Restoration of habitats in Valle Cavanata Natural Regional Reserve

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Valle Cavanata Nat.Reg.Res. is included in Grado municipality and covers the easternmost part of the Grado and Marano lagoon, on a surface of 327 ha.
The protected area includes:
• an embanked area of about 190 ha with canals and open water basins (chiari di valle), islets, saltmarshes, small shrub and wood areas.
• a naturalised peninsular area – 9 ha.
• a tidal area with a small beach and wood – 65 ha.
• part of canale Averto with riveline woodland – 50 ha.
• Luseo meadows – 9 ha.
• a freshwater basin called ripristino – 2 ha.

1) Regulation of water levels in embanked areas, according to bird's requirements; integration with educational and fruition activities; cleaning of water basins

Water levels are regulated by mobile dykes (metal barriers of 2x4 m). Water is kept at lower levels than those typical of active fish farms.

Periodical interventions
Water excursion is never more than 10 -15 cm, and this implies frequent interventions. Dykes are moved from 80 to 110 times per year, with higher frequencies during summer, in order to oxigenate and rigenerate the water basins. Frequent interventions are also carried out in rainy periods, especially from october to december, in order to eliminate the excess of rainwater and to offer additional roosting places to the birds, when open areas (out of the embankements) are interested by high tides. The low water levels have favoured in particular the presence of waders.
From march to may, water flows are created in order to enhance the incoming of wild juvenile fish. A special structure called "montada" was built to favour such incoming without increasing too much the water levels. Low water levels, high temperatures, high bird densities, are all a cause of nutrient increase and can favour algal blooms that have a negative impact on Ruppia maritima beds and on benthic fauna. The presence on water basins of such vegetation covers (march-september) represents a conflict between bird needs and other

requirements, including those of tourists and people living in the surrounding areas. The only action that can be carried out is the exchange of water as often as possible. During july-august the basin is completely cleaned up, creating a temporary water current from the sea into the basin and out to the sea again.
The temporary increase in water levels induces a raise in the salinity of islets and saltmarshes, which causes decrease in the rate of vegetation growth, favouring halophytic associations.
Water exchange and circulation will also be enhanced by mechanical pumps provided with timers.

2) Better use of aquifers: creation of a freshwater basin called "sabbia" and of two areas with a salinity gradient

A basin of about 1 ha, with water depth of 2 m, communicating with an acquifer, is characterised by the presence of freshwater only. This was achieved by a series of barriers and other interventions that created a small freshwater flow that reaches the basin.
The salinity gradient has lead to the formation of typical riveline vegetation areas (Scirpus sp.), and this has favoured the presence of certain waterfowl and wader species.
Between march and november a second area is also interested by the freshwater flow, creating another gradient zone. During the coldest months all freshwater is gathered inside the basin. As the aquifer has a constant temperature of 13°C, freezing of the basin is avoided and waterbirds can still be present in the area.

Periodical interventions
• check of barriers
• reedbed cutting in order to avoid cover of the observatory (between august and october)
• placement and maintainance of roosting devices

3) Variations of drainage in Luseo meadows and in "ripristino" areas

Luseo meadows are typical reclamation areas. By modifying water circulation and inputs, it was possible to cover ¼ of the meadows with water. During dry periods only the bottoms maintain water, whereas during raining periods about 30% of the surface is covered in water. The aquifer emergence has caused the emergence of salt as well, that favoured the development of halopytic plants, the creation of muddy areas and of intermediate soft areas. Since 1992 the first vegetation cutting has been postponed to mid july, in order to protect breeding birds. In some years part of the meadows are not cut, so that the reedbed can better develop. The submerged meadows are cut between october and november, to make the area more attractive for greylag geese and to give a better overview of the area.
Periodical interventions
• Barrier maintainance.

4) Creation and maintainance of "peschiera" educational trail

A trail of about 1 km has been created in the area of "peschiera", that used to be a fish farm (brackish waters of about 20 cm). The trail is located close to the embankements and is characterised by the proximity of the main road, making the access particularly easy and convenient. The trail is protected by banks of vegetation and lead to a hide, that can be reached without causing any disturbance to the birds present in the area.
Some artificial roosts and additional devices have been placed close to the trail, so that waterbirds are encouraged to stay in the area even when human presence is higher.

Naturalistic settings

• Artificial islets for Sterna hirundo breeding, creation of roosts using trunks and mud.

Periodical interventions

• Reparation of barriers, winter coverage of islets with nets, and addition of mud and clams to keep the shape and height of islets.

5) Creation of hides for naturalistic photographers

A number of temporary and mobile hides has been created, in cooperation with professional photographers. Such structures are placed in areas that cannot be reached by other visitors.

Foto Glauco Vicario