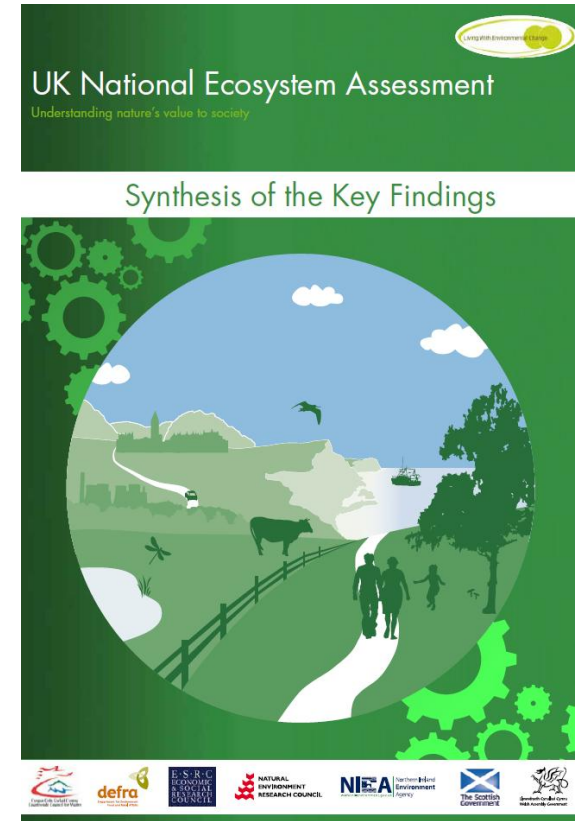
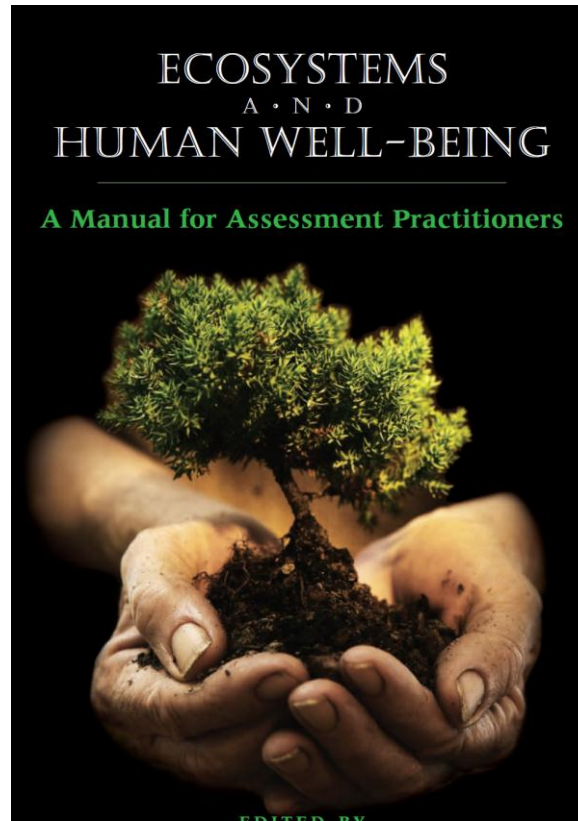
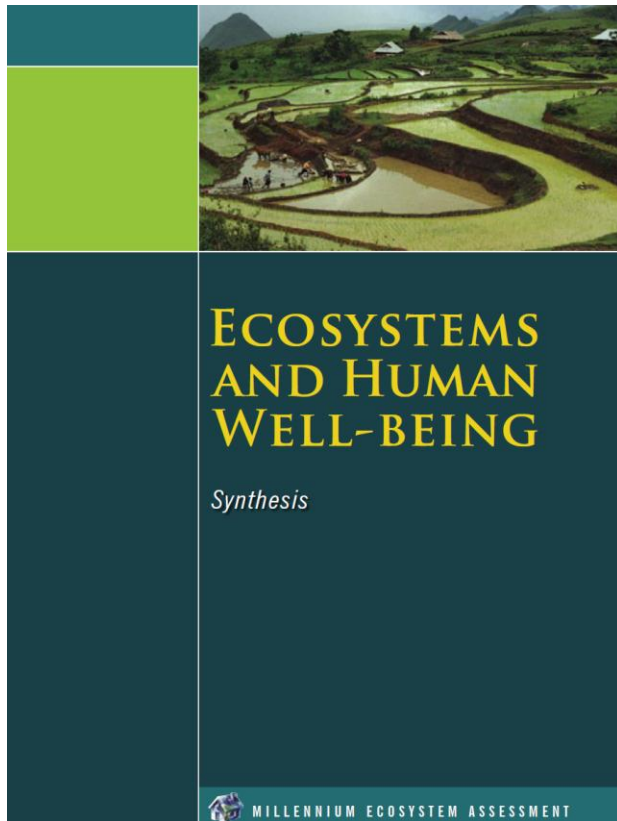


