Scientific support service for monitoring project impacts, as provided for in Action D4 of the LIFE19 NAT/IT/000851 project – LIFEEL "URGENT CONSERVATION MEASURES FOR CRITICALLY ENDANGERED POPULATION OF EUROPEAN EEL (Anguilla anguilla) IN PO RIVER BASIN"

FINAL REPORT

EU LIFE Biodiversity Project

LIFE19 NAT/IT/000851

Università
degli Studi
di Ferrara

Summary

1. BACKGROUND AND AIM OF THE RESEARCH....1
2. BIODIVERSITY AND CULTURAL ECOSYSTEM SERVICES ALONG THE PO RIVER....2
3. FISHERMEN'S INTERACTIONS WITH EELS 11
4. EEL'S ROLE IN THE FOOD INDUSTRY OF THE PO RIVER'S DELTA.... 13
5. PUBLIC PERCEPTION AND ACCEPTANCE OF THE LIFEEL PROJECT 16
6. IMPLICATIONS FOR THE MANAGEMENT AND CONSERVATION OF EELS.... 18
7. GREEK CASE STUDY 19
8. KEY MESSAGES 27
9. SUPPLEMENTARY 28

1. BACKGROUND AND AIM OF THE RESEARCH

In line with the provisions of Action D4, the scientific support activities for monitoring project impacts aim to verify the effects of the project's conservation actions *(*"*conservation actions*") on the local socio-economic sector and on ecosystem services. The activities carried out during the study period, under the scientific supervision of the Ecology Group at the University of Ferrara, adhered to the timetable and procedures set out in the technical proposal, which included:

- Verification of the effects of the "*conservation actions*" on the local socio-economic sector

- Verification of the effects of the "*conservation actions*" on ecosystem services

Following a preliminary review of the scientific literature and available methodologies, it was considered appropriate to adopt a strategy based on the distribution of structured questionnaires to residents and tourists, fishermen, restaurant owners and customers. This decision was motivated by the impossibility of measuring direct short-term conservation effects on the species, as a direct estimation of the effects of conservation actions would not be methodologically robust, given the ecological timescales required for the implemented measures to produce measurable effects on eel stocks and, therefore, on the associated ecosystem services and socio-economic benefits.

On the other hand, the use of questionnaires proved to be the most suitable method for the objectives of Project Action D4, as it was effective in identifying the social, cultural and economic preferences of various stakeholders, whilst integrating these with the perceived natural values along the entire length of the River Po and its catchment area.
In this scenario, the questionnaires were not designed as a tool for directly quantifying the socio-economic and cultural impacts of conservation measures, but rather as a means of analysing the current state of public perception, knowledge and attitudes among residents and tourists regarding the naturalness of the River Po, the biodiversity and the conservation theme, as well as the LIFEEL project itself.
This approach also makes it possible to establish a baseline of knowledge (perceptual baseline), which is useful for interpreting and contextualising the potential effects of the project's actions in the medium to long term.
Two types of questionnaire were therefore prepared and distributed:

Biodiversity and cultural services questionnaire: designed to study the general public's (city residents and tourists) perception of biodiversity and cultural services along the course of the River Po and its catchment area, investigating the symbolic significance of the eel compared to other species as a provider of cultural services. The approach was designed in accordance with the methodology proposed by Ruedisser et al. (2019)[1]. It also includes an additional section for fishermen. With the aim of obtaining a representative sample of the entire river course, dissemination took place via:

i) publication on the LIFEEL project website

[1] Rüdisser J., Schirpke U., Tappeiner U. (2019). Symbolic entities in the European Alps: Perception and use of a cultural ecosystem service. *Ecosystem services*, 39, 100980. Doi: https://doi.org/10.1016/j.ecoser.2019.100980

ii) email/mailing list comprising public authorities (municipalities, parks) and private organisations (sport fishing and non-sport fishing associations, sailing and rowing clubs)

iii) hard copy distribution (see Annexes S1 and S2), to enable their distribution at local events, including through the use of interviewers

iv) posters with QR codes (see Annex S3) linking to a designated web page.

Catering questionnaire: to evaluate the role of eel in the catering sector in the Po Delta and the associated perception among restaurant owners and customers. In this case, the survey was conducted exclusively via printed questionnaires, as this was considered the most effective method for reaching these stakeholder groups, and was limited to the Po Delta area.

Both types of questionnaire include a section on the profiling of the respondent and a section on their knowledge of the project and their interest in biodiversity conservation. The former will enable the observed preferences to be linked to the individual characteristics of the respondents, whilst the latter will provide an assessment of the general perception of the project and of public support for conservation efforts, key elements for the success and sustainability of the initiatives. All data has been digitised into separate datasets by questionnaire type for further statistical analysis.

The questionnaire surveys yielded **717 respondents** for the version on biodiversity and cultural services and **269 respondents** for the version on catering, resulting in a total of **986 respondents**.

The specific aims of the analysis, the characteristics of the sample of respondents and the analysis of the results are reported below.

2. BIODIVERSITY AND CULTURAL ECOSYSTEM SERVICES ALONG THE PO RIVER

The questionnaire on biodiversity and cultural ecosystem services was designed to describe perceptions of the natural character of the River Po and its catchment area, as well as the role attributed to biodiversity, with particular reference to the european eel, in the provision of cultural ecosystem services. The main objective was to build up a comprehensive picture of the current perceptions of residents and tourists, which would be useful for interpreting the indirect and potential effects of the conservation actions envisaged by the LIFEEL project.

The questionnaire was divided into several thematic sections, designed to investigate:

- **River naturalness and biodiversity:** Perceptions of the state of naturalness of the River Po along its entire course and the perceived importance of river biodiversity, including native and non-native animal and plant species, with a particular focus on identifying any symbolic, identity-related and cultural role played by the european eel compared to other species
- **Human-environment relationship and ecosystem use:** Forms of interaction with and use of the river environment in its various aspects, aimed at estimating cultural ecosystem services

In accordance with the proposed methodological approach, the analysis was not limited to the single target species, but included an implicit comparison with other animal and plant species, with a view to assessing the eel's position within the collective imagination and the system of cultural values associated with river ecosystems. This approach has highlighted the role of the eel as a potential symbolic species and as a key element in the perception of the cultural ecosystem services provided by the River Po.

Respondents were recruited from various sources, including nature parks, universities, local events and other outreach channels (Fig. 1). This distribution reveals a highly diverse sample, with a significant proportion of participants coming from public events and non-institutional channels ("Other"), thereby complementing the information gathered from nature parks and universities. This variety of channels ensures that the sample is more representative of the different contexts within the Po basin, which is useful for analysing the perception of biodiversity and cultural services by a heterogeneous audience.

Tab. 1 reports the profile of the **717 respondents**. The sample has an average age of 45 and a median age of 47, in line with the italian population (average 48.4-48.7 and median 48.7, according to EUROSTAT data).
Likewise, the proportion of graduates and postgraduates (33.2%) is consistent with national figures (~32%, OECD data). However, it should be taken into account that there may be a systematic bias towards more educated respondents, which is common in surveys conducted online or through organisations and associations.
Regarding the respondents' employment status, certain categories, such as students, are slightly over-represented, due to a preferential recruitment channel targeting students on courses at the University of Ferrara (which also contributes to lowering the average age of the sample). It should be noted that categories with fewer than five respondents have been grouped under the heading 'Other'. The geographical distribution of the provinces of residence of the respondents (Fig. 2) shows a clear prevalence of provinces located along the Po river.

Overall, **the sample can be considered reasonably representative** of the adult population in the Po river basin, despite slight over- and under-representations by occupational sector. In general, the sample is consistent with the Italian population and representative of the active population and users and beneficiaries of river ecosystems.

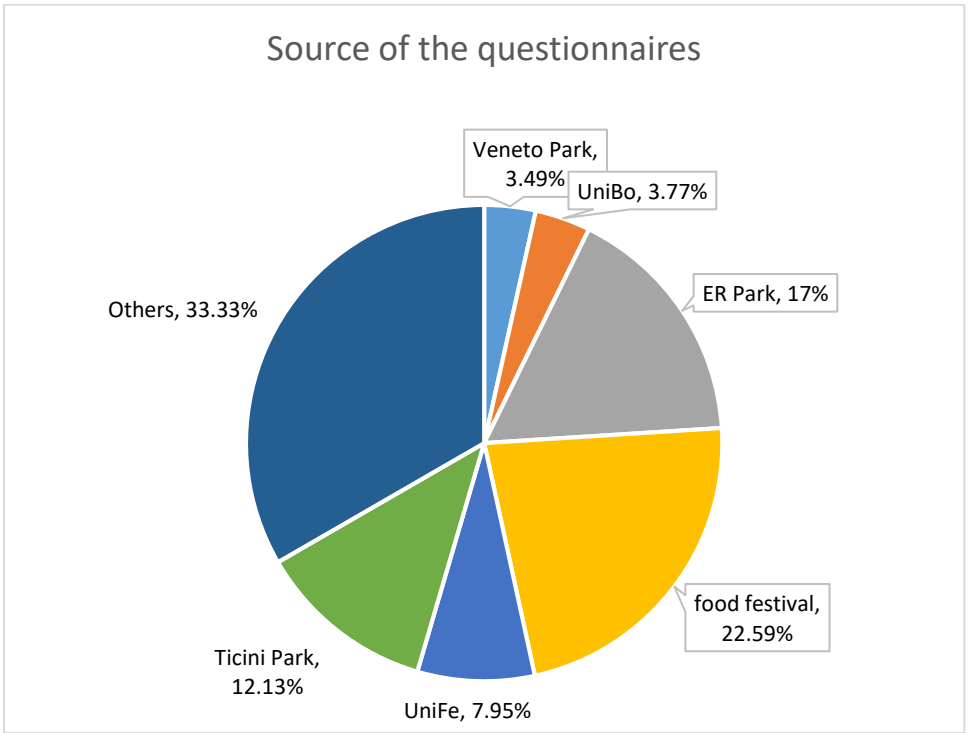


Figure 1: Distribution of the 717 respondents to the questionnaire on biodiversity and cultural services based on their source of origin.

Table 1: Distribution of socio-demographic variables among the 717 respondents to the questionnaire on biodiversity and cultural services along the course of the River Po. The categories with fewer than five respondents have been grouped under "Other".

