



Water finger grass (*Paspalum distichum*)

Managing water finger grass in Mas Lake

Auvergne nature conservatory

- The conservatory is a certified environmental-protection non-profit and a member of the Federation of conservatories for natural areas. Its headquarters is in the town of Riom (Puy-de-Dôme department).
- The objectives of the Auvergne nature conservatory are to protect nature, landscapes and all the components of the natural heritage by preserving species, maintaining ecological balances and protecting natural and semi-natural environments and the biological diversity of the region.
- Work at the conservatory covers all the natural areas in the four departments making up the region, namely mountain forests and peat bogs, the Allier and Loire Rivers, flatland marshes, dry hills with orchids, etc. Over 2 000 hectares spread over 250 sites are managed by the Auvergne conservatory.
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Intervention site

- Mas Lake is located on the Val d'Allier-Alagnon Natura 2000 site (FR 830138), in the town of Issoire.
- The site comprises 83 kilometres of river and all the aquatic environments and linked wetlands (side channels, gravel pits, streams).
- Management, implementation and monitoring of the set objectives have been ensured by the Auvergne conservatory since 2007.
- Immediately in 2008, the conservatory produced a characterisation report and maps on the aquatic invasive alien plants found on the Natura 2000 site and in the surrounding areas.
- The management strategy for these species on the site was to:
 - take action as early as possible against newly established species (curly waterweed, water finger grass, large-flowered waterweed and summer lilac);
 - conduct preventive monitoring on side channels not yet colonised;
 - intervene on the invasion front of water primrose at Issoire.
- Water finger grass was discovered in Mas Lake in 2010, the only known site for the species in alluvial areas in the Auvergne region.
- Since the fall of 2011, management experiments have been conducted by the conservatory in view of eliminating the species from the site.



1. Mas Lake, the intervention site.

Disturbances and issues involved

■ Impacts on use of the site

- The site is used for an array of socio-economic purposes (relaxation, summer tourism, commercial fishing) year round.
- Over the short to mid term, widespread colonisation by water finger grass would have a severe negative impact on the landscape and site uses (tourism and fishing).

■ Risk of dispersal via flooding

- Flooding of the Allier River could disseminate the water finger grass. It was there deemed necessary to intervene on the Issoire site to limit the risk of propagation downstream.

Interventions

- The limited distribution of water finger grass in Auvergne meant that time was of the essence in halting its spread. The management techniques employed had to take into account:

- the economic activities on the peri-urban site;
- the high reproductive and dissemination capability of the species, an obstacle to its elimination;
- the presence of native plants, notably sea clubrush (*Bolboschoenus maritimus*), a species close to being threatened in Auvergne;
- the long shoreline to be treated (250 metres);
- management of the plant waste;
- varying hydric conditions.

■ Given the significant recreational activities on the site, it was decided not to mechanically scrape the lower edges of the banks using a backhoe. The work was done in the fall to hinder the fishing activities as little as possible and to limit the visual impact of the work.

However, in light of the objective to totally eliminate the plants, it was necessary to intervene prior to fruition (in June) in order to limit the dispersal of seeds at the end of the summer and in the fall.

■ A method targeting eradication and combining several components was experimented:

- manual uprooting and use of a brushcutter without dispersing the aerial parts of the plants;
- thermal weed control of the plants and rhizomes;
- manual turning of the soil;
- replanting of the area with creeping bentgrass (*Agrostis stolonifera*) and reed canary grass (*Phalaris arundinacea*) to compete with the water finger grass. The first produces large numbers of creeping stolons and the second grows in large, dense groups.

■ The combination of the various techniques was tested in a sector with six different plots, each measuring 4 square metres.

■ Phytosociological studies on the vegetation were conducted using abundance-dominance coefficients. Two studies (September 2011 and August 2012) were run on each of the six plots.

Results and costs

■ Results

■ The water finger grass recolonised all the plots in 2012, but occupied less surface area. This result demonstrated the difficulty of total elimination, even by combining uprooting, turning of the soil and burning of the roots and rhizomes.

