

« Recovery of *S. Macrostigma*: Application of Innovative Techniques and Participatory Governance Tools in rivers of Molise »

LIFE Nat.Sal.Mo.

(LIFE17 NAT/IT/000547)

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WORKSHOP 4 OTTOBRE 2019



coordinatore beneficiario



UNIVERSITÀ
DEGLI STUDI
DEL MOLISE

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ULBS
Universitatea "Lucian Blaga" din Sibiu



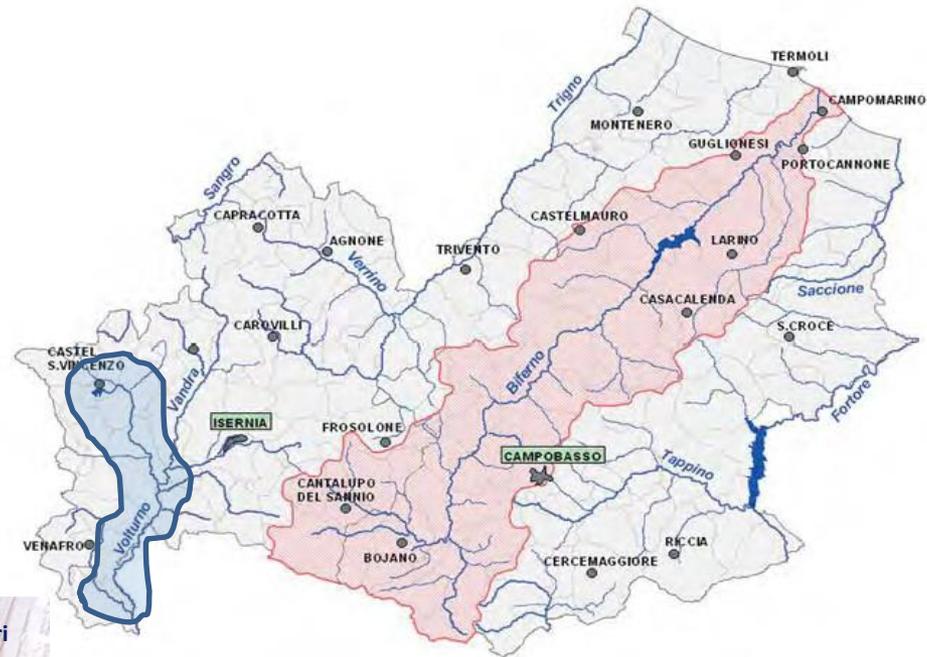
UNIVERSITATEA DE ȘTIINȚE
AGRICOLE ȘI MEDICINA VETERINARĂ
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General description of the area / site(s) targeted by the project



Intraspecific
biological
diversity

Adaptation to
local
environmental
conditions



Esemplare tipico catturato nel Rio Caprionero a poche centinaia di metri dalla confluenza col Fiume Volturno (Codice DNA: 25V - ST2V)



Esemplare tipico del corso principale del fiume Biferno (Cod. DNA: 54B - ST5B)
Femmina marcata con Pit-Tag num. 36551

The project area includes the upper part of Volturno and Biferno river and the main tributaries in the Molise region. The Biferno river flows into the Adriatic Sea, while the Volturno river in the Tyrrhenian Sea.

Description of species / habitats / biodiversity issues targeted by the project

The introgression by zootechnical strains caused an overall genetic impoverishment, eliminating the original genetic variability and ecological specializations that are distinctive features of the salmonid species.