Variables	Answer category	Value
Age	Average (±st.err)	45(±0.7)
	Median	47
Gender	Male	53.56%
	Female	43.93%
	X	2.51%
Educational qualification	None	0.98%
	Elementary school diploma	1.12%
	Lower secondary school	13.81%
	High school diploma	46.86%
	Degree	28.73%
	PhD/Masters	4.46%
	N/A	4.04%
Occupational field	Other (< 5)	5.86%
	Agriculture/Forestry	5.72%
	Public administration	9.90%
	Insurance sector	0.70%
	Housekeeper	0.70%
	Trade sector	1.53%
	Industry/Production/Artisanship	14.23%
	Education	1.67%
	Nature/Environment	5.58%
	Retired	6.56%
	Fishing/Aquaculture	2.51%
	Research	3.07%
	Health/Society	6.14%
	Student	16.60%
	Transport	2.65%
	Turism/Leisure	8.37%
	N/A	8.23%

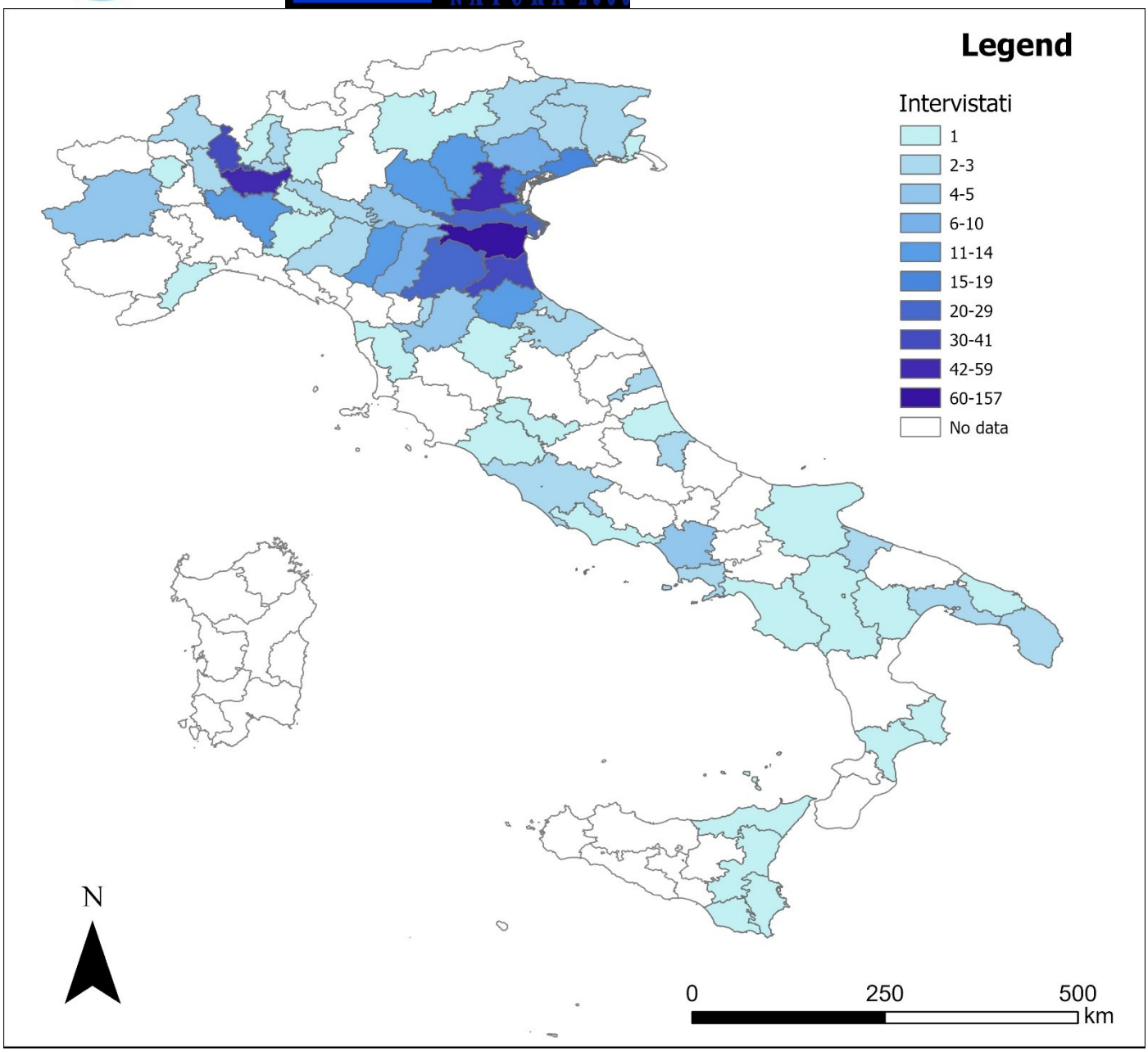


Figure 2: Number of respondents by province of declared residence. The value ranges were determined using the Jenks natural breaks method.

Results

The results listed below are considered to be the most relevant to the objectives of this study and/or statistically significant.

The results highlighted the significant role played by the eel in public perception. Indeed, in response to question n12 "*Which of these animals best represent the naturalness of the river?*" (Fig. S1) a total of 71% of respondents selected the answer "Eel" (Tab. 2). This result suggests that, in the participants' imaginary, **the**

specie is strongly associated with the naturalness and ecological identity of riverine environments. The comparison with the other animal species reported by respondents reinforces this interpretation. Despite the fact that some species typical of riverine or wetland habitats, such as the grey heron (37%), sturgeon (32%) and mallard (29%), were frequently associated with the river's natural state, none of them achieved figures comparable to those attributed to the eel. Of particular relevance is the result regarding the sturgeon, another species of historical and iconic importance.

This pattern was also confirmed when analysing the responses according to the river section from which the respondents originated (Tab. 3). In all the areas considered, the eel was cited with high frequency as a species indicative of the river's natural state, with values ranging from 65% to 76%, the highest being in the Po Delta. However, the chi-square test did not reveal any statistically significant differences between the river sections ($p = 0.054$), although it suggested a trend towards a stronger association in the Po Delta, with values close to the threshold of significance. This trend appears plausible, as it reflects the greater familiarity of local communities with the species, historically linked to fishing activities in the transitional areas between river and sea. At the same time, the presence of high values even in the middle section and the upper basin indicates that the eel retains a significant symbolic role along the entire course of the river, even in contexts where it is less directly associated with local economic activities.

The activities reported by respondents along the River Po can be interpreted as a direct expression of the *Cultural Ecosystem Services (CES)* provided by riverine environments (Table 4). Overall, the results highlight a prevalence of CES linked to **recreation and contact with nature**, in particular walking, cycling and nature observation, followed by social activities and enjoyment of the river landscape. Activities related to research, environmental monitoring and conservation, on the other hand, represent a marginal component, indicating that the use of the river is primarily linked to recreational and non-professional benefits.

The analysis along the river gradient reveals a clear spatial differentiation of the CES, reflecting the different purposes of the various sections in terms of land use. In the upper section, CES linked to direct experiences of nature and the enjoyment of river environments for their naturalistic value, including the gathering of wild resources, predominate. In the middle section, recreational and landscape-based CES are the main features, associated with a more general use of the area. In the lower section, services linked to fishing and social activities take on greater importance, whilst in the Po Delta there is a higher incidence of CES linked to tourism, water-based activities and food and wine experiences, highlighting a strong integration between the natural and cultural dimensions of the landscape. Visitor frequency also reflects this pattern: the upper section shows a higher intensity of visits, whilst in the middle and lower sections and in the delta, more sporadic visits prevail, consistent with a less daily and more occasional use of the river environments.

The Po River is therefore perceived not as a single system, but as a sequence of distinct functional landscapes along the river's gradient, each characterised by different modes of interaction between local communities and the environment. This suggests that the effects of conservation measures can be interpreted through multiple socio-ecological contexts, with direct implications for the communication and management of such interventions.

Another interesting aspect emerges from the analysis of *Travel Costs (TC)*, which serve as an indirect economic estimate of recreational value. The results (Fig. 3) show that the river areas of the Po basin generate a tangible recreational value for visitors (totalling approximately €40 per visit), which varies in a statistically significant manner between the various river sections (Kruskal-Wallis test, Dunn post-hoc test, $p<0.05$). The highest average value is recorded in the middle section of the River Po (€58.03), followed by the Po Delta (€43.6) and the lower section (€36.03), whilst the lowest value is observed in the upper section (€26.01). In particular, the

significantly higher average value in the middle section could reflect the presence of visitors from more distant areas or the greater appeal of specific river areas for recreational and nature-based activities.

Although the estimated value is not directly linked to the presence of individual species, it reflects the **value that users attribute to the overall quality of the river environment**. In this context, the conservation measures promoted by the project, aimed at improving river connectivity and restoring habitats for migratory species such as the eel, can indirectly contribute to maintaining and enhancing the CES associated with the use of the river. **Improving the ecological conditions of the river system, in fact, not only promotes the conservation of biodiversity but also supports the recreational and identity-related value that local communities attribute to the river**.

In addition to the CES currently provided by the river system, an analysis was carried out of the most important aspects associated with the River Po, with the aim of investigating the reasons behind the respondents' interest in using it. The results showed that these are strongly centred on naturalistic and aesthetic dimensions (Fig. 4), with statistically significant differences (Kruskal-Wallis test, Dunn post-hoc test, $p<0.05$). In particular, the most significant aspect appears to be "the environment itself", which recorded the highest mean value (4.54). The river therefore appears to be perceived primarily as a natural ecosystem of intrinsic value, regardless of the specific activities that can be carried out there. Immediately following this are two dimensions closely linked to the enjoyment of nature: the beauty of the landscape (4.36) and the observation of nature (4.29), highlighting the value of the river system as a space for contact with nature, where landscape features and biodiversity are central components of the visitors' experience.

A second group of benefits, characterised by average scores ranging from 3.6 to 3.7, relates instead to aspects linked to personal well-being and recreational use, such as physical exercise and sport (3.71), tradition and cultural identity (3.68), recreation and leisure (3.67), education (3.65) and health (3.61). These results suggest that, secondarily, the river also plays an important role as a natural infrastructure for well-being and social interaction.

This value hierarchy is particularly relevant in the context of conservation policies, as it confirms that ecological restoration and environmental quality improvement measures can directly enhance the cultural benefits perceived by local communities. Within this framework, the conservation actions promoted by the project can also indirectly contribute to strengthening the CES associated with the river. **The restoration of biodiversity and the ecological functionality of the river system, in fact, represents a key element in maintaining and enhancing the natural and landscape values that emerge as priorities in visitors' perceptions**.

Conclusions

The results suggest that the eel is not only a species of conservation interest, but also a powerful symbolic element through which communities perceive the natural character of the River Po, establishing itself as a potential **cultural flagship species for the Po river**. In this sense, the ecological restoration actions promoted by the LIFEEL project can generate benefits that go beyond species conservation, contributing significantly to strengthening cultural ecosystem services and the bond between the population and the river environment. The recovery of the eel can therefore represent not only an ecological objective, but also a factor in the social and cultural enhancement of the river and its basin.

