How to conduct a Choice Experiment valuation survey

And beyond…

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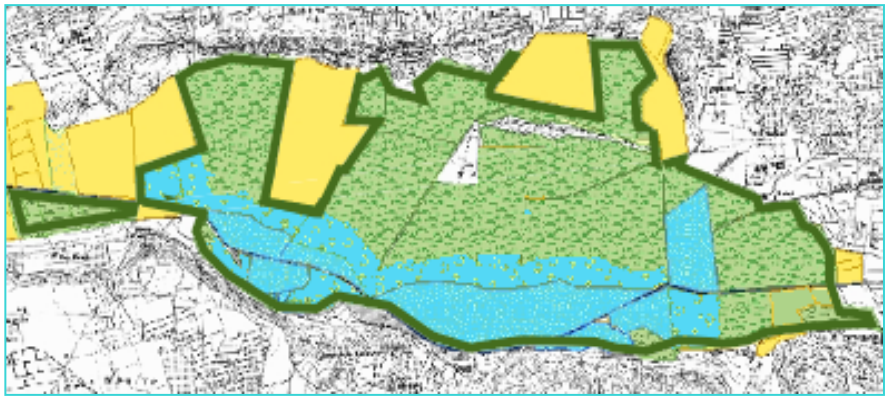
Plan…

- A choice modelling exercise
- Results
- Key take-home lessons
- Presentation of an actual case-study employing a Choice Experiment
- Other valuation methods that may be used in the same context, to replace or complement stated preference valuation.

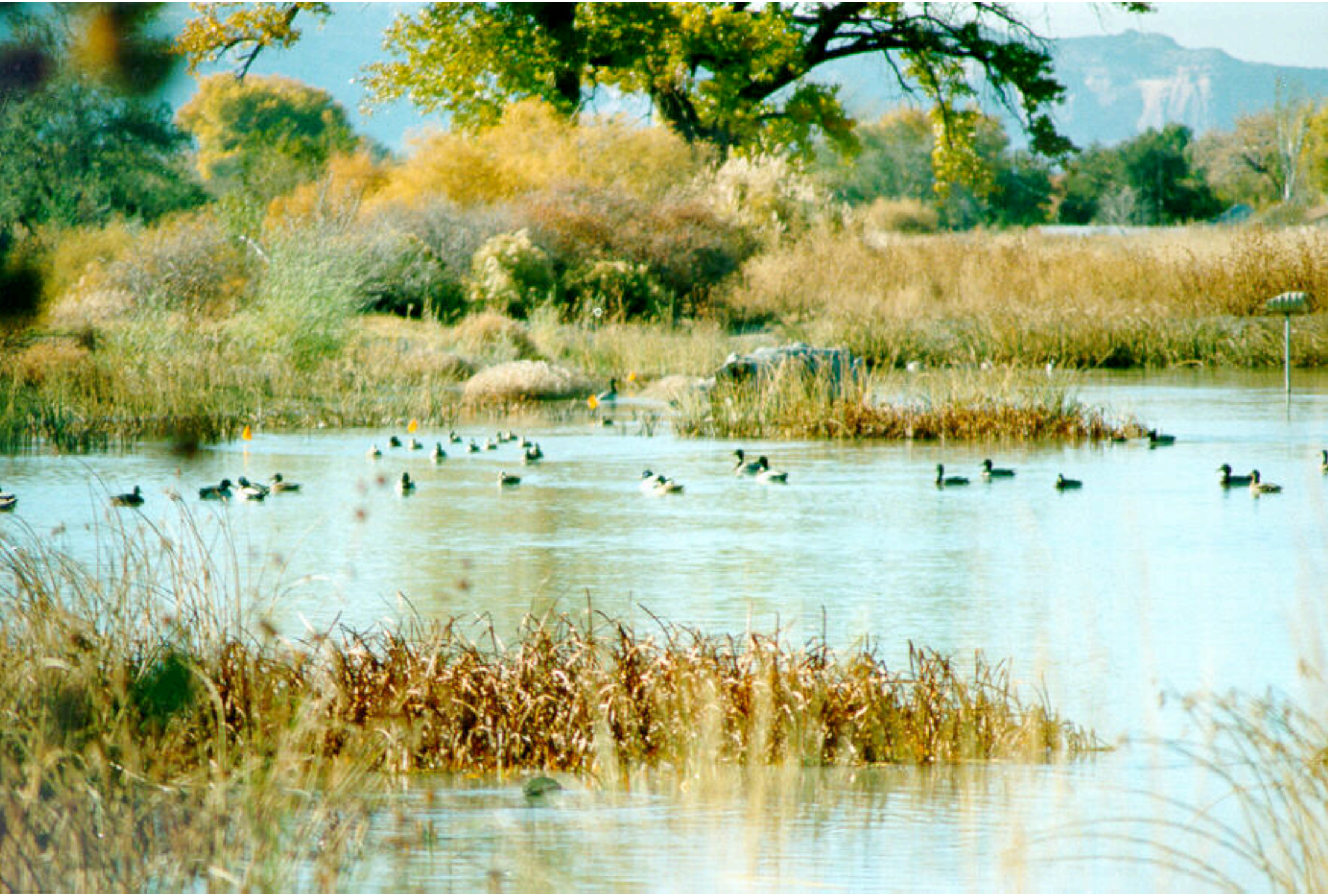
Assume that…a wetland nearby your home will potententially be restored

From **1/6th** of its original size

To 2/3rds of its original size (10 km^2)

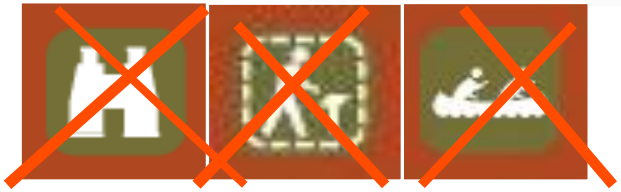


& you shall help decide - if the wetland is to be restored & - its management options.



Recreation and access

Status Quo: No access and little visibility.



Passive recreation: The visual experience of the restored wetland is enhanced with information signs and observation towers on a surrounding circuit.

Active recreation: There is access to the wetland, with board way walks, bicycling, kayaking and horse riding, facilities. Hunting and fishing is restricted to certain areas.

Biodiversity and land management

Agriculture, reed harvesting, hedgerows, access & disturbance, mosquito control…

<u>Status Quo - Low</u>: There is little change in the level of biodiversity in the valley.

<u>Medium</u>: The population of common and rare species of ducks, birds, insects, dragon flies, turtles and fish will increase.

<u>High:</u> The population of common and rare species of birds, insects, dragon flies, turtles and fish will increase a lot. Several rare bird species will with high likelihood return to the valley

The valuation scenario….

"We will now propose you to choose between different possible land use management options"

The land-use changes will be financed **by an increase in your municipal taxes** channelled to a wetland management fund, that will be exclusively dedicated to the overall management of the wetland.