GENETIC INTROGRESSION



LOSS OF SPAWNING HABITAT



POORLY REGULATED FISHING

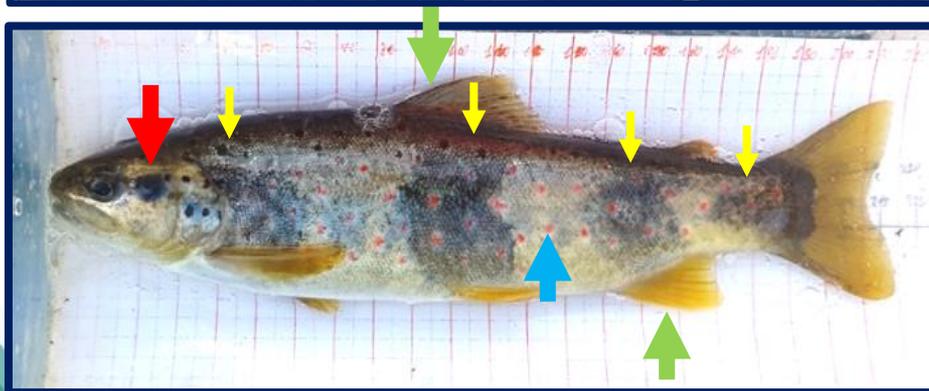
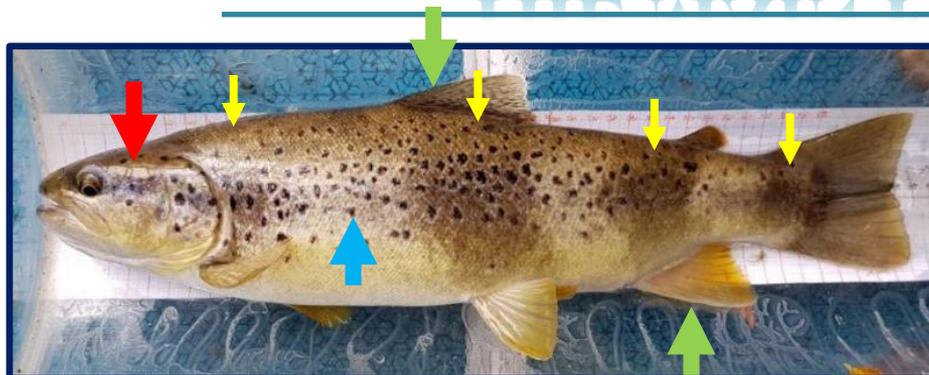


The Biferno river springs in Bojano are frequented by a large number of wild breeders during the spawning period, but the site is severely altered by waste material (tires, electrical appliances, etc...).

TARGET SPECIES:

the Mediterranean Trout within the project area

THE MAIN FEATURES



- ➔ Blue-black preopercular mark (or halo)
- ➔ Frequent presence of 4 darker bands along the side to create a zebra-like pattern
- ➔ Anterior margin of the anal and dorsal fin without a marked black and white band
- ➔ Black or red spotting (frequently mixed) depending on environmental and population characteristics

! Strong tendency to reproductive migrations in the Biferno and Volturno river basin !

SPECIFIC GOALS OF THE PROJECT



To recover the genetic integrity of native populations of *S.macrostigma*



To recover the spawning habitat and restore the fluvial connection



To optimize the semen cryopreservation protocols and use in the artificial reproduction



To promote the dispersion of native trout inside the project area and restocking in suitable areas



To achieve positive socioeconomic return and an increase of environmental awareness

C.1 Incremental path to River Contract as a participatory tool for the sustainability of the project results

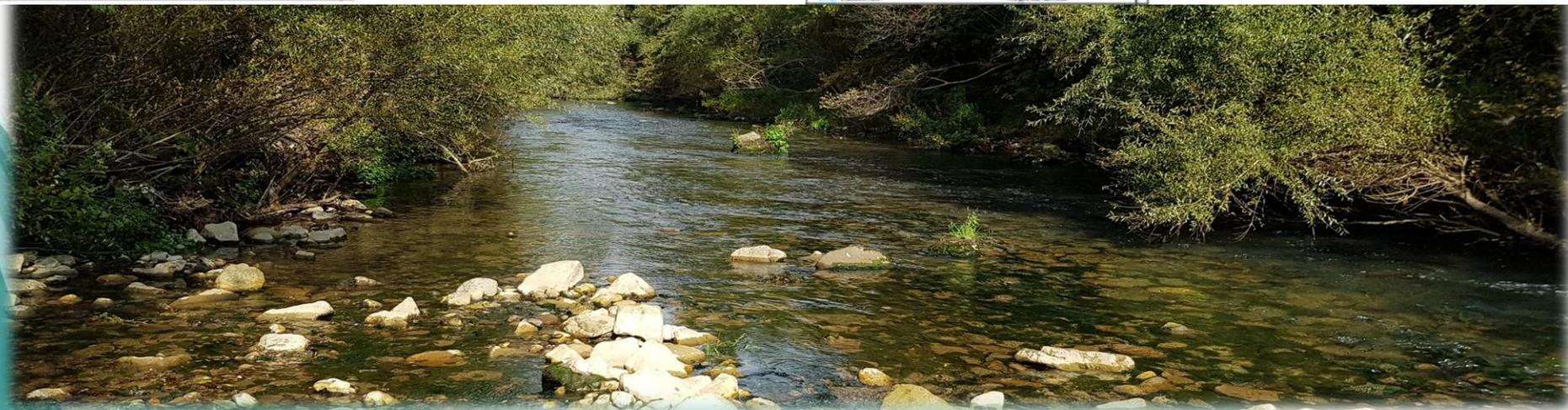
- C1.1 Stakeholders' identification, prioritisation and motivation by open forum
- C1.2 A Protocol of Agreement