Table 2: Percentage of respondents who identified each species as indicative of the river's natural state (question 12). Respondents could select up to five options; therefore, the percentages represent the proportion of respondents who selected each species, and their total may exceed 100%. Categories with fewer than five respondents have been grouped under "Other".

Animals	%
Eel	71.77
Grey heron	37.30
Sturgeon	31.65
Mallard	29.12
Carp	26.15
Coypu	22.29
Catfish	19.02
Seagull	16.34
Cormorant	14.26
Hare	12.63
Roe deer	9.21
Wild boar	4.01
Crow	3.12
Flamingo	1.04
Other (<5)	3.42

Table 3: Percentage of respondents who cited eels as an indication of the river's natural state (question n.12), divided by the most visited river section.

River section	Eel (%)
Po Delta	0.76
Lower reaches of the Po river	0.66
Middle reaches of the Po river	0.65
Upper basin and upper reaches	0.68

Table 4: Activities carried out by respondents in the various sections of the river (question n.9), expressed as a percentage.

Activities	Total	Upper reaches	Middle reaches	Low reaches	Delta
Research/Nature Conservation	2.8	4.6	0.6	1.8	3.1
Environmental monitoring	2.9	5.7	0.6	1.5	3.0
Cycling	13.1	13.1	14.1	13.1	13.0
Running	4.7	3.9	2.8	3.6	5.9
Going for a walk	21.6	24.5	26.6	20.8	19.6
Boating	4.3	3.5	3.4	3.6	5.0
Sunbathing	6.5	3.9	5.6	6.2	7.8
Picnicking/Barbecuing	3.4	3.5	4.5	2.9	3.3
Meeting friends	11.2	10.6	11.9	15.0	9.8
Observing nature	13.0	14.2	16.4	13.5	11.3
Food and wine	7.3	3.5	5.1	6.9	9.4
Mushroom/Wild herb foraging	2.4	6.4	1.1	1.1	1.6
Hunting	0.3	0.0	0.0	0.0	0.5
Fishing	5.7	1.8	6.2	9.5	5.7
Photography	0.5	0.7	0.6	0.0	0.5
Other (<5)	0.3	0.0	0.6	0.4	0.3

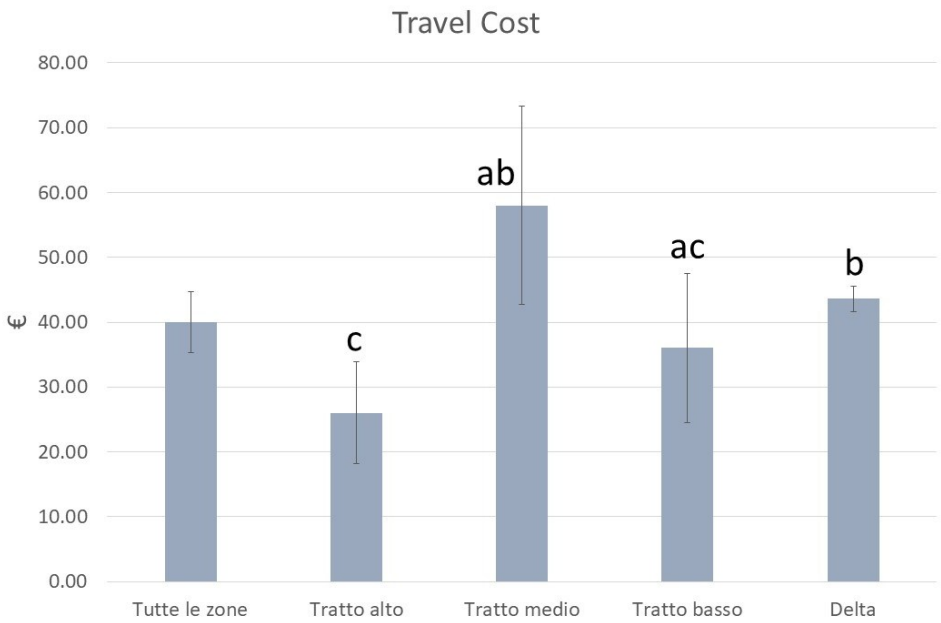


Figure 3: Average values (± st.err) of the travel cost per visit (€) associated with the use of river areas along different sections of the River Po. Different letters above the bars indicate statistically significant differences between river sections (post-hoc test, $p < 0.05$).

Table 5: Frequency of visits to river areas in the Po basin as reported by respondents, expressed as a percentage, both overall and for each specific river section.

%	All	Upper reaches	Middle reaches	Low reaches	Delta
Several times a week	15.3	23.4	10.0	13.2	14.3
Several times a month	20.6	30.5	21.3	18.2	17.8
Once a month	14.5	13.3	13.8	15.7	14.3
Less than once a month	49.6	32.8	55.0	52.9	53.6

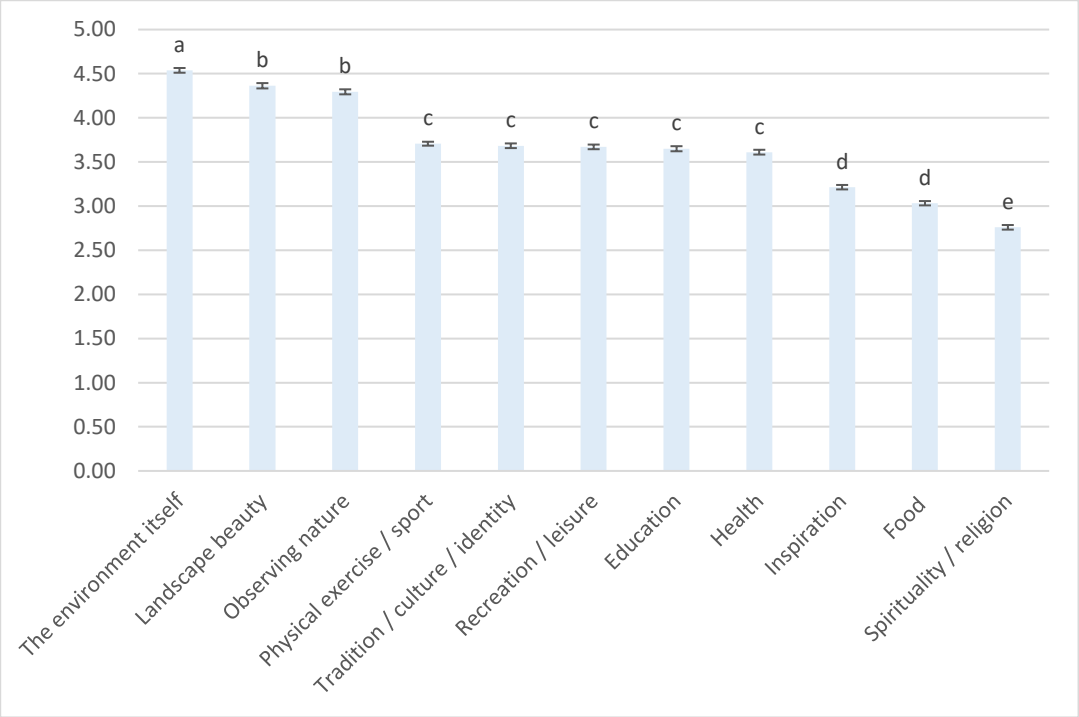


Figure 4: Average scores (± st.err) assigned by respondents to the various factors associated with their reasons for using the River Po. Scores are expressed on a scale of 0 to 5. Different letters above the bars indicate statistically significant differences.

3. FISHERMEN'S INTERACTIONS WITH EELS

The questionnaire on biodiversity and cultural services included a specific section dedicated to fishermen, with the aim of gathering information on fishing practices and incidental interactions with the European eel. Of the 717 respondents to the questionnaire on biodiversity and cultural services, **92 identified themselves as fishermen** and answered questions regarding: fishing techniques used, accidental catches of eels (by-catch) and, where applicable, the average number of individuals caught per unit of effort and the type of eel (yellow or silver).
The gathering of information on fishing practices and incidental interactions with the European eel is considered fundamental to the project, as it enables an investigation into:

- **Direct human pressures on the species**, in particular by-catch, which can have a negative impact on natural stocks and, at the same time, serve as an indicator of their presence
- **The socio-economic impacts of conservation efforts**, as fishing represents both a local economic activity and a cultural link to the river and its ecosystems
- **Critical fishing techniques**, which are useful for designing or tailoring targeted conservation measures, such as by-catch mitigation measures or awareness campaigns aimed at fishermen.

The sample of fishermen is predominantly male (79.3%), with an average age of 51.6 years and a median age of 60.0, and a level of education at upper secondary school level (48.9%). The proportion of those with a degree or a master/PhD is 22.9%. The sector in which they work is rather fragmented, with only 9.8% employed in fishing/aquaculture.
Overall, **the sample can be considered consistent with the typical profile of fishermen in the Po basin**, being predominantly male, older than the average for the general population, and tending to have a lower level of education. Indeed, these characteristics are consistent with the historical and socio-demographic profile of active fishermen in the area, giving the sample a good degree of representativeness for the analysis of fishing practices and interactions with the european eel.

Results

By-catch of eels serves as an indirect indicator of the species' presence in riverine and transitional ecosystems. Although such catches do not necessarily constitute a direct threat when the eels are released, they can contribute to mortality within the species if the eels are injured or not returned to the water.

Of a total of 92 fishermen interviewed, **42 (45.7%) reported having accidentally caught eels during their fishing activities**. Of these, 37 fishermen provided a quantitative estimate of the *Catch per Unit Effort (CPUE)*. The results indicate that in most cases the number of eels caught accidentally is relatively low (Tab. 6): the most frequent values are 1 or 2 individuals per unit of effort, whilst only a few respondents reported higher catches (up to 15-20 individuals), suggesting the presence of sporadic episodes of greater local abundance.

By-catches include both silver and yellow eels (Tab. 7). However, the distribution of catches across different fishing methods (Tab. 8 and 9) indicates that **the interaction between fishing activities and the presence of the species is relatively widespread in the riverine and transitional ecosystems under consideration**. In absolute terms, the highest number of reports concerns fishing with a handline, followed by hook and line fishing, whilst lower figures were recorded for traps, gillnets, trawling and fyke nets. The distribution of catches across different techniques suggests that the interaction between fishing activities and the presence of eels is relatively widespread in the river and lagoon systems under consideration.

In this sense, the information gathered through the questionnaires can be interpreted not only as an indicator of human pressure, but also as a social indicator of the species' presence, based on the direct experience of river users. From an ecological perspective, the presence of both yellow eels and silver eels among the individuals caught suggests that **fishing activities intercept different stages of the species' life cycle, both during their stay in inland waters and during their migratory movements towards the sea**.