Current and future work on forest ecosystem services

Richard Yao

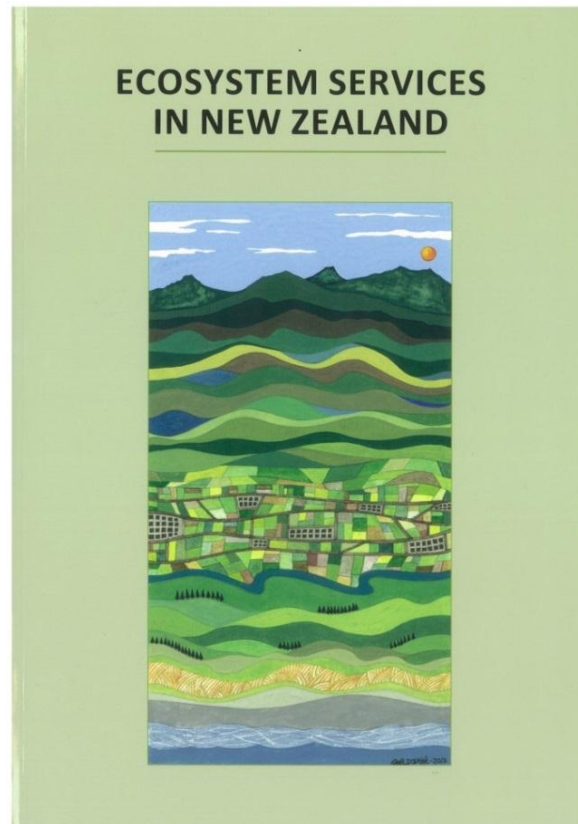


Ecosystem services

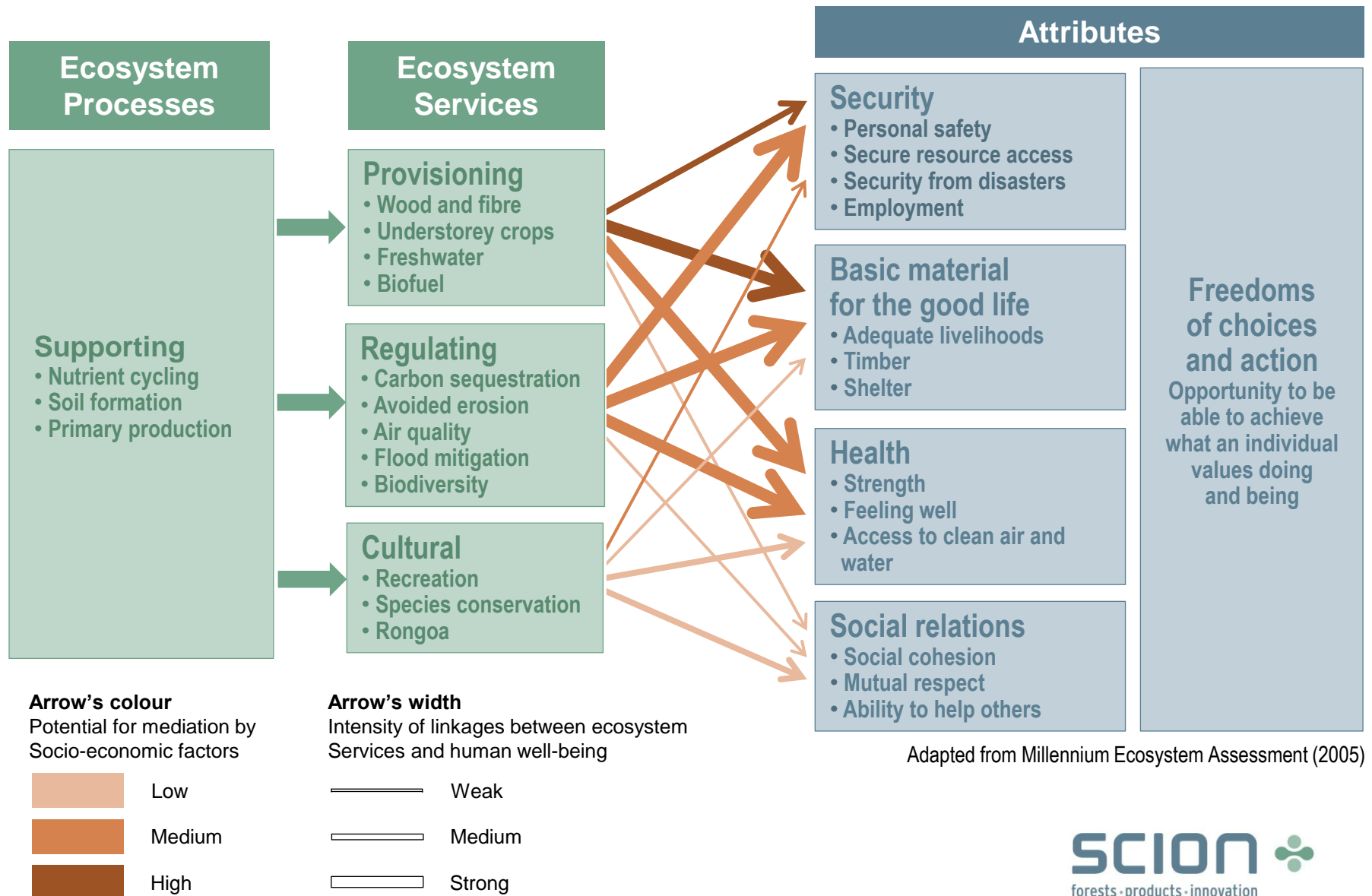


Ecosystem Services in New Zealand

- Valuing Nature Conference in Jul 2013
- ES in NZ book - launched by MfE in Feb 2014
 - 539 pages, 36 chapters, >100 NZ scientists
 - **Chapter 1.4 – Planted forests**



ES provided by NZ planted forests (updated)



Papers and a report on FES values

Recreational walking and mountain biking

