

# Towards a Total Economic Valuation of the Hauraki Gulf

*Presenter: Ross Wilson – RIMU*

# Towards a TEV of the Hauraki Gulf

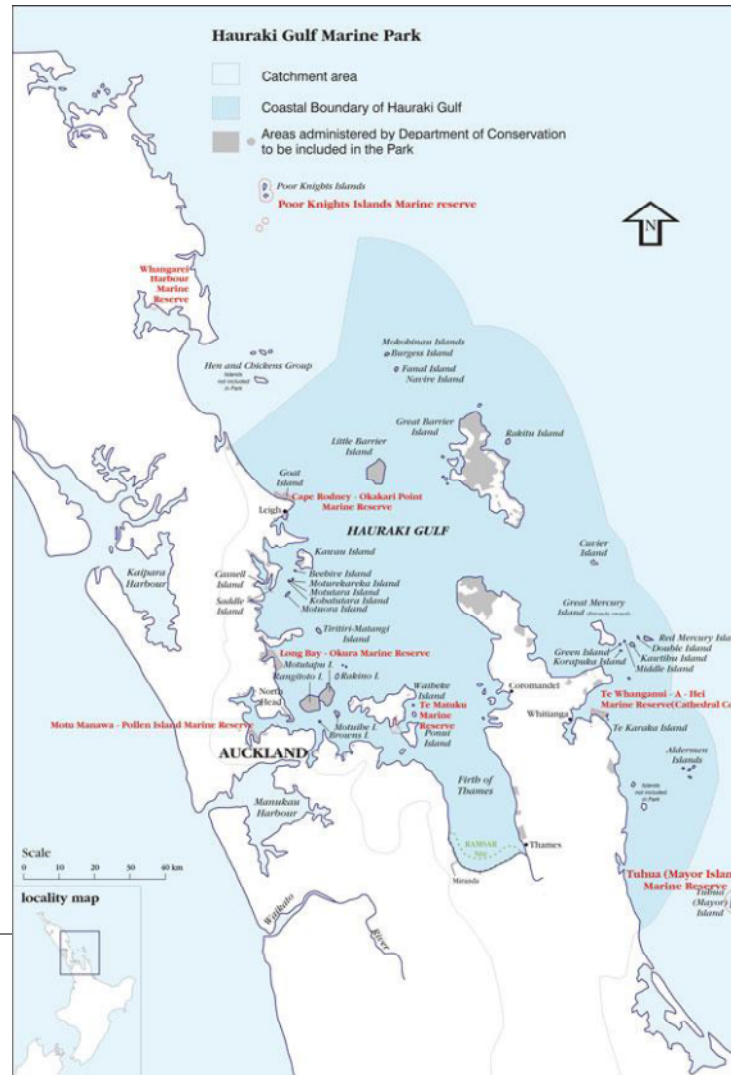
## Achievements

- identified the economic benefits provided by the Hauraki Gulf
- identified and built a relationship with key stakeholders, partners and knowledge holders
- reviewed the existing studies and summarised the available methodologies and results
- identified gaps
- produced a general view of the total economic value of the HG, specifying values and methodologies for each identified benefit.

