



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

2021
3

@Fisheries Research Institute - GREECE

Project title:

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

Acronym:

LIFEEL

Specific financing EU programme:

LIFE Biodiversity

Codice LIFE:

LIFE19 NAT/IT/000851

Duration of the project:

50 months - from 01/10/2020 to 31/12/2024

Coordinating beneficiary:

Regione Lombardia -DG Agricoltura

Associated beneficiaries:

Regione Emilia-Romagna - D. Agricoltura,
caccia, pesca

Parco Lombardo della Valle del Ticino

Parco Regionale Veneto del Delta del Po

Ente Parco Delta del Po Emilia-Romagna

Università di Bologna

Università di Ferrara

G.R.A.I.A. srl

Hellenic Agricultural Organization - "DEMETER"
(GRECIA)

Co-financers:

EU LIFE Programme

Canton Ticino (Svizzera)

ENEL GREEN POWER

Fondazione Cariplo

Associazione Italiana Pesca Sportiva e
Ricreativa

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SILVER EELS

We select the best and release them in nature

THE PROTOCOL FOR THE SELECTION AND RELEASE OF EEL SPAWNERS AT SEA IS READY

In previous newsletters we described the complex life cycle of European eel. The young eels enter estuarine and riverine ecosystems at stage of Glass eels (6/8 cm). In these ecosystems, eels grow and became adults, Yellow eels. Finally, when they mature, then eels begin the journey back to the Sargasso Sea, where the reproduction takes place.

OUR TARGET: MIGRANT EELS. In autumn and winter the eels leave the growth fields in the inland waters and head towards the sea. During these movements, the last metamorphosis of eels takes place ("silvering"), where eels through a complex mechanism of metabolic and morphophysiological changes, are transformed

Comacchio Valleys, photo from the archives of the Po Delta Regional Park of Emilia-Romagna

into Silver eels. One of the most evident change is the body color change, that passes from a yellowish color (Yellow eel) to silver color characterizing the migratory eels (Silver eel).

Studies have shown, that female silver eels can be divided into two sub-groups, the pre-migrant and the migrant. Morphologically the separation of the two sub-groups is difficult (Figure 1), but the Silver eels show a different behavior. In particular, the pre-migrants eels, which are not genetically mature, tend to remain in growth fields, in contrast to migratory eels, which are genetically mature, begin the long journey back to the breeding fields in the sea.

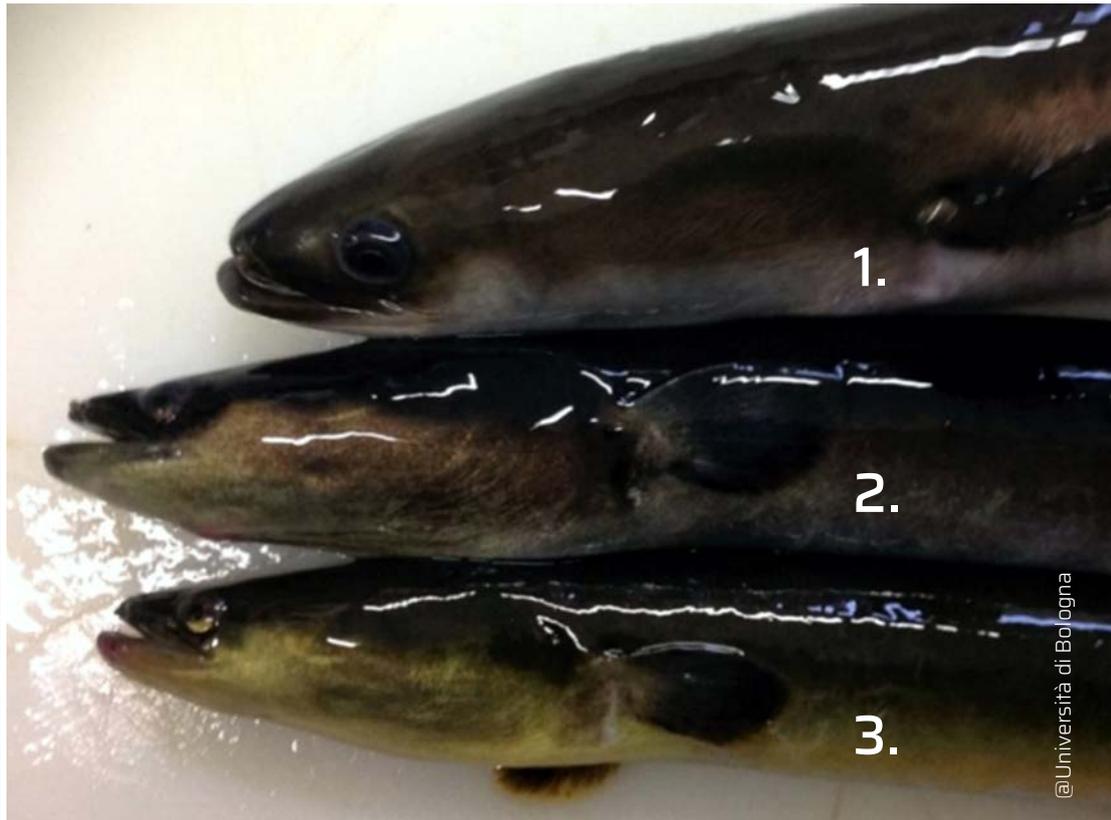
This categorization of the female Silver eels will contribute significantly to the design of the new measures to address the decline of the wild population and the conservation of the species. One of the suggested indications is the release of mature adults specimens into the sea which are capable of contributing to reproduction. These specimens will come from eels collected from commercial fishing.

