PROJECT LIFEEL LIFE19 NAT/IT/000851
Urgent measures in the Eastern Mediterranean for the long term conservation of endangered European eel (*Anguilla anguilla*)

NEWSLETTER

THE LATEST NEWS FROM THE LIFEEL PROJECT

2022 5

News LIFEEL from GREECE PAGE 6

Project title: Urgent measures in the Eastern Mediterranean for the long term conservation of endangered European eel

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Parco Regionale Veneto del Delta del Po
Ente Parco Delta del Po Emilia-Romagna
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Università di Ferrara
G.R.A.I.A. srl
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DROUGHT ALERT 2022
The Po is below the hydrometric level

THE LONG DROUGHT CAUSED A DRASTIC DECREASE IN THE FLOW OF RIVERS, THE PO RIVER INCLUDED

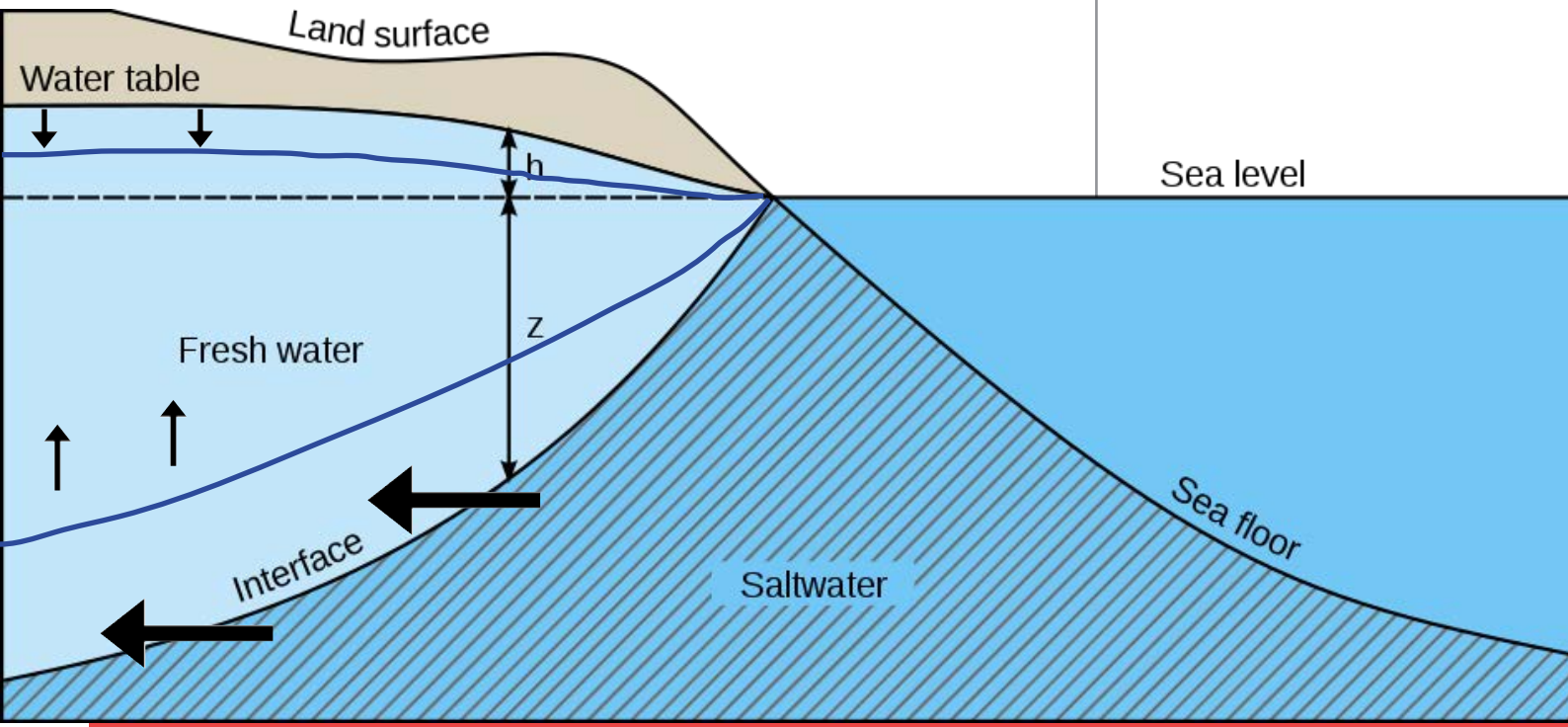
The long period of drought has caused a drastic lowering of the flow of rivers including the Po. We asked Prof. Castaldelli of the University of Ferrara and partner of the LIFEEL project, to illustrate what ecological repercussions this situation entails for the species that populate the Po and for eel in particular.

