

Biodiversity valuation for biosecurity decisions when time is acutely constrained and uncertainty abounds

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Outline

- The problem
- Approach
- Choice modelling
- Benefit transfer
- Risk simulation
- Discussion and conclusions



The problem

- MAF BNZ allocating resources to response
 - Investigation
 - Cost Benefit Analysis
 - Pest management & other issues
- TEV & Market v Non-Market benefits
- Focus on biodiversity values
- Integrate with existing systems
- In-house analysis - Manual

Implement response

Liaison

Communications

Logistics

Advisory groups

Approvals and exemptions

Operational specifications

Correspondence

Investigate

Initiate response

Plan and report

Response Brief

Develop business case

Plan and report

Response Management Plan

Transition from response

Learn and close

Implement field response

Perform surveillance

Investigate

Control movement

Manage organism

The problem

- MAF BNZ allocating to response
 - Investigation
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Approach

- Survey literature: biosecurity & biodiversity
- Systematic database
- Choice modelling
 - Case studies
 - Biodiversity Valuation Database
- Benefit transfer
- Risk simulation
- Manual for MAF BNZ

Choice modelling case studies

■ Diverse ecosystems selected

- Coastal marine: European shore crab
- SI high country: Wilding pine
- Freshwater: Hydrilla
- Beech forest: European wasp

Coastal Marine – crabs



S.I. high country - wildings



Beech forest - wasps



Freshwater - hydrilla



Choice modelling case studies

- Common methodology
 - Science
 - Focus groups
 - Convenience sample priors
 - Bayesian efficient design
 - Hybrid meetings for data collection
 - Random Parameters Logit (RPL) model
 - Panel version
 - Biodiversity(t,1), price fixed

Presentation of CM results

- Next 3 slides
 - Four case studies, 36 attributes
 - Comparison of values between and within studies
 - Distance decay
- Environmental attributes
 - Mean, variance, correlation