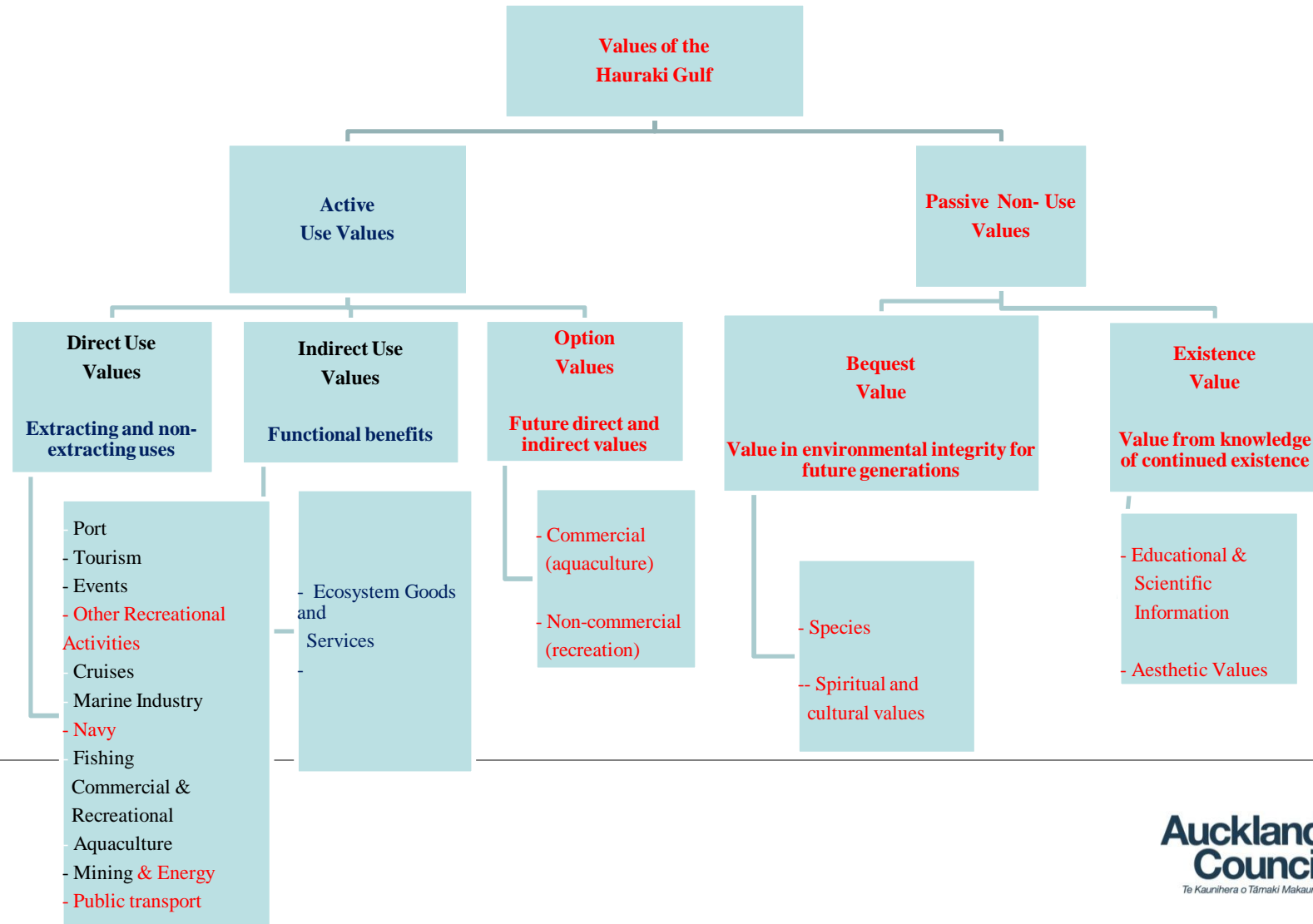
# Towards a TEV of the Hauraki Gulf: structure of the presentation

1. The Environment and Total Economic Value (TEV)
2. The Different Economic Values and Perspectives
3. A Tentative Valuation
4. Individual Activity Valuations
5. What Next? Linking Environment and Economy

# The Hauraki Gulf



# Total Economic Value Framework



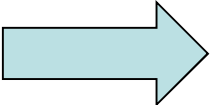

# Total Economic Value: time

Values have different time frames:

- **Stocks** are measured at **one specific time**  
biomass, value of a house, the total capital value of Auckland's real estate is officially worth \$354 billion in October 2011
- **Flows** are measured **over a time period**  
annual fish catch, rent, GDP yearly
- **Potential** are **projections in the future**  
forecast, projected growth

# Total Economic Value: values

Different kind of values

- 4-wellbeings: Social, Cultural and Environmental
- As well Economic
- Market Values  Prices
  - Externalities (not priced) (e.g. Pollution, sediments)
- Non-market Values  Monetized and non-monetized

# Total Economic Value: GDP

**GROSS VALUE:** = value added + cost of inputs

## **TYPE I MULTIPLIER:**

- **Direct** GDP impact: value added within a sector
- **Indirect** GDP impacts: value added by suppliers to that sector (plus their suppliers & theirs ...)

