Beam trawling technology was introduced to Newfoundland and Labrador from British Columbia in 1996. The Department of Fisheries and Aquaculture (DFA) has been promoting the shrimp beam trawl fishery as an option for the <45-foot vessels. Through several gear demonstration projects, DFA has made beam trawling equipment available to fishermen to determine
the commercial viability of a shrimp beam trawl fishery. The fishery has now been developed to the point where a commercial fishery exists in Fortune Bay involving 10 vessels. However, fishing demonstrations in the stronger current and deeper water along the northeast coast of the Province, and the coast of Labrador, have revealed that current technology has several limitations. Since its introduction to the Province, beam trawl technology has undergone various modifications to all components independently by fishers, fabricators and government. The objective of this project was to research and document materials and designs of all equipment used in the shrimp beam trawl fishery including the vessel size, hydraulics system, drum winch, stern roller, beam, warp, and net components.

**Methodology**

An experienced beam trawl fisher was contracted as a technical advisor to work in partnership with a Fisheries Development Officer to research and document shrimp beam trawling components. Both individuals travelled to Fortune Bay, Trinity Bay and St. John's, and interviewed fishers, equipment fabricators and gear technologists. The technical advisor sketched all components of shrimp beam trawl gear and equipment. An engineering firm recreated the sketches into CAD (Computer Aided Design) format.

**Results**

The sketch of the 34' 11" shrimp beam trawler illustrates the location of all equipment needed to gear up for beam trawling. Each piece of equipment must be designed and installed properly to operate effectively. Fishers engaged in the shrimp beam trawl fishery in Fortune Bay and Trinity Bay have modified their gear to make it work to their own particular situations. This report will outline the purpose and operation of each piece of equipment for shrimp beam trawling.

**Beam Trawl Net**

Beam trawls are towed fishing nets. The spreader beam is used to provide horizontal opening of the beam trawl. Floats permit the opening to have vertical height. The foot gear is usually made of rubber tire discs and roller balls spaced along a wire cable. The net portion of the trawl is made up of bellies that consist of factory-made netting, usually 200 meshes long. There are various designs of beam trawl nets available from local suppliers.

**Drum Winch**

The drum winch assembly is used to take back the single warp, bridle and net. The drum can be used to control resistance on the net or even stop the net and/or warp during the setting of the trawl. The brake is used to hold the tension on the net during the tow. The drum winch must be properly secured to the deck. Drum winches are made from aluminium because of its light weight and corrosion resistance. The drum component has to be wide enough to allow for easy loading of the end posts.
**Stern Roller**
When taking back the warp, a manual system of movable pins, or a hydraulic system of sliding pins, must be used on the stern roller to guide the warp on the drum. Most warps are made of wire; therefore, pillow block bearings, or similar type bearings, are used to support the roller. The moveable upright pins should be covered in hard surface welding the first six inches from the bottom to prevent wear due to friction caused by the warp. The distance between the outside holes on the stern roller must closely match the width of the drum. To avoid wear on the stern roller caused by friction from the warp, a hard surface welding may be applied.

**Spreader Beam**
The spreader beam, commonly called the "beam", is made from aluminum pipe and is constructed to be watertight. The length and diameter of the beam varies, dependent upon the vessel size and fishing conditions. The beam is attached to the forward part of the trawl to give the trawl horizontal opening. It is kept off the bottom by two end posts. The beam is attached to a three-point bridle system that leads to the main warp.

**Fishing operations**
Beams trawls are towed along the sea bottom at 1.5 to 2.0 knots for up to two hours. Weights made from chain (amounts vary, dependent on warp diameter, net size and tow speed) are placed on the wings of the trawl and at the centre hook-up to ensure the trawl stays in contact with the ocean floor. When the gear is hauled back, the beam is disconnected from one of the end posts and guided to the roof of the wheel house for storage between sets. The drum pulls the net until the cod-end can be pulled onboard and the catch is removed.

**Conclusions**
The design and materials of each piece of shrimp beam trawl equipment is much more detailed than indicated in this summary report. A full report is available, including specifications of shrimp beam trawl gear that DFA had fabricated and used in a demonstration project on the south coast of Labrador.
The $10 million Fisheries Diversification Program is part of the $81.5 million Canada-Newfoundland Agreement Respecting the Economic Development Component of the Canadian Fisheries Adjustment and Restructuring Initiative.