Dhakal B, Yao RT, Turner JA, Barnard TD 2012. Recreational users' willingness to pay and preferences for changes in planted forest features. *Forest Policy and Economics* 17: 34-44.

Indigenous forestry report (recreation use values in native and planted forests)

Heaphy M, Harrison DR, Holt L, Steward G, Yao RT 2014. Exploring the opportunities for indigenous forestry. A project report. Scion, Rotorua.

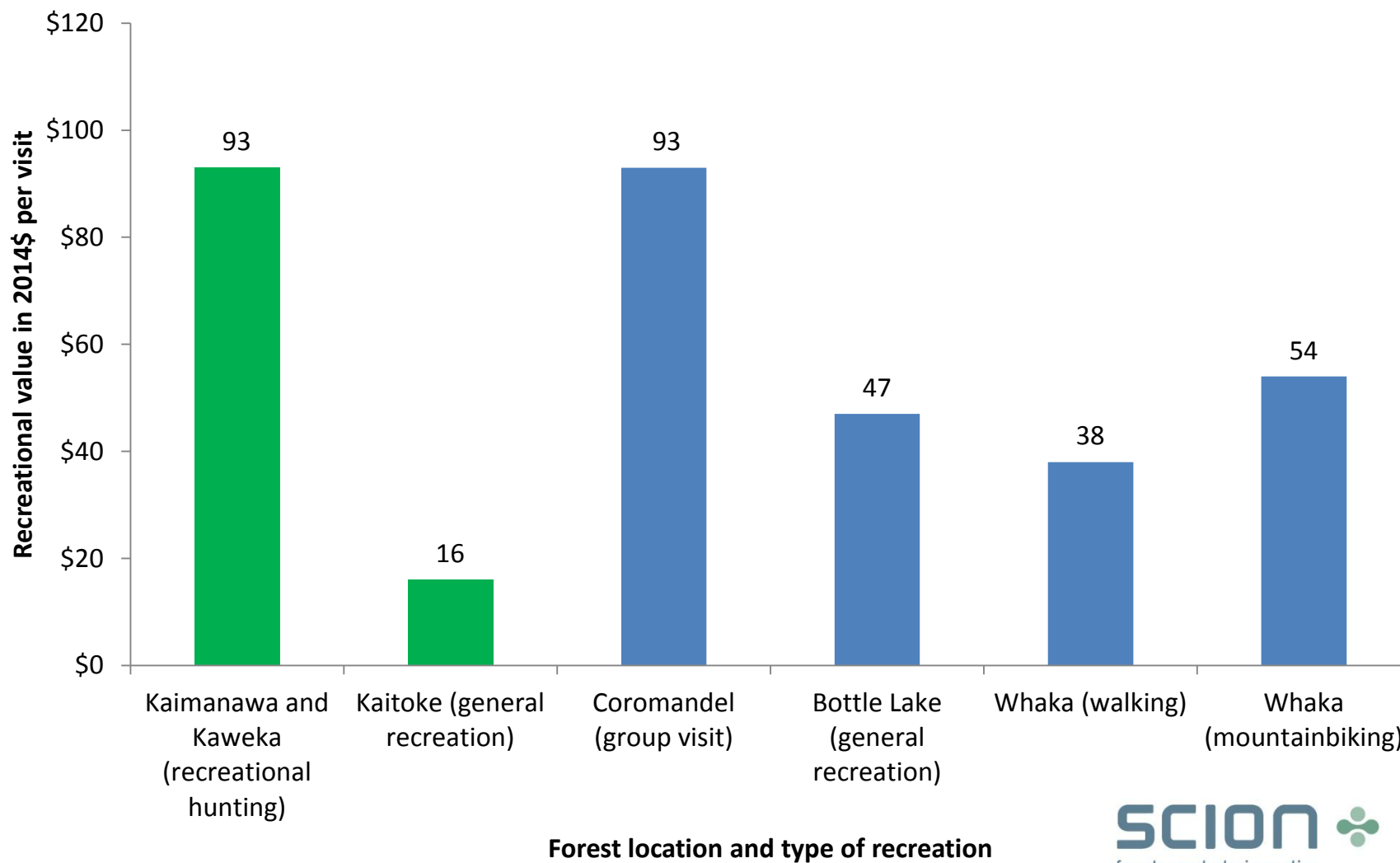
Biodiversity enhancement values in planted forests