RIVER CONTRACT

C2.1 Recovery of spawning grounds

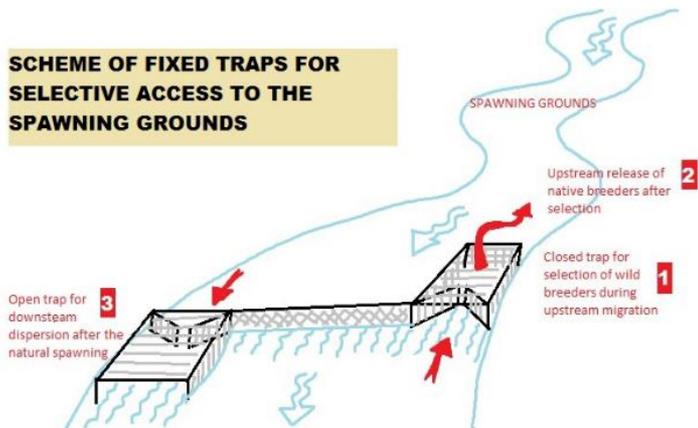
C2.2 River reconnection



Selective access

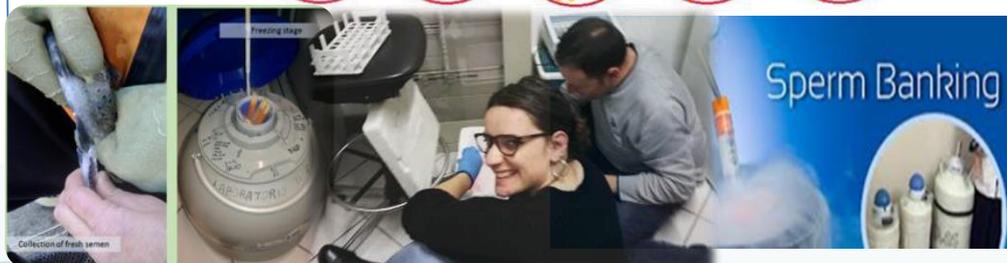
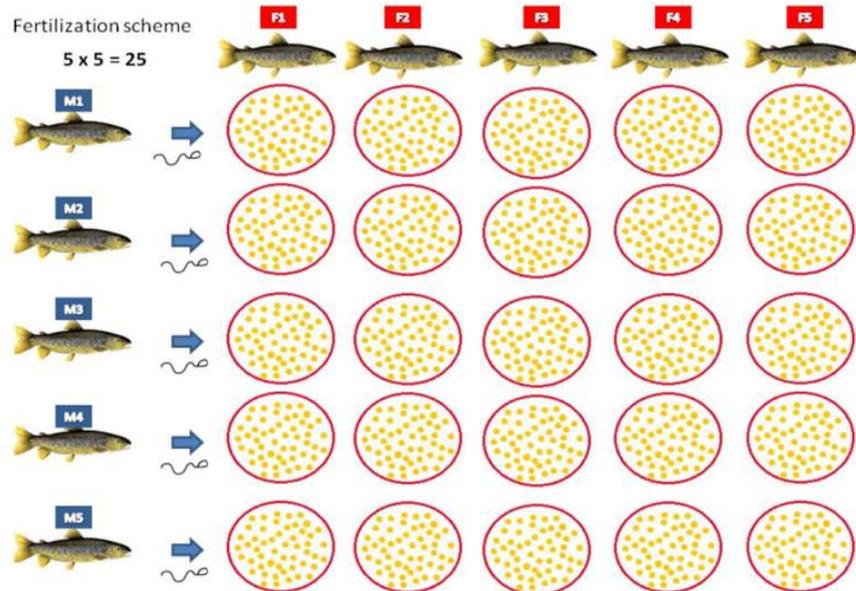
selecting wild breeders
(genetic and morphological analysis)

