

## Acknowledgements

The results that contributed to this work have been funded by the LIFE Programme of the European Commission under the Grant Agreement LIFE14 ENV/IT/000514 (LIFE FutureForCoppiceS, “Shaping future forestry for sustainable coppices in Southern Europe: the legacy of past management trials”).

## BACKGROUND

The maintenance and restoration of forest have been characterized by high costs but the only function of forest that generates income is the timber production. Often, due to the negative economic balance, a lot of areas are abandoned. At the same time, the other non-market functions related to forest are missing.

## AIM AND METHODS

This work analyzes, from economic point of view, three typical forest management approaches in Tuscany region:

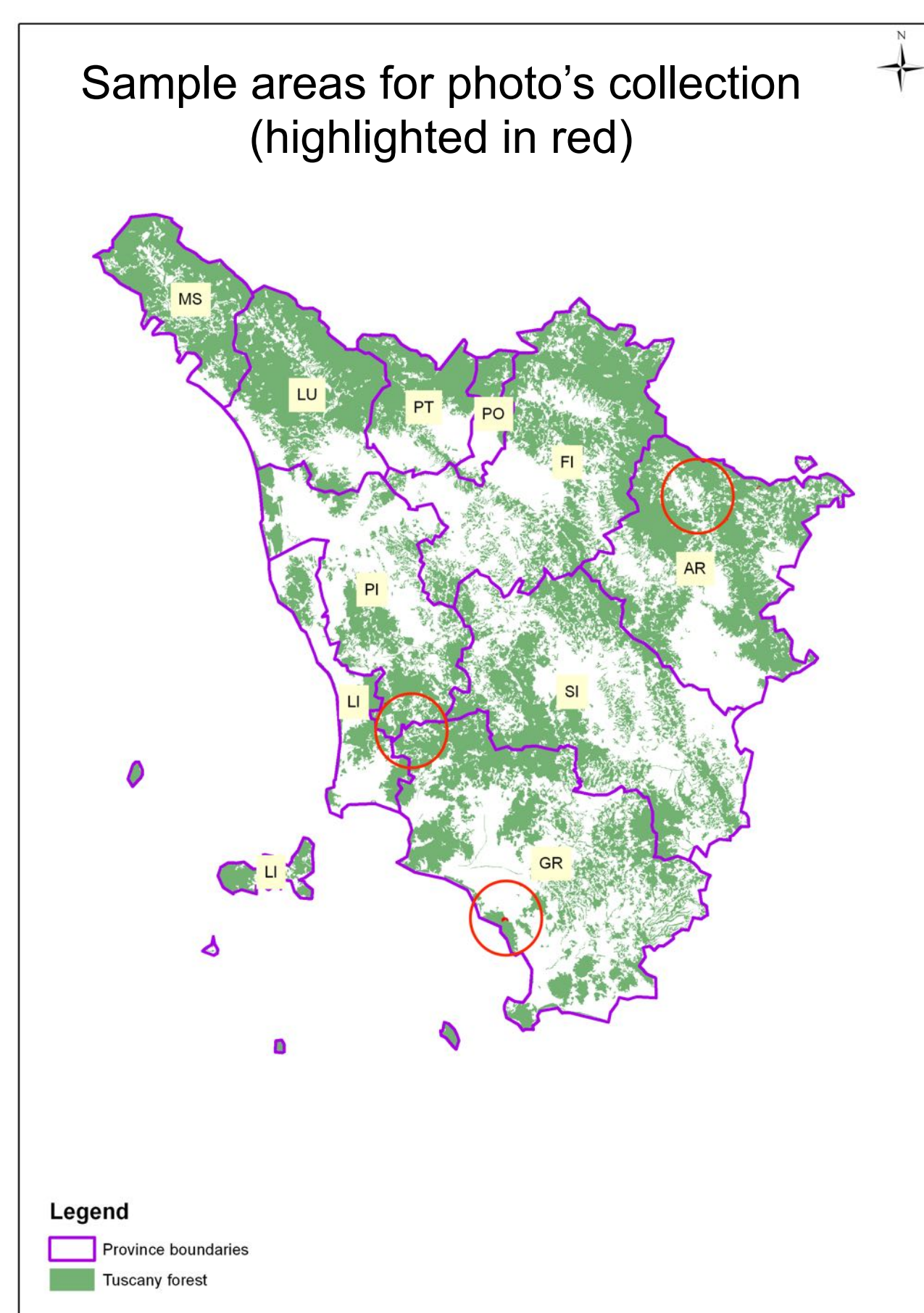
- coppice;
- active conversion to high forest;
- natural evolution of forest.

