Strategic Research Theme : Natural Resources and Sustainability

Research Project undertaken within the **Centre for Marine and Freshwater Research**

Project Title:	Development of Technologies for the marketing of Live Shellfish Products.
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Project Summary

The **SHELLTEC** project aims to transfer and/or develop novel technologies in Ireland that
This major 3 year project began in the summer of 2005 with the planning and design of a dedicated state-of-the-art closed-circulation seawater research facility at GMIT. Due for completion in December 2005, the facility will house 6 full-time researchers including the Project Manager/Principle Investigator, a postdoctoral scientist/laboratory manager and 4 postgraduate students (2 Masters, 2 Ph.D.). The facility itself boasts 3 purpose-built wet laboratories that can be controlled via a computer monitoring and management system from the adjoining office suit.
permit the medium to long-term holding of various commercially valuable crab, lobster, shrimp and mollusc species so that their condition and survival is uncompromised**,** and to optimise systems for their subsequent transport to national, European and International markets. Despite the importance of crustacean and mollusc fisheries in Ireland, the current level of technology used to store and transport shellfish is generally well below the state-of-the-art in other countries. It is not uncommon for large quantities of poor quality individuals to be landed and survival is often low during subsequent storage and/or transport. Improvements in these areas have the real potential to add significant value to the industry, stabilise markets and promote regional economic growth. The **SHELLTEC** team will assist the industry in reaching its potential by the transfer of technology, information and expertise.

The condition of shellfish at capture varies widely due to biological variability in the timing of moulting and/or reproduction, but often the way in which these cycles affect condition are poorly understood. A more detailed knowledge of seasonal and geographic variation in shellfish quality would be of immense value to fisheries managers, processors and exporters alike, and the **SHELLTEC** team will collate this information. Due to their hard shells it is often difficult to determine shellfish condition without causing damage or stress to the animal (which in itself will reduce its condition). Existing methodologies to determine condition are often time consuming and/or relatively expensive, and do not facilitate the rejection and discarding of unsuitable individuals while at sea. This often results in the landing of large numbers of unmarketable individuals that are subsequently rejected from onshore processing facilities but not returnable to the sea. The **SHELLTEC** project will assess existing technology for determining shellfish condition and attempt to develop novel methodologies for rapid sorting that are based on the

individual unit value of the various species fished. Reduction in wastage associated with these fisheries will have enormous stock conservation and economic benefits.

Even though pre-condition is a relatively good indicator of likely resilience to storage, other factors such as moult and/or reproductive status can be influential. The type of equipment used to hold the individuals and variables such as temperature, stocking density, water quality etc. will all effect species-specific maximum storage time. Pre-transport condition is thought to contribute directly to subsequent mortalities in transit, but this can be further complicated by handling and environmental conditions prior to, during and after transport. There is a need to determine the optimum biological, handling, packaging and transport options for shellfish species, whether they are being transported in bulk to the continent or in small numbers by air-freight to international destinations.

In summary, the SHELLTEC project aims to:

- Examine the current global state-of-the-art technology for the non-destructive determination of shellfish condition
- Explore the feasibility of adapting current technologies for use with Irish species
- Determine the most cost effective method for the determination of shellfish quality in key commercial species
- Develop, test and commercialise novel methods: these may involve mechanical, passive or biochemical analyses depending on the economic value of the species
- Promote the use of such technologies by industry and assess the impact of their introduction
- Conduct geographical sampling at regular intervals to determine spatial and temporal variation in shellfish condition
- Identify key periods when the moulting and/or reproductive cycles significantly impact on species condition
- Make recommendations relating to fishing practices and the marketing of shellfish based on findings
- Monitor changes in condition during storage, particularly in relation to pre-storage condition
- Assess the effect of various storage media on condition and survival
- Determine optimum medium and long-term storage protocols for commercially valuable shellfish species
- Determine whether pre-transport condition effects subsequent survival
- Assess the effect of packaging environment, handling and transport