



## **PhD position at CNSS** **in collaboration with BOREA**



The CNSS (Conservatoire National du Saumon Sauvage) offers a 3-year PhD position in fish biology and conservation. The PhD project will be developed in collaboration with the research Unit BOREA. The position is part of an EU Innovative Training Network (ITN) project "IMPRESS".

**PhD project title : *Environmental and neuroendocrine control of metamorphosis and swimming activity in long-river (Loire-Allier axis) Atlantic salmon: implication for conservation***

The selected candidate is expected to start on October 1, 2015, and will be registered at the PhD School of the National Museum of Natural History (MNHN), Paris, France.

The position is funded by a new EU Horizon 2020 Marie Skłodowska-Curie Innovative Training Network (ITN) on "Improved production strategies for endangered freshwater species" (IMPRESS). IMPRESS is a nine partner project starting in January 2015, and co-ordinated by the Norwegian University of Life Sciences (NMBU), Oslo, Norway.

IMPRESS offers a highly interdisciplinary and international training for 15 PhD students throughout the EU (see [www.impress-itn.eu](http://www.impress-itn.eu) for a description of all 15 PhD projects), with a highly competitive salary and close contacts with industry, government agencies and leading laboratories. In addition to conducting research, students will be enrolled on an extensive programme of short training courses, and secondments at other partner institutions.

IMPRESS aims to develop new technologies and approaches for improved production, management and conservation of three threatened diadromous fish species, the European eel, Atlantic salmon and the sturgeons. IMPRESS is an intersectoral training network covering a range of multidisciplinary aspects including molecular biology, physiology, and aquaculture production, as well as human dimensions of conservation management.

**Host Institute:** Conservatoire National du Saumon Sauvage CNSS, Chanteuges, France ([www.saumon-sauvage.org](http://www.saumon-sauvage.org)).

**Contact person and co-supervisor:** Patrick Martin, CNSS. ([p.martin@cnss.fr](mailto:p.martin@cnss.fr)) ([www.saumon-sauvage.org](http://www.saumon-sauvage.org)).

**Co-supervisors:** Sylvie Dufour ([sylvie.dufour@mnhn.fr](mailto:sylvie.dufour@mnhn.fr)) and Karine Rousseau ([karine.rousseau@mnhn.fr](mailto:karine.rousseau@mnhn.fr)), Research Unit BOREA (Biology of Aquatic Organisms and Ecosystems), MNHN, Paris, France (<http://www.borea.mnhn.fr>)

The PhD student will be member of CNSS, Chanteuges, and of Team 2 "Reproduction and Development of Aquatic Organisms: evolution, adaptation, regulations" of BOREA, Paris. He/she will mainly work in Chanteuges and in Paris, in close interaction with the other members of CNSS and BOREA.

## **Project Description**

### **Objectives:**

The Atlantic salmon, *Salmo salar*, from the Loire-Allier is the last European population able to perform long-distance migrations in rivers, but is endangered. CNSS has developed a restocking program for conservation of this emblematic unique strain. The current increase in water temperature, resulting from global change and local human activities, may impact the life cycle, by disturbing various physiological processes including triggering and progress of smoltification and downstream migration. Gaining new basic knowledge on salmon neuroendocrinology and behavior, is crucial for sustainable conservation of this population. The PhD project will aim : - to characterize the neuroendocrine control of the induction of secondary metamorphosis (smoltification); - to investigate the brain control of downstream swimming behavior; - to evaluate the effect of temperature, in interaction with photoperiod, on these processes.

### **Main tasks:**

- Predict *in silico* gene sequences for neuropeptides, hormone and receptors , with special attention to paralogs resulting from the teleost genome duplication (3R) and salmon-specific tetraploidization (4R); Validate by cloning; Perform phylogenetic analysis of neuropeptide and receptor families
- Develop qPCR assays and *in situ* hybridization to investigate gene expression regulation
- Investigate neuroendocrine controls *in vitro* (on pituitary cell cultures)
- Perform *in vivo* environmental experiments
- Perform behavioural tests

## **Collaborating Partners**

During the 3-year project period the student will have the opportunity to interact with the other IMPRESS partner institutes. This mobility will enhance multidisciplinary training of the student, and give him/her important experience of both academic and non-academic sectors.

The PhD student will also benefit from interactions with additional national partners of CNSS and BOREA, in the frame of the ANR project SALTEMP "Global warming and adaptation of migration in Atlantic salmon from long river Loire-Allier axis ».

## **Qualifications**

In addition to meeting the general qualifications, the ideal candidate will have a strong biological background, ideally a degree or Masters in fish physiology, or behaviour, and have a strong interest on the conservation and management of fishes. Driving licence useful.

**Candidates must be eligible according to the ITN recruitment guidelines for Early Stage Researchers**, *i.e.* they must have maximum 4 years research experience, measured from the time they completed their Masters degree, and cannot have resided or carried out their main activity (work, studies etc.) in the host country (France) for more than 12 months in the 3 years immediately prior to their recruitment.

**Application deadline:** June 1, 2015

**Starting date:** October 1, 2015