SCHEME OF FIXED TRAPS FOR SELECTIVE ACCESS TO THE SPAWNING GROUNDS



to allow the access to the main natural spawning grounds only to non-introgressed wild breeders

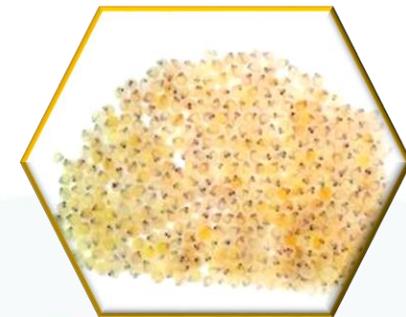
Sperm cryopreservation and fertilization schemes in the artificial reproduction activities



Planting eyed eggs (nesting technique)



To Avoid the
domestication
of wild stock



D. Monitoring of the impact of the project actions

D.1 Monitoring of the impact of the project actions

D1.1 Monitoring of the genetic status

D1.2 Dispersal of *S. macrostigma*

D1.3 Migration patterns (recaptured in C4,

D1.1, D1.2+reports)

D1.4 Performance indicator



AVVISO IMPORTANTE AI PESCATORI

Da luglio 2018 è partito il Progetto Europeo LIFE **SAVANA**, coordinato dall'Università degli Studi del Molise, che si propone di studiare e recuperare le trote native del Molise nei bacini idrografici del Fiume Volturno e Fiume Giferno. Il progetto è nella prima fase conoscitiva e sta già coinvolgendo diverse associazioni di pescatori ricreativi che ci stanno offrendo un fondamentale supporto attivo e che stanno condividendo gli obiettivi del progetto. Nel corso del progetto saranno promossi numerosi incontri con pescatori, turisti del fiume e portatori di interesse, in una logica di partecipazione ai processi decisionali per la gestione, il mantenimento e di conservazione delle risorse naturali.

Ai pescatori (200 individui) sono stati marcati tramite microchip e sottocostole ad "etichetta" esterne ben visibili e di cui i pagherelli naturali ancorati al dorso, riportando la sigla del progetto ed un codice numerico identificativo. Queste etichette sono fondamentali per tracciare gli spostamenti dei riproduttori nativi. L'aiuto dei singoli pescatori, riportando della propria cattura, sarà determinante per una buona conoscenza degli spostamenti delle trote nei fiumi molisani e quindi per proteggerne la riproduzione naturale.

Il pescatore è richiesto di rinviare a info@natsalmo.it i dati relativi ai marcatori e segnalare la cattura attraverso:

- una apposita scheda da compilare e riconsegnare nel luogo di ritiro della scheda stessa oppure
- attraverso una segnalazione via web.

Le segnalazioni dovranno riportare:

- il colore della "pagherella" VERDE
- il codice numerico "pagherella" BIANCO
- data di cattura ARANCIO
- luogo di cattura (il più preciso possibile)

Il tracciamento più approfondito riguarda le attività di recaptura e alle medesime finalità si consiglia di dare del pescatore una ripresentazione nella area dedicata ai pescatori e alle segnalazioni in www.natsalmo.greenproject.info dato il sito Home Page del sito web del progetto

www.natsalmo.greenproject.info

Partners:

TRANSFERABILITY WORKING

To assess the replicability of innovative strategies used in the project



Case study on
Hucho hucho

To generate at least two replicability assessments in two different Member States, with at least one species other than the *S. macrostigma* (i.e. France)