Yao RT, Scarpa R, Turner JA, Barnard TD, Rose JM, Palma JHN, Harrison DR 2014. Valuing biodiversity enhancement in New Zealand's planted forests: Socioeconomic and spatial determinants of willingness-to-pay. *Ecological Economics* 98: 90-101.

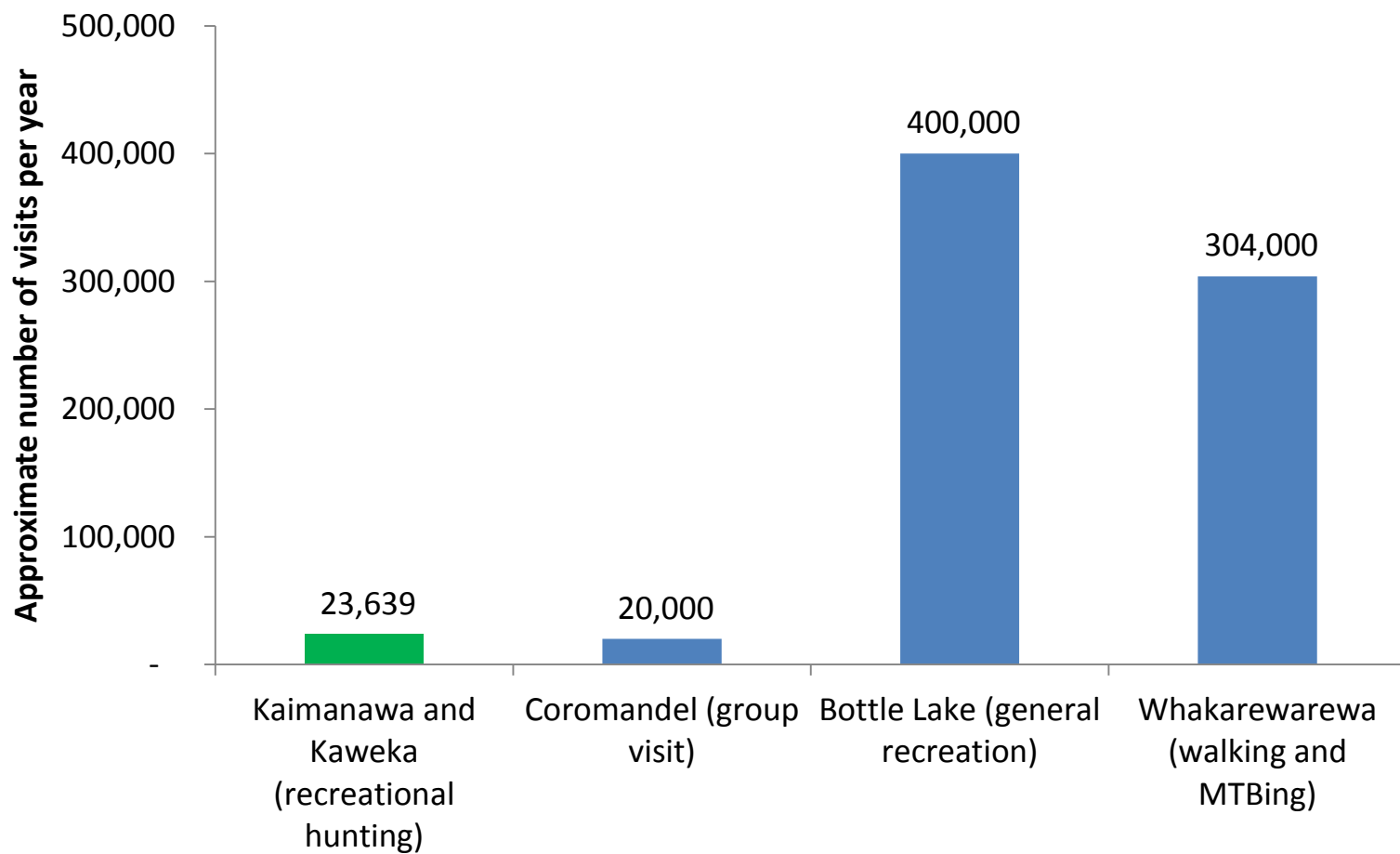
Avoided erosion from afforestation of marginal land