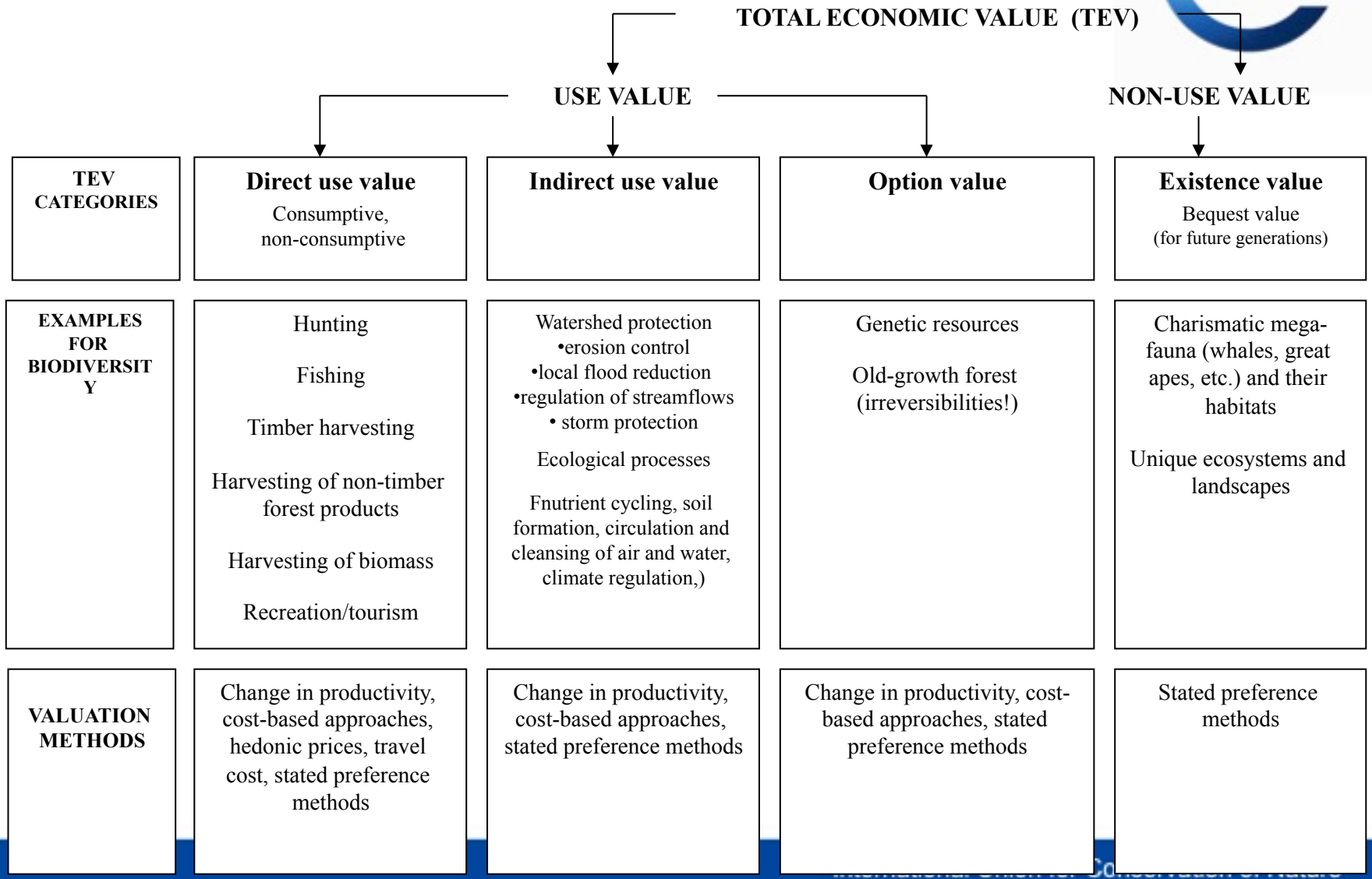
If you choose to conserve the present land use configuration (no wetland restoration, no rise in biodiversity, no access), there will be **no increases** in your municipal tax.

The valuation scenario….

Please connect your lab-tops to internet and go to the following URL:

