

INFORMATION AND AWARENESS PAMPHLET

***AZOLLA FILICULOIDES* (RED WATER FERN) IN THE KRUGER NATIONAL PARK.**

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1. What is *Azolla filiculoides*?

A. filiculoides is a small, green to reddish-brown or purplish, free floating plant. The adult plant is approximately 25-35 mm long, with the length of the individual leaves being approximately 1-1,5 mm. *A. filiculoides* is native to South America and was introduced to South Africa some 30 years ago. The plants are able to rapidly colonise open water surfaces through vegetative reproduction as well as produce spores that may be transported over vast distances. The National Botanical Institute has recorded the weed at 136 localities throughout the country, and it is reported to infest every river in the Free State.

The major consequences of the dense mats that are formed by the plant are:

1. Reduction in quality of drinking of water caused by bad odours, colour and turbidity.
2. Promotion of water-borne, water-based and water related diseases.
3. Increased siltation of rivers and dams.
4. Loss of water by water evaporation through the weeds surface.

2. History of this alien plant in the KNP

A. filiculoides was first found in the Levuvhu River in 1994 at Crooks Corner, and subsequently along the entire river. For reasons not known, the plant never reached an exceptionally high density, except for certain pools in various reaches of the river.

A. filiculoides propagates easily and extremely rapidly (doubles in 4-5 days) and all the water ways in the KNP have been under a constant threat from invasion, especially with the vast distances traveled by aquatic waterfowl. It was suspected by the ARC (Agricultural Research Council) that Mozambique has been heavily infested with *A. filiculoides* for some time, but this was never confirmed.

3. Current status and threats to the KNP

In October 1998, during water lettuce (*Pistia stratiotes*) sampling at Sunset Dam, *A. filiculoides* was recorded. The source of the infestation at this time was completely unknown. The aquatic plant was then found at Orpen Dam in January 1999. An aerial survey shortly thereafter showed that the plant was densely (100%) covering the lower

reaches of the Nwaswitsontso River in the KNP and into Mozambique (as far as could be seen with the helicopter), with high densities first being reached at Orpen Dam itself. The aquatic weed then dispersed widely over the southern region of the KNP, being recorded at Nwanesti in 99/06, Sabiepoort 99/06, Letaba River 99/05, confluence of the Crocodile and Komati Rivers 99/06 and Lugmag Dam 99/07. Since then numerous reports of the dispersal of the plant have been received.

A. filiculoides is currently establishing itself and dispersing at an alarming rate in the above-mentioned regions and is placing an even greater threat on other water sources in the KNP. Man-induced dispersal of the waterweeds is also being evidenced, where vehicles driving through shallow water infested with *A. filiculoides* may easily carry the plant into the next water crossing. This may have been the case with the infestation being transferred by vehicles on the 4x4 Lebombo Overland Trail from the Nwaswitsontso to Nwanetsi Rivers. Further, as has been seen with other waterweeds in the country, equipment that has not been adequately washed, especially pumps and boats, carry seeds from one source to another providing a continuous source of infestation.

4. Monitoring of dispersal and effectiveness of biological control efforts

In order to curb the spread of this alien plant, biological control agents (small weevils, *Neohydronomus affinis*) were released at affected sites. These have been monitored on a regular basis, indicating that the insects are dispersing effectively throughout the infestations. Heavy rains over the recent summer months have however impacted on the insect populations and their effectiveness as control agents. Most of the plants and subsequently also the biocontrol agents have been washed down into Mozambique. This in itself is positive, and will allow for the control of areas downstream of the KNP which are heavily infested and may continue to re-infest the entire river systems. Re-infestation from the seed banks and remaining plants is inevitable, and the insect populations will require some time to regain their numbers before becoming efficient control agents.

5. What can you do to help?

- Please continue to monitor the riparian areas and inform the Alien Biota Section of further infestations. This will assist with monitoring the rate of spread and facilitate the release of biocontrol agents.
- Also, please ensure that where water pumps and other equipment is transferred between rivers or dams, that the equipment is thoroughly washed.
- Precaution should also be taken while driving through rivers infested with *A. filiculoides*, in order to prevent the spread of these invasive plants.

**FOR FURTHER INFORMATION PLEASE CONTACT LLEWELLYN FOXCROFT,
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