Barry LE, Yao RT, Harrison DR, Paragahawewa UH, Pannell DJ 2014. Enhancing ecosystem services through afforestation: How policy can help. *Land Use Policy* 39: 135-145.

Recreation value per visit – natural & planted

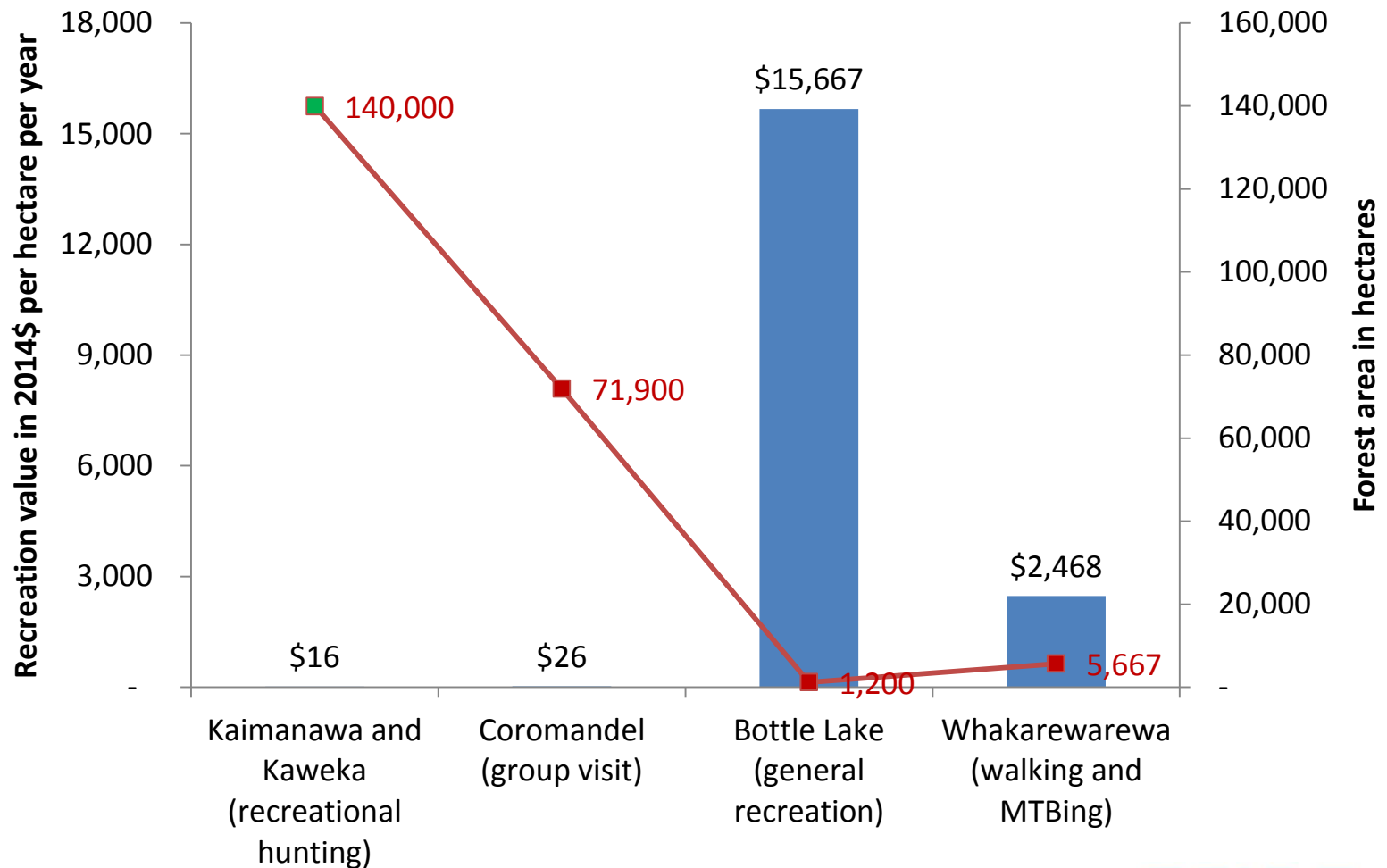


Number of visits per year – natural & planted



Recreation value per ha per year – natural & planted

(blue bar = value per hectare; dot = forest area)



Valuing biodiversity enhancement in NZ planted forests (Yao et al. 2014)






| <i>Threatened Animal/Plant</i> | <i>Current Condition</i> | <i>Option I</i> | <i>Option J</i> |
|---|---|---|--|
| <p><u>Brown Kiwi</u> (Frequency of hearing calls in planted forests in North Island)</p>  | Kiwi calls heard in 1 out of 200 planted forests | Kiwi calls heard in 1 out of 200 planted forests | Kiwi calls heard in 20 out of 200 planted forests |
| <p><u>Giant Kokopu</u> (Occurrence in slow moving streams with overhanging native vegetation in planted forests throughout New Zealand)</p>  | Kokopu seen in 1 out of 10 suitable streams | Kokopu seen in 3 out of 10 suitable streams | Kokopu seen in 1 out of 10 suitable streams |
| <p><u>Kakabeak</u> (Occurrence in 20% of the planted forests on the East Coast and Hawke's Bay)</p>  | At least 3 naturally occurring Kakabeak shrubs | At least 20 actively managed Kakabeak shrubs | At least 3 actively managed Kakabeak shrubs |
| <p><u>Auckland Green Gecko</u> (Gecko sightings in open grounds in planted forests in Northland, Waikato and Bay of Plenty regions)</p>  | Gecko sighted in 1 out of 50 walks | Gecko sighted in 3 out of 50 walks | Gecko sighted in 1 out of 50 walks |
| <p><u>NZ Bush Falcon</u> (Bush falcon sightings while driving through pine forests in Central North Island and Nelson)</p>  | Bush falcon sighted in 1 out of 8 drives | Bush falcon sighted in 5 out of 8 drives | Bush falcon sighted in 1 out of 8 drives |
| Additional amount to be paid yearly in your income tax for five years only | \$0 | \$30 | \$30 |
| I would choose (please tick) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Fig. 1. An example of a choice task used in the survey.

