

impossible without enhanced fund-raising and a staffed home office. Project proposals that are submitted to AwF are examined by a Technical Advisory Group that includes Dr. David Little of the Institute of Aquaculture. India became the first country to have an AwF field project, which is being coordinated by AwF volunteer M.C. Nandeesh as a cooperative activity with St. Xavier's Bishramganj, near Agartala in Tripura. In the first phase thirty farmers and their wives were trained in fish culture. Utilizing the knowledge gained they renovated existing ponds, previously used mainly for water storage and the capture of wild fish, using proper aquaculture practices. Popular carp species along with some of the self recruiting species were introduced to ensure the sustainability of the activity. Farmers were encouraged to use locally available feed resources and the integration of fish ponds with other agricultural activities was encouraged. These activities have been extended to 50 families in the second phase of the project (2006).



Trainees being instructed by Tamanna Khatun on simple cage construction. (Photo courtesy Tamanna Khatun)

AwF has two on-going projects in Bangladesh. The first, in conjunction with Caritas-Bangladesh, involves the empowerment of women in integrated aquaculture (carp culture in ponds); fourteen women and their ponds are involved. The second project is a joint activity with another local NGO, the Voluntary Organization for Social Development. Again, the focus is women in aquaculture: our overall goal is the introduction of low-cost cage culture technology, using monosex Nile tilapia to thirty-five poor women to improve their nutritional status and livelihoods.



The men catch the fish and mother scales it for the family meal (Photo courtesy M.C. Nandeesh)

Although disaster relief is not our primary activity, AwF was asked to become involved by WAS in administering its YSI-funded relief funds for Aceh. Several projects implemented

by the Directorate of Aquaculture have been supported, including pilot tambak rehabilitation work, the restoration of two small shrimp hatcheries, and the introduction of seaweed culture. In addition, AwF has also been providing technical assistance to two other NGOs working in Aceh - Professionals International and MercyCorps. On-site advice has been provided by AwF volunteer (and now AwF Director) Kevin Fitzsimmons, while email advice has been provided by another AwF volunteer, Dallas Alston. Using funds provided by the LACC Chapter of WAS, AwF has also been able to provide some relief to a group of Indian shrimp farmers who suffered in the tsunami.

The European Aquaculture Society has provided funds to support student volunteers from European universities. The first grant was made to a Kenyan postgraduate student at the University of Wageningen; AwF co-funded (with Nutreco) a study to explore the potential for creating a hatchery to supply fish fry for aquaculture and restocking purposes in the Lake Naivasha area.

AwF Director Geoff Allan is currently working with World Vision Thailand (WVT) and the Department of Fisheries to provide AwF support to an expansion of WVT's earlier aquaculture training programme in the impoverished NE of Thailand. AwF volunteers have also provided email advice to a number of individuals and organisations in various countries, including Colombia and Peru.

Since AwF was formed in 2004, steady progress has been made and project activities have been commenced in several countries. It is clear that the concept behind the formation of AwF was sound; that there is a real need for the assistance that we can provide; that scientists and others in the aquaculture sector are keen to provide their experience on a voluntary basis, both in the field and through communications; and that the aquaculture sector is supportive, both morally and financially.

Individual, aquaculture society, and corporate donations have been received and it has been shown that the general public will support AwF, if individual supporters are willing to devote time and energy to organize fund-raising activities; such work needs expansion worldwide.

AwF Directors are currently considering the medium- and long-term future of AwF. In theory, activities could continue at the present level indefinitely if the work-load can be shared amongst the Directors and Foundation Members. However, scaling AwF up to address the needs that have been identified, and enabling full utilization of the voluntary services that are being offered to its cause, would demand a different management structure. Among the possibilities being considered are synergetic linkages with other international organisations dedicated to advancing responsible aquaculture.

# A review of the sea lice bath treatment dispersion in Scotland

**Dr Trevor Telfer and Dr Richard Corner, Environment Group**



Enclosure for sea lice treatment

Therapeutants are key to combatting disease and its spread in aquaculture. This is of no less importance in reducing transmission and damage done by sea lice in salmon cages. In Scotland only two therapeutants against marine ectoparasite infestation are commonly used with salmon farms, one is an "infeed" (SLICE) and the other a bath treatment (EXCIS). SLICE is an "infeed" treatment which is preferentially used by the salmon farming industry because it is convenient and highly effective. EXCIS (active ingredient cypermethrin) is a bath treatment often used as an alternative or an accompaniment to SLICE to prevent overdependency.