The Po is below the hydrometric level. "AIPO advises against navigation", "The all-time record: the Po's level has never been so low", "The Po River dried up, a huge sand island and a rivulet of water remains: the video between Mantua and Ferrara", "Anbi:

In the picture: LIFEEL speaks about itself to school children. See page 6
(Photo by DEMETER)

Saltwater Intrusion

'The great river no longer exists". "The saltwater intrusion has gone upstream 40 km in the Po di Goro".
The list could go on. Similar headlines have indeed become commonplace, in a summer never seen before. And in the meantime, day after day the levels are lowering and, less perceptible but even more important, at the same level the river flow is falling, reaching values never recorded before, now in the order of a hundred cubic meters per second, at the basin closure section, at Pontelagoscuro, Ferrara.
The Po, the river of rivers, is almost at a standstill from Ferrara to the sea. The usual flow velocities, of a few tens of centimeters per second, even in summer, are now comparable to those of the placid canals that lie in the countryside, outside the river embankments, equal to a few centimeters per second.
For those who care about the aquatic ecosystem, the question that arises is what the effects of these completely abnormal conditions might be on the animal communities and on protected species. As is often the case when approaching an ecosystem analysis, the answer is not even one. Let us try to distinguish a few terms.
First, the saltwater intrusion. In the Po, as in all rivers or canals that flow into the north-western Adriatic, this is a phenomenon that in summer usually affects the terminal stretches, where the water column is made of a bottom layer with salinity close to that of the sea and a fresh surface layer. The more the flow decreases, the more the thickness of the sea water layer extends and the thickness of the freshwater layer decreases.
If the conditions persist, as the season progresses the seawater extends westwards, moving up the course and reaching sections further upstream. This phenomenon has different effects on the various communities in the ecosystem. Freshwater aquatic plants may suffer to the point of death, but since they are very poorly represented in the Po today, the phenomenon now underway is not substantially changing the river's vegetation.



The saltwater intrusion. That is how it manifests (modified from: @wikimedia commons)

The long dry summer in the Po River

Bottom-dwelling freshwater invertebrates, the river benthos, which are not very mobile or not at all, die when salinity extends into portions of the riverbed which are usually freshwater. They are, however, characterized by a high capacity to rapidly recolonize such parts of the river when freshwater returns to them permanently. Freshwater fish species, such as carp, bream, Danubian bleak, sheatfish, American catfish, and pikeperch, move further upstream when the saltwater intrusion rises, awaiting the return of low salinity or freshwater. For euryhalines, i.e. those species able to live in a wide salinity range from fresh to sea water, such as mullet, sturgeon and eel, the problem does not even arise.

Salinity aside, there are also other factors that, sometimes less obvious, can have unexpected effects on animal communities following the drastic reduction in flow rates. Let us remember, for example, that the Po, for various reasons, anthropic and natural, has lost connectivity with its lateral environments, the floodplains, over the last fifty years. Using a term proper to Ecology, it has lost the lateral connectivity. There are few remaining floodplains, and they generally have a low ecological quality. Water floods the floodplains once a year, during major floods, and they remain submerged for a short time, from a few days to a few weeks, depending on the intensity of the flood and the time of year. Therefore, in almost all the year, the entire discharge travels in the central, recessed riverbed, meters away from the floodplains. Flow velocities are on average high, on the order of tens of centimeters per second, conditions that

Po River in summer 2022 (picture: https://www.agrapress.it/)

Drought an ecosystem in crisis

do not favor the development of submerged vegetation, which in fact is practically absent. As proof, animal species that need aquatic vegetation for all or part of their life cycle are practically absent, while animal and fish species typical of bare, sandy, or silty bottoms and adapted to high flow velocities dominate.
It is in this context that the paradox of this summer takes place: the reduction in flow rates and flow velocities has increased the diversity of habitats. The summer calamity we are experiencing has had an unexpected effect on the great river, increasing the diversity of habitats and, momentarily, also that of animal communities. The channeled and homogeneous course has changed into a series of shallows, shallow holes, slow-flowing minor courses and small oxbows. In these environments, bottom invertebrates, insect larvae, crustaceans, and mollusks, to name but a few groups, and fry have found more diverse habitats and food resources than those available in the usual summer situation, to the extent that an increase in the number of species present is evident, as is evident from ongoing monitoring. However, these are transient phenomena that will subside when normal hydrological conditions return.
In this environmental context, special mention must be made of the European eel, one of the very few native fish species still present in the Po and protected by a European regulation because it has been declared at risk. The results of the LIFEEL project's ongoing monitoring have revealed a more dramatic picture than expected, in which the Po's populations are currently undergoing a further, drastic decline. What emerged from the monitoring carried out in the spring of 2021 and 2022, on juvenile stages, glass eel caught in the delta and elvers at the Pontelagoscuro section of Ferrara, is a near absence of recruitment.