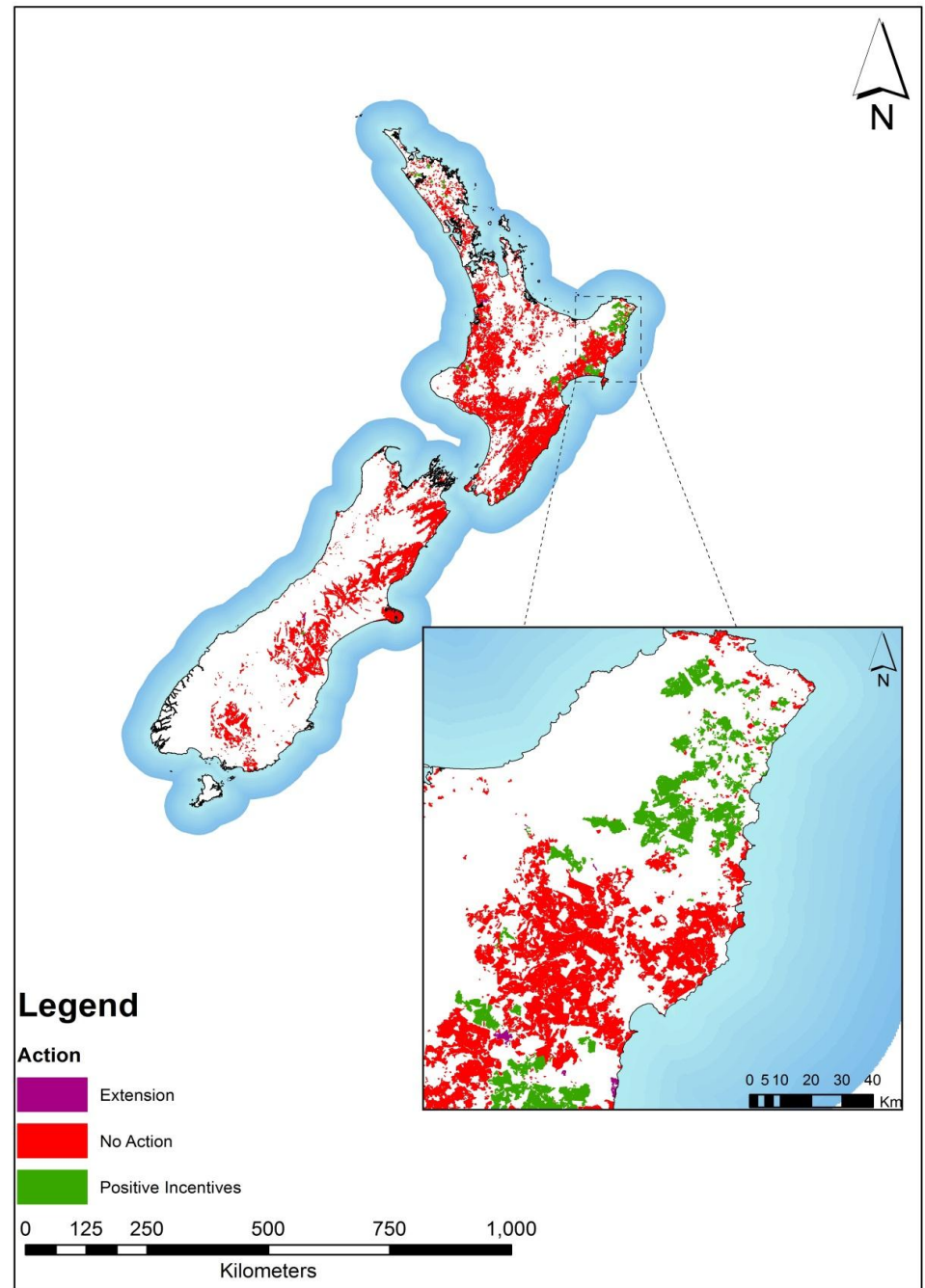
Simulated willingness to pay (in NZ\$) [n = 209]

| | Mean WTP | Median WTP | Std Dev |
|------------------|----------|------------|---------|
| Brown Kiwi 1 | 24.18 | 18.07 | 16.78 |
| Brown Kiwi 2 | 28.24 | 21.10 | 19.59 |
| Kokopu 1 | 8.37 | 6.25 | 5.81 |
| Kokopu 2 | NS | NS | NS |
| Kakabeak 1 | 8.89 | 6.64 | 6.12 |
| Kakabeak 2 | 8.37 | 6.05 | 8.59 |
| Green Gecko 1 | NS | NS | NS |
| Green Gecko 2 | NS | NS | NS |
| Bush Falcon 1 | 24.44 | 18.26 | 16.96 |
| Bush Falcon 2 | 31.68 | 23.63 | 23.86 |
| Indicator for SQ | NS | NS | NS |

Note: NS means the coefficient is not statistically significant at the five percent level.

Avoided erosion value from afforestation (Barry et al. 2014)

- Forest investment finder (spatial economic model) – estimated the profitability
- New Zealand Empirical Erosion Model (NZEEM) – estimated the reduction in sedimentation of waterways
- Areas in **green** on the East Coast → \$1 loss in *P. radiata* planting = at least \$3 in avoided erosion benefit
 - those **landowners** should be provided with incentives to plant trees on marginal land