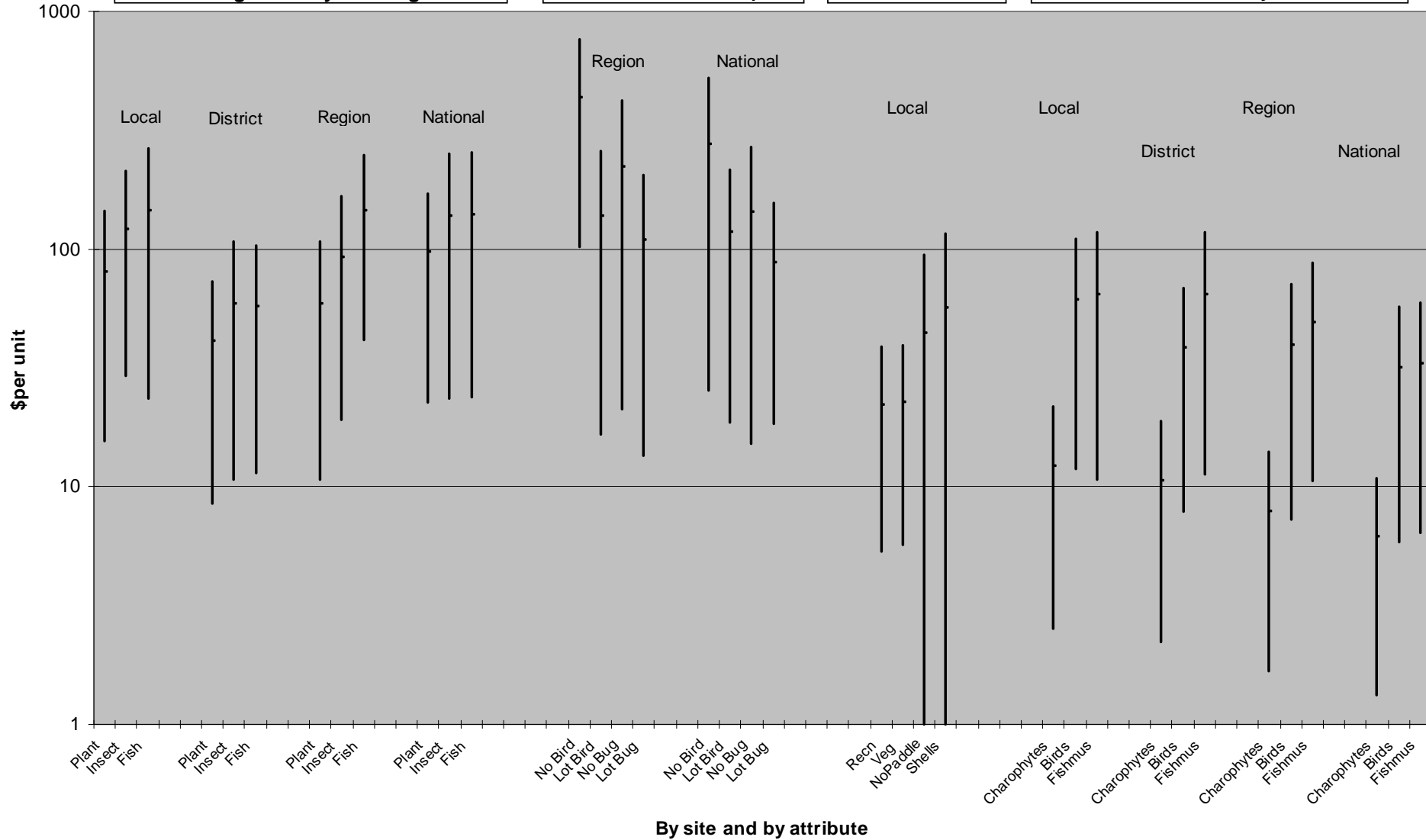
**WTP Comparison
(95% confidence)**

SI high country - Wildings

Beech forest - Wasps

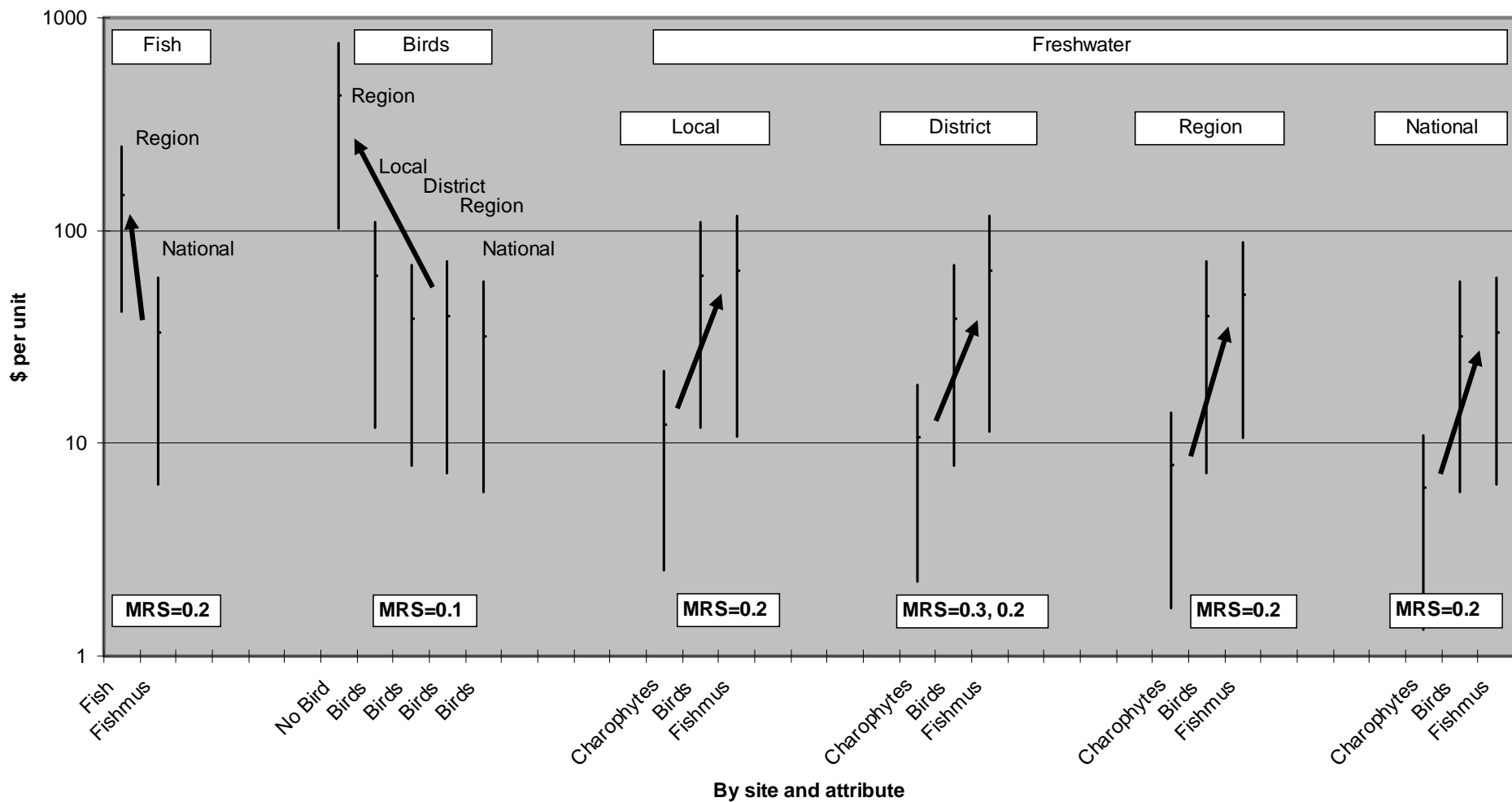
C. Marine - crabs

Freshwater - hydrilla

