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Science linking with School
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Alien invaders

**Alien plants and their role in reconstructions of river banks.
A neglected problem**

LEADING INSTITUTION

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Alien invaders – Alien plants and their role in reconstructions of river banks. A neglected problem

At the moment, the project is going according to plan. All planned activities took place in time. But it became evident, that workload and time requirement is higher than expected before the beginning of the project. Therefore it was necessary, especially for the investigations in the field, to get additional assistance to optimize work with the pupils.

Summary cooperation university-school

A kick-off event in the autumn of 2008 was the start of the cooperation between the Institute of Botany of the University of Innsbruck and the pupils of the PORG Volders. On the 11th of November in 2008 pupils, teachers and scientists met at the study site in Völs, nearby the Inn River for the first time. Beside a general introduction to riverside habitats, first investigations concerning Canada Goldenrod (*Solidago canadensis*), done by the pupils and supervised by the scientists, were carried out. From March to June 2009 the project team visited the study site in Völs again. The aim was to improve knowledge of flora and vegetation of riverside landscape but also to continue the scientific research on Canadian Goldenrod – with focus on the influence of dense growing Canada Goldenrod on the diversity of invaded sites.

A highlight was the study trip to a large-scale building site at the Inn River, nearby Innsbruck. For infrastructural purposes the riverbed of the Inn River was displaced for about 70 meters westward in 2008/2009. In the course of the building measures, parts of the area under concern were revitalized. The cooperation between scientists and school, as well as all activities at school concerning the project “Alien invaders” are documented by the project coordinator of the PORG Volders.

Summary scientific studies

In a first step the vegetation of five (out of ten) restored sites along the Inn River, potentially riverside woodland and wetland, were analyzed by using the method of Braun Blanquet. The study sites were split into distinct subsets, using abiotic and biotic features (e. g. soil, ground structure, vegetation structure). Per site several samples were taken. Abundance of species was estimated in percentage of ground cover. Number and average size of individuals of the species were also recorded.

In a second survey, studies focused on the two invasive alien species Canada Goldenrod and Himalayan Balsam (*Impatiens glandulifera*), which followed in June and July 2009. Aim of this part of the project was to collect data about the influence of these invasive species at invaded restoration sites along the Inn River, at three different regions, located in the eastern half of North Tyrol. Comparison of densely and sparsely covered sites was used to get information on the influence of *Solidago canadensis* and *Impatiens glandulifera* on the local vegetation at the restored riverside areas.

Extensive data at the site “Völs” were collected repeatedly by the pupils of the PORG Volders.



Progress evaluation: Alien Invaders

In line with this project, a formative evaluation is carried out in order to investigate, which terms and conditions are needed to establish a successful partnership and to test and improve strategies developed (announcement Sparkling Science 2007).

At the end of each project day, pupils make notes about impressions, experiences, expectations, questions etc. in their project diaries. The diaries are analyzed immediately after each project day and the results are used to plan following project days.

In addition, pupils take part in semi-structured interviews and answer questionnaires at the beginning, in the middle and after these two years of working in this partnership. A very important question for the project team is, **“Do pupils understand the main goal of the project?”** 96% of the pupils think that they have understood it well. All research methods applied revealed that pupils learned much about alien plant species, riverine vegetation and data acquisition. On the other hand 54% of the pupils consider data collection is used to learn something about alien plant species, their dispersion and abatement. Only two pupils associated data collection with the main question the project is focusing on: *Is it actually possible to establish an autochthonous flora through a natural succession process at restoration sites?*


So within the first year, pupils have learned a series of facts about different methods used in this particular scientific context. They developed an understanding for various aspects related to alien plants, the role they play at riverbanks in particular as well as the morphological and anatomical features of selected alien plants. Their self-concept about understanding is mainly based on knowing these facts but a sound understanding of an overall picture has not been developed yet. The complexity of the problems concerning restoration as well as the overall project goals need to be addressed in more detail within the second year of the project. Due to these results, an additional project day is planned to focus on these aspects in October 2009.

Data analysis showed that most of the pupils know that data must be collected carefully as the results will be used for future publications. 80% of the pupils are very interested in learning about the results based on their work. 81% say that they “want to achieve knowledge to understand and interpret” the results. Not only did 91% of the pupils say that the cooperation between pupils and researchers is running well, but an equal number said the cooperation between pupils and pupils as well as pupils and teachers is good.

Right from the start it became obvious that more scientific staff is needed to support pupils while working in small groups. When pupils are working outdoors, the project team is now drawing on additional helping hands.

“We’ve learned quite a lot. The days have been arranged accurately and comprehensive. The researchers included us and our opinion was important.” (Student from the PORG Volders)





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