TWG composition

- ❖ Scientific expert on semen cryopreservation (UNIMOL)
- ❖ Scientific expert on nesting techniques (MTRG)
- ❖ Genetics and biodiversity expert (UNIMOL)
- ❖ Ichthyologist (MTRG)
- ❖ Expert on habitat restoration (LAM)



A.3 Survey of fish communities and evaluation of biological, genetic status and migration patterns of native Mediterranean brown trout (*S. macrostigma*)

A3.1 Field activity

Sampling by electrofishing

Tissue collection (Adipose fin-clipped)

Marking (PIT-tags+ spaghetti-tags)



A3.2 Genetic Screening and morphological analysis

Genetic analysis

Morphological analysis

*Integration of genetic and morphological studies
(Morphological analysis will be crossed with genetic data)*



A3.3 The determination of trout migration patterns

Demographic analysis during the reproductive non-reproductive period

Analysis of marked fish recaptured



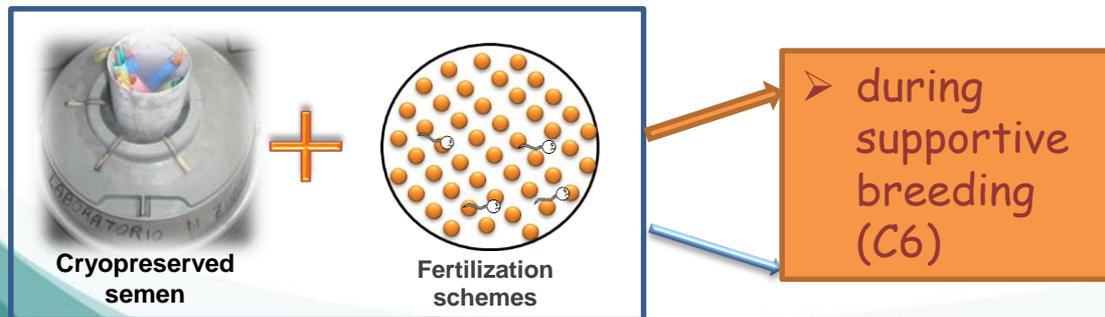
A.4 Sperm features and optimization of semen cryopreservation of *Salmo macrostigma*

A4.1 Characterization of sperm quality and sperm membrane lipid profile of native trout populations captured in the project area

- ✓ Field activities
- ✓ Evaluation of semen quality and sperm membrane lipid profile

A4.2 Optimization of semen cryopreservation protocol

- Sperm lipid composition & affect the cryotolerance of male gametes.
- success of semen freezing procedure vary among populations.
- An effective semen freezing protocol ----→ cryobanks (C5)

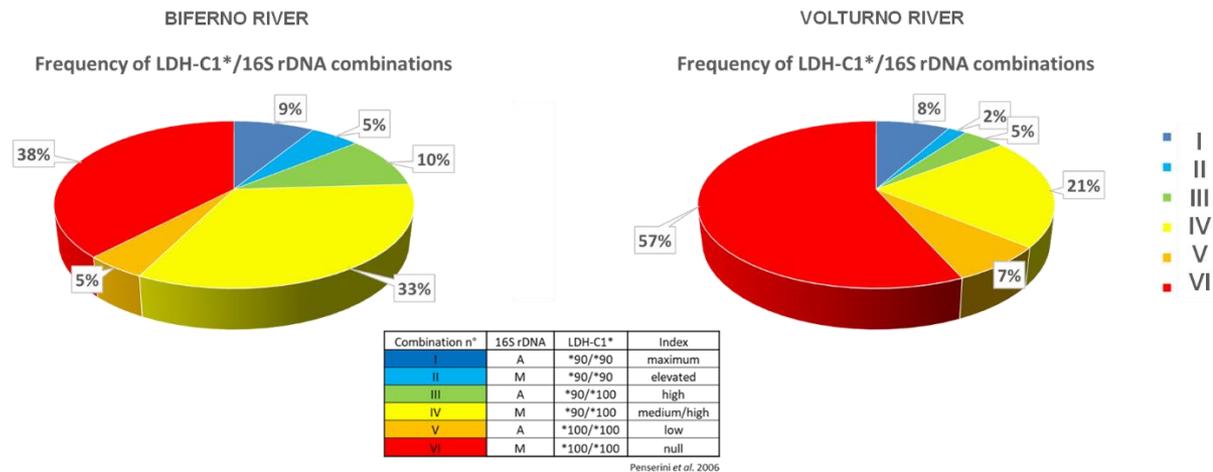


Rocchetta a Volturno Hatchery (in progress...)