Po River at Polesine Zibello, in the province of Parma (picture: Paolo Panni/ADBPO - CC-BY 3.0, from: Le Scienze.it)

European eel and the long drought 2022

This phenomenon was indirectly confirmed for 2019 as well, through analysis of data from professional fishing. These results, which will be presented in detail and discussed in the next newsletters, underline the seriousness of the situation in which the Po's populations, which are further rarefied in the smaller size classes, find themselves.

Returning to the effects of the lowering of water levels, it can be said that it is not benefiting eel but, on the contrary, may have caused some further negative effects. In the Po, in fact, the scarce residual populations of eel generally reside in the embankments, set up as bank defenses. The almost complete absence of vegetation in the river, in fact, does not allow eel to use other habitats, as it would otherwise be too exposed to predation by both exotic species, such as the Wels catfish, and native species, such as the cormorant. Therefore, barring special weather, hydrological and moon-phase conditions, the few eels in the Po spend most of their lives hidden in the recesses between one boulder and another of the groynes and bank defenses. For this reason, the problem that has occurred for the eel during this extreme lowering of water levels is that many of the groynes and bank defenses have emerged in their entirety, forcing the few eels present there to abandon them, to take refuge in the few embankments that remain, at least in part, submerged. What has happened, and what will happen again when water levels return to normal, is that the eels have had to move 'against their will', exposing themselves to a higher risk of predation.

Semi-submerged river brush due to extremly low flow conditionsPoris

GREECE
LIFEEL presents itself

LIFEEL project is presented in Greece

30 YEARS LIFE. On June 28th 2022, a conference for the celebration of the 30 years of LIFE was organized by the Hellenic Agricultural Organization “DEMETER”. The event was held at the premises of the Institute of Mediterranean Forest Ecosystems and Forest Products Technology. During the event all the researchers of the Hellenic Agricultural Organization “DEMETER” presented all nine projects funded by LIFE, LIFEEL included. The presentation of the project was done by Dr. Sapounidis Argyrios, Assistant Researcher, Project leader of the Greek team. The presentation aimed to present the various Working packages, the work that has already been done and what is being expected in the near future and until the end of the project. The project was advertised also through a Roll up banner and leaflets that were given to the participants of the event.

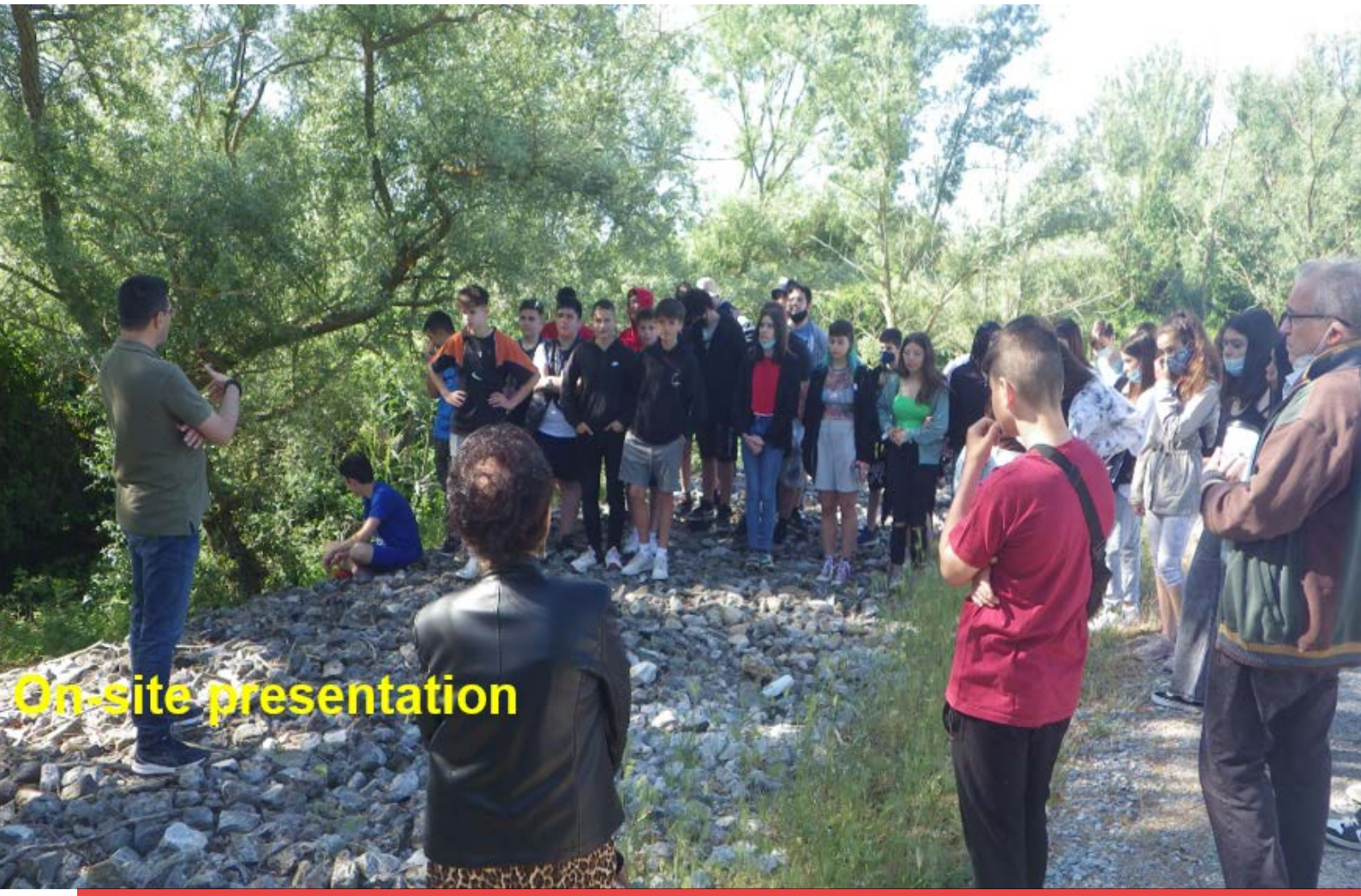
Moments of the LIFEEL presentation event organised in GREECE on 28 June 2022 (pictures by: Argyrios Sapounidis)