## **TYPE II MULTIPLIER:**

- **+Induced:** stimulus due to increased household spending from extra wages and employment

**FLOW-ON IMPACTS** = Indirect + Induced impacts

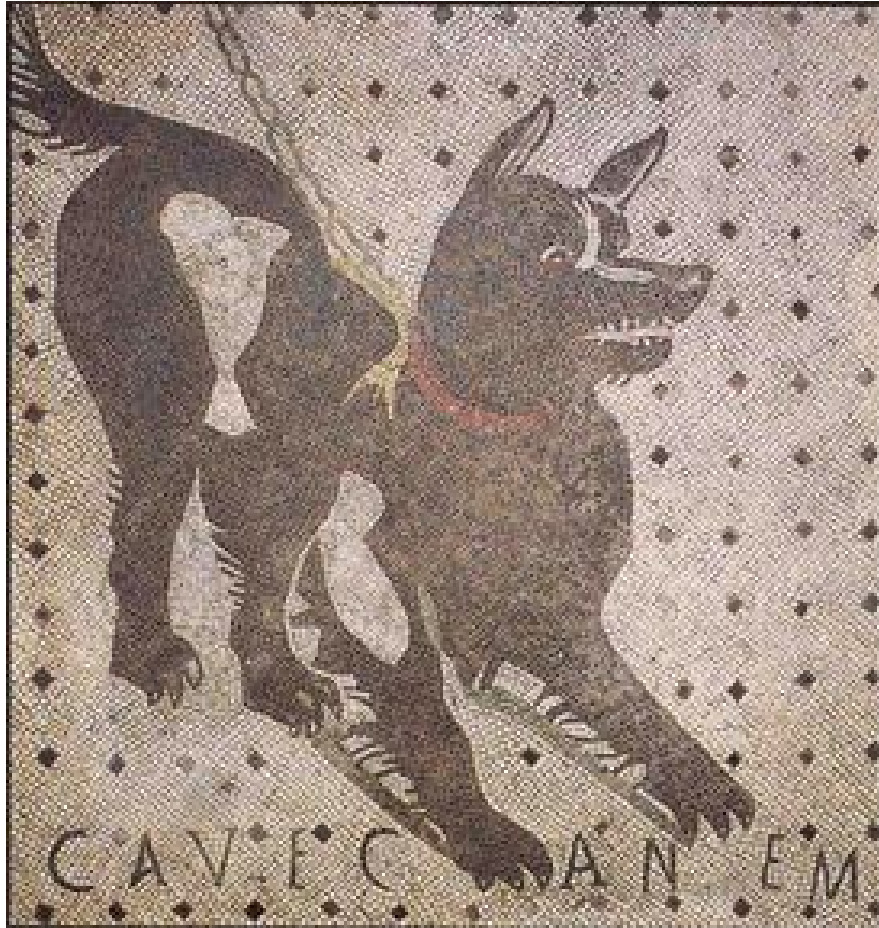
**INPUT OUTPUT TABLES** = multipliers for flow-on impacts



# Economic Values: Activities

1. Port
  2. Cruise industry
  3. Recreational marine sector, **marinas-boating**
  4. Aquaculture
  5. Fishing – commercial, recreational and **customary**
  6. Tourism
  7. *Events*
  8. Mining
- 
9. *Marine reserves*

# Caveats



- **Different years**
- **Different methodologies**
- **Different assumptions**
- **Not mutually exclusive**

**However**

**evidence-based quantitative  
valuation of the Gulf's economic  
drivers**

Pompei. House of the Tragic Poet. Mosaic

# Tentative Valuation

	Year	Direct value added \$ <sub>2011</sub> million <sup>1</sup>	Indirect + induced value added \$ <sub>2011</sub> million <sup>1</sup>	Total value added \$ <sub>2011</sub> million <sup>1</sup>	Employment <sup>2</sup>	
Tourism	2008	656	281	937	15,742	FTEs
Marine recreational <sup>3</sup>	2008	na	na	550	5781	FTEs
Recreational fishing	2010	na	na	81	na	
Aquaculture <sup>4</sup>	2008/2010	49	50	99	939	FTEs
Commercial fishing <sup>5</sup>	2010	41	na	41	1183	FTEs
Ports of Auckland	2008	113	143	257	2027	ECs
Cruise industry	2009	35	34	69	928	ECs
Sand mining	2010	na	na	10	100	FTEs

