

# WETLANDS – LIFE TO THE LANDSCAPE



**The habitats need management**



## Well-managed wetlands attract birds and create life to the landscape

Wetlands are extremely important for both the environment and people. Shallow wetlands full of life create ideal spots for nature's biodiversity to thrive. They offer natural habitats for e.g. waterfowl. In addition, they function as nature's own filters by stopping sediment from leaching further downstream and by binding nutrients that leak from the drainage waters of agriculture, forestry and peat production.

The project "LIFE+ Return of Rural Wetlands" promotes the establishment, restoration and management of wetlands in the everyday environments of agricultural and forest areas. As an example, a nationwide network of model wetlands was created together with landowners and by the means of a participatory working model. The project has helped restore or establish 48 model wetlands.

The wetlands must be actively monitored and managed to maintain their vibrant habitats.



Juha Siekkinen



Mikko Alhainen

## Myllärinniitty, Kirkkonummi

The Myllärinniitty wetland located in the Evitskog Forest in Kirkkonummi is a peaceful natural environment similar to areas flooded by beaver dams. The wetland is situated only some dozens of kilometers from the hustle of the capital Helsinki. The dammed wetland is ca 4.5 hectares large and characterized by low-lying woodlands completely surrounded by steep, sloping forests and clifftops. The wetland's catchment area is only 20 hectares large due to the area's topography reflecting the opposite extremes. A rich spring by the shore maintains the wetland's water resources even during summer droughts.

One of the prerequisites for the establishment of the Myllärinniitty wetland was the construction of a nearly 170-meter long and sturdy clay dam. The controllable drainage well installed in the dam allows to adjust the water-level with almost one meter, which significantly improves the wetland's management options during its different development stages.

The regulation well also enables the wetland to be completely drained. This occasional draining mitigates the conditions of temporary wetlands and stimulates the area's insect production and improves the waterfowl brood production.

The wetland was established in order to provide waterfowl and waders with more nesting and brood habitats and to restore the condition of the downstream lakes and rivers by improving the drainage basin's water retention capacity.

The wetland was rendered more welcoming for waterfowl by building islands and underwater ridges and by shaping the shoreline. Brushwood and sturdier stumps left over from logging were used to build resting and dry-off grounds favoured by the birds.



Mikko Alhainen

*The lowland forest of Myllärinniitty in June 2013 right before the start of the construction work.*



Mikko Alhainen

*The Myllärinniitty wetland after the flooding in late 2013.*



Timo Niemelä

*Landowners Anne Timonen-Lindfors and Jonne Lindfors, who acted as co-financiers of the project and participated in the tree removal. To the left Jouni Metsola, who was responsible for the construction work.*

## Checklist for establishing a wetland

1. Favour low-lying meadows, where the water area can be formed cost-effectively by damming and flooding.
2. Anticipate the wetland's establishing method and assess the project's potential impacts to surrounding land-use.
3. Find out all the landowners, water area owners and other concerned parties (e.g. drainage companies and road owners) whose rights or interests the project's implementation may concern. Be open and inform all the concerned parties of the project's planning and progress.
4. Find out and take into consideration any possible obstacles and constraints as well as the request for an opinion and the permits regarding the project. For instance, the existing natural values of the area need to be checked from the relevant environmental authorities etc.
5. Implement or commission suitable topography measurements for the planning area. These measurements will provide valuable information on e.g. the effects of planned water levels on fields, forests, roads and structures in the wetland's immediate surroundings. Implement these measurements in cooperation with all the concerned parties who are eager to participate in the hands-on field planning.
6. Find out about financing possibilities relating to the establishment of the wetland and of the conditions of external financing.

*It is important to give information about the wetland project. The landowners of the Perräinen model wetland organized an impressive briefing both before and after the construction of the wetland.*





Juha Siekkinen

*The topography measurements give valuable information about the wetland's construction options and the coordination of other land use. Terrain measurements can be completed with a grade laser in open land areas.*

7. Prepare or order a wetland plan accordant with the project's scope and the demands of the financier(s). The project's realizer, responsible foreman or person responsible for the wetland's maintenance should be clearly stated in the plan as regards to any legal liability issues.
8. Deliver the finalized wetland plan to all the concerned parties (landowners, water area owners and other parties) whose rights or interests the project's implementation may concern. Ask for all necessary written consents in order to be able to prove the project's legal status.
9. Deliver the finalized wetland plan to the relevant environmental authorities etc. for an opinion or permit and remember to attach all necessary consents, statements and documents.
10. Wait for the decisions concerning the project's permit matters and financing before signing contractor agreements or purchasing materials. Be prepared that the permit procedure in accordance with the Water Act etc. can take over a year.
11. Put all necessary construction materials and dam devices out to tender and sign the contractor agreements regarding the excavation and earthmoving works.
12. Direct and supervise the wetland's construction work and make sure that everything is executed in a professional manner and according to the wetland plan approved by the concerned parties.
13. Rise the area's water to the desired level slowly and in a controlled way with the help of dams so that the newly built dam bank is not put under too much pressure. If possible, the dam should be left to settle for at least six months before flooding!
14. Regularly observe the dam bank's durability and the water regulation equipment's functioning. Remember to also implement other management measures regarding the upholding of the wetland's productivity.

