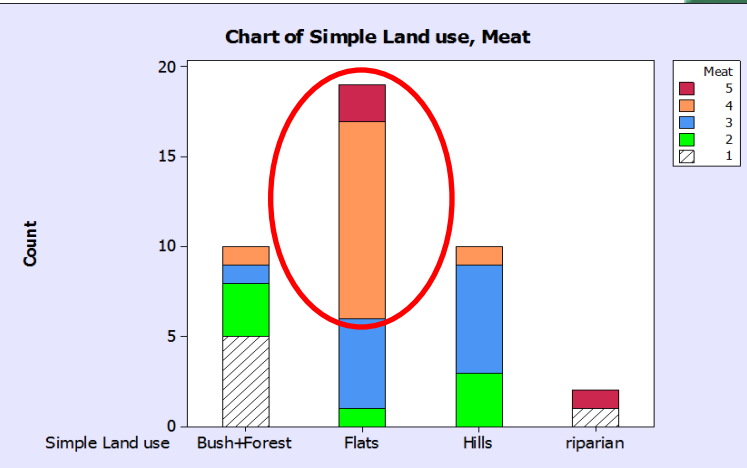
0 250 500 1,000 Meters

Compiled 28th August 2006  
Philip Budge agrresearch

# Landowners: Perceptions of Ecosystem Services

- Rural land is comprised of different land units
- Each land units provides different types and scale of ecosystem services

# How landowners scored their land?



Ecosystem Service	1	2	3	4	5
<b>Provisioning Services</b>	Provides no service	Provides low levels of service	Provides a level of service (e.g. yield, production) similar to most of the region	Provides more of the service (e.g. yield, production) than most but is not top performing	Provides some of the highest levels of a service (e.g. yield, production) in the region; is top performing
<b>Regulating Services</b>	Provides no service	Provides little service	Provides an average level of service in the region	Provides more than average service but not the highest level of a service in the region	Provides the highest level of a service in the region
<b>Cultural Services</b>	Provides no service	Provides few non-material benefits	Provides an average amount of non-material benefit in the region	Provides more than average non-material benefits but not the highest amount in the region	Provides the highest amount of non-material benefits in the region
<b>Supporting Services</b>	Provides no service	Provides little service	Provides an average level of service in the region	Provides more than average service but not the highest level of a service in the region	Provides the highest level of a service in the region

Took awhile to get my head around it but felt that it made me think about my management differently  
*~dairy farmer*

I thought we all produced meat but now realise how much we all depend on aesthetics and ecotourism [many farmers had farm stays when time were tough]  
*~sheep and beef farmer*

# What do farmers think?

I really struggle to explain the environment to other farmers & I think this could get them on board...and we get some change  
*~ dairy farmer*

It was really hard & stretched my mind but it was good  
*~sheep and beef/cropping farmer*





Māori Aspirations

Tangible and Intangible Benefits

Provisioning

Regulating

Cultural

Supporting

Ecosystem Services

Cultural Values

Mātauranga Māori



# Landscape Level Decisions

Conservation areas:  
habitat, pollinators, pest control, recreation, cultural significance