LIFEEL goes on also in Greece

LIFEEL MEETS SCHOOL CHILDREN. During May and June, more than 100 students from 10 different class from Primary and High schools were informed about the importance of European eel (Anguilla anguilla). The presentation took place both in the premises of the Fisheries Research Institute and on site, where a demonstration of fish samplings with electrofishing device took place. The pupils had the opportunity to get to know the peculiar life history of the European eel, the problems the species is facing and why LIFEEL is a very important project for the protection and the recovery of the species.

CONSTRUCTION OF THE EEL-PASS ON NESTOS RIVER. Meanwhile, after getting the permission from the Regional Authority of East Macedonia and Thrace, the tender for the construction and installation of ae eel passage in the Toxotes dam in River Nestos is getting formulated and ready to be published!

SCIENTIFIC COMMUNICATION IN GREECE. Finally, the Greek working team hired a Science communicator, who will take over and organize all the upcoming events in the area of East Macedonia and Thrace. After the publication of an open tender, the Department of Public Relations of the TV Station of Macedonia and Thrace was awarded the contract of the Science Communicator, and the first contacts to organize the future work has already taken place.



ITALIAN RECREATIONAL AND SPORT FISHING ASSOCIATION cofinances and supports LIFEEL

LIFEEL benefits from the contribution of the Co-financers who, from the outset, have decided to support it in a concrete way. We asked some questions to Maurizio Braghittoni, President of the Italian Association of Sport and Recreational Fishing until June 2022, association that co-finances the project.

"The Italian Recreational and Sport Fishing Association is an association established in 1984. Its purpose is not only to organise and coordinate recreational fishing activities carried out by the owners of fishing huts in the Emilia-Romagna Region's territory but to act as a guardian of a social and cultural heritage rooted in history, and art and life of our people and territory. Along the coastline, inside the lagoons and along the rivers, in the alternation of landscapes with various contours, fishing hut structures can be identified in perfect harmony with the surrounding environment.

Already in 2015, thanks to a meeting with Prof. Mordenti, we became aware of the University of Bologna's projects to safeguard the Adriatic sturgeon and the European eel. I personally mentioned them at the general members' meeting and the proposal to help, with the means at our disposal and not only economically, these types of projects passed unanimously. Thanks to our collaboration with the University of Bologna, every member can report any 'anomalies' in the waters to the research body, and we also report to the forest ranger if we sense poaching. WE HAVE BECOME A SORT OF 'SENTINELS' OF OUR TERRITORY also because the fishing hut, over the years, has increasingly lost its role as a fishing tool and has become a social gathering place.

Our Association is present in the Regional Ichthyic Commission, continues to monitor the waters of the territory and has been aware for years that climate change has led to the presence of fish species that were not there before.

Regarding the LIFEEL project, we will continue to support it, aware of the importance of safeguarding this wonderful species that has unfortunately been in difficulty for several decades".

Maurizio Braghittoni, president till june 2022 of the Italian Recreational and Sport Fishing Association

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9TH SEPTEMBER 2022 - BOLOGNA
with the organization by Emilia-Romagna Region

LIFEEL AT **SANA 2022**
34th International Exhibition of Organic and Natural

PROJECT LIFEEL LIFE19 NAT/IT/000851

LIFE Programme
Italy-Greece

Do you have any information we might be interested in?
Do you have something to report?

CONTACT US!

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