## Kangasala, Pohtiolampi

The Pohtiolampi wetland is situated along the Vääksynjoki River, which flows from Lake Vesijärvi to Lake Längelmävesi. The site is a former fish-farm, and the old dam and water control structures were utilized by the project. The aim of the wetland restoration in the ca two hectare area was to reform the old fishponds to waterfowl breeding and staging area.

The construction work was carried out from the strips of land between the ponds. The strips provided landfill for filling and reshaping of the ponds so that the result was a scenically open wetland of varying depths, islands and meandering shoreline.

The project's machine work and materials cost approx. 12,000 euros. In terms of the restoration's success and the project's favourable cost efficiency, it was crucial that the summer and autumn preceding the construction work were exceptionally dry. The water-level in the Vääksynjoki River was lower than average during the work in October 2013.

Taigabird Ltd. built a public observation tower in the area's south end in the summer following the construction work. The tower offers a spectacular opportunity to observe the wetland's diverse waterfowl and wader populations. It has unhindered, wheelchair-accessible passage!

*The old fish-pond were pumped empty before wetland construction for efficient working with excavators.*





Risto Mattila

*The Pohtiolampi ponds built for fish farming before the area was converted into a productive waterfowl habitat.*



Risto Mattila

*A photo taken by a remote-controlled helicopter in July 2014 of the Pohtiolampi wetland after the restoration work implemented by the "LIFE+ Return of Rural Wetlands" project. The habitat for waterfowl and waders was improved by e.g. building versatile feeding grounds and tailor-made nesting and resting places for different species.*

## Karstula, Isoniitty



Juha Heikkilä

The Isoniitty wetland in Karstula's cultural environment blends perfectly into the landscape. The adjacent road provides a view to the open-water wetland, thus increasing the area's scenic value. The fields bordering the wetland create a broad and open environment which, in turn, draws waterfowl to the area. The neighbourhood's birds favour the fields as their feeding grounds which, together with the wetland, form a diverse area where waterfowl can stage during their migration.

The water in the wetland's shores and around the tiny islands is mostly only some dozens of centimetres deep. The man-made islands differ in sizes and shapes. The wetland provides versatile habitats for aquatic vegetation and invertebrate creatures living in the water, thus ensuring also the food supply for waterfowl. The mosaic variation of the open water and the plant-covered areas increase the wetland's value as a brood habitat for waterfowl.



Juha Heikkilä

The successful maintenance of the Karstula wetland scenery requires that the area is kept open. For instance, the grass and shrubs in the dam banks and islands must be cut down regularly.

The wetland's water drainage has been carried out via a stone-covered weir built as part of the dam bank's extension. A plastic pipe with its wetland-facing end above the water-level was installed in the dam bank in front of the bottom threshold for the optional drainage of the wetland.



## Monitor the wetland

Mikko Alhainen

### Waterfowl counts

The significance of restored and constructed wetlands for biodiversity is being studied in various follow-ups. Waterfowl are an excellent object for monitoring because many waterfowl species are quick to discover new, viable habitats. Moreover, they are fairly easy to perceive and recognize. The “LIFE+ Return of Rural Wetlands” project studied the effects of model wetlands via a nationwide point-count of waterfowl. These counts are important because:

- The changes in the species and individual diversity of waterfowl indicates the development of the wetland's condition for instance, if the number of breeding waterfowl in the wetland diminishes, the population's descent can call attention to the wetland's management needs.
- The use of wildlife populations must be ecologically sustainable, and the brood count produces specific information about the annual production to assess the population status and to estimate sustainable levels of harvest.
- The results can be utilized in both national and international waterfowl research.

Waterfowl counts performed in the wetlands revealed that Teal and Mallard were the most typically found dabbling ducks in constructed wetlands. Wetlands located close to agriculture had the best brood production per hectare, whereas wetlands constructed on peatlands had the least amount of species and individuals. Flooded wetlands had on average a higher densities of waterfowl than on merely excavated wetlands.

