

# Valuation and the reconciliation of fisheries with conservation

---

Ussif Rashid Sumaila

Fisheries Economics Research Unit  
Sea Around Us Project  
Fisheries Centre  
University of British Columbia

[r.sumaila@fisheries.ubc.ca](mailto:r.sumaila@fisheries.ubc.ca)



**4<sup>th</sup> World Fisheries Congress, Vancouver, May 3-6, 2004**



# Outline of talk

- Is the economic theory of valuation adequate?
- Is the practice of valuation adequate?
- New emerging approaches.

# Theory of valuation

- Reconciliation of fisheries to conservation is all about **VALUES** and **VALUATION**
  - What are your values?
  - What do you value?
  - How do you value the ‘present’ and the ‘future’?
  - How do you value ‘here’ and there’?
  - How do you value market and non-market values?

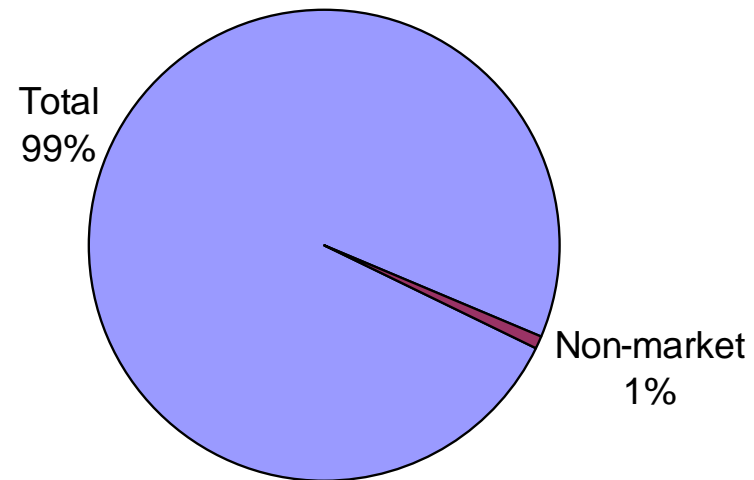
# Total economic value

- The economic theory of valuation calls for the computation of total economic values made up of both market and non-market values:
  - Direct use value;
  - Indirect use value;
  - Option value;
  - Existence value;
  - Bequest value.