Ecosystem services values from NZ forests

| Group | Ecosystem service | Forest type | |
|--------------|--|---------------|---------|
| | | Planted | Natural |
| Provisioning | Wood and fibre | \$7.3b | • |
| | Bioenergy | \$1b | |
| | Understorey cropping (e.g. Ginseng) | \$4/gram | |
| | Freshwater | • | • |
| Regulating | Carbon sequestration (\$4/tonne of CO ₂) | \$100m/yr | • |
| | Avoided erosion (avoided sedimentation) | \$1,250/ha/yr | • |
| | Flood mitigation (avoided flood damage) | \$250/ha/yr | • |
| | Air quality | • | • |
| | Water quality | • | • |
| | Water quantity | • | • |
| | Habitats | • | • |
| Cultural | Recreation | \$100m/yr | \$3m/yr |
| | Conservation of endangered species | \$28m/yr | • |
| | Aesthetics | • | • |
| | Cultural heritage | • | • |

Scion's economics and land use capability

Dr Richard Yao (Environmental Economist)

Economic valuation/assessment of ecosystem services, market values (provisioning), non-market values (regulating, cultural) and spatial economic modelling of ecosystem services

Dr Juan Monge (Resource Economist)

Economic land use policy impacts, carbon policy, energy, life cycle assessment, Computable General Equilibrium (CGE) modelling, risk analysis

Dr Sandra Velarde (Ecological Economist and Forest Engineer)

Carbon, biodiversity and profitability trade-offs, environmental services compensation and reward mechanisms, land-use change decision making, participatory planning and climate change mitigation

Duncan Harrison (Spatial Analyst)

Spatial economic modelling of ecosystem services and land use

Stefania Pizzirani (Life Cycle Assessment)

Life cycle assessment and land use within cultural frameworks

Thank you. Any questions?



ADB Consultant Management System

Consulting Services Recruitment Notice (CSRN)

TA-8564 REG: Promoting Ecosystem Services and Forest Carbon Financing in Asia and the Pacific-Senior Ecological Economist and Team Leader (44141-012)

Date Published: 26-Apr-2014 Deadline of Submitting EOI: 09-May-2014 11:59 PM Manila local time

- Profile
- Terms of Reference
- Cost Estimate

Selection Profile

| | | | |
|----------------------------|---|------------------------------|-----------------------|
| Consultant Type | Individual | Source | International |
| Selection Method | Individual Consultant Selection (ICS) | Technical Proposal | Not Applicable |
| Selection Title | <u>Promoting Ecosystem Services and Forest Carbon Financing in Asia and the Pacific-Senior Ecological Economist and Team Leader</u> | | |
| Package Number | Package Name | Approval Number | 8564 |
| Advance Action | <input type="radio"/> Yes <input checked="" type="radio"/> No | Approval Date | 06-Dec-2013 |
| Engagement Period | 22 MONTH | Estimated Short-listing Date | 17-Feb-2014 |
| Consulting Services Budget | USD 325,000 | Estimated Commencement Date | 03-Mar-2014 |
| Budget Type | <input type="radio"/> Estimated <input checked="" type="radio"/> Maximum | | |

Additional Information

- Possibility of contract extension Yes No Not known
- Possibility of consideration for downstream assignment Yes No Not known
- Indefinite Delivery Contract (IDC) Yes No
- Country of assignment **Philippines; Regional**

Contact Information

Project Officer: **Bruce Kevin Dunn**
 Designation: **Senior Environment Specialist**
Asian Development Bank



S O N O M A C O U N T Y

**AGRICULTURAL PRESERVATION
AND OPEN SPACE DISTRICT**

Request for Proposal (RFP) FOCUSED ECOSYSTEM SERVICES VALUATION SERVICES

Introduction

The Sonoma County Agricultural Preservation and Open Space District (“District”) is requesting proposals to evaluate the economic value of a variety of natural landscapes and systems within Sonoma County. A county-wide ecosystem services valuation (ESV) report is currently being produced which will provide screening level data and analysis. However, the District desires to develop 10-15 geographically and/or topically focused valuations for use in decision making, outreach and education. These studies may utilize qualitative and quantitative methods and a variety of ecological economic methods. District staff have developed a list of 14 potential studies, and desires consultants to provide a proposed approach, methodology, timeline, and cost estimate for one or more of the studies. Four of these studies are considered “priority” and the District intends to complete these studies immediately. The remaining ten studies will be completed as funding and partners are available, likely over the next 18 months. Consultants may select as many or few of the studies as they are interested in, at one of three levels of detail/types of study as described in this RFP.

With respect to these services, the District desires to enter into an open-scope contract with one or more consultants for an amount not to exceed \$150,000 to provide economic consulting services on an ‘as needed’ basis.