The preservation of forests, through the three type of management listed above, could allow to maintain the ecosystem functions of the forest, in particular the one related to recreation. 248 questionnaires have been performed with the aim of evaluating the recreational aspect of forest. Each interview has provided a willingness to pay (WTP) for maintenance of forests in the region of Tuscany. Using a monetary range of WTP, a revised price list method (PL) by adopting a payment card (PC) in the second stage has been conducted.

Considering that the elicitation of WTP uses a monetary range, the data elaboration has based on *Random Effects Interval Data Regression models*.

By using photos collected in sample areas in Tuscany, each interviewed have provided his willingness to pay for the maintenance of forests through the forest management approaches. Requested amount was formalized through a supplement to income tax at regional scale.

Present work aims to test which socio-demographic variables of respondents could influence the WTP for each forest management approach examined.



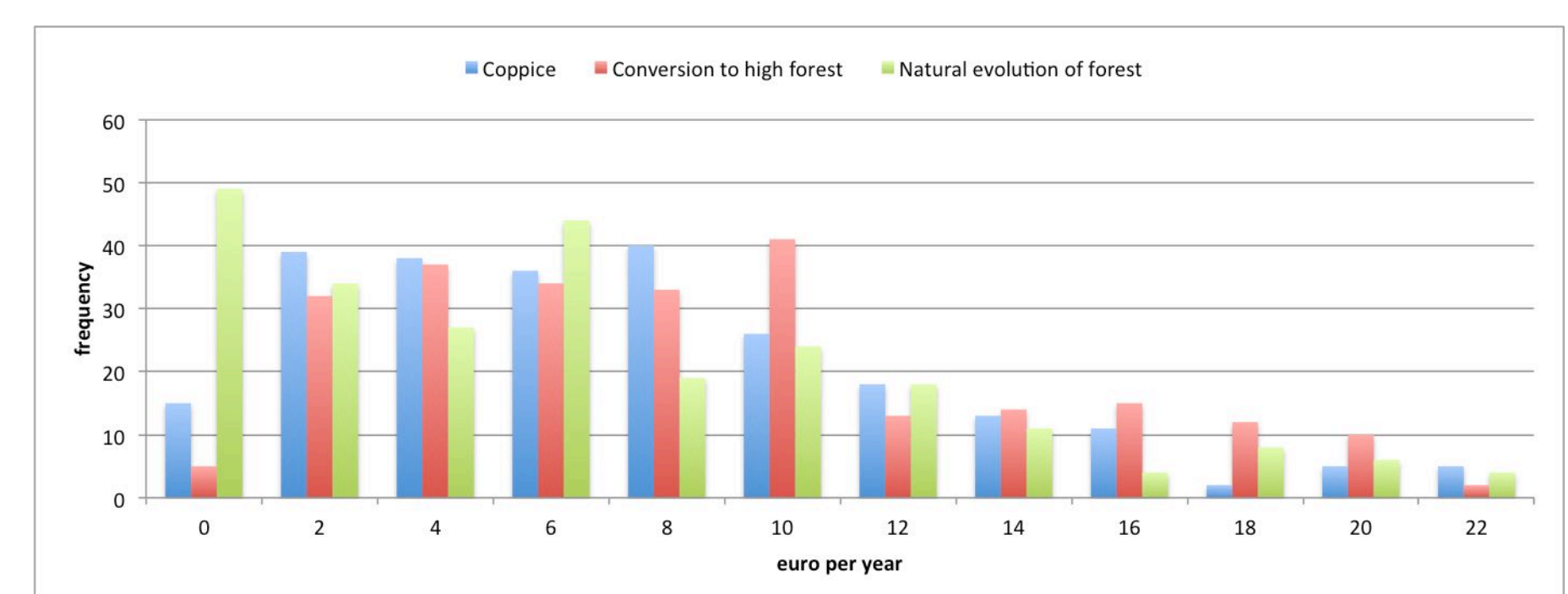
## RESULTS

The results showed that significant differences occurred between WTP values for coppice and evolution to high forest and between coppice and natural evolution of forest ( $p < 0.05$ ).

Highest WTP has been revealed for conversion to high forest (7.85 €/year per person). WTP for coppice and natural evolution are respectively 6.47 and 4.99 €/year per person.

Eight combinations have been tested: 4 socio-demographic variables and two forest management approaches (coppice was sets as baseline approach). Only two combinations were significant predictors of WTP: educational degree and gender.

In both cases, the significance concerns the conversion to high forest, that is particularly appreciated from aesthetic point of view: this probably because, conversion to high forest is the management least affected by cutting (as opposed to coppice management) and by abandonments effect that make it an impenetrable bush (as opposed to natural evolution).



Frequencies of WTP

Variable	Description	Mean	SD	Variables	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Age	1 = 18-35 years old; 2 = 36-50; 3 = 51-65; 4 = >65	2.02	1.01	conversion	1.4844	0.3517	4.2200	0.0000*	0.7950 2.1737
Gender	Dummy variable 1 = male; 0 = female	0.54	0.50	natural	-1.3836	0.3565	-3.8800	0.0000*	-2.0823 -0.6849
Educational degree	1 = primary school; 2 = secondary school; 3 = high school; 4 = master of science or above	3.01	0.64	age_conversion	-0.6341	0.7045	-0.9000	0.3680	-2.0149 0.7468
Occupation	1 = student; 2 = retired; 3 = housewife; 4 = employee; 5 = freelance; 6 = unemployed	3.08	1.66	age_natural	0.7229	0.7114	1.0200	0.3100	-0.6714 2.1172
Typical landscape	Likert scale from 1 = less appreciated to 5 = very appreciated	3.27	1.10	gender_conversion	-0.8523	0.4050	-2.1000	0.0350*	-1.6460 -0.0586
Agricultural and forest landscape	Likert scale from 1 = less appreciated to 5 = very appreciated	3.95	1.01	gender_natural	0.7557	0.4101	1.8400	0.0650	-0.0481 1.5595
WTP	Values in the payment card (interval values from 0 to 22 euros per year)	6.52	5.66	edu_conversion	1.2849	0.5381	2.3900	0.0170*	0.2301 2.3396
				edu_natural	-0.9121	0.5478	-1.6700	0.0960	-1.9857 0.1615
				occu_conversion	-0.0902	0.4256	-0.2100	0.8320	-0.9244 0.7440
				occu_natural	-0.1355	0.4315	-0.3100	0.7530	-0.9812 0.7102
				_cons	6.3705	0.2969	21.4600	0.0000*	5.7886 6.9523
				/sigma_u	4.0973	0.2445	16.7600	0.0000*	3.6181 4.5765
				/sigma_e	3.7853	0.1488	25.4400	0.0000*	3.4937 4.0770
				rho	0.5395	0.0378			0.4652 0.6125
				Log likelihood	1637.5868				
				Wald chi2 (10)	61.01				
				Prob > chi2	0.0000				
				Obs	744				
				Groups	248				

Descriptive statistics of variables

Random Effect Interval Data Regression  
(\*statistically significant at 0.05 level)

## CONCLUSIONS

The aim of this work is to test which socio-demographic variables of forest' users could influence their WTP for forest management approaches: research is based on the assumption that adopting the three type of management listed above, it is possible to guarantee the preservation of forests and consequently, to maintain their recreational function.

Many people attend the forest for different recreational reasons (hiking, mountain biking, hunting, etc.), so it is important to analyze whether the obtained WTP is influenced by the socio-demographic characteristics of users. The present study provided important new insights into human preferences for aspects of different forest management approaches and can be used in territorial planning processes with the aim to help stakeholders to better analyze the correlation between environment and human characteristics and activities.