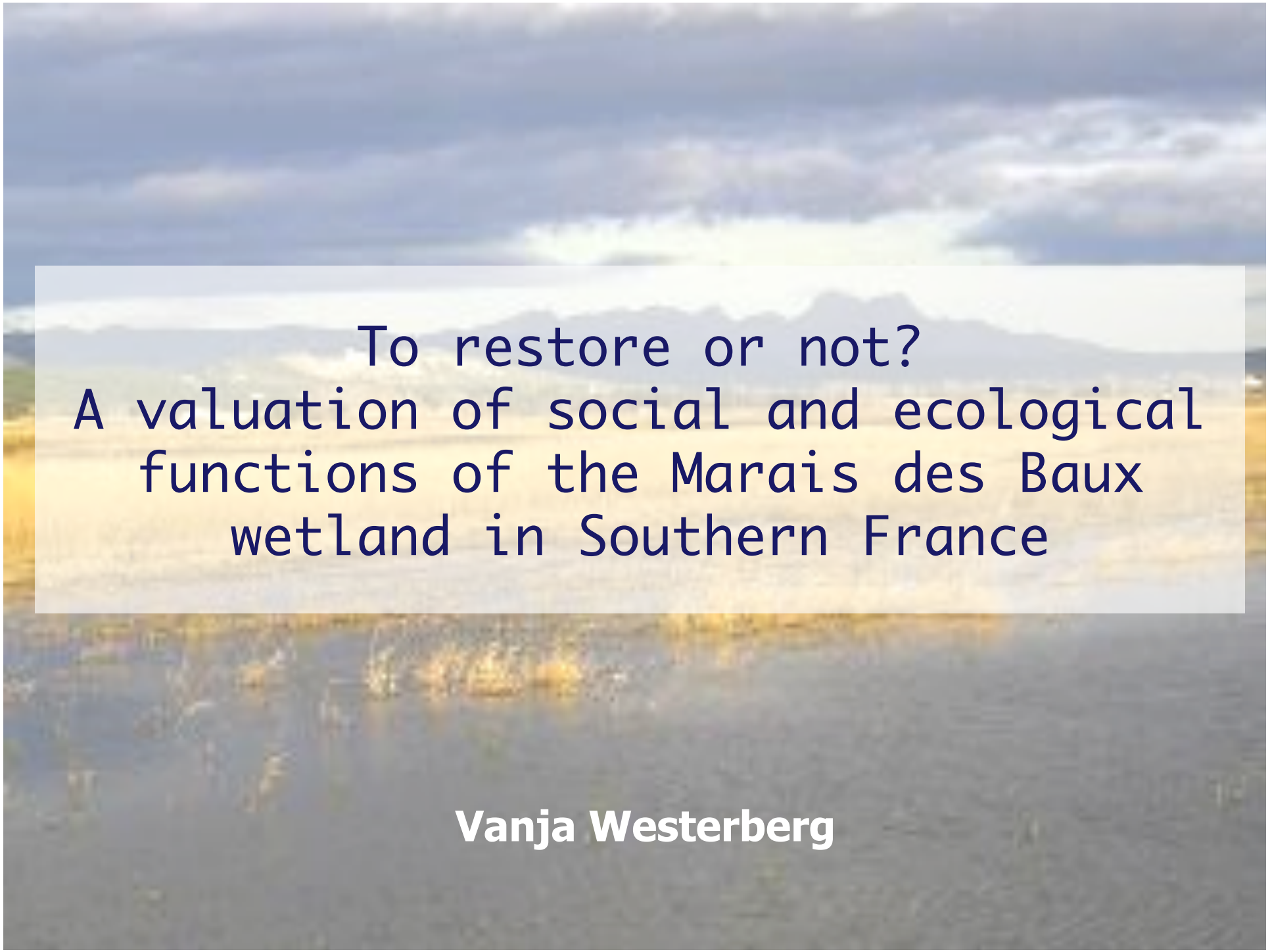
https://www.survey-xact.dk/LinkCollector?key=1J5Y52UXCP3P

Cost Benefit Analysis & Total Economic Value



Results

Lessons learned ?



To restore or not? A valuation of social and ecological functions of the Marais des Baux wetland in Southern France

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Ecological Economics 69 (2010) 2383–2393

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

To restore or not? A valuation of social and ecological functions of the Marais des Baux wetland in Southern France