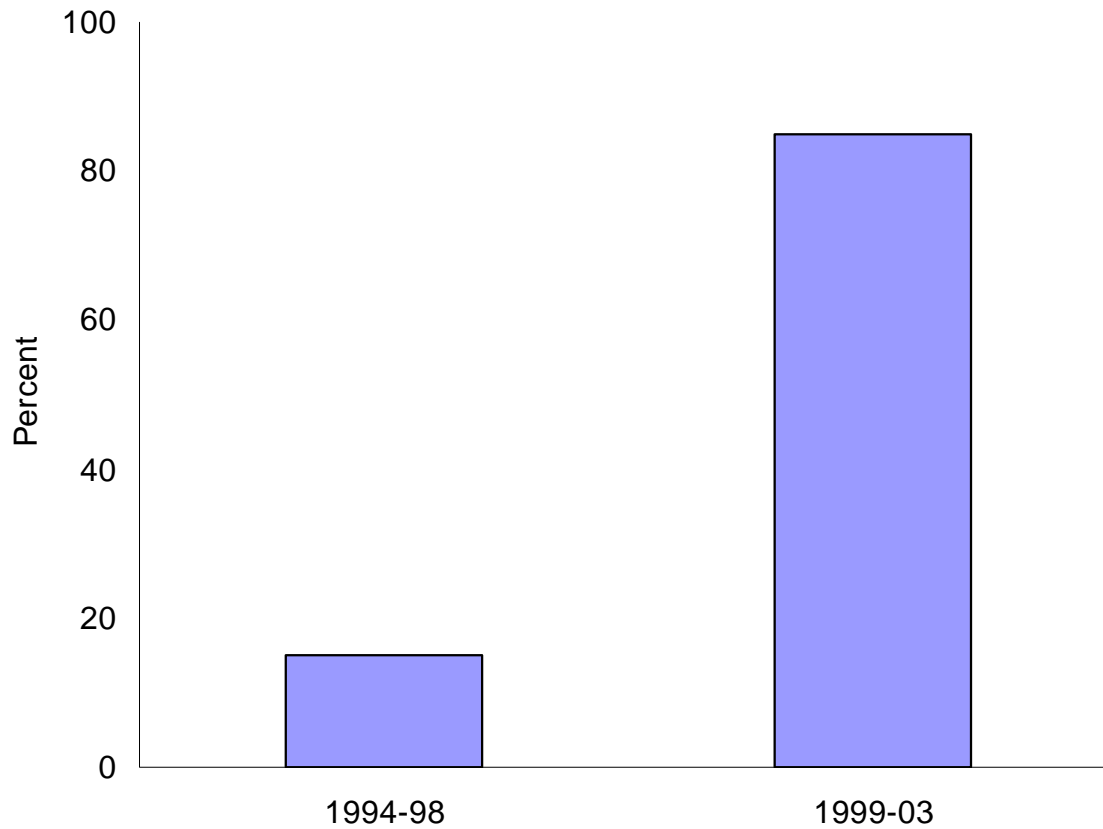
# The practice

- Survey of 9 leading Environmental & Resources economics journals:
  - the # of articles published: 1994-2003;
  - articles that contain the words ‘non –market’ or ‘existence value’ or ‘option value’ or ‘bequest value’
    - during the full period from 1994 to 2003;
    - during the period 1994-1998 and 1999-2003.

