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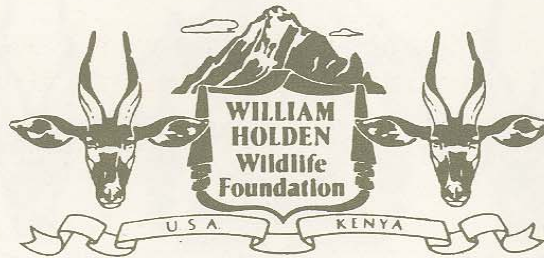


Gerenuk at Samburu  
National Park, Kenya



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Dear Friends,

The recent rains in Kenya stopped just long enough for me to take the picture of the lovely Gerenuk female on our cover. There was so much food in the other wise dry north of the country due to the lengthy rains, that all the animals looked sleek and fat. I only hope the down side of these unseasonal rains does not forebode a long dry season whose drought will bring famine to man and animal. To give you an idea of the dimension of these rains, we measured at the education center 78" between October and January. As we go to press with this newsletter the rains have not yet stopped. Under normal conditions the dry season in Kenya (i.e.: our summer) starts mid-December and ends early April with the coming of the long rains. All agriculture and patterns of life are geared to predictable weather, so when a phenomenon of this nature occurs it clearly alters everything dramatically. The farmers can neither harvest or plant, the roads and bridges are washing away which makes transport of food and medicine impossible. When the weather unleashes its force on a country like Kenya everyone and everything suffers. Thank you El Niño, don't come back soon!

The education center has used this period of time to make needed repairs and add to our education programs.

Elections in Kenya have returned the incumbent president to office and we hope for the best. It is the Chinese Year of the Tiger which in their calendar means prosperity for all -or so we hope.

We have just printed a new brochure for the foundation which we will be mailing to you next month. It is our hope that each member of the foundation will consider passing the brochure on to an interested friend. We need to expand our audience and we need your help to do that. Thank you in advance.

Warmest Regards,

Stefanie Powers



## News From Kenya:

- \* In the education center library, all newly acquired books were processed, the wildlife fact-file was updated, and the library catalogue was updated and new entries were added.
- \* A visit to the Ken Norris Library was done to assess the need and extent of repairs required.
- \* Day visits were conducted for the Nyange Primary School, the Thingithu Primary School and the Kigumo Boarding Primary School. The day visit program includes an introductory lecture, WHWF video, projects / nature trail walk, lecture on 'The Importance of Our Environment', wildlife video and review, visit to the animal orphanage as well as club activities.
- \* Camping visits from the Imani School, the Laikipia Baraka Academy and the Hillcrest Secondary School. Each three day camping visit included a welcome discussion, WHWF video, projects / nature trail walks, visit to Mt. Kenya Game Ranch and Animal Orphanage, wildlife board games, scavenger hunts, wildlife video and closing discussion.

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## Young Street Girls Visit the Foundation

*Recently girls from the Rehabilitation of Young Street Girls, an organization of the Catholic Archdiocese of Nairobi, visited the foundation's education center. After their visit we received the following letter:*

Dear All:

On behalf of all the 42 girls from the Rescue Dada Centre and the three staff members a very big thank you to you all for three wonderful days which were thoroughly enjoyed by all. Most of all, as there were no charge it meant that we were able to afford the whole trip and so give the girls such a wonderful experience - thank you.

The trip was undoubtedly a resounding success with the girls learning and seeing a lot. The lectures, videos and nature walk certainly taught them a lot and the trip to the animal orphanage and the game drive in the Mt. Kenya Game Ranch meant that the girls saw animals that they have never seen before and are otherwise unlikely to have ever seen. It was also such a treat for them simply to be away from the centre and to be able to run and play on green grass and to spend time in such a well kept compound. The girls are still full of all the stories.

We were so impressed with every minute of the three days and particularly with the way in which you all dealt with the girls.

Thank you also for your kind donation of trees which have already been planted in Limuru at our soon to be opened long term care unit.

We are very grateful indeed as we depend on donations from people of good will who are concerned for the plight of these homeless girls and children. We hope very much that if any of you are ever in Nairobi you will come and visit us.

With your very best regards, yours sincerely,  
Irene Baumgartner, Project Coordinator





## CONSTRUCTED WETLANDS FOR WASTEWATER MANAGEMENT

Report by Francis Maina after a Wetlands Conference held at the Education Center

### INTRODUCTION

Constructed Wetlands (CWs) have been widely used in temperate countries for nearly 40 years but are relatively new in the tropics. South Africa has however made important headway in construction and design of CWs.