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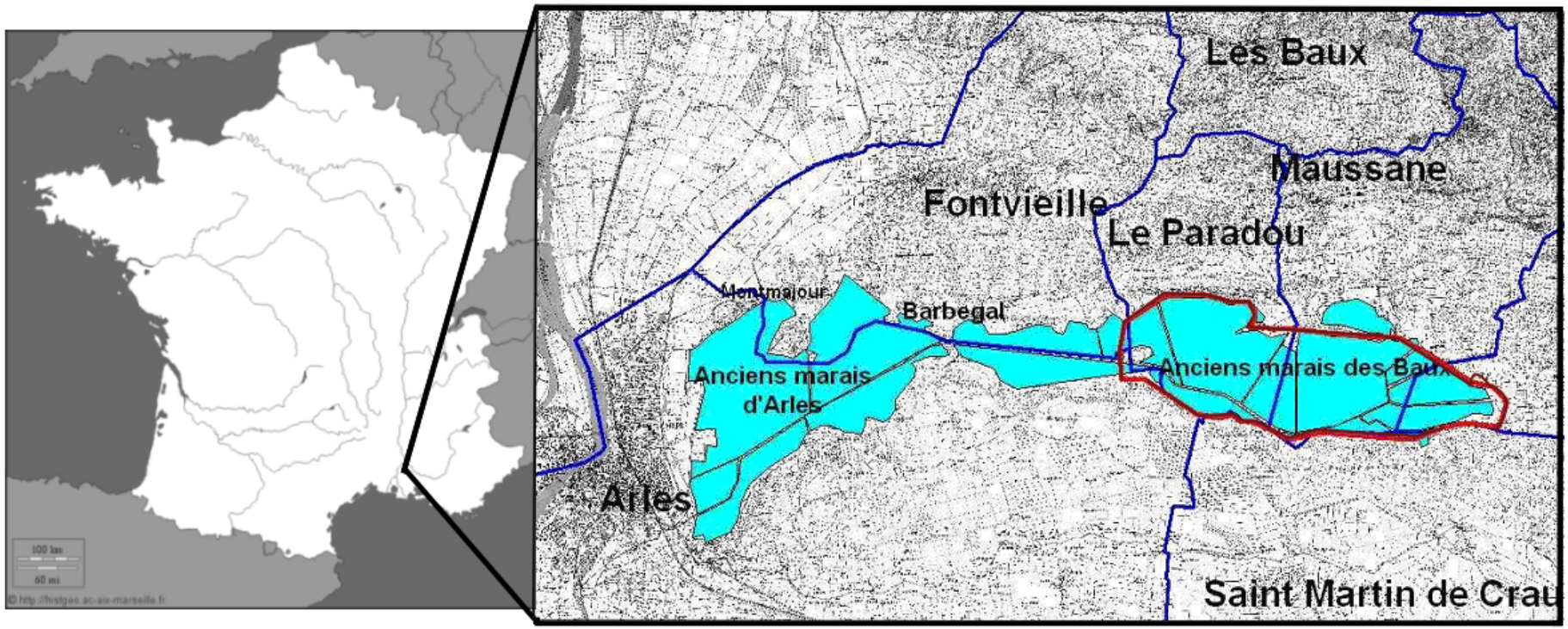
New horizons in the vallée des Baux ?

- Historical context



Drainage: 1642, 1843, 1950s-1960s

”Wetlands are useless, putrid and the men living there are pitifull victims”

Why restore ?

- A push towards wetland restoration
- Triggers
  - Flooding, decoupling of agricultural payments, drainage costs, environmental consciousness, water quality and scarcity, financial compensation schemes
- Constraints -cultural
- User externalities:
  - Reed harvesting – biodiversity, biodiversity - recreation, hunting – mosquitoes
- Positive externalities:
  - Kidneys of the landscape & biological supermarkets

The choice experiment

- Stated preference: Ex-ante + Use and non-use values
- CE:

  → The value of a good comes from the components of the good, not the good itself.

  → The disaggregating of values between different components of a land use setting

  → Ideally suited for defining policy priorities

The choice experiment

- Wellbeing is measured:
  - Compensating surplus:

$$WTP(q^0, q^1) = V(p, q^1,\ B - WTP\ ) - V(p, q^0,\ B)$$

- The compensating surplus equals the maximum amount of money that the indivial can give up after an increase in utility without being worse off than without the change

Questionnaire construction

- Formulation of the valuation problem
    - Identification of the attributes to be valued
    - FOCUS GROUPS
- Pre-testing of attributes and design
- Additional questions
- Pre-testing the draft questionnaire