<b>Market values</b>	<b>Value added</b>  <b>+</b> <b>Input Output Analysis</b> <b>Impacts</b> <ul style="list-style-type: none"> <li>• Direct</li> <li>• Indirect</li> <li>• Induced</li> </ul> <b>Multipliers</b>	<b>Tourism</b> <b>Recreational Marine Industry</b> <b>Events</b>  <b>Aquaculture</b> <b>Port</b> <b>Cruise Industry</b>
	<b>Gross value of catch</b>	<b>Commercial Fishing</b>
<b>Non-market values</b>	<b>Hedonic modelling</b>  <b>Willingness to Pay</b>	<b>Property values</b>  <b>Recreational Fishing</b> <b>Marine Reserves - Goat Island</b>
	<b>Methodologies</b>	<b>Values /Activities</b>

# GDP Valuation: Ports

\$257 million/year =

\$113m direct GDP + \$143m indirect & induced  
("flow on").

*(Market Economics 2011)*

- Based on market revenue and input-output
- Ignores trade facilitation
- Ignores net effects on national economy

Covec 2008 had only \$44m flow-on so \$144m total

# GDP Valuation: Cruise Ships

\$69 million/year = half direct + half flow-on

\$40m passengers + \$21 m vessel + \$6m crew.

*(Market Economics 2010)*

- Based on market revenues and payments
- Volatile, but overall up-trend

# GDP Valuation: Rec. Marine

\$550 million/year = 0.8% of Auckland's total GDP

Turnover: 40% export, 43% domestic, 17% imports

*(Market Economics 2008 and ARC 2009)*

- Based on market revenues (estimated)
- Includes only direct impacts on marine sectors
- Boatbuilding and also equipment and services

Includes 17 marinas and Devonport naval base

Westhaven and Hobsonville are major clusters

# GDP Valuation: Aquaculture

\$99 million/year = half direct, half induced

\$64m Waikato + \$34m Auckland

*(ARC 2010, Sapere 2011 (HCDG))*

- Based on market revenues and input-output
- Auckland 80% of value added is from processing
- Auckland 85% of mussels processed come from other regions
- Waikato 60% of GDP effects are in other regions



# Valuation: Recreational fishing

\$81 million/year = 35% (=pop) x New Zealand  
Based on Average Willingness To Pay (AWTP)

*(Wheeler & Damaria 2001 and Lindsay et al 1999)*

- NZ Survey of AWTP, spend, fish caught, MWTP
- AWTP includes fish value plus total experience
- Fish value (MWTPMarginal)=12% of total AWTP
- Total **expenditure** is 4.6 x AWTP (???)

Adjusted to 2011 dollars; excludes rock lobster & blue cod

# Valuation: Recreational fishing (all NZ)

New Zealand, 1999	Value per fish kept/caught		Value on a per kilogram basis				Amount spent \$ <sub>2011</sub>	
	MWTP \$ <sub>2011</sub>	AWTP \$ <sub>2011</sub>	MWTP \$ <sub>2011</sub>	AWTP \$ <sub>2011</sub>	Total MWTP Value \$ <sub>2011</sub> m	Total AWTP Value \$ <sub>2011</sub> m	Per trip	Total annual expenditur e \$ <sub>2011</sub> m
Snapper	7.8	41.9	7.9	42.3	21.5	115.5	48.6	566.4
Kingfish	26.8	245.8	4.4	40.5	1.7	15.5	67.4	173.9
Blue cod	2.2	33.2	3.3	49.5	2.4	36.1	59.9	154.0
Kahawai	4.7	81.0	3.8	65.8	5.8	99.9	34.4	206.9
Rock lobster	8.9	65.6	13.5	99.3	4.2	31.1	69.9	220.3
<b>Total values</b>	—	—			<b>35.5</b>	<b>298.1</b>	—	<b>1321.5</b>

Source: Wheeler, S. & Damania, R., 2001.