# Results from survey

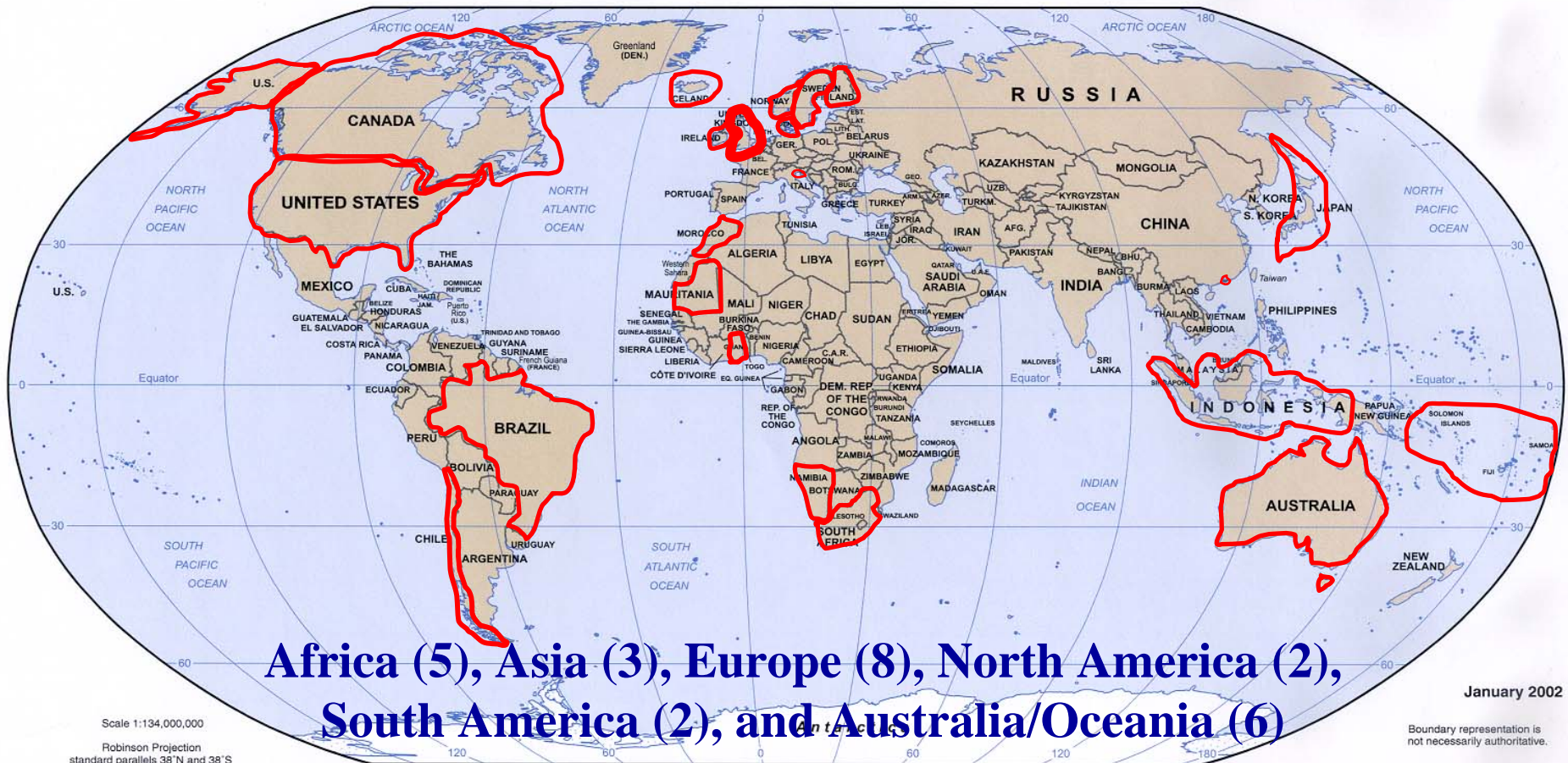


# Changing trends?



# Direct use values

## The Ex-vessel Price Database



January 2002

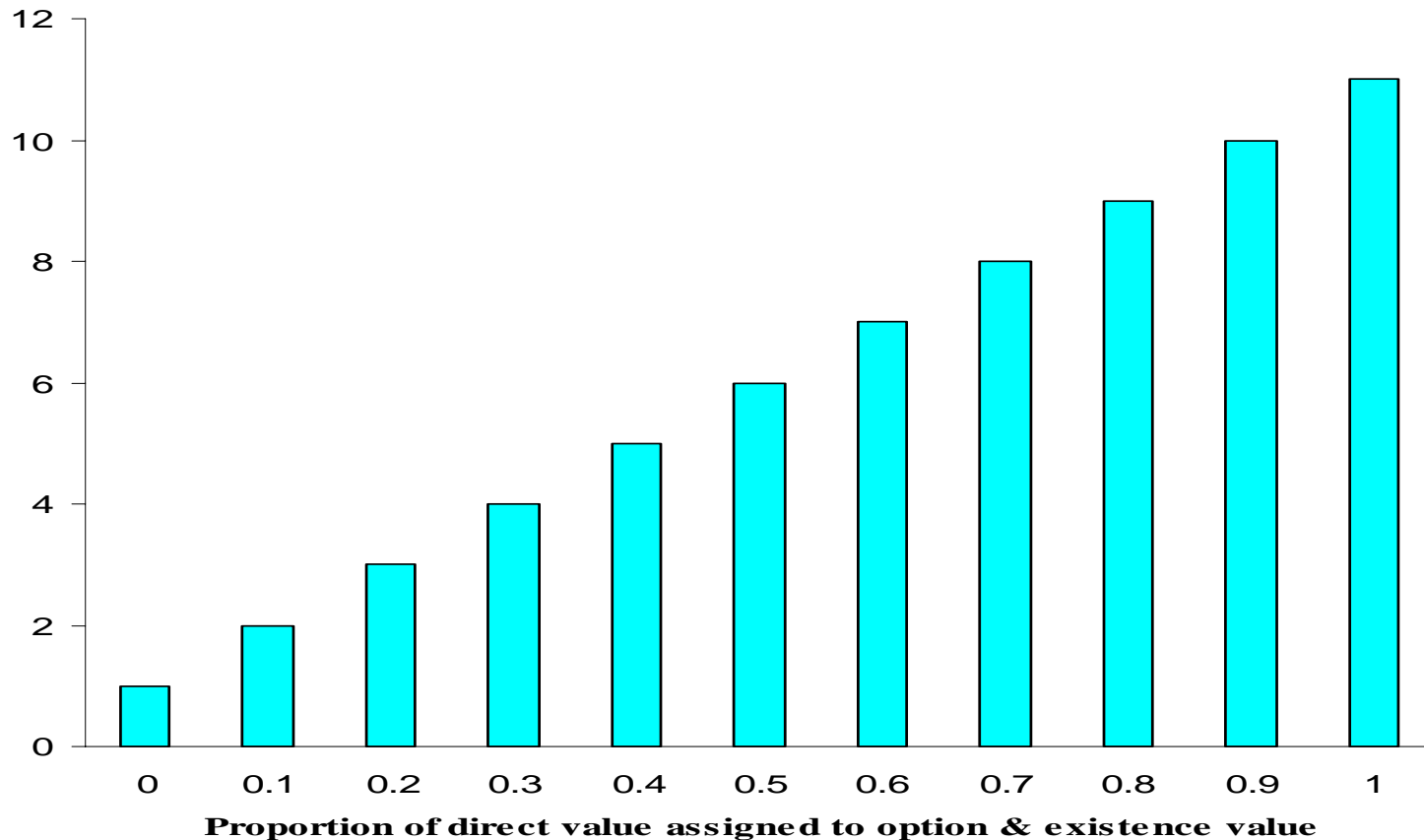
Boundary representation is not necessarily authoritative.