Natural Wetlands clean polluted water by a series of biological interactions and are used as models when creating CWs. According to Harald Kraft, a consulting engineer in Berlin, "With simple construction, low energy consumption, lack of any machinery and minimum maintenance, no other treatment system can ensure such extensive elimination of pathogenic germs without applying additional chemical or physical process."

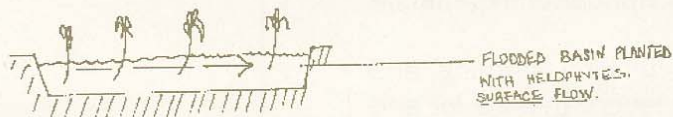
Waste water treatment using CWs has several uses, including: 1) irrigation; 2) discharge into surface waters, and 3) recovery of purified water for reuse.

### CONSTRUCTION AND DESIGN

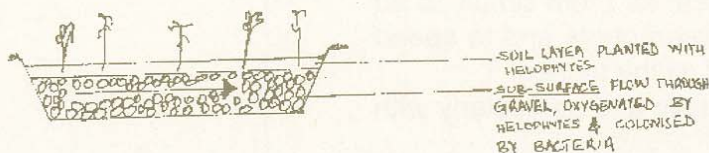
Unlike the municipal council sewage works, CWs are designed and constructed to look as natural water systems as much as possible. Large open stone and cement structures are therefore to be avoided. There should be at least three stages in a CW.

The first stage involves root-zone treatment where helophytes (swamp plants like bulrushes and reeds) are used. These plants have a unique and great ability to oxygenate their root-zones (rhizospheres) while utilizing biological nutrients from the waste water. The two commonly used configuration for root treatment of waste water are shown below:

#### ① SIMPLE REED BEDS



#### ② GRAVEL BED HYDAPONICS (GBH)



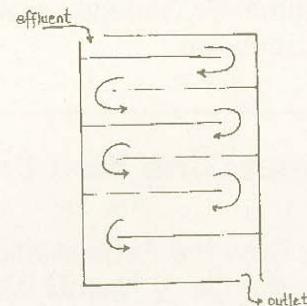
Configuration No. 2 or GBH is more efficient because the gravel offers an enormous surface area for the attachment of bacteria that break down pollutants in the water. A good habitat for both aerobic and anaerobic bacteria is found in the roots of the helophytes making the process more efficient.

In the second stage the wastewater for the first time is directly exposed to the surface. In the open ponds, sunlight

penetrates killing pathogenic bacteria by UV radiation. Many water plants also exude bactericidal chemicals which help to clean the water. There are at least three open ponds in this stage all of which are gravity fed.

The open ponds have a meandering flow pattern as shown below. This is used to: 1) prevent stagnant water at the corners and sides; 2) ensure more overturn of water which allows for its oxygenation; 3) give variety of depth; and 4) give more surface area for water to be worked on by bacteria.

In this stage all types of aquatic, semi-aquatic and water margin plants are important and should be encouraged. They assist with the oxygenation of water and uptake of nutrients. Plants also offer shelter and habitat for many life forms.



In the 3rd and final stage the water has been purified enough for uses like irrigation, recovery of water for reuse or discharge into surface waters.

From research conducted by two post graduate students from Moi University (Kevin Khasia and Daniel Nzenya), purification of wastewater achieved has greatly surpassed standards achieved by any other treatment means (mechanical, chemical or both). Water quality has surpassed that of the area's boreholes within the first five months of operation.

A 20% margin for periods when too much wastewater is discharged (ie: entertaining guests, or future expansion of housing) should be catered for during design and construction.

### CONCLUSION

Constructed Wetlands are definitely friendly to the environment. They can be used as dry-weather reservoirs, if an excavation, the final pond is made larger than actually needed. The wetlands have low operating cost and the only major maintenance function is harvesting dead vegetation (rotting plants depletes oxygen in the water and it generally reduces quality). Liquid fats and oils from domestic uses need to be removed before the water gets into the wetland and this can add to the cost of the project but it can be taken that Constructed Wetlands offer treatment to a known and reliable standard.

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## PROGRESS REPORT ON NYARIGINU PRIMARY SCHOOL CONSERVATION PROJECTS



The Nyariginu Primary School in Laikipia District is one of the three beneficiaries of the William Holden Wildlife Foundation rural library programmes. The library at Nyariginu was given to WHWF president Stefanie Powers and Patrick de la Chesnais as a wedding gift by longtime WHWF supporter Jon Lovelace. Since 1995 when the library was completed, it has served students from one of the poorest communities in Kenya and results in national examinations have already shown a marked improvement. In the library students can study any of the subjects offered by the Kenyan education system, including Math, English, Kiswahili, Art, Craft, Music, Geography, History and Science. Books, magazines and charts on environmental sciences are also readily available.