Conclusions

Within the framework of the LIFEEL project, these findings are particularly significant. Fishermen are, in fact, one of the main social groups that interact directly with the species, and their experience can serve as a complementary source of information to the ecological data collected through scientific monitoring. At the same time, the fact that by-catches are relatively common but generally limited to a few individuals suggests that **awareness-raising initiatives and good release practices for accidentally caught specimens, particularly when using certain fishing techniques (e.g. longline and hook-and-line fishing), could significantly reduce the potential impact on the population**.

Table 6: Number of eels caught incidentally per unit of fishing effort (CPUE) as reported by fishermen who reported by-catches.

Eels (n/CPUE)	Nr people
0.2	1
1	13
2	18
4	1
5	2
15	1
20	1
Totale	37

Table 7: Types of eels caught as by-catch (yellow eels, silver eels or both) according to fishermen's reports. The total may exceed the number of respondents, as some fishermen selected more than one option.

Eel type	Nr people
Silver	12
Yellow	19
Both	15
Undeclared	4

Table 8: Total number of fishermen by fishing method and number of fishermen who reported incidental catches of eel. The total may exceed the number of respondents as some fishermen selected more than one option.

Fishing techniques	Tot nr people	Nr people with by-catch
Bottom trawling	2	1
Fish traps	5	3
Angling	55	17
Gillnets	6	3
Spearfishing	2	0
Lift net	31	31
Cast net	1	1

Tabella 9: Distribuzione delle tipologie di anguilla catturate accidentalmente per tecnica di pesca.

Tipologia Anguille	Bottom trawling	Fish traps	Angling	Gillnets	Spearfishing	Lift net	Cast net
Yellow	0	2	8	2	0	11	0
Silver	0	0	5	0	0	6	1
Both	0	0	1	0	0	14	0
Undeclared	1	1	3	1	0	0	0

4. EEL'S ROLE IN THE FOOD INDUSTRY OF THE PO RIVER'S DELTA

In order to assess the role of the European eel in the catering sector and its socio-economic and cultural implications, a specific questionnaire was designed for restaurant owners and customers, and administered exclusively in the Po Delta area, a region where the species holds particular historical, gastronomic and cultural significance. The questionnaire provided a fascinating insight into the relationship between eels, the local economy and food culture in the Po Delta, helping to assess the effects of conservation measures on the socio-economic sector and cultural ecosystem services, in line with the objectives of Action D4 of the LIFEEL project.

The analysis involved a total of 269 respondents, comprising **249 customers** and **20 restaurant owners**. The questionnaire was designed to investigate:

- the presence of eel on local restaurant menus and its relative importance within the culinary offering;
- consumer demand, estimated through the perceptions of restaurateurs and customers regarding the proportion of diners who consume eel;
- the profile of consumers (local customers, Italian or foreign tourists);
- the cultural and symbolic motivations underlying consumption, expressed through scores attributed to factors such as regional identity, tradition, connection with nature, the species' appeal and gastronomic palatability.

In line with previous questionnaires, a section was also included focusing on the socio-demographic details of the respondents (age, gender, educational background, field of work and residential area), in order to link consumption preferences and behaviours to individual characteristics. The collection of this information is particularly relevant within the LIFEEL project, as it enables the analysis of:

- the **indirect socio-economic impacts** of conservation measures, considering the catering sector as one of the main areas for the economic and cultural enhancement of the species
- the **value of cultural ecosystem services associated with the eel**, particularly in terms of gastronomic tradition, local identity and tourist appeal

The customer sample has an average age of 41.8 years (median 43), a relatively balanced gender ratio (46% men and 54% women) and a diverse distribution across occupational sectors, suggesting that it is **reasonably representative of consumer demand in the study area**.
Conversely, the sample of restaurateurs, with an average age of 42 (median 44) and a limited size, **cannot be considered fully representative of the entire catering sector in the Po river Delta**. The results relating to this category should therefore be interpreted in an exploratory manner. Nevertheless, the information gathered has proved useful in outlining general trends and widespread perceptions relevant to understanding the role of eel in the local supply chain and to guiding future, more in-depth analyses.

Results

The results indicate a convergence in perception between restaurateurs and customers regarding the prevalence of eel consumption. According to restaurateurs, approximately 61.3% of customers eat eel, whilst the estimate provided by the customers themselves is slightly lower, at 57.3%, highlighting a substantial consistency between perceived and self-reported demand. An analysis of customer origin (Tab. 10), based on restaurateurs' perceptions, reveals a diverse demand structure, with a prevalence of local consumers but a significant tourist presence, suggesting that eel consumption in the Po Delta is driven primarily by local demand. This finding is confirmed by the analysis of customers' stated reasons for consumption (Fig. 5). Indeed, customers cite tradition as the main driver of eel consumption, followed by gastronomic appeal and identity- and culture-related motivations (Kruskal-Wallis test, Dunn post-hoc test, $p<0.05$). This pattern highlights how the consumption of this species is deeply rooted in the local cultural system, going beyond the mere dietary dimension and emerging as an expression of a link between territorial identity and traditional gastronomic practices.

Table 10: Main origin of customers who eat eel in restaurants in the Po Delta, as perceived by the restaurateurs interviewed. The figures indicate the number of restaurateurs who reported each type of customer.

Origin	Nr.
Italian tourists	5
Foreign tourists	1
Locals	8
Mixed	6

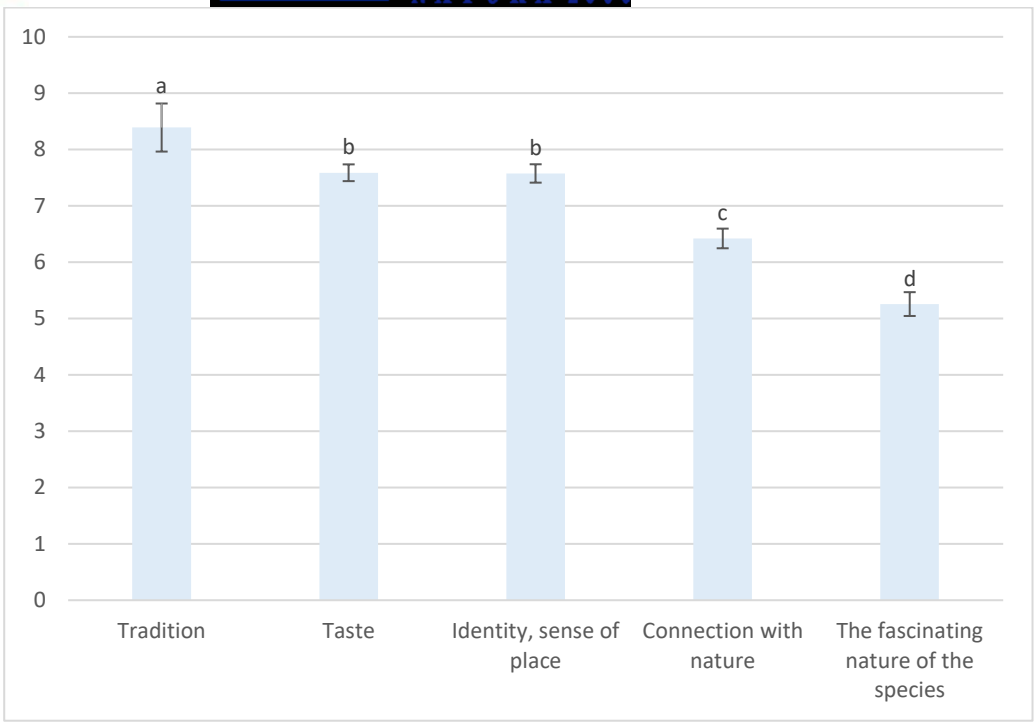


Figure 5: Mean rating (± st.err.) of the main factors motivating the consumption of eel, as reported by customers at restaurants in the Po Delta. The values represent the average score assigned to each factor on a scale of importance ranging from 0 to 10. Different letters above the bars indicate statistically significant differences.

5. PUBLIC PERCEPTION AND ACCEPTANCE OF THE LIFEEL PROJECT

The analysis of perceptions regarding eel conservation and the LIFEEL project, the results of which are detailed in Tab. 11, reveals a picture characterised by a high level of awareness of the species' decline and general support for conservation measures.

Regarding the question about LIFEEL project, the majority of respondents (75.08%) believe it is right to take active measures to conserve the species, whilst a minority (2.92%) express scepticism about the effectiveness of such measures and 22.0% say they are not interested. This result indicates a generally high level of public acceptance of conservation measures.

In line with this perception, 61.85% of respondents consider the eel to be an endangered species, whilst 38.15% do not perceive it as such. Furthermore, the vast majority (81.78%) believe that the population has declined over the last ten years, whilst only a small proportion consider it to be stable (16.95%) or increasing (1.27%). Overall, these results highlight a widespread perception of the species' decline, consistent with its conservation status.

The analysis of awareness regarding conservation tools, however, reveals a more limited level of knowledge. Only 28.57% of respondents say they are familiar with the Natura 2000 network, whilst 71.43% are not aware of it. Similarly, the LIFEEL project is known to 28.32% of the sample, whilst 71.68% of respondents are unaware of it. As regards the pressures on the species, pollution emerges significantly (χ^2 test, $p<0.05$) as the main perceived pressure, followed by illegal harvesting and river fragmentation due to the presence of weirs (Fig. 6). Fishing activities, both commercial and recreational, are also recognised as significant factors, although to a lesser extent than direct environmental pressures.

Conclusions

Overall, the results highlight a strong awareness of the decline in eel populations and a high level of public support for conservation measures, despite still limited knowledge of specific conservation tools and projects. Pollution and habitat fragmentation are perceived as the main threats, indicating a good understanding of the most obvious environmental pressures. In other words, communities recognise the decline of the species, perceive its main causes and show a high willingness to support its conservation.

In this context, the LIFEEL project fits into a favourable socio-perceptual framework, characterised by widespread recognition of the need to take action to conserve the species, but which at the same time highlights the need to strengthen communication and outreach activities to increase awareness of existing conservation tools.

Table 11: Respondents' views on eel conservation and the role of conservation policies. The percentages represent the proportion of respondents who selected each answer.

What do you think of LIFEEL	%
It does not address the problems	2.92
I'm not interested	22.00
It is right to take action	75.08
Eel on extinction?	
Yes	61.85
No	38.15
Has it decreased?	
increased	1.27
decreased	81.78
stable	16.95
Do you know about Natura 2000?	
Yes	28.57
No	71.43
Do you know about LIFEEL?	
Yes	28.32
No	71.68

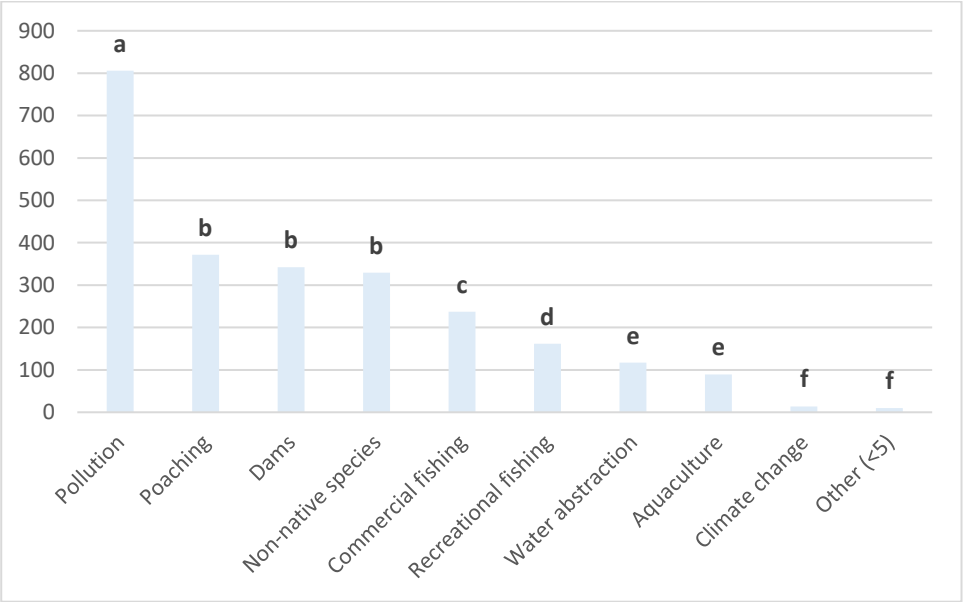


Figure 6: Respondents' perceptions of the main environmental factors considered harmful to eels. The categories represent the number of times each pressure factor was cited by respondents. Multiple answers could be selected; therefore, the figures represent the total number of mentions for each factor and not the percentage of respondents. Different letters above the bars indicate statistically significant differences.

6. IMPLICATIONS FOR THE MANAGEMENT AND CONSERVATION OF EELS

Overall, the findings outline a **socio-ecological system** in which the eel plays a key role, linking ecological, cultural and economic dimensions throughout the entire Po basin. From the perspective of **production and direct interaction with the resource**, fishermen represent the primary point of contact with the species. By-catches, although generally limited, indicate that eels are still widespread in river and lagoon ecosystems and highlight how fishing activities constitute a constant interface between local communities and population dynamics. In this context, fishermen are not only users of the resource but also observers of the species' conservation status.

In parallel, the **catering sector** serves as a means of promoting the species both economically and culturally. In the Po Delta, eel consumption remains significant and deeply rooted in the local culinary tradition, with demand sustained by both residents and tourists. The main reasons for its consumption (tradition, identity and palatability) highlight how the species continues to play an important role in **shaping the area's identity**.

From a perceptual point of view, the eel also emerges as the species most closely associated with the natural character of the river, indicating a strong symbolic element shared among the interviewees. This reinforces the idea that the species is not perceived solely as a biological or food resource, but also as a **cultural element within the river system.**

The integration of this evidence allows us to interpret the Po river system through the lens of cultural ecosystem services, in which the eel acts as a connecting element between direct experience (fishing), consumption (catering) and symbolic representation (perception of naturalness). In this context, the species acts as a genuine **socio-cultural driver of cultural ecosystem services**, helping to shape the way in which the river is experienced, valued and recognised by local communities.

In relation to the LIFEEL project, analyses show that conservation measures do not merely affect the ecological aspect of the species, but are part of a broader system of socio-economic and cultural relationships. The recovery of the eel therefore also involves the preservation of local practices, values and identities associated with the river, with the aim of strengthening the link between biodiversity and the cultural well-being of river communities.

However, a critical issue has also come to light: direct knowledge of conservation tools, including Natura 2000 and the LIFEEL project, remains limited. This highlights a gap between awareness of the problem and knowledge of institutional responses, suggesting a need to strengthen **communication efforts and the involvement of local communities**.

7. GREEK CASE STUDY

The analysis conducted in the Greek area involved a total of **102 respondents** distributed along the environmental gradient of the Nestos river basin, including coastal ecosystems, transition zones and inland river sections. The sites considered comprise, in order of the river continuum from upstream to downstream::

- Nevrokopi (the most inland and mountainous area, the source of the basin)
- Stavroupoli (mid-basin hilly/mountainous section)
- Galani (lowland section of the Nestos system)
- Nestos River outh (river-sea transition zone)
- Lake Vistonida (lake system connected to the delta)
- Porto Lagos Lagoon (coastal lagoon environment)

The sample has an **average age of 45.8 years** (median 47.5) and a relatively balanced gender distribution (46.1% men and 53.9% women) (Table 12). **The level of education is particularly high**: over 80% of respondents hold a master's degree or PhD, whilst a smaller proportion hold a bachelor's degree (12.7%).

The other categories are marginal. From a professional perspective, the sample is characterised by a strong presence of **individuals directly or indirectly involved in the management of natural resources**: 24.5% of respondents work in the fisheries or aquaculture sectors, 22.6% in scientific research and 15.7% in the environmental sector. Similar proportions are accounted for by public sector workers (15.7%), whilst a smaller proportion are employed in the health and social services sectors or in other professional categories. It is therefore important to underline that the sample **is not fully representative and cannot be considered fully representative of the river area under study**.

Results

As observed in the Italian case study, an analysis of the species perceived as representative of the natural state of the river system highlights the significant role played by the eel. When asked which animals best reflect the natural state of the river, 68% of respondents selected this species, **confirming its symbolic importance in the Greek context as well** (Table 13). However, compared to the Italian case, there is a greater variety of species perceived as representative of river biodiversity. Among these, the Peloponnesian chub (54%), the otter (49%), the mallard (40%), the Peloponnesian barbel (37%) and the carp (36%) are particularly significant. Analysis along the territorial gradient (Table 14) also highlights a decrease in the association between eels and naturalness as one moves from coastal areas towards the interior of the basin. The highest percentages are in fact recorded in coastal transition systems, such as the Porto Lagos Lagoon (23.3%) and the mouth of the Nestos (25%).

The activities reported by respondents along the Nestos river basin mainly reflect forms of interaction with the natural landscape linked to cultural ecosystem services (Table 15). The most frequently reported activities are walking (19.7%), nature observation (19.7%) and meeting friends (16.3%), indicating that **use of the river system is linked both to contact with nature and to the social dimension of river spaces**. A distinctive feature compared to the Italian case is the relatively high proportion of activities related to nature research and conservation (16.8%) and environmental monitoring (10.6%), consistent with the professional composition of the sample, which includes numerous professionals from the environmental and scientific sectors. More typically tourist- or sports-related recreational activities, such as boating, sunbathing or cycling, are instead marginal, whilst fishing accounts for a very limited share of the activities reported (1.9%).

The travel costs analysis shows an average recreational value of **approximately €68 per visit** associated with the use of the Nestos river basin (Fig. 7). This figure is higher than that observed in the Italian case of the River Po, where the average cost per visit is around €40. However, unlike the Italian context, no statistically significant differences emerge between the different river sections (Kruskal-Wallis test, $p>0.05$). This result suggests that the value attributed to the use of the river system in the Greek context is relatively uniform across the basin and may be influenced by the greater geographical distance of visitors or the more sporadic nature of visits. In fact, **the frequency of visits to the river areas of the Nestos basin is generally low** (Table 16). Overall, 85.2% of respondents state that they visit these areas less than once a month, whilst only a very small proportion visit the river on a weekly or monthly basis.

The reasons behind the respondents' visits to the Nestos river system are strongly linked to **natural and landscape-related factors** (Fig. 8) The results indeed show significantly higher average scores for aspects such as the natural environment itself, the beauty of the landscape and the observation of riverine nature (Kruskal-Wallis test, Dunn post-hoc test, $p<0.05$), highlighting a picture very similar to that observed in the Italian case study.

Interviews with fishermen (n = 7) can provide some preliminary insights into interactions between fishing and fish species. Various fishing techniques were reported, with a clear prevalence of hook-and-line fishing, mentioned by four respondents (Table 17). The other techniques are marginal in the sample and include the use of spearguns, nets and electricity, each reported by a single fisherman. In the sample considered, fishing activities appear to be predominantly associated with less intensive and more selective practices, whilst techniques with potentially greater impact are sporadic. However, the decidedly small sample size does not allow for more in-depth analysis. For the sake of completeness, data on catch per unit effort (CPUE) and the types of eels caught are nevertheless presented in Tables 18 and 19.

Concerning the main causes of river ecosystem degradation, respondents cited littering (40%) and drought (24%) as the most significant factors (Table 20). Perceptions of specific risk factors for eel conservation show a relatively balanced distribution of responses across different types of pressure. Pollution (21.6%) and the presence of dams (20.7%) emerge as the most frequently cited factors (Table 21). These data are consistent with what was observed in the Italian case.

Respondents' views on the conservation status of the eel and the role of conservation policies reveal an **overall positive attitude towards conservation measures** (Table 22). In particular, the majority of respondents believe that the LIFEEL project is an important tool for the protection of biodiversity (60.58%) or for the recovery of a species that is also significant from a local economic perspective (33.65%). At the same time, there is **widespread awareness of the species' critical status**: 89.22% of respondents believe that the eel is

endangered and 85% perceive a decline in its populations over time, whilst no respondent indicated an increase in the species' numbers and 15% consider it stable. As regards knowledge of conservation policies and tools, the majority of respondents stated that they were aware of the Natura 2000 network (81.37%), whilst specific knowledge of the LIFEEL project was slightly lower but still in the majority (59.80%).

Taking into account the limited number of respondents and the exploratory nature of the survey, these results suggest **a relatively high level of environmental awareness among those who completed the questionnaire, as well as a generally positive perception of conservation initiatives aimed at the European eel.**

Conclusions

The findings for the Greek section of the Nestos basin show **patterns that are partly consistent with those observed in the Italian case**, highlighting in both contexts **a widespread perception of the ecological and cultural value of the eel and a clear awareness of its declining status**. The activities undertaken and the motivations associated with the use of river environments are predominantly linked to recreational aspects and contact with nature, although there are differences in the structure of activities along the territorial gradient. As in the Italian case, the main perceived pressures in Greece also relate to hydromorphological alterations (in particular dams and water management) and environmental quality.

Overall, and taking into account the exploratory nature of the analyses and sampling limitations, particularly in the Greek case, **the results suggest the presence of comparable perceptual dynamics between Italy and Greece.** This evidence reinforces the hypothesis that **the conservation of eels and river ecosystems is supported by an existing but still heterogeneous social awareness base, highlighting the importance of coherent communication and engagement strategies at a Mediterranean scale within the LIFEEL project.**

Tabella 12: Table 12: Distribution of socio-demographic variables among the 102 respondents to the questionnaire on biodiversity and cultural services along the course of the River Nestos. Categories with fewer than five respondents have been grouped under 'Other'.

Variables	Category	Values
Age	Average (±st.err)	45.8(4.7)
	Median	47.5
Gender	Male	46.08%
	Female	53.92%
Education	Elementary school diploma	1.96%
	High school diploma	4.90%
	PhD/Masters	80.39%
	Degree	12.75%
Occupational field	Research	22.55%
	Fishing/Agriculture	24.51%
	Nature/Environment	15.69%
	Public administration	15.69%
	Health/Society	8.82%
	Other(<5)	12.75%

Table 13: Percentage of respondents who identified each species as indicative of the river's natural state (question 12). Respondents could select up to five options; therefore, the percentages represent the proportion of respondents who selected each species, and their total may exceed 100%. Categories with fewer than five respondents have been grouped under 'Other'.

Animals	%
Eel	68.0
Crab	25.0
Peloponnesian barbel	37.0
Carp	36.0
Peloponnesian chub	54.0
Otter	49.0
Coypu	9.0
Cormorant	32.0
Mallard	40.0
Grey airon	33.0
Seagull	17.0
Crow	8.0
Wild boar	10.0

Table 14: Percentage of respondents who cited eels as an indication of the river's natural state (question 12), broken down by river section of origin.

River section	Eel (%)
Porto Lagos lagoon	23.33
Vistonida lake	17.22
River Nestos mouth	25.00
Galani	9.44
Stavroupoli	12.22
Nevrokopi	8.89
Nonbe	3.89

Table 15: Activities undertaken by respondents in the various river sections (question 9), expressed as a percentage.

	Total area	Porto Lagos lagoon	Vistonida lake	River Nestos mouth	Galani	Stavroupoli	Nevrokopi
Research/ nature conservation	16.8	20.5	21.0	16.9	15.6	23.9	14.1
Going for a walk	19.7	15.7	20.0	19.0	20.3	18.3	18.8
Meeting friends	16.3	13.4	14.0	16.2	17.2	21.1	17.2
Observing nature	19.7	22.0	23.0	21.8	21.9	16.9	17.2
Environmental monitoring	10.6	13.4	13.0	10.6	10.9	12.7	12.5
Boating	3.4	3.1	1.0	4.2	3.1	1.4	4.7
Sunbathing	4.3	2.4	3.0	4.2	3.1	2.8	4.7
Cycling	1.4	0.8	0.0	1.4	1.6	0.0	3.1
Working	1.0	1.6	1.0	0.7	1.6	1.4	1.6
Running	2.4	3.1	1.0	2.1	1.6	0.0	3.1
Mushroom/Wild herb foraging	2.4	1.6	2.0	1.4	3.1	1.4	1.6
Fishing	1.9	2.4	1.0	1.4	0.0	0.0	1.6

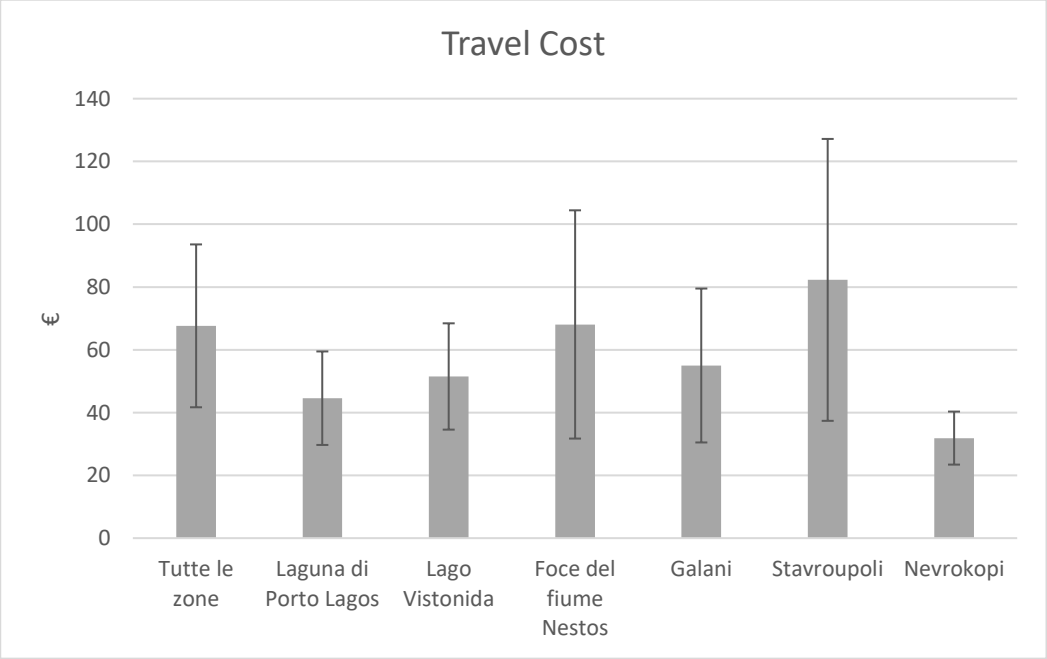


Figure 7: Mean value (± st. err.) of the travel cost per visit (€) associated with the use of river areas along different sections of the River Nestos. No significant differences were found between the regions.

Table 16: Frequency of visits to river areas in the Nestos basin as reported by respondents, expressed as a percentage, both overall and by river section.

%	Total area	Porto Lagos lagoon	Vistonida lake	River Nestos mouth	Galani	Stavroupoli	Nevrokopi
Several times a week	1.1	1.9	2.3	1.8	4.5	3.2	4.5
Several times a month	5.7	7.4	9.1	1.8	13.6	6.5	90.9
Once a month	8.0	9.3	9.1	10.9	13.6	16.1	4.5
Less than once a month	85.2	81.5	79.5	85.5	68.2	74.2	0.0

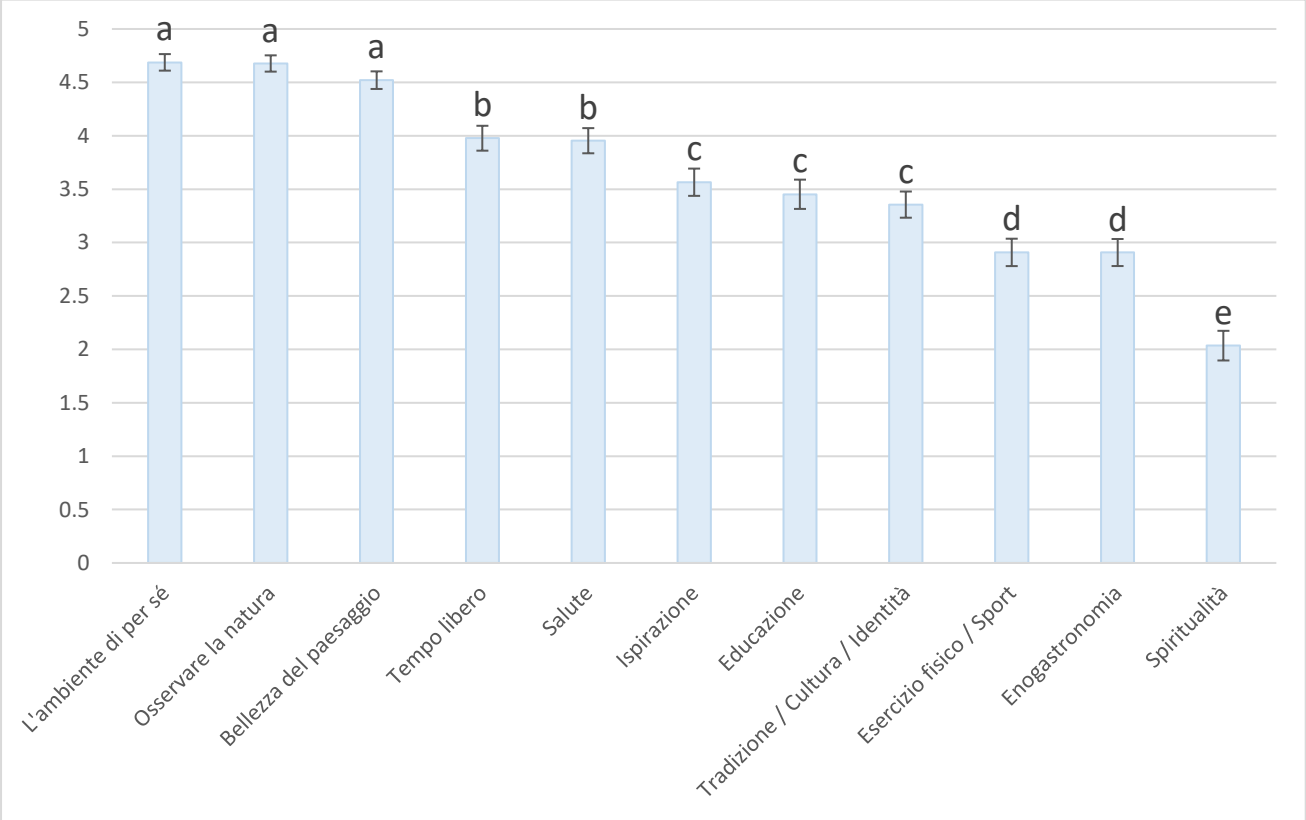


Figure 8: Mean scores (± st.err.) assigned by respondents to the different factors associated with their reasons for using the River Nestos. Scores are given on a scale of 0 to 5. Different letters above the bars indicate statistically significant differences.

Table 17: Total number of fishermen by fishing method.

Fishing techniques	Nr people
Speargun	1
Net	1
Electric fishing	1
Angling	4
Total	7

Table 18. Number of eels caught incidentally per unit of fishing effort (CPUE) as reported by fishermen who reported by-catches.

Eels (n/CPUE)	Nr people
3	2
10	1
5	1

Table 19: Eels types caught as by-catch (yellow eels, silver eels or both) according to fishermen's reports. The total may exceed the number of respondents, as some fishermen selected more than one option.

Eel stage	Nr people
Yellow	2
Silver	2
Both	1
I don't know	1

Table 20: Main reasons cited by respondents for the degradation of river ecosystems. The figures represent the percentage of responses attributed to each factor**.**

Reasons	%
Littering	40.0
Changes to the surrounding landscape	1.0
Extinction of animal and plant species	15.0
Neglect of vegetation and riverbanks	5.0
Poaching	6.0
Presence of weirs and dams	9.0
Drought	24.0

Table 21: Respondents' perceptions of the main risk factors for eel conservation. The figures show the percentage of responses associated with each pressure factor.