The attributes should be capable of being understood…

Status quo - Few trees

OPTION WITHOUT WETLAND

OPTION WITH WETLAND

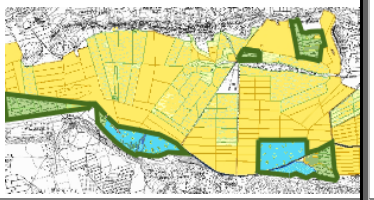
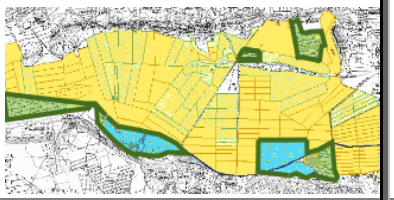
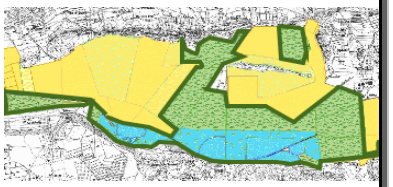
Some trees

Permitting a view of the Alpilles

- Credible and realistic to have incentive compatibility

Questionnaire design

- Use of the tailored design method (Dillman 2007)
- Choice set construction - Experimental design
  - Full factorial: $3^5 \times 6^1 = 1458$ management alternatives
  - Efficient fractional factorial: 18 management alternatives.

11	CURRENT STATE	ALTERNATIVE A	ALTERNATIVE B
Size of wetland	No restoration 	No restoration 	
Control of mystiques	No control 	 Chemical control	Natural control 
Access and recreation	Little observation, no protection and no facilities 		Observation et protection 
Biodiversity	Low 		
Hedges	Few 		
Increase in the municipal tax	**0**	**5 €**	**3 €**
YOUR CHOICE	☐	☐	☐

The sample

- 90 locals from surrounding villages (Arles, Tarascon et Salon) = 810 observations

- Face-to-face interviews

RESULTS

	RPL with attr interact		WTP
RANDOM PARAMETERS	Value	t-test	
Mosquito cntr chemical	-0.72	(-2.5)**	-21.0
Mosquito cntr chemical_SD	2.10	(-3.9)***	61.0
Medium Biodiversity	0.43	(1.9)*	12.5
Medium Biodiversity_SD	1.56	(-2.6)**	45.3
FIXED PARAMETERS			
ASC	0.18	(0.4)	5.1
Active recreation	0.81	(3.4)***	23.6
Passive recreation	0.71	(2.8)***	20.5
More hedges	0.98	(3.1)***	28.4
Most hedges	0.38	(1.4)	11.0
Moderate wetland size	0.71	(2.2)**	20.5
Advanced wetland restoration	-0.21	(-0.7)	-6.2
Mosquito cntr Nat	0.68	(2.1)**	19.8
High Biodiversity	-0.06	(-0.2)	-1.8
COST	-0.06	(-4.3)***	
Adv Wetland*Mosquito cntr Nat	0.98	(2.0)**	28.5
OBSERVED HETEROGENEITY			
High biodiversity*Green	1.05	(3.6)***	30.5
COST*Child	0.03	(2.9)***	
COST*MdBcare	0.03	(3.0)***	
Final log-likelihood:	-706.38		
Adjusted rho-square:	0.186		
Sample size	810		

Table 4: Compensating surplus for various management options	
SCENARIO	WTP per person per year
High impact management scenario (most preferred) • The wetland is restored to 2/3 of its original size • with natural mosquito control conducted, • There is an intermediate amount of hedges, • The area accommodates passive recreation • Biodiversity is managed at its intermediate level.	**107 €**

Conclusions and research challenges

- There are significant welfare benefits to society from land use and landscape changes in Marais des Baux
- If biodiversity is a policy priority - there may be a real case for public awareness raising campaigns, in a Mediterranean biodiversity hotspot.
- The biodiversity result: raises fundamental questions regarding the use of stated preference methods. What do people actually understand by "more birds, fish, insects, etc?"

Research challenges

- It is people's perception of a good's characteristics that influences their preferences, not necessarily the goods objective characteristics (Ghermandi A., et al 2007)…

Questions on validity

- Scope sensititivity / value expressive motives
- Warm glow – yeah saying behaviour
- Right/wrong responses
- Fair price behaviour
- Strategic biases
- Incentive compatibility?

Comments and Questions ?