Through the Action A2, which is preparatory to the other actions of LIFEEL, a protocol was developed, based on some controlled parameters, capable of separating migratory eels from “pre-migratory”.

Silver eels



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THE PROTOCOL

The development of this protocol was carried out in Italy by Prof. Mordenti of the University of Bologna (Dept. of Veterinary Medical

Eels compared each other:

1. "migrant" female;

2. "pre-migrant" female;

3. "resident" female.

Spawners selection.

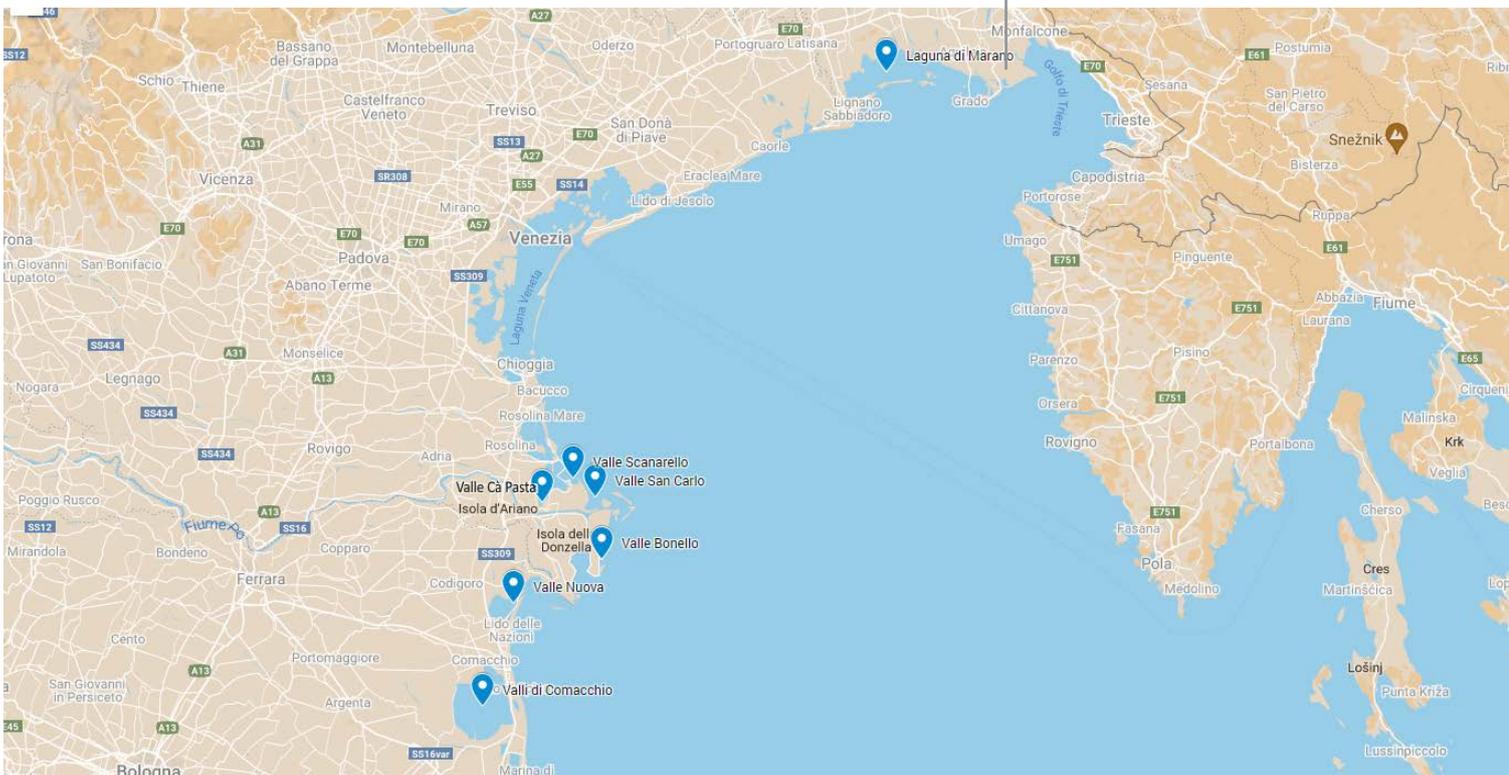
Sciences) in collaboration with the University of Ferrara, the Po Delta Parks of Emilia and that of Veneto and with Dr. A. Sapounidis, researcher of Fisheries Research Institute, in Greece.