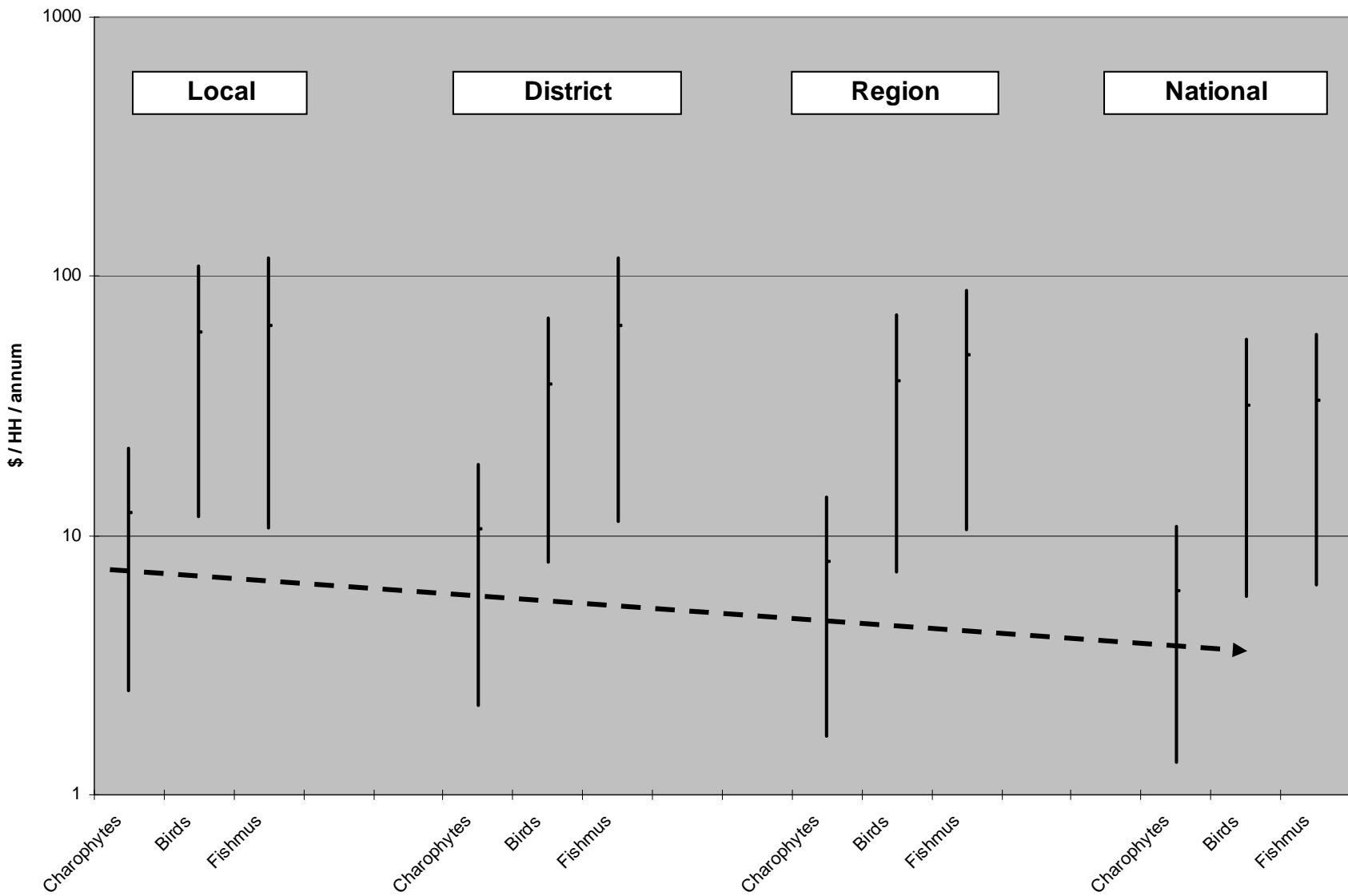


By site and by attribute

WTP comparisons - significant differences



Freshwater WTP by location

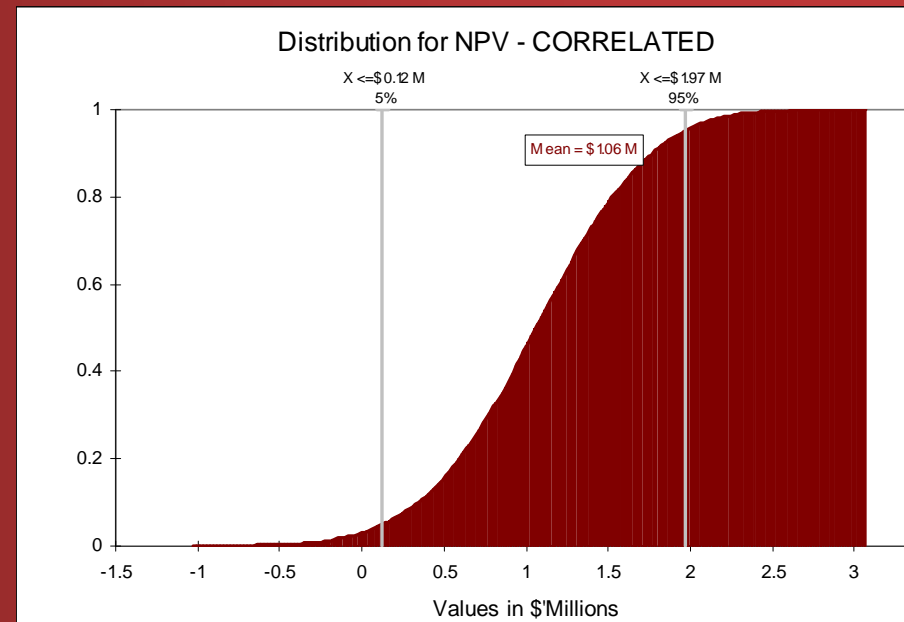


Using the results

- Systematic database of biodiversity values
 - Means, SD, correlation coefficients
 - Bands
 - Extinct v local loss
- Socio-economic characteristics e.g.
 - Income
 - Membership of conservation group
- Univariate benefit transfer
- CBA with Risk Simulation