# Valuation: Commercial fishing

\$41 million/year = \$36m exports + \$5m local

Export=revenue including processing,

Local=export price times 120%

90% by weight is exported (average all species)

*(Boyd 2012 (for NIFMC))*

- Snapper in HGMP 2275 tonnes/yr cf NZ 6400
- NZ snapper exports \$36.9 m
- Snapper exports \$10.39/kg; port price \$5.35

# Valuation: Commercial fishing

Hauraki Gulf Marine Park commercial fishing by species, 2010/11. *Boyd, 2012*

Species	Total catch (kg)	Port price/kg	Total landed value	Export value/kg	Total export value
Snapper	2,275,752	\$5.35	\$12,175,273	\$10.39	\$23,645,063
Trevally	446,768	\$1.75	\$783,184	\$9.10	\$4,065,589
Kahawai	345,026	\$0.41	\$142,496	\$0.97	\$334,675
Flatfish	175,846	\$3.20	\$562,707	\$9.61	\$1,689,880
Jack mackerel	173,169	\$0.20	\$34,634	\$1.20	\$207,803
Gurnard	135,875	\$2.15	\$292,539	\$9.38	\$1,274,508
John dory	113,413	\$6.66	\$755,671	\$12.44	\$1,410,858
All other species	1,102,573	2.30	\$2,560,268	3.00	\$7,584,616
<b>Total</b>	<b>4,700,000</b>	<b>3.80</b>	<b>\$18,000,000</b>	<b>8.50</b>	<b>\$40,000,000</b>

# Valuation: Tourism

\$937 million/year = \$656m direct + \$281m flow-on  
\$681m Auckland + \$255m Coromandel.

\$587m international + \$349m domestic tourists

*(AC, from Covec 2009 & Min Tourism 2009 & 2012)*

- GDP market impacts from nature based tourism
- Nature based tourists x average spend x GDP%
- Domestic & International x propensity (% nature)
- Domestic 22%, international 70% are nature

# Valuation: Sand Mining

\$10 million/year

Based on market revenues – rough estimate

*(Auckland Council from ARC 2007, Seafriends 2000)*

- $\$33/\text{m}^3 \times 0.15\text{m m}^3/\text{year} \times \text{GDP multiplier } 1 \text{ or } 2$
- Non-renewable, but enough for 200 years

Value could be much higher than market price

Still relatively trivial value

# Knowns & Unknowns

“Knowns”	Partially known	Unknowns/ Gaps
<ul style="list-style-type: none"> <li>• Port</li> <li>• Cruise Industry</li> <li>• Recreational Marine Industry</li> <li>• Aquaculture</li> <li>• Fishing :               <ul style="list-style-type: none"> <li>commercial</li> <li>recreational</li> <li>customary (partially)</li> </ul> </li> <li>• Tourism</li> <li>• Events</li> <li>• Marine Reserves (partially)</li> <li>• Mining</li> </ul>	<ul style="list-style-type: none"> <li>• Boating</li> <li>• Marinas</li> <li>• Transport/Ferries</li> <li>• Property values</li> </ul>	<ul style="list-style-type: none"> <li>• Navy</li> <li>• Environmental goods and services not yet accounted for</li> </ul> <hr/> <p><b>Out of the Scope of Phase 1</b></p> <ul style="list-style-type: none"> <li>• Option values</li> <li>• Existence values</li> <li>• Bequest Values</li> <li>• Cultural values</li> <li>• Social values</li> <li>• Spiritual values</li> </ul>