Tremendous progress has also been shown by the students in making their environment a better place to live in. This is due to the fact that apart from supporting the normal Kenyan education curriculum, the foundation takes pride and effort to support environmental conservation projects in all the schools where we have libraries.

The students regularly visit the William Holden Wildlife Education Centre where they are given practical lessons on sustainable agriculture (agroforestry and permaculture), conservation of energy, water harvesting techniques, natural history and the importance of wildlife to our environment. Given the fact that Nyariginu is a typical rural community and that up to 70% of Kenyans rely on fire wood for their energy needs and that 65% of our wildlife is outside the designated National Parks and Reserves, then the importance of our lessons to these students cannot come at a more crucial time.

We also take our message to the schools through our rural outreach programme. The wildlife club at Nyariginu has had lessons on dinosaurs (fascinating as usual!) among other topics.

During our visits to the schools, we provide the wildlife club with tree seedlings grown at our Education Centre. These are mainly indigenous tree species like Podocarpus, Oleas, Acacias and Sesabias. The most important of these is Sesbania sesban which is a fast growing leguminous tree with a multitude of uses.

Being a legume, it converts free nitrogen in the air into nitrates and nitrites which are then available to other crops. The leaves can be used as fodder for livestock and the wood cut for firewood.

We have supplied tree seedlings to Nyariginu since 1995 when our library was completed. The school has been transformed beyond our wildest imagination. All around the school fence there are trees which are growing. The school has also established a special tree growing area in their compound which will grow into a beautiful recreation park. Manure from a biogas digester which serves the library as a source of energy (light and heat) has been used extensively to grow these trees.

In the last nine months however, disaster almost struck. The rains have completely failed and the whole country is gripped in a terrible famine. The rivers have dried up, livestock is dying and food relief is now supporting a larger part of the population.

Nyariginu school students have worked hard to ensure that their trees do not die. Each student has his or her own tree and they are having to walk up to six kilometres to fetch two litres of water to quench the trees. To conserve the water, bottle/drip feeding is being applied to the trees and as a result the two litres can last at least one week. We also advised the students to provide more mulch material to the trees to reduce evaporation rates.

We have only been a spark to fuel the conservation of the environment by these students. They have understood the importance and the fact that their very lives depends on the well being of their environment. These students have done the most difficult work under severe climatic conditions and at the moment we can confirm that the trees are the only green vegetation in the vicinity of Nyariginu School.

We are now preparing 500 tree seedlings which the students want to plant for their parents at home when the rains come in April. The students already have the message and we are targeting the parents and the surrounding community. We will continue to support them in this way for they have shown the determination to improve their environment and consequently their own lives.





### Orangutan Foundation Int. Calendar Offer

The Orangutan Foundation international is pleased to offer to our members their Gorillas Chimps & Orangutans 16-month calendar by Michael Turco.

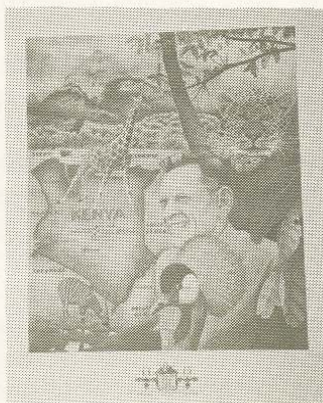
For any of our members who would like to order one, please send your check for \$8.00 (plus \$3.00 S&H in the USA, \$6.00 for all international orders) to:

Orangutan Foundation International  
822 S. Wellesley Ave.  
Los Angeles, CA 90049



### William Holden Wildlife Foundation Greeting Card Offers

We hope our members will enjoy the enclosed brochure on our complete line of greeting cards, and will consider using the enclosed to place an order directly through our Los Angeles office.



Posters are \$18.00 each (\$15.00 plus \$3.00 postage.)  
Please send check or money order to:

WILLIAM HOLDEN WILDLIFE FOUNDATION  
Post Office Box 67981, Los Angeles, CA 90067

Please send \_\_\_\_\_ poster(s) to:

Name \_\_\_\_\_

Address \_\_\_\_\_

City: \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

### *Just a reminder that the Foundation has WHWF t-shirts!*

T-shirts are \$12.00 each (\$10.00 plus \$2.00 postage).  
Please send your check or money order to:

WILLIAM HOLDEN WILDLIFE FOUNDATION  
Post Office Box 67981, Los Angeles, CA 90067

Please indicate size/color and quantity below:

White or Power Blue

Safari Green or Black

Small \_\_\_\_\_

Medium \_\_\_\_\_

Large \_\_\_\_\_

Extra Large \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone ( ) \_\_\_\_\_