For anti-sea lice treatments to be used a discharge consent (as total amount of Treatment in a specified time) must be approved by the Scottish Environment Protection Agency (SEPA). Such consent assesses the ability of its active ingredient to be diluted within the wider environment to specified environmental quality standards (EQSs). Pre-use consenting is achieved by prediction of environmental concentrations of active ingredients and comparison with EQSs through dynamic modelling. The dispersion characteristics of the active ingredients within the environment is vital to the accuracy of the models developed for this purpose. This one year project aims to review the present information on dispersion of cypermethrin bath treatment and obtain more detailed dispersion and diffusion data. This will aid SEPA in improving existing dynamic models and to develop more robust environmental quality standards. Included in this project, in conjunction with Professor Peter Davies of Dundee University, will be a theoretical investigation of the effectiveness of "skirts" for treatment and their likely effects on dispersion models used for regulation, compared to the completely enclosed systems used at present.

Initial field work has been carried out to develop consistent sampling and analysis methods for measuring the spread of cypermethrin and the environmental concentrations of this very hydrophobic substance in the water column using GPS tracking drogues and in sediment using sediment traps.

All sample analysis for cypermethrin in water and sediments is being done in-house, and initial results are showing that rigorous environment sampling and analytical methods are being used. These will be implemented at a number of fish farms sites treating with EXCIS in the new year. The project is ongoing and will be completed by May 2007.

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Sampling dispersion

# Lobsters: Biology, Management, Aquaculture, and Fisheries

Edited by Bruce F. Phillips. ISBN 978-1-4051-2657-1. Blackwell Publishing. 506pp. £125.00  
Review by Janet H Brown

You cannot legislate for common names. How often do I say that in lectures? But I was still surprised to see the photo of the magnificent spiny lobster illustrating this book – "lobsters". Maybe this is more of a problem from the European viewpoint but the confusion is compounded in the preface where there is reference to "the marine lobster literature being vast in comparison to the freshwater species". So this is a book taking a very wide sweep when it comes to covering its topic. When it finally is made clear that the book is covering clawed and spiny lobsters there still remain problems, not least probably for the contributors. The difficulties of covering such a wide scope must have been particularly taxing when covering larval development.

The preface also says that the book owes much to the model of David Holdich's 2002 volume on the freshwater crayfish from the same publisher. This however seems to be mainly in that it finally separates the commercially important lobsters into their taxonomical groupings such as *Homarus* spp, *Jasus* spp, *Panulirus* spp etc. It does not follow the more total approach of the crayfish book; the biology it covers is quite selective in comparison. The chapters cover growth and development, reproduction, behaviour, phylogeny and evolution, pathogens, parasites and other symbionts, before tackling nutrition of both wild and cultured lobsters, larvae and post larval ecology, juvenile and adult ecology before finishing with the individual chapters on the species groups in turn.

It is thus covering a huge range of information. Different contributors however take different approaches so that while this book would provide a very valuable first step into seeking information on any aspect of lobsters, for some chapters it could also provide the information and the source, for others it is often just a reference and in this latter case it is arguably an expensive book to require readers to then go and seek the original sources.

Further disincentive for the student use, rather than the serious researcher is the use of a very old description of the cuticle of crustaceans; why in this case did they not

use the more particular "crustacean" version as given in the Crayfish book rather than talk of exocuticle and endocuticle which was argued against so succinctly as relating more closely to insect physiology in 1985 (Stevenson J Ross 1985. Dynamics of the Integument. In The Biology of Crustacea vol 9 1-42).

For the aquaculturist there is not as much information as might be hoped for. One explanation could be as given by the editor in his conclusions; that much of the recent work on spiny lobsters is being regarded as commercially sensitive and therefore is unavailable. Additionally much of the instrumental work on *Homarus* spp has been done some time ago and in this case it is perhaps entirely justifiable to refer the reader to an earlier review. I was however looking for updates on work on rearing spiny lobster larvae on jelly fish substitutes. The Scyllarid appear to have an association with medusae, but a search of the index will not help you find that reference very easily. The index is not generous to the casual reader and this is a pity. Greater generosity with photographs would also have been nice but might have increased costs even further. This is a valuable book for the scholar of the Decapoda and while bringing together such a wide taxonomic range has its difficulties it will no doubt provide a usefully wide view and a significantly helpful source book.