# Total Economic Value: what for?

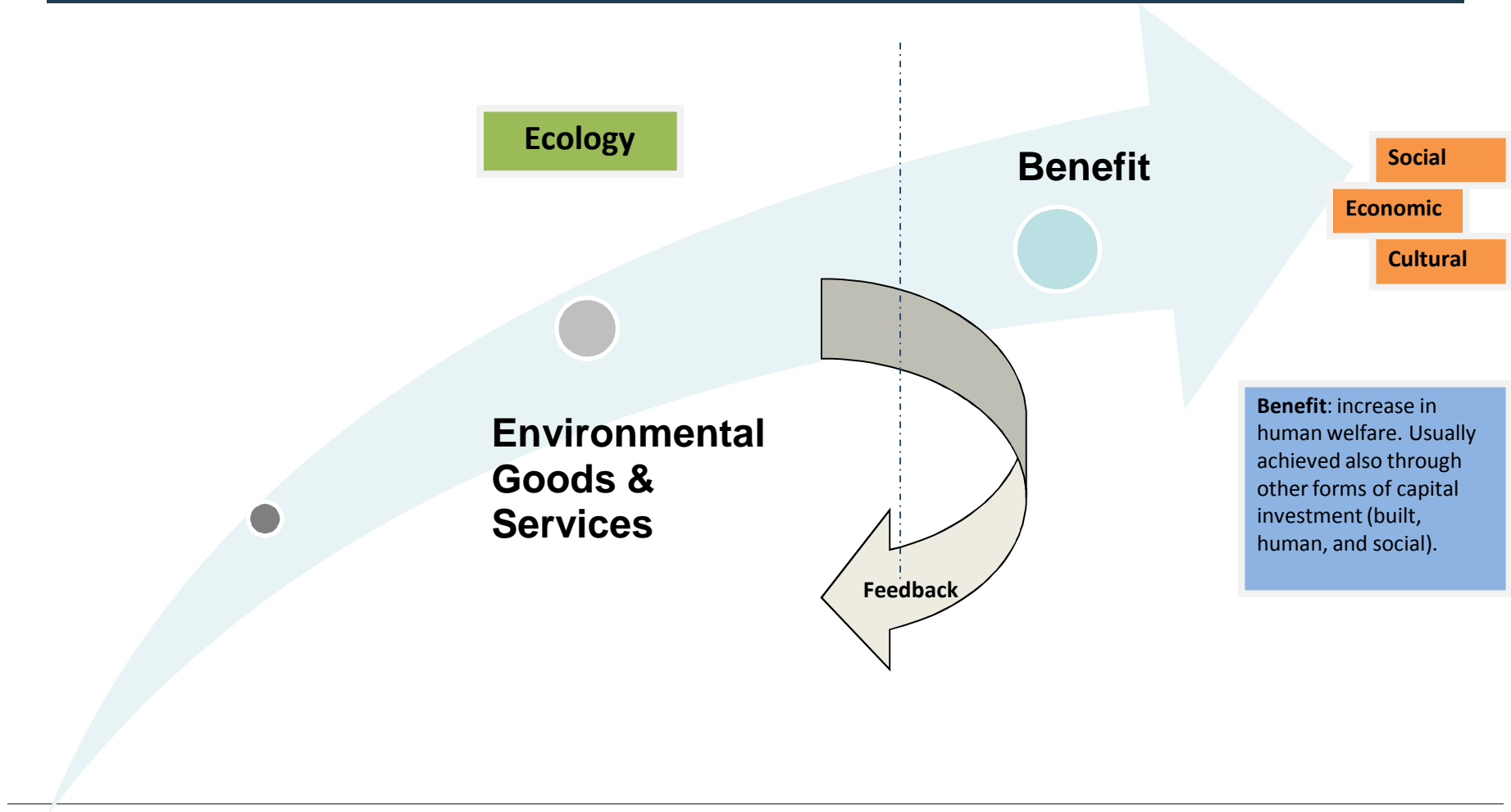
- affirm the economic relevance of the HG being the result of multiple values (econ/cult/soc/envir)
- recognise the relative importance of the different actors/benefits
- highlight the network that inter-relates these values
- contribute to the inter-Agency planning process for the HG
- assess incremental changes arising from a policy change



policy scenarios



# Linking Environment & Economy



# Linking Environment & Economy

Environmental Goods and Services		Benefits	Feedback
<ul style="list-style-type: none"> <li>Physical structure</li> </ul>	Shoreline and storm protection	port transport navy	partially extractive (dredging) invasive and exclusive
<ul style="list-style-type: none"> <li>Exhaustible resources</li> </ul>	Minerals and sand	mining	extractive, invasive and exclusive

# Linking Environment & Economy

Environmental Goods and Services	Benefits	Feedback
<ul style="list-style-type: none"> <li>Supporting goods &amp; services</li> <li>Regulating goods &amp; services</li> </ul>	commercial fishing	Extractive
<ul style="list-style-type: none"> <li>Provisioning goods &amp; services</li> </ul>	aquaculture	Non-extractive Invasive and Exclusive
	recreational fishing	Partially non-extractive
<ul style="list-style-type: none"> <li>Cultural goods &amp; services</li> </ul>	<ul style="list-style-type: none"> <li>recreational</li> <li>property values</li> </ul>	Non-extractive Partially invasive

# Activity requirements

