Fact sheet
Restoration of coastal bogs

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Background

- The extraction of peat lowers the surface topography of coastal bogs and makes them vulnerable to contamination by salt water when high water levels occur during storms that are coupled with high tide events.
- Because of saline and acidic soil conditions, high water table conditions and reduced availability of nutrients, former commercial bogs that have been contaminated with salt water remain devoid of a vegetation cover for a long period of time (> 10 years).
- The restoration of these surfaces by the moss layer transfer technique cannot be undertaken because *Sphagnum* mosses, the key species used in that method, are intolerant to saline conditions. Without a carpet of mosses, establishment of other peatland plants is problematic. Another approach must be developed for restoring the plant cover in these coastal bogs so as to counter soil erosion and any resulting sedimentation.
- The salt marsh ecosystem exhibits similarities with a salt contaminated coastal bog. Using plant species typical of salt marshes to accelerate the revegetation of these former commercial bogs appear to be good approach.

Recommendations for restoration

Three different approaches based on greenhouse and field experiments conducted by PERG:

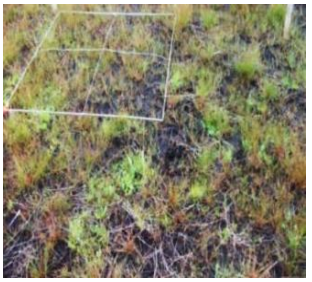
1. The **salt marsh hay transfer** provides an interesting recovery of the exploited coastal bog**.** This method consists of mowing ground vegetation in a *Spartina pectinata* dominated area of a salt marsh and then spreading that material on the bare substrate of a coastal peat bog that has been affected by saline waters. In the study by Breathnach (2008), the plant material was cut by hand using a scythe and then stored in large plastic bags. The collection of plants can also be done using a rake. The hay should be collected when a maximum of seeds have matured. A harvest to spread ratio of 1:1 is used on the bog (Breathnach 2008). This method appears to have no significant effect on the salt marsh and has the advantage of providing a protective mulch.

2. The **salt marsh diaspore transfer** method involves the late-summer harvesting of salt marsh vegetation with a tiller, followed by the transfer of the plant fragments to the bare peat substrate in a 1:6 ratio. Diaspores refer to any part of a plant, i.e. seeds, spores, buds or leaves, which is capable of giving rise to a new individual. The tiller is adjusted to collect sub aerial plant fragments, as well as subsurface material to a depth of 5 cm, in order to access the seed bank. Introducing species through diaspore transfer is slower than transplanting but results in a greater diversity of species (Emond 2013).

3. The **transplantation of *Carex paleacea*** (5 plants/m²) produces a good vegetation cover and a significant sub aerial biomass (Emond 2013). Plants are obtained from the high marsh environment in early summer (June) with their complete root system intact and quickly transplanted in the salt affected bog. Plants can be stored for 2 or 3 days in a drainage ditch if the time of transplantation is delayed. Studies by Montemayor (2006) and Breathnach (2008) indicate that ***Spartina pectinata*** also offers a good potential for revegetating salt affected bogs, although not as good as *C. paleacea* (Emond 2013). The transplantation method is labor intensive but leads to a rapid greening of the bare peat substrate.

Harvesting *Carex paleacea*

Transplanting *Carex paleacea*



Additional observations

- An application of **phosphate rock fertilizer** (9 g/plant or 50 g/m²) improves the establishment of salt marsh plant material introduced in a coastal bog environment. The fertilizer is applied in the root zone, directly into the transplant cavity (10 cm depth), or spread on the surface and incorporated in the peat substrate by raking. Fertilizing with **dolomitic limestone is not recommended** (Emond 2013). On the other hand, **spreading a layer of sand** on the surface of the restored area reduces the acidity of the peat and may assist in the rooting of salt marsh species (Montemayor 2006).

- Following the transfer of salt marsh plants to the restored bog, **it is not necessary to prevent sea water intrusions** because the plants are naturally adapted to saline conditions. Moreover, the water table is usually high in coastal bogs and **blocking drainage ditches is not necessary.**

References

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