■ The planting of reed canary grass was a failure (95% mortality).

■ The clearing of the soil surface is an important factor for the colonisation by pioneer species, which may explain the dominance of water finger grass following the work and the isolated presence of large-flower water primrose in a plot.

■ In light of the above, more extensive manual work was not deemed feasible because it would produce only limited results.

■ Monitoring should, however, be pursued to determine whether the creeping bentgrass can effectively compete with the water finger grass.

■ In addition to the phytosociological studies on the plots, an inventory of the points where water finger grass was present was conducted around the entire lake in order to assess the spread of the species on the site.

■ Between 2010 and 2012, the number of points increased 50%, with an increase in the shoreline of 20% and in surface areas of 30%.



2. A plot prior to the work in September 2011.

3. A plot after the work in August 2012.

Work done on plot 3:

- manual uprooting of plants in the water and use of the brushcutter;
- thermal weed control of all vegetation, over an area 1 to 2 metres wide;
- manual turning of the soil;
- thermal weed control to burn the rhizomes.

■ Technical and financial aspects

- The technical work was done on 27 September 2011.
- Preparatory work was done by the team manager (1 day) and the study manager (1 day).
- The intervention team consisted of 3 conservatory personnel and 2 interns, with oversight by the study manager, for 1 day.
- The equipment included a manual burner (20 cm in diameter), spades, garden forks, hoes and broadforks.
- For replanting, 20 grammes of creeping-bentgrass seeds (supplied by Semences du Puy, 43000 Le Puy-en-Velay) and 80 large sods of reed canary grass (supplied by AquaTerra, 26270 Clionscat) were used.
- 600 litres of plant waste were removed from the site.
- The waste was burnt in the open air on the conservatory site.
- Monitoring of the flora took 1 day.
- Assessment of the work and awareness raising took 2.5 days.
- The work cost 1 400 euros, the monitoring and assessment cost 1 000 euros.

Outlook

- Given the poor results achieved by the thermal weed control, another set of techniques to eliminate water finger grass was proposed.

■ Landfill on colonised points and planting of local species

- This solution will be tested in the spring of 2014 in a partnership with the technical department of Issoire, an active participant in the project.
- The work will take place on a spring day (the low-flow period begins in June), on a plot measuring 5 to 10 square metres:
 - 20 centimetres of sand and gravel (from the gravel pits in the Issoire basin), without any alien plant debris, will be deposited on the bank and at the foot of the bank to cover the water finger grass;
 - 10 centimetres of topsoil will then be deposited on top. In the dry (top) section, ray grass will be sown, in the aquatic and semi-aquatic sections, water mint (*Mentha aquatica*) or flowering rush (*Butomus umbellatus*) will be planted or sown.
- In parallel, suggestions for differentiated management of the banks were put forward:
 - regular mowing outside the vegetative phase to limit the risks of dispersing the aerial parts of the plants;
 - early mowing of fishing spots exclusively on non-colonised sites.

Information on the project

- Efforts to raise the awareness of local stakeholders on the site were undertaken to avoid the dispersal of water finger grass to a wider area:
 - anglers were informed via the certified association for fishing and protection of aquatic environments (AAPPMA) and the fishing federation. Further information on water finger grass and water primrose will be published in the AAPPMA bulletin for the members;
 - a meeting on the site between the Auvergne conservatory and the head of the municipal technical department (urban sports and parks) set up differentiated management techniques in order to limit the spread of the species on the site (mowing exclusively on the tops of banks, leaving an unmown strip at least 1-metre wide along the water edge).



4. Reed canary grass.
5. Creeping bentgrass.
6. Phytosociological monitoring.
7. Manual uprooting.

For more information

- Sylvain Pouvaret and Sylvie Martinant, Auvergne nature conservatory
- <http://www.cen-auvergne.fr>
- Auvergne nature conservatory 2013. Managing water finger grass in Mas Lake. Report on experimental work in Issoire. 22 pp.