Risk factors	%
Pollution	21.6
Dams	20.7
Water abstraction	13.5
Recreational fishing	12.9
Commercial fishing	11.4
Poaching	12.0
Non-native species	5.4
Aquaculture	2.1
Climate change	0.3

Table 22: Respondents' views on eel conservation and the role of conservation policies. The percentages represent the proportion of respondents who selected each answer.

What do you think of LIFEEL?	%
I think it's pointless	3.85
I believe there are more important issues	1.92
It is essential for the recovery of a species that is important to the local economy	33.65
It is essential to halt the loss of biodiversity	60.58
Are eels facing extinction?	
Yes	89.22
No	10.78
Has it decreased?	
Increased	0.00
Decreased	85.00
Remained stable	15.00
Do you know Natura2000?	
Yes	81.37
No	18.63
Do you know LIFEEL?	
Yes	59.80
No	40.20

8. KEY MESSAGES

- **The eel as a symbolic species and an indicator of river health**

In both study cases (the Po and Nestos rivers), the eel is consistently recognised as one of the key species indicative of the natural state of river systems, taking on significant symbolic as well as ecological value. This supports its potential role as a flagship species in the river systems analysed.

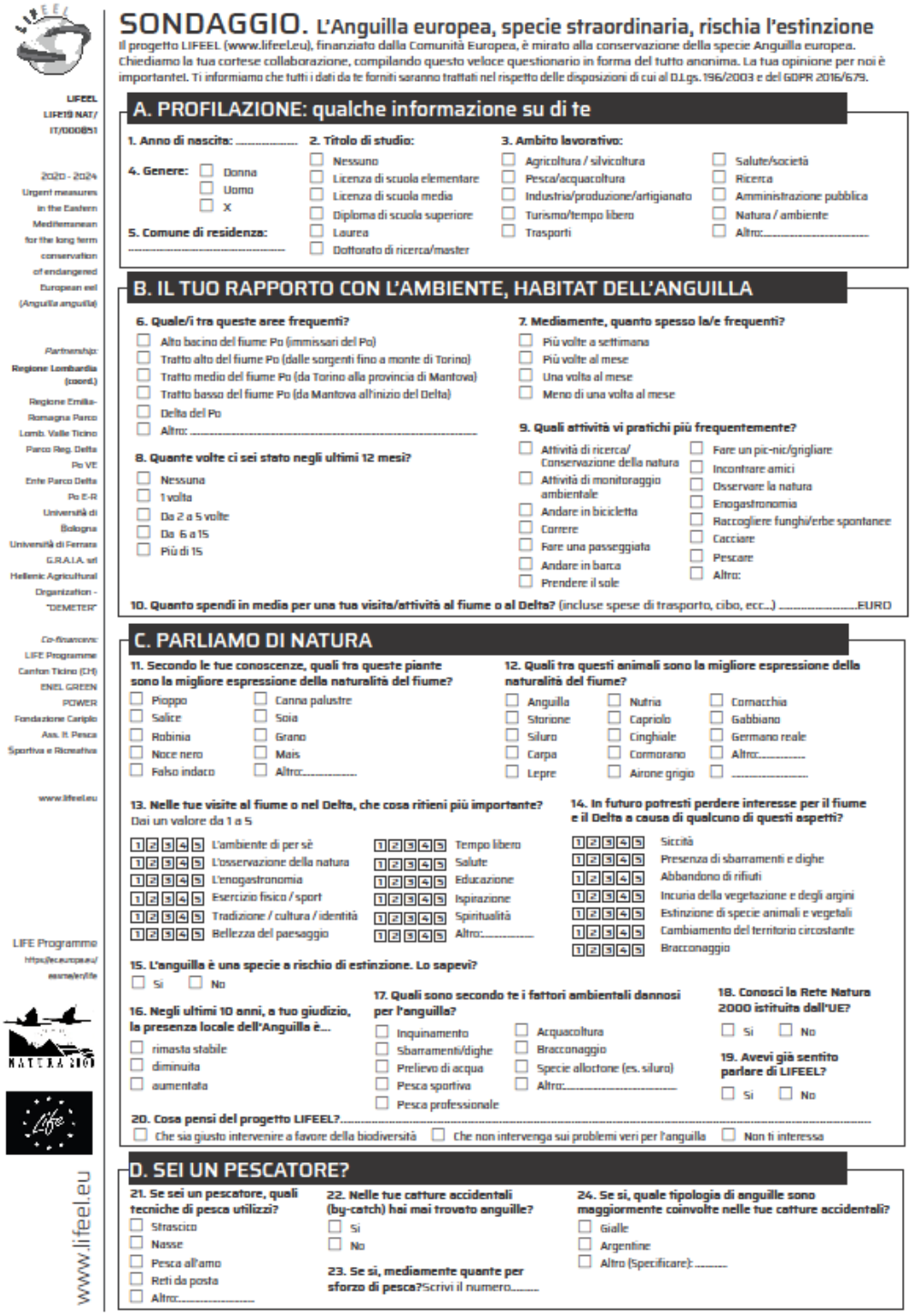
- **Widespread public support for conservation, but limited knowledge of management tools**

Local communities demonstrate widespread awareness of the decline in eel populations and strong support for conservation measures. However, awareness of specific tools and initiatives (e.g. Natura 2000, LIFEEL) remains relatively low, highlighting a significant communication gap.

- **Cultural ecosystem services and regional differences in socio-ecological systems**

The river is primarily perceived as a space for recreational and nature-based activities. In Italy, there is a clear and significant integration of ecological, economic and cultural aspects (fishing, catering, local identity).

9. SUPPLEMENTARY



SONDAGGIO. L'Anguilla europea, specie straordinaria, rischia l'estinzione

Il progetto LIFEEL (www.lifeel.eu), finanziato dalla Comunità Europea, è mirato alla conservazione della specie Anguilla europea. Chiediamo la tua cortese collaborazione, compilando questo veloce questionario in forma del tutto anonima. La tua opinione per noi è importante! Ti informiamo che tutti i dati da te forniti saranno trattati nel rispetto delle disposizioni di cui al D.Lgs. 196/2003 e del GDPR 2016/679.

LIFEEL
LIFE19 NAT/IT/000851

2020 - 2024
Urgent measures in the Eastern Mediterranean for the long term conservation of endangered European eel (Anguilla anguilla)

Partnership:
Regione Lombardia (coord.)
Regione Emilia-Romagna Parco Lomb. Valle Ticino
Parco Reg. Delta Po VE
Ente Parco Delta Po E-R
Università di Bologna
Università di Ferrara
G.R.A.I.A. srl
Hellenic Agricultural Organization - "DEMETER"

Co-financers:
LIFE Programme
Canton Ticino (CH)
ENEL GREEN POWER
Fondazione Cariplo
Ass. It. Pesca Sportiva e Ricreativa

www.lifeel.eu

LIFE Programme
https://ec.europa.eu/easme/en/life

www.lifeel.eu

A. PROFILAZIONE: qualche informazione su di te

1. Anno di nascita: .....
4. Genere: ☐ Donna ☐ Uomo ☐ X
5. Comune di residenza: .....

2. Titolo di studio:
☐ Nessuno
☐ Licenza di scuola elementare
☐ Licenza di scuola media
☐ Diploma di scuola superiore
☐ Laurea
☐ Dottorato di ricerca/master

3. Ambito lavorativo:
☐ Agricoltura / silvicoltura
☐ Pesca/acquacoltura
☐ Industria/produzione/artigianato
☐ Turismo/tempo libero
☐ Trasporti
☐ Salute/società
☐ Ricerca
☐ Amministrazione pubblica
☐ Natura / ambiente
☐ Altro:.....

B. IL TUO RAPPORTO CON L'AMBIENTE, HABITAT DELL'ANGUILLA

6. Quale/i tra queste aree frequenti?
☐ Alto bacino del fiume Po (immissari del Po)
☐ Tratto alto del fiume Po (dalle sorgenti fino a monte di Torino)
☐ Tratto medio del fiume Po (da Torino alla provincia di Mantova)
☐ Tratto basso del fiume Po (da Mantova all'inizio del Delta)
☐ Delta del Po
☐ Altro: .....

7. Mediamente, quanto spesso la/e frequenti?
☐ Più volte a settimana
☐ Più volte al mese
☐ Una volta al mese
☐ Meno di una volta al mese

8. Quante volte ci sei stato negli ultimi 12 mesi?
☐ Nessuna
☐ 1 volta
☐ Da 2 a 5 volte
☐ Da 6 a 15
☐ Più di 15

9. Quali attività vi pratichi più frequentemente?
☐ Attività di ricerca/ Conservazione della natura
☐ Attività di monitoraggio ambientale
☐ Andare in bicicletta
☐ Correre
☐ Fare una passeggiata
☐ Andare in barca
☐ Prendere il sole
☐ Fare un pic-nic/grigliare
☐ Incontrare amici
☐ Osservare la natura
☐ Enogastronomia
☐ Raccogliere funghi/erbe spontanee
☐ Cacciare
☐ Pescare
☐ Altro:

10. Quanto spendi in media per una tua visita/attività al fiume o al Delta? (incluse spese di trasporto, cibo, ecc...) .....EURO

C. PARLIAMO DI NATURA

11. Secondo le tue conoscenze, quali tra queste piante sono la migliore espressione della naturalità del fiume?
☐ Pioppo
☐ Salice
☐ Robinia
☐ Noce nero
☐ Falso indaco
☐ Canna palustre
☐ Soia
☐ Grano
☐ Mais
☐ Altro:.....

12. Quali tra questi animali sono la migliore espressione della naturalità del fiume?
☐ Anguilla
☐ Storione
☐ Siluro
☐ Carpa
☐ Lepre
☐ Nutria
☐ Capriolo
☐ Cinghiale
☐ Cormorano
☐ Airone grigio
☐ Cornacchia
☐ Gabbiano
☐ Germano reale
☐ Altro:.....
☐ .....

13. Nelle tue visite al fiume o nel Delta, che cosa ritieni più importante? Dai un valore da 1 a 5

1 2 3 4 5	L'ambiente di per sè	1 2 3 4 5	Tempo libero
1 2 3 4 5	L'osservazione della natura	1 2 3 4 5	Salute
1 2 3 4 5	L'enogastronomia	1 2 3 4 5	Educazione
1 2 3 4 5	Esercizio fisico / sport	1 2 3 4 5	Ispirazione
1 2 3 4 5	Tradizione / cultura / identità	1 2 3 4 5	Spiritualità
1 2 3 4 5	Bellezza del paesaggio	1 2 3 4 5	Altro:.....