River: Food, fresh water, recreation, cultural significance

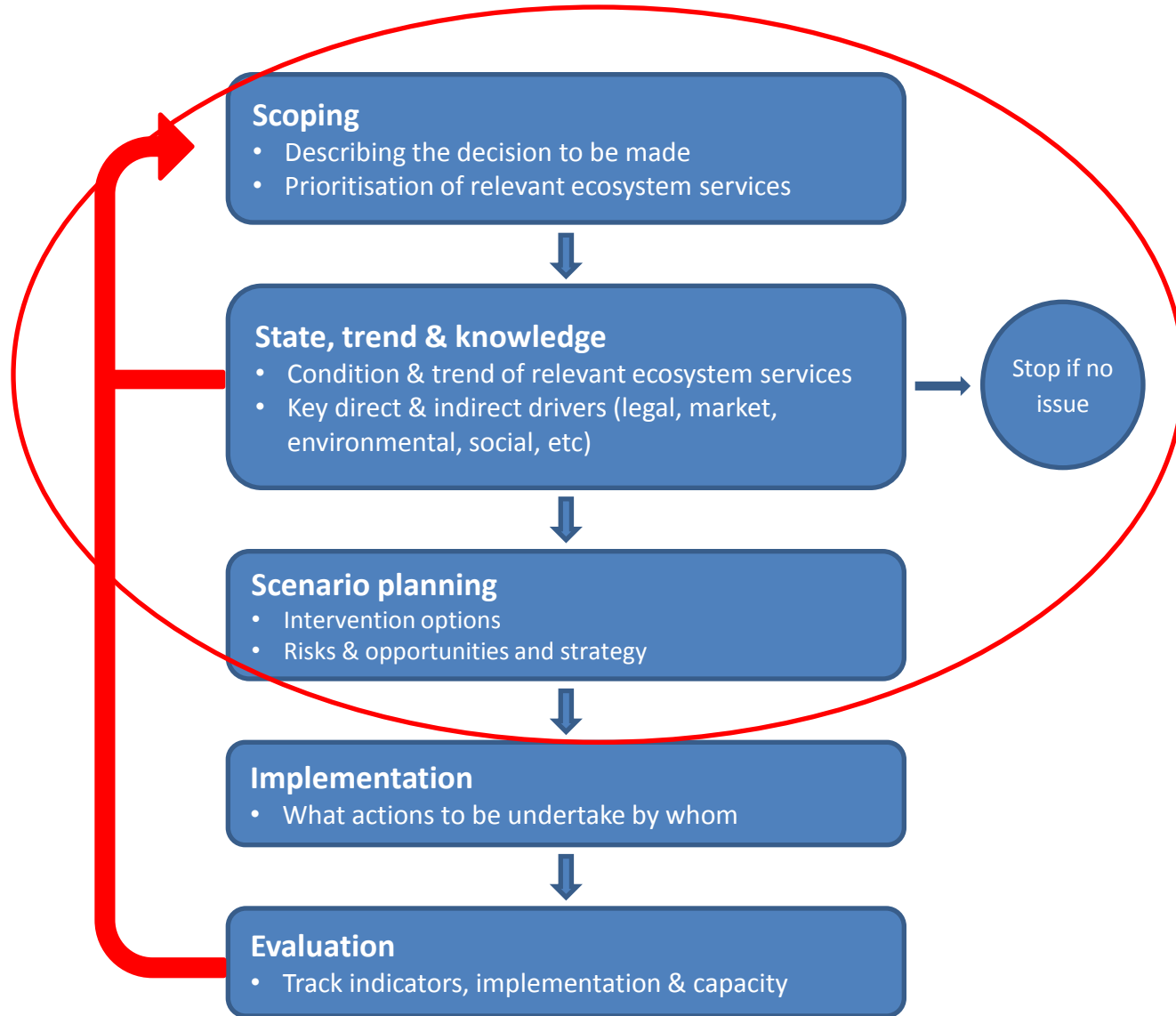
Forests: Timber, carbon storage, clean water & air, recreation

Farmland:  
Food, waste recycling, pest regulation

Source:  
[www.biodiversityplanningtoolkit.com](http://www.biodiversityplanningtoolkit.com)

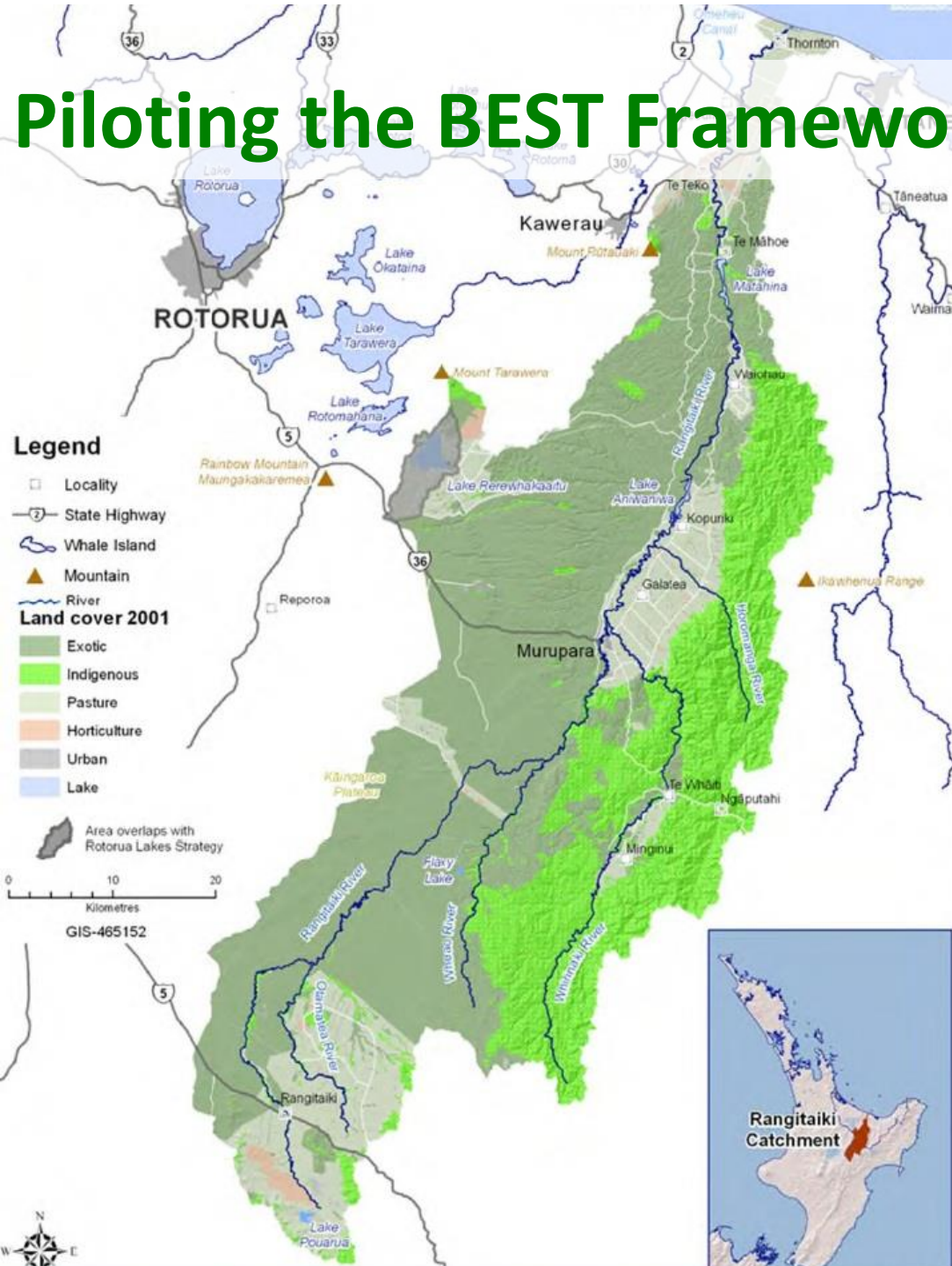
Resilient landscape → Sustainable Land Uses → Community Well being

# BEST Decision-making Framework





# Piloting the BEST Framework in the Rangitāiki



## Why this catchment?

- Co-governance Forum --The Rangitāiki River Forum -- have clear vision for the catchment
- Diversity of landscapes, land uses & stakeholders
- Multiple potential future options
- Variety of implementation pathways

## Seven workshops

### 1. Introduction

- **Building a common platform**
- *Share knowledge and build a common understanding in the group around the Rangitāiki catchment and the ecosystem services approach*

### 2. Field trip

- **Exploring the catchment**
- *Further extend collective knowledge and understanding of the catchment and the ecosystem services it provides*

### 3. Prioritise

- **Prioritising ecosystem services**
- *Identify the local natural resources, current uses and associated services critical for delivery of the groups objectives*

### 4. Future scenarios

- **Scoping future landscape scenarios**
- *Identify future drivers, translate these drivers into possible alternative future land use and management scenarios for the catchment*

### 5 & 6. Future forecast

- **Exploring the scenarios**
- *Discuss scenario findings based on modelling*

### 7. Strategise

- **Strategising**
- *Identify decisions/options for future actions*



# Many Thanks

Suzie Greenhalgh

[Greenhalghs@landcareresearch.co.nz](mailto:Greenhalghs@landcareresearch.co.nz)



# Where is NZ in this timeline and are we future-proofed???

2020

- EU member states start reporting Nat Cap in National Accounts

2015

- India publishes first Nat Cap accounts
- World Bank delivers WAVES Nat Cap accounting project

2014

- EU member states submit 1<sup>st</sup> assessments and economic valuation of ecosystems

2012

- Brazilian Business Coalition call for ecosystem inclusion in business practice
- 39 banks, 50+ countries, big biz sign Natural Capital Declaration at Rio
- 10 African countries sign accord to report on state of natural capital

2011

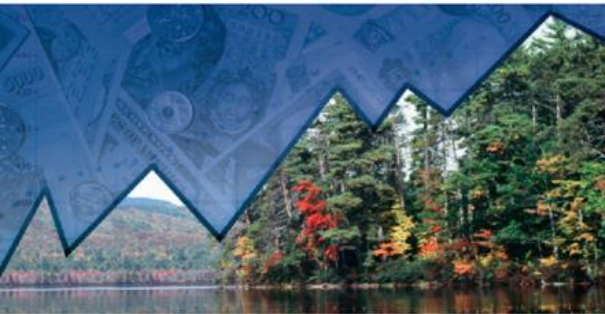
- Chinese government works with TEEB
- Nordic Countries agree to undertake Nordic TEEB
- UK National Ecosystem Assessment published and Natural Capital committee established

2010

Final TEEB report published

# Business support tools

## THE CORPORATE ECOSYSTEM SERVICES REVIEW



**Guidelines for Identifying Business Risks  
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Version 1.0



DEDICATED TO MAKING A DIFFERENCE



*Guide to Corporate Ecosystem Valuation*

A framework for  
improving corporate  
decision-making



WRI REPORT



CRAIG HANSON

CORNIS VAN DER LOOT

SUZANNE OZMENT

**NATURE IN PERFORMANCE**

Initial Recommendations for Integrating  
Ecosystem Services into Business Performance Systems

# Overview [TO DELETE]

- Global context
- Overview of where NZ is at
  - Business
  - Community/councils
  - Farmers
- Using ES in decisions
  - ES framework
  - Rangitaiki process
- Where next and what do we need to do





# Upcoming Business Issues: Biodiversity & Ecosystem Services