A total of 16 populations of eels were analyzed, 15 of Italian and one of Greek origin, in order to develop this protocol. Specifically, seven (7) populations came from the upper Adriatic, six (6) from the valley areas of the Po Delta Park of Veneto (Valle Bonello, Valle San Carlo, Valle Cà Pasta, Valle Scanarello) and Emilia-Romagna (Comacchio and New Valleys) as well as one (1) population from the northern regions of the Marano-Grado valley. Regarding the eels of Greece, the under study population originated from Lake Vistonida, located in the National Park of Eastern Macedonia and Thrace in Northern Greece.

IN ITALY. The sampling campaign involved the morphometric analysis of 1,600 adult females' eels specimens', of which 1,513 belong to the Italian populations and the remaining 98 to the Greek. In each sampling were recorded: length, weight, diameter (vertical and horizontal) and length of forearm area, eye diameter (horizontal and vertical), length of lateral fins and length of head. The data of these measurements were used in the necessary biometric analyzes to obtain the most important external indices correlated with the stage of maturation of the gonads (Silver Index). In addition, the age determination of the populations was estimated from the scales. In a significant sample of eels (over 12%), which were collected from eel farms, the gonads were properly processed to calculate the gonadosomatic index (GSI). Histological analyzes were also performed on the gonad samples for further validation of the protocol.

We release
the best eels

Places of origin of eel samples used for the development of the protocol for the silver "migrant" eels selection.



IN GREECE. The special situation created by the global pandemic of Covid-19, due to the emergency security measures (ban on movement of citizens, gatherings, school closures, etc.) affected the conduct of samplings in Greece, complicating the collection of the necessary data. Restrictions and quarantine measures that applied in both countries, prevented the Italian research team from participating in the Greek samplings. Also, the planned air transport of eel samples from the Fisheries Research Institute to the University of Bologna, for the implementation of biometric analyzes and reproduction tests became impossible, due to the ban on the transport of live animals within the EU. It has been rescheduled for next fall, where new data collection efforts are planned in Greece.

As a further validation of the protocol, reproduction in captivity was carried out using 40 females and 60 males. The breeders were selected from the different sampling campaign in relation to their silver index and origin; the excellent quantity and survival of the larvae produced by the eels identified by the protocol as migrants confirmed the effectiveness of the result achieved.

ONE PROTOCOL FOR EVERYONE! This protocol was developed as a computer program - currently valid only for the populations present in the Po Valley and northern Adriatic area. It is shortly downloadable from the project website (www.lifeel.eu) and allows the researcher with the insert of only two morphometric parameters (total length and diameter of the eye), to separate the captured eels into the three (3) different life stages, the resident (non-migrating) eels, the fully migrating eels (100%) and eels with a degree of migration greater than 90%.

THANKS TO THIS LIFEEL PRODUCT, RESEARCHERS AND OPERATORS IN THE SECTOR ARE PROVIDED WITH A VALID TOOL CAPABLE OF MAKING A SELECTION OF THE MOST VALID BREEDERS TO BE RELEASED IN SUPPORT OF REPRODUCTION IN THE WILD, ENSURING A FURTHER IMPORTANT STEP FORWARD IN THE CONSERVATION OF THE EEL.

Oliviero Mordenti is Professor in Aquaculture and Director of the Master in Aquaculture and Ichthyopathology at the Department of Veterinary Medical Sciences of the University of Bologna. The research activity is mainly linked to the fields of reproductive biology, nutrition and technologies for the breeding of aquatic organisms, the management of natural fish populations and the quality of fish products.



Watch the interview with Oliviero, guest on the GEO TV program (https://lifeel.eu/wp-content/uploads/2021/09/Geo-Progetto-LIFE_24-12-2020.mp4)



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

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