First results from Preparatory Actions

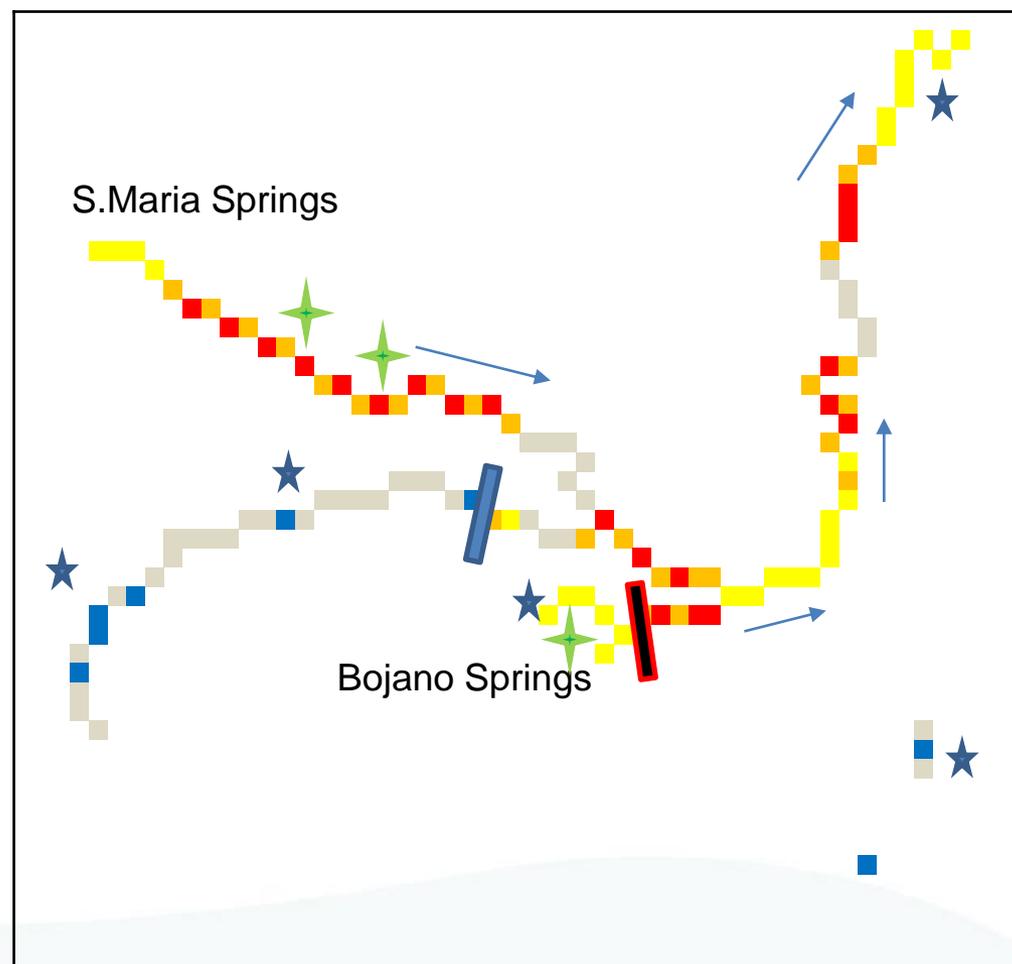
LDH + 16s RFLP analysis



SNPs analysis (55.000 sites) in progress

LDH + 16s RFLP DISTRIBUTION OF CLASSES

- ★ Presence of introduced zootechnical individuals
- Insurmountable barriers
- ▬ Fixed trap station for selective acces to spawning grounds
- ✦ Main spawning grounds





GRAZIE PER L'ATTENZIONE