14. In futuro potresti perdere interesse per il fiume e il Delta a causa di qualcuno di questi aspetti?

1 2 3 4 5	Siccità
1 2 3 4 5	Presenza di sbarramenti e dighe
1 2 3 4 5	Abbandono di rifiuti
1 2 3 4 5	Incuria della vegetazione e degli argini
1 2 3 4 5	Estinzione di specie animali e vegetali
1 2 3 4 5	Cambiamento del territorio circostante
1 2 3 4 5	Bracconaggio

15. L'anguilla è una specie a rischio di estinzione. Lo sapevi?
☐ Si ☐ No

16. Negli ultimi 10 anni, a tuo giudizio, la presenza locale dell'Anguilla è...
☐ rimasta stabile
☐ diminuita
☐ aumentata

17. Quali sono secondo te i fattori ambientali dannosi per l'anguilla?
☐ Inquinamento
☐ Sbarramenti/dighe
☐ Prelievo di acqua
☐ Pesca sportiva
☐ Pesca professionale
☐ Acquacoltura
☐ Bracconaggio
☐ Specie alloctone (es. siluro)
☐ Altro:.....

18. Conosci la Rete Natura 2000 istituita dall'UE?
☐ Si ☐ No

19. Avevi già sentito parlare di LIFEEL?
☐ Si ☐ No

20. Cosa pensi del progetto LIFEEL?.....
☐ Che sia giusto intervenire a favore della biodiversità ☐ Che non intervenga sui problemi veri per l'anguilla ☐ Non ti interessa

D. SEI UN PESCATORE?

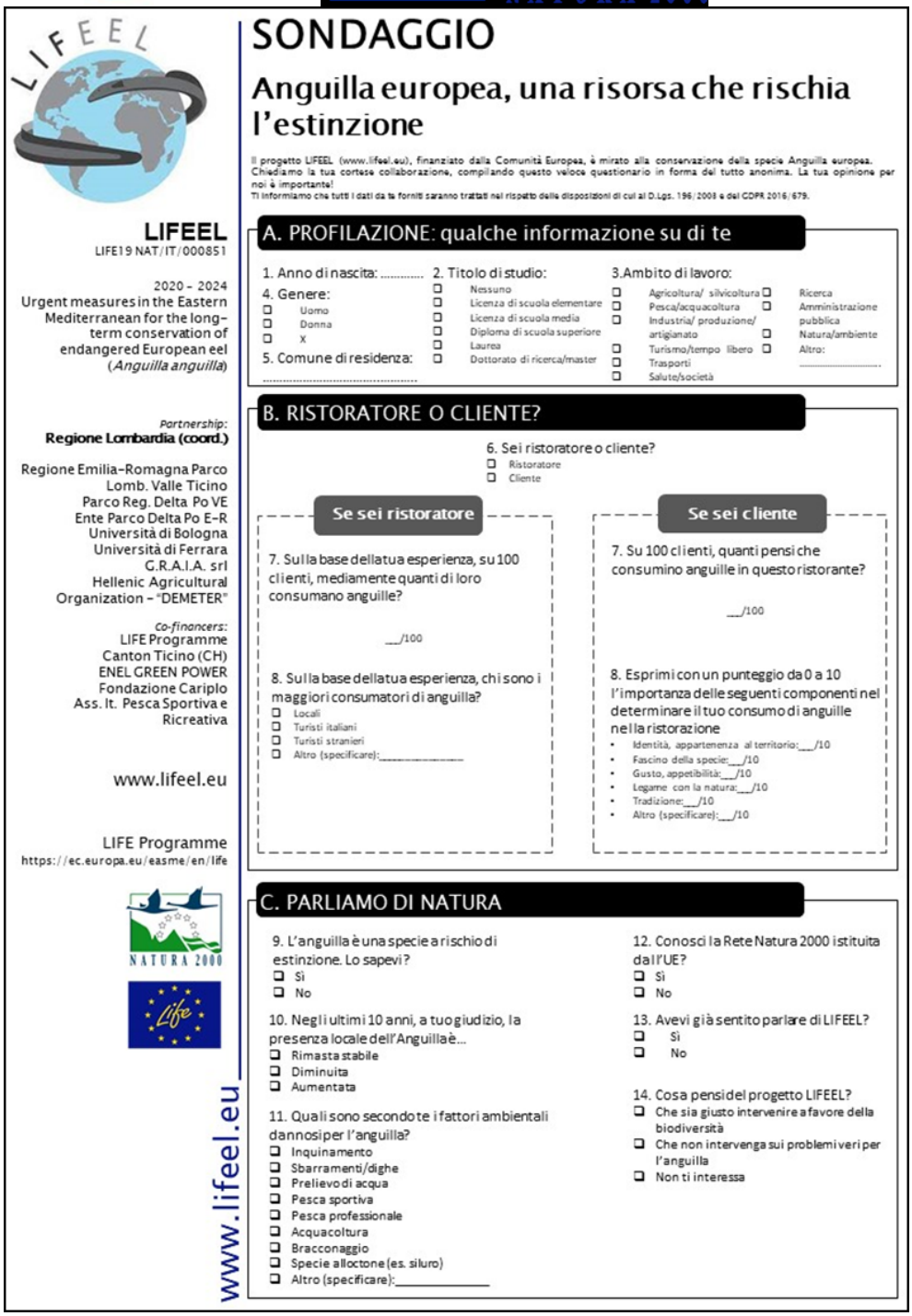
21. Se sei un pescatore, quali tecniche di pesca utilizzi?
☐ Strascico
☐ Nasse
☐ Pesca all'amo
☐ Reti da posta
☐ Altro:.....

22. Nelle tue catture accidentali (by-catch) hai mai trovato anguille?
☐ Si
☐ No

23. Se si, mediamente quante per sforzo di pesca?Scrivi il numero.....

24. Se si, quale tipologia di anguille sono maggiormente coinvolte nelle tue catture accidentali?
☐ Gialle
☐ Argentine
☐ Altro (Specificare):.....

Figure S1: Questionnaire for the general public on biodiversity and cultural services.



SONDAGGIO

Anguilla europea, una risorsa che rischia l'estinzione

Il progetto LIFEEL (www.lifeel.eu), finanziato dalla Comunità Europea, è mirato alla conservazione della specie Anguilla europea. Chiediamo la tua cortese collaborazione, compilando questo veloce questionario in forma del tutto anonima. La tua opinione per noi è importante!
Ti informiamo che tutti i dati da te forniti saranno trattati nel rispetto delle disposizioni di cui al D.Lgs. 196/2003 e del GDPR 2016/679.

LIFEEL
LIFE19 NAT/IT/000851

2020 - 2024
Urgent measures in the Eastern Mediterranean for the long-term conservation of endangered European eel (*Anguilla anguilla*)

Partnership:
Regione Lombardia (coord.)

Regione Emilia-Romagna Parco Lomb. Valle Ticino
Parco Reg. Delta Po VE
Ente Parco Delta Po E-R
Università di Bologna
Università di Ferrara
G.R.A.I.A. srl
Hellenic Agricultural Organization - "DEMETER"

Co-financers:
LIFE Programme
Canton Ticino (CH)
ENEL GREEN POWER
Fondazione Cariplo
Ass. It. Pesca Sportiva e Ricreativa

www.lifeel.eu

LIFE Programme
https://ec.europa.eu/easme/en/life

A. PROFILAZIONE: qualche informazione su di te

1. Anno di nascita: .....
2. Titolo di studio:
   - ☐ Nessuno
   - ☐ Licenza di scuola elementare
   - ☐ Licenza di scuola media
   - ☐ Diploma di scuola superiore
   - ☐ Laurea
   - ☐ Dottorato di ricerca/master
3. Ambito di lavoro:
   - ☐ Agricoltura/ silvicoltura
   - ☐ Pesca/acquacoltura
   - ☐ Industria/ produzione/ artigianato
   - ☐ Turismo/tempo libero
   - ☐ Trasporti
   - ☐ Salute/società
   - ☐ Ricerca
   - ☐ Amministrazione pubblica
   - ☐ Natura/ambiente
   - ☐ Altro: .....
4. Genere:
   - ☐ Uomo
   - ☐ Donna
   - ☐ X
5. Comune di residenza: .....

B. RISTORATORE O CLIENTE?

6. Sei ristoratore o cliente?
   - ☐ Ristoratore
   - ☐ Cliente

Se sei ristoratore

7. Sulla base della tua esperienza, su 100 clienti, mediamente quanti di loro consumano anguille?

__/100

8. Sulla base della tua esperienza, chi sono i maggiori consumatori di anguilla?
   - ☐ Locali
   - ☐ Turisti italiani
   - ☐ Turisti stranieri
   - ☐ Altro (specificare):_____

Se sei cliente

7. Su 100 clienti, quanti pensi che consumino anguille in questo ristorante?

__/100

8. Esprimi con un punteggio da 0 a 10 l'importanza delle seguenti componenti nel determinare il tuo consumo di anguille nella ristorazione
   - Identità, appartenenza al territorio:__/10
   - Fascino della specie:__/10
   - Gusto, appetibilità:__/10
   - Legame con la natura:__/10
   - Tradizione:__/10
   - Altro (specificare):__/10

C. PARLIAMO DI NATURA

9. L'anguilla è una specie a rischio di estinzione. Lo sapevi?
   - ☐ Sì
   - ☐ No
10. Negli ultimi 10 anni, a tuo giudizio, la presenza locale dell'Anguilla è...
    - ☐ Rimasta stabile
    - ☐ Diminuita
    - ☐ Aumentata
11. Quali sono secondo te i fattori ambientali dannosi per l'anguilla?
    - ☐ Inquinamento
    - ☐ Sbarramenti/dighe
    - ☐ Prelievo di acqua
    - ☐ Pesca sportiva
    - ☐ Pesca professionale
    - ☐ Acquacoltura
    - ☐ Bracconaggio
    - ☐ Specie alloctone (es. siluro)
    - ☐ Altro (specificare):_____
12. Conosci la Rete Natura 2000 istituita dall'UE?
    - ☐ Sì
    - ☐ No
13. Avevi già sentito parlare di LIFEEL?
    - ☐ Sì
    - ☐ No
14. Cosa pensi del progetto LIFEEL?
    - ☐ Che sia giusto intervenire a favore della biodiversità
    - ☐ Che non intervenga sui problemi veri per l'anguilla
    - ☐ Non ti interessa

www.lifeel.eu

Figure S2: Questionnaire for the restoration sector.

Figure S3: Poster featuring a QR code used to distribute the questionnaire on biodiversity and cultural services.