802804AI (R00352) 12-01

# Option and existence values

## A modified contingent valuation approach

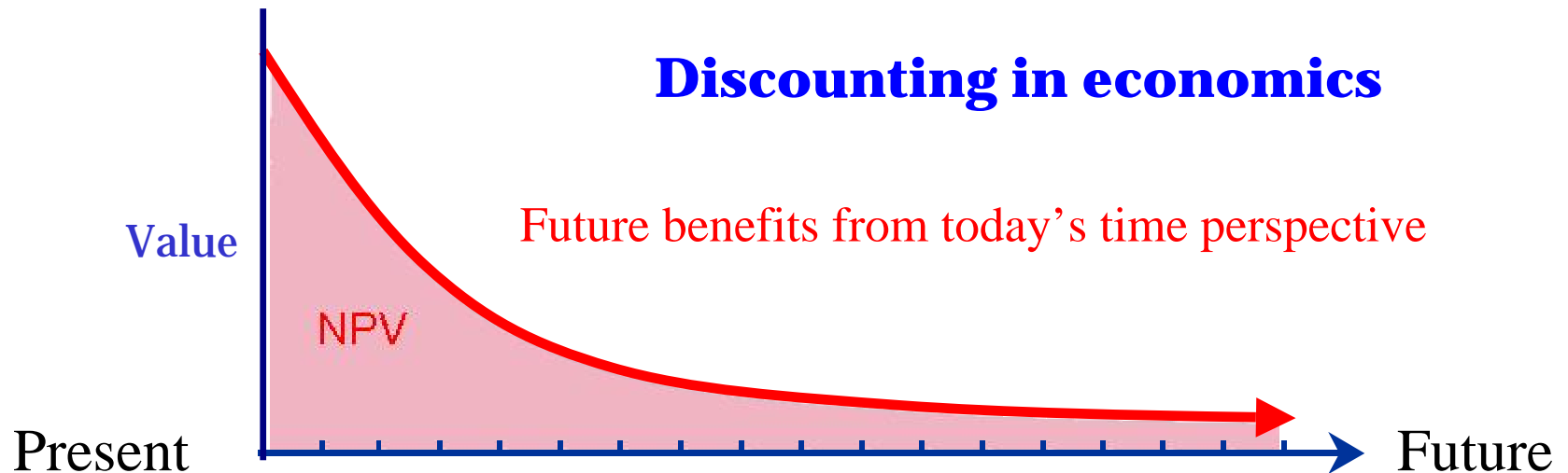
**Sum of normalized value  
(direct use +option+bequest)**