### Aquatic invertebrates



Invertebrates (e.g. equal-footed crustaceans, boat bugs, water beetles and insect larvae) are most important food sources for waterfowl broods during their first weeks. Shallow fertile wetlands full of invertebrates are in favour of waterfowl because of the abundant food source.

The number of invertebrate species and individuals in a wetland can be monitored by placing one-liter glass jars equipped with plastic funnels in shallow shore waters.

In the “LIFE+ Return of Rural Wetlands” wetlands the waterfowl numbers had clear correlation to invertebrate abundance, birds favoured the sites with the best feeding opportunities. Shallow flooded wetlands had significantly higher invertebrate densities than in excavated basins.

If your wetland does not have abundant population of waterfowl, invertebrate monitoring may give you the answer!

Juha Siekkinen

## Habitat quality is maintained by active management

Wetlands and their bordering ecotones are ever-changing habitats that quickly overgrow without proper management. The declining proportion of open water and the aggressively growing willows, cattails and reed are serious threats to the biodiversity and species dependent on open and semi-open wetland habitats.



*The establishment of aggressively growing cattails or other problematic aquatic plants can be prevented by cutting or rooting up the first emerging individuals.*

Proper management conserves the area's nature values and scenery as well as the wetland's ability to bind sediments and nutrients from drainage waters. For instance, it is important for the effective sedimentation that deep basins are excavated in front of the in-flowing ditches, and the sedimentation basins are emptied when necessary.

Regarding flooded wetlands it is important to monitor the durability of the dam and embankments and to regularly check the functioning of the regulation well. The wide adjustment range of the wetland's water-level and the possibility to drain the area completely, if necessary, significantly improves the area's management opportunities.

Well managed riparian zones around the wetland and semi-open biotopes support wetland's diverse and demanding species. Grazing is great management tool, creating diverse habitat patches favoured by many birds. Small mud-flats and varying grass-densities and height are especially important for many wader species. Significant benefits can also be achieved by moving and clearing the shores and by managing the riparian forests.

Wetlands are productive habitats that are rich in species and, as such, they attract small and medium size predators that predate the waterfowl and wader nests and broods. The effective culling of American Mink, Raccoon Dog and Red Fox is not easy, but successful predator control is essential for nesting success and brood survival.



Timo Niemelä

*The grazing of open shore meadows is long-term nature management at its best. The model wetland landowners in the “LIFE+ Return of Rural Wetlands” project are committed to the management of their wetlands. This secures the conservation of the positive effects of project actions far into the future. Highland cattle grazing in the Isoahde wetland in Raasepori in the summer 2014. Landowner Ville Porkka is responsible for the well-being of the cattle.*

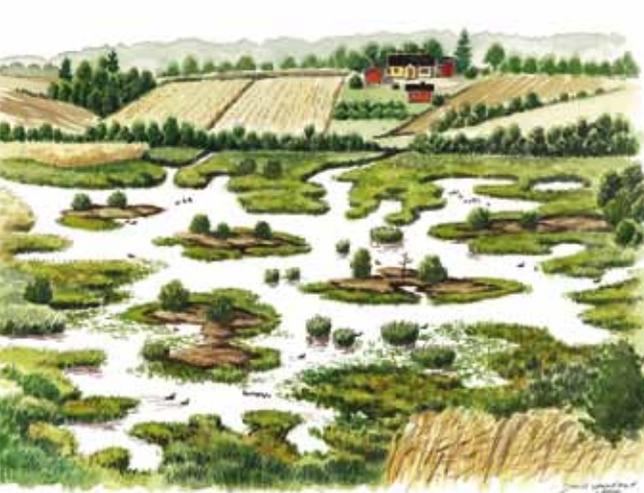
*The eradication of Invasive Alien predators (e.g. American mink) is vital for the conservation of waterfowl and wader species.*



Mikko Alhainen

# THE PROJECT'S RESULTS

- implementation of a nationwide network of model wetlands: 48 wetlands constructed or restored on private lands
- the total area of all the constructed or restored wetlands is close to 340 hectares
- assistance and guidance to landowners offered at 210 wetland sites
- information about the importance of wetlands and their management shared in over 400 events and 200 articles in press as well as at the project website



## LIFE+ Return of Rural Wetlands -project

- **Duration:** 1.9.2010–31.12.2015
- **Budget:** ca 2 million euros
- **Financiers:** EU LIFE+, The Finnish Wildlife Agency, Ministry of Agriculture and Forestry
- **Website:** [www.kosteikko.fi](http://www.kosteikko.fi)



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