Benefit transfer adjustments

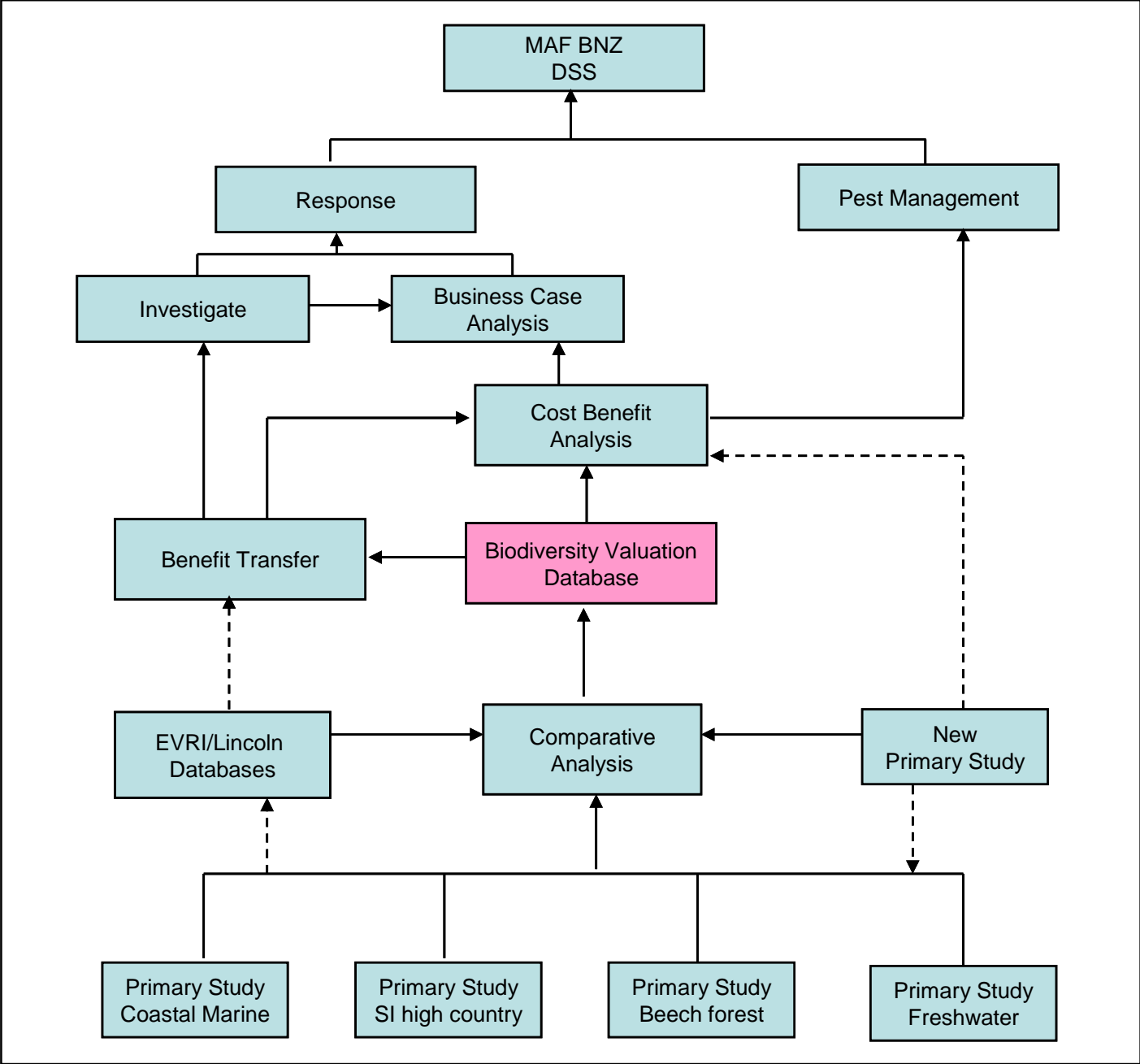
- Biodiversity Valuation Database (Univariate)
 - Plus EVRI & Lincoln Non-Mkt Valn Database
 - Inflation, PPP
- Scale and scope
 - Distance decay – mental account
 - Procedural invariance
- Aggregation
 - SDCs
 - Income
 - Conservation orientation
- Uncertainty
 - Mean, SD, correlation
 - Risk simulation using QuRA™



Using the database for decision making

- Decision Support System
 - Investigation
 - CBA
 - Pest Management
 - Other resource allocation issues





Summary and conclusions

■ Achievements

- Efficient choice modelling practice
- Effective database construction
- Effective decision making using tools developed

■ Next steps

- Choice modelling
- Database development
- Enhancing decision making