

## Appendix A - Scientific Sampling Protocols

### 1. At Sea Operations

Fishing effort for the survey is standardized as determined at the start of the survey in 1994. Gear specifications are as follows:

- One set is 5 tubs of gear
- A tub of gear will contain 450 to 500 hooks
- Hooks will be #12 circle
- Gangions are 18 inches long made of 150-200 lb. test (3-4 lb. Linear weight) braided nylon set 6 ft apart along the groundline. The groundline should have floating line spliced to it at intervals to raise hooks off the bottom. The floating line is added every 60 hooks; thus from the anchor, by groups of hooks: 30 normal back line; 60 floating line spliced in; 60 normal; 60 float; 60 normal; 60 float etc.
- The bait will be mackerel
- The soak time should be 3 to 6 hours

A total of 56 sets will be made, the positions of which will be determined ahead of time by Fisheries and Oceans, Canada (DFO) based on a stratified random design. A captain may move a set position in the event that setting gear would interfere with other previously set gear, a navigational aid or any other obstacle which would jeopardize either the boat or the gear. The new set position should be as near to the original as practicable.

A temperature recorder (supplied by ~~DFO~~the Contractor) will be attached to the trawl anchor attachment at the end of one set of gear. This will be returned to the onshore technician for downloading of data upon return of the boat to shore.

The first 50 cod over the rail from each set will be kept in a separate tub for delivery to the onshore technician hired by the contractor. Ensure that these cod are clearly identified as to set number.

All information on the sets will be recorded by an observer with the assistance of the boat captain. The captain should confirm that the set number and positions for shooting and haul back of gear are correct. Boat crews are required to assist the observer with sampling. The captain will retain all paperwork for delivery to the onshore contractor's representative.

### 2. At-Sea Observer Sampling:

The standard Groundfish protocol for at-sea observers should be followed. In addition, as per regular observer trips, all fish should be keyed out to species. For example, do not record skate non specified - key out to species (thorny, smooth, etc). Similarly, key out wolfish (northern, spotted, or striped) and hake (red, white, etc.) to species. Avoid using any non-specified species codes.

#### a. Cod Sampling

Sample for length up to 150 Atlantic cod (not including the first 50 cod set aside), and remember that **every set needs** to be sampled.

#### b. White Hake, Atlantic Halibut, American Plaice & Wolffish Sampling

Observers are required to sample for length up to 100 fish for each species per set. Note that Atlantic Halibut and American Plaice must be sexed (except halibut <81cm which must be released). Observers should check with captains and crew to see if normal sampling techniques will damage fish making it unmarketable. If captains and crews are concerned that cutting fish to determine sex will damage the fish and make it unmarketable the requirement to sex these species should be dropped.

#### c. Sets

Before each haul back ask the vessel captain what set number is being hauled to ensure that the length frequencies to match the captain's paperwork. The boats will make an average of 3 sets per day, but may not haul back in the order they set. This is extremely important. There have been cases in the past where the observer had a cod sample for set 3, but the captain didn't have any cod recorded for that set or the observer had a length frequency for set 4 while the captain only recorded 3 sets for the trip.

**3. Onshore Analysis of Cod by Contractor's Technician**

This sampling procedure relates to the first 50 cod retained from each set. The procedure for sampling each fish is as follows:

- Weigh and measure for length
- Remove otoliths and store in envelope identified by trip, set and fish number
- Record sex of fish
- Remove and weigh the liver
- Remove and weigh the gonad
- Record the maturity stage of the gonad
- Estimate and record the stomach fullness
- Remove and weigh the stomach
- Remove and identify the stomach contents as often as is practical. If the backlog of fish to be dealt with is large, identify the stomach contents of one fish only for each centimeter length grouping
- Weigh the empty stomach (even if contents not identified).
- Carry out any special requests from DFO given a sampling protocol and sampling materials are provided for such a request (e.g. collection of cod fin clips)

All these data are recorