

OVERSEAS WORK

Lake Turkana

Due to concerns over the impact of Gibe 3 Dam on Lake Turkana, the African Development Bank commissioned an independent study by Dr Sean Avery. The study confirmed that the proposed dam would reduce flows and threaten the lake's most productive fishing area: the work will be presented at the 14th World Lake Conference in Austin [Texas], 31 October to 4 November 2011.



Lone acacia on the shores of Lake Turkana [NW Kenya]

Lake Turkana is located within Kenya's northern arid and semi-arid lands, which comprise 80% of Kenya's land area. The Omo River is Ethiopia's second largest river system and contributes 90% of the lake's inflow.

Lake Turkana is a closed basin; its waters are almost saline, unfit for consumption and unsuitable for agriculture. The Lake was once 80 meters higher and was connected to the Nile system, with interesting ecology, including special bird areas.



Indigenous people depend on livestock

Indigenous people use the lake resources, living in harsh conditions. The lake's desert margins include an archaeological conservation area gazetted as a National Park. Southern parts of the lake fall within

the Mount Kulal Biosphere Reserve, listed in the UNESCO Biosphere Directory.

Runoff patterns in the Omo River have been changing over the last 20 years, as a result of vegetation clearance: runoff has become more variable, and changes to the Omo delta reflect accelerated erosion.

The Omo River is the lake's "umbilical cord". If its inflow is reduced, the lake level and its associated biomass will fall, and if its flow patterns are modified, the lake ecology will be impacted. The lake is almost entirely within Kenya, whereas the Omo River is entirely within Ethiopia. Hence management of the Omo Basin and lake water resources presents trans-boundary challenges.



The study reviewed climatic, hydrological and fisheries data, in order to assess the impact of Ethiopian hydropower and irrigation developments on Kenya's lake levels. The fall in lake level as a result of the Gibe 3 Dam would be as much as 20 m.

This study overcame the absence of river flow data by computing river discharge from lake level fluctuations through water balance modelling. Satellite radar altimeter readings of the lake level were utilized, thereby establishing a very useful tool for ongoing lake inflow monitoring in this remote area.

The lake is highly vulnerable to activities in the Omo River Basin. If irrigation development proceeds as planned, the lake will diminish, as will biomass and fisheries, with potentially adverse consequences to the livelihood of indigenous Kenyan tribes. The dilemma of Lake Turkana exemplifies the need for trans-boundary co-operation in determining the value of water resources.

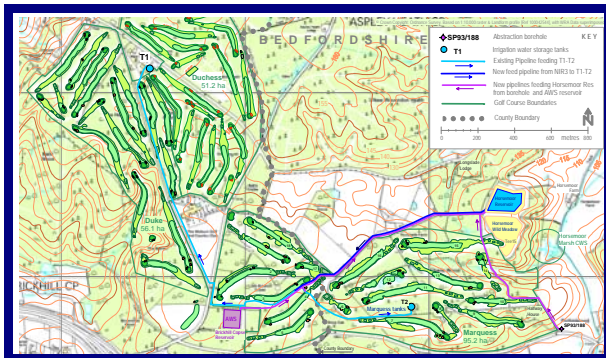
UK WORK

Horsemoor Reservoir scheme

Paul Holmes is currently leading a team of 20 experts assessing the environmental impact of a new groundwater-reservoir irrigation scheme for Woburn Golf Club. The assignment aims to obtain planning permission so that reservoir construction can proceed over the winter period ready for the 2012 irrigation season. This facility will provide water storage for the three 18-hole courses and guarantee the quality of turf for championship events.



In addition to reservoir construction, the scheme involves pipeline-laying and landscaping of a new wild flower meadow, using spoil excavated from the reservoir basin.



A number of issues have complicated the process, including rare bats, great crested newts, badgers and ancient remains. Headland Archaeology has been commissioned by WRA to carry out the site investigation by excavating 21 trenches across the reservoir and meadow area following the indications of a geophysical survey. Each trench is an average of 50 metres in length and has yielded a variety of pottery fragments, post holes, iron slag, and other evidence of small-scale industrial activity.



The most concentrated human presence was found at the head of the shallow valley which drops down to Horsemoor Marsh, most likely serving as the nearest settlement water supply.

It is anticipated that the Horsemoor Reservoir planning submission will be made by mid-November.

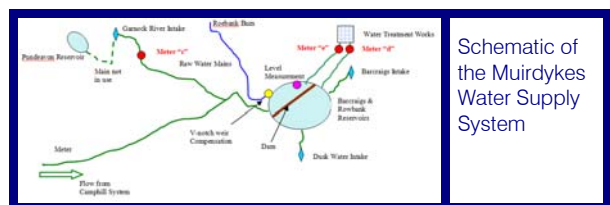
Paul Garrad and Debbie Snook are working on the Woburn Lakes scheme with an anticipated abstraction licence application at the end of January 2012.

Hysim-Aquator Modelling

Rob Brown is providing expert support and reviewing Aquator water resource simulation models, to help Scottish Water with yield and licensing studies and to meet the requirements of the Water Framework Directive.



So far, WRA has reviewed Aquator models developed for the Muirdykes, Dougliehill, Greenock, Corsehouse, Amlaird, and Burncrooks water supply systems. The review has also taken a look at the general guidance documents, system operation, monitoring plans, and abstraction licences to ensure that the models perform appropriately, and to verify model configuration against the actual asset data and assumptions made.



WRA is well acquainted with Scottish hydrology having developed the yield methodology for Scotland and Northern Ireland, under the SNIFFER project during the period 1997-2001.

WRA Board Meeting

4th November 2011, Marlow

The WRA Bulletin is a quarterly publication, and relies on contributions submitted by Directors, Associates and Consultants. The document is circulated by email, and published on the WRA web-site, aiming to keep the WRA network, up-to-date with respect to current activities. Please email contributions for future issues to Paul Holmes: pach@watres.com

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