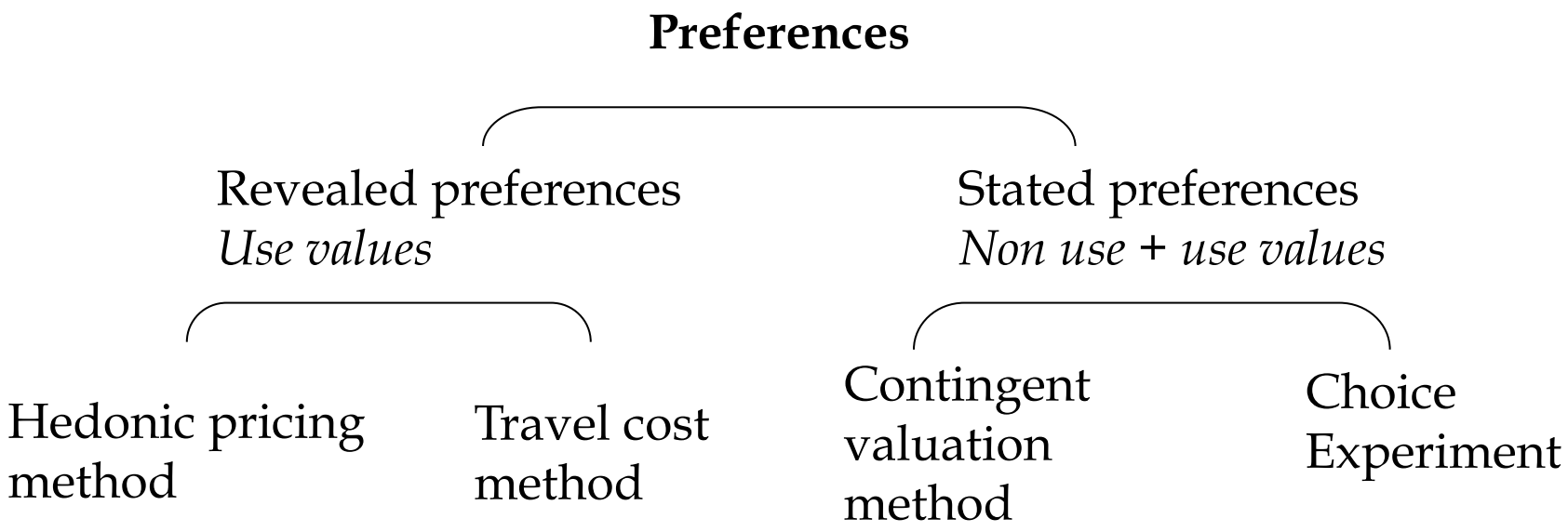
A CBA of wetland restoration

Split up into groups

Total Economic Value

- Cost side
  - Foregone agricultural revenues
  - Restoration costs
- Benefit side
  - Water purification
  - Aquifer replenishment
  - Reduced risk of flooding
  - Reduced pumping & dike maintenance costs
  - New opportunities for fishing and hunting
  - Landscape amenities

Brief recall



& market price and cost based methods (damage cost avoided, replacement cost)

Valuing benefits

- Assume we know with accuracy (thanks to InVEST) :
- That groundwater quality in the valley improves, and to what extent – what method(s) could you use to value such improvements?
- That wetland restoration replenishes the underground aquifer – how can you put a value on the quantity of freshwater generated?

Valuing benefits – your inputs

- …Hints: Avoided cost, replacement cost, price-based measures, production function…
- Discussion
- Answers

Valuing benefits

- Reduced risk of flooding
  - Possible valuation methods?
- New opportunities for fishing and hunting (commercial / recreation)
  - Possible valuation methods?
- Landscape and amenity value
  - Possible valuation methods?
- For all cases, distinguish between methods that can be used ex-ante versus ex-post any policy invigoration.

Valuing benefits – your inputs

- Hints: stated preference methods, travel cost method, hedonic pricing method, benefit transfer….
- Discussion
- Advantages and disadvantages of using stated preference valuation methods.
- Answers

NPV, positive or negative?

$$NPV = \sum_{t=0}^{T} (B_t - C_t)/(1 + r)^t$$

- B_t : Landscape amenities, biodiversity, water purification, aquifer replenishment, recreation, etc..
- C_t : Costs of restoration and forgone agricultural revenues (less public subsidies).
  - Over the life-time of the project