# Bequest value

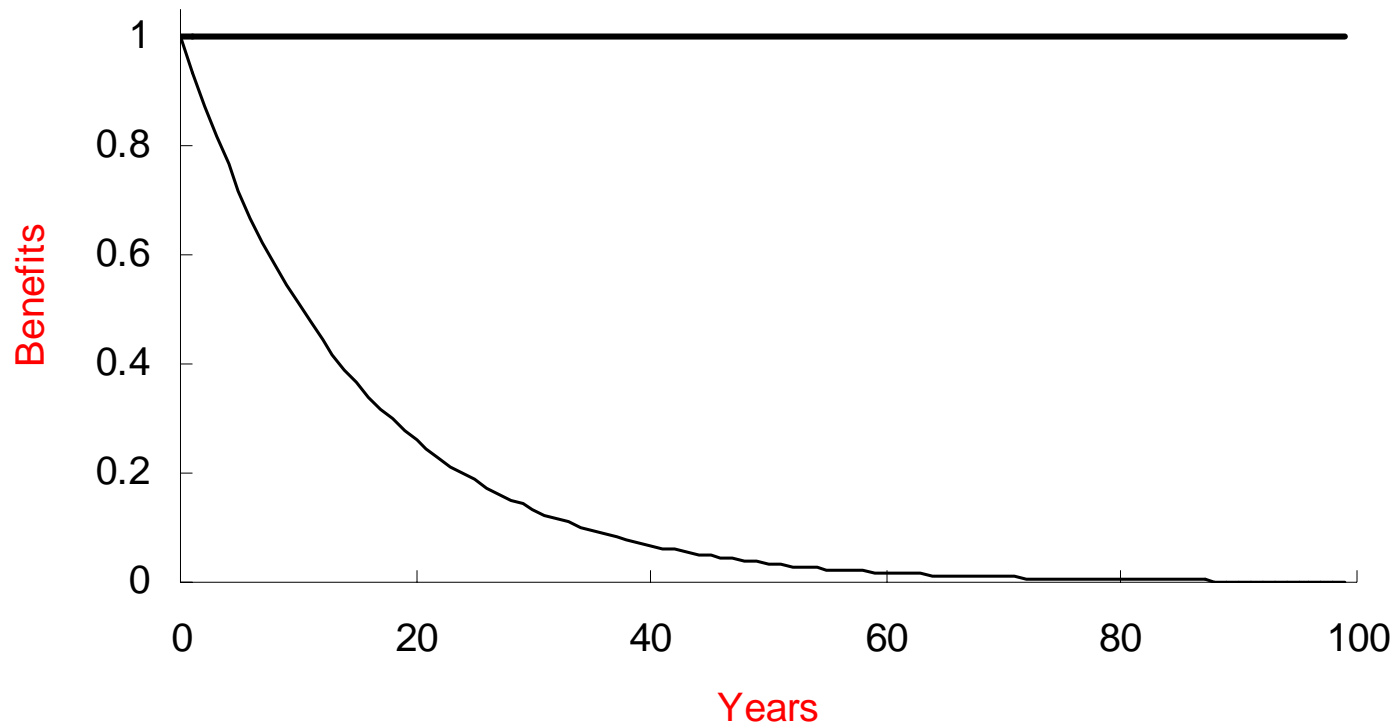
## Short-sightedness in valuation

“Egoism is the law of perspectives as it applies to feelings, according to which what is *closest* to us appears to be *large* and *weighty*, while size and weight *decrease* with our *distance* from things” Friedrich Nietzsche (1844-1900).



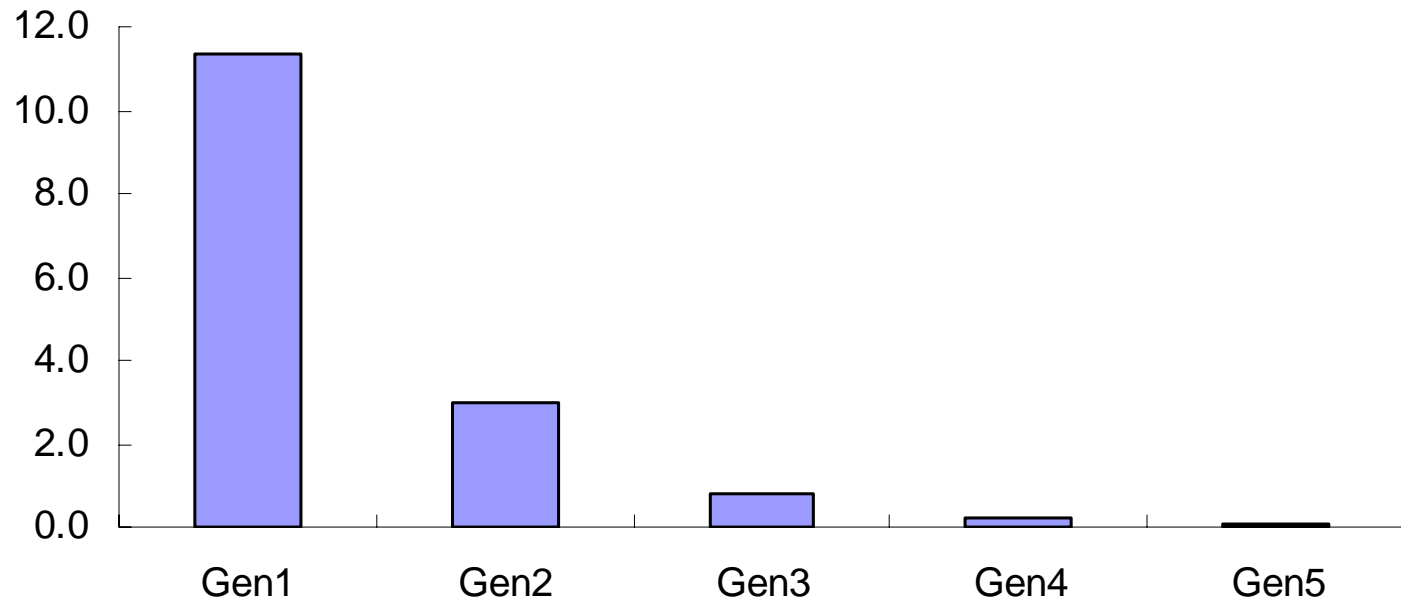
**Results in the urge to frontload fisheries benefits**

# Flow of 1 unit of benefit in current and discounted value (7% d.r.)



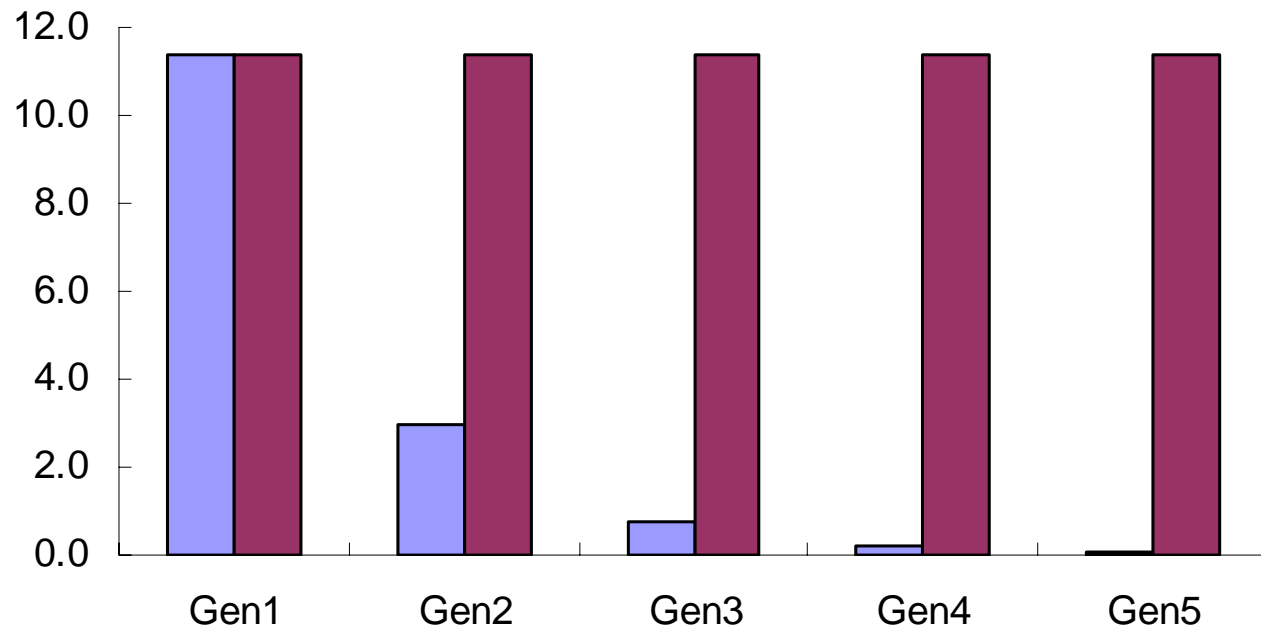
# NPV accruing to each of 5 generations of fishers within 100 yrs

Conventional discounting



# NPV accruing to each of 5 generations within 100 years

Resetting the discounting clock



# Inter-generational discounting equation

- Assumptions
  - Present generation discount flows of benefits at standard rate;
  - New generation of size  $1/G$  enters population each year: they discount at standard rate every year after entry;
  - Current generation as decision makers discount the interest of future generations at a ‘future generation’ rate at the time they enter the population.

<i>Year( t )</i>	<i>Present</i>	<i>Join yr 1</i>	<i>Join yr 2</i>	<i>...</i>	<i>Join year t</i>
<i>0</i>	<i>1</i>				
<i>1</i>	<i>d</i>	$\frac{d fg}{G}$			
<i>2</i>	<i>d<sup>2</sup></i>	$\frac{d d fg}{G}$	$\frac{d fg^2}{G}$		
<i>.</i>					
<i>.</i>					
<i>.</i>					
<i>t</i>	<i>d<sup>t</sup></i>	$\frac{d^{t-1} d fg}{G}$	$\frac{d^{t-2} d fg^2}{G}$	<i>...</i>	$\frac{d fg^t}{G}$

# The inter-generational CBA model

$$NPV = \sum_{t=0}^T W^t (V_t - C_t), \quad t = 0, 1, 2, \dots, T$$

where  $W = d + \frac{d_{fg} d^{t-1}}{G} \left[ \frac{1 - \Delta^t}{1 - \Delta} \right]$

and  $\Delta = \frac{d_{fg}}{d}$ ;  $G = \text{generation time}$

# Concluding remarks

- Theory is **broad enough** to help ensure that fisheries are reconciled with conservation;
- Problem is with the **practice**:
  - Computing direct use;
  - Determining & including non-use values into policy decision making;
  - Special care needed to capture bequest values;
- New approaches being developed to help **improve the practice** of valuation.

# Acknowledgements...

- Members of FERU
- OCEANA
- the SAUP and the Pew Charitable Trusts Philadelphia
- the BTF/CUS project

THANKS FOR YOUR ATTENTION

