



**Final Report**

# **Communications and Extension in the Southern Rock Lobster Fishery**



**Ross Hodge**

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# Acoustic Release Technology

From the adoption of technology perspective, an excellent presentation on the use of acoustic release technology by NSW Rock Lobster fishers at the Rock Lobster Congress 2013 was of great interest. The presentation by Dr Geoff Liggins Supervising Scientist – Rock Lobster Wild Fisheries program NSW DPI and Scott Wesley NSW Lobster Industry Association highlighted how the adoption and implementation of new technology addressed a number of issues the NSW Lobster fishery was faced with.

With the support of FRDC funding a project titled: **Industry-extension of acoustic release technology for at-call access to submerged head-gear in the NSW rocklobster fishery** was undertaken. The objectives of the project were:

1. Install Desert Star ARC-1XD acoustic release system and integrate with on-board electronics on at least 3 vessels in the NSW lobster fishery
2. Provide training and support in the use and maintenance of the system for fishers who adopt this technology in 2012-13 & 2013-14
3. Produce documentation (manuals, diagnostic & problem-solving tools) covering installation, use and maintenance of the system
4. Broker changes/improvements to the acoustic release system's hardware, firmware and software with the manufacturer
5. Monitor the performance of acoustic release systems implemented in the NSW lobster fishery

Since the early 2000's the NSW Eastern Rock Lobster fishery has really taken its "hard medicine" and committed to rebuilding stocks. The efforts and investment by industry to better understand recruitment dynamics and to rebuild stock levels had paid off considerably however fishers were faced with a number of issues in regards to gear losses.



Figure 1

The deep-water component of the fishery operates on the mid- and outer-continental shelf in 100 – 200 metres of water and between 5-50 kilometers offshore. Initial trials of submerged head-gear & "at call" release technology on lobster traps during 2011-12 proved promising and led to the current project, in an attempt to address issues such as:

1. Reducing ghost fishing by reducing trap losses
2. Reducing opportunity for theft of gear & lobsters
3. Providing insurance against whale entanglements
4. Improving onboard OH&S

Through addressing each of these issues there were subsequent benefits through increased efficiency and improved economics. It was a true win/win outcome i.e. problems solved and efficiency & economic gains.

The causes of trap losses was due to using traditional float on the surface head gear that was regularly being damaged and lost by:

- Larger commercial vessels
- Other fishing vessels
- Recreational boats
- Entanglement with other types of fishing gear
- Vandalism

Acoustic release technology put simply is a system for managing the deployment and retrieval of seabed payloads. It consists of at least one release station (transponder/release unit) in this instance attached to a lobster trap and surface station hardware with software installed on the fishing vessel. The name 'acoustic release' implies the surface station communicates with the release station using acoustic (sonar) signals. The system chosen by NSW Rock Lobster fishers integrates with the vessel's on-board electronics including the GPS.

The release unit (refer fig 1) is attached to the outside of a heavy duty plastic mesh bag which contains ropes and head gear. The plastic bag is secured so that it floating just above the lobster trap. As the boat is approaching the GPS mark for the trap at the appropriate distance the surface station will activate a signal



Figure 2

to the release station. The transceiver component of the release station receives the signal and activates the release mechanism which deploys the release cord allowing the top of the bag to open enabling the head gear to travel to the surface. Once contact is made with the head gear the trap is hauled to the surface using the vessels winch system.

Importantly all components of the release station can be reset and reused in setting the lobster trap. The NSW fishers went through a considerable trial period in testing the acoustic technology they have chosen and the failure rate was minimal in mid shelf sets and higher in outer shelf sets. However, if the release unit failed there is a galvanic time release (GTR) attached to the release cord (refer fig 2) which operates as a trigger system after a given period of allowing the bag to open and release the head gear. The GTR is being replaced by new technology in the form of a back up time capsule which can be programmed by computer to release on a pre-determined time and date.

After 6 months of commercial fishing in a depth of 100–120m the conclusions were:

- Integrity of release unit at depth – no leakage
- Battery voltage longevity / power consumption ok
- Detection range is practical (with GPS)
- Electronics & release mechanism functional
- Minimal bio-fouling
- Rigging / release cord functional - no entanglements
- Loss rate of AR traps << GTR traps
- Lobster catch AR traps >> GTR traps

The fishers using the acoustic release equipment have already clearly identified benefits from investing in new and innovative technology. They still have a few minor bugs to rectify and are working through those. However, as they continue to become more familiar with the system and as the technology is updated, they should continue increasing the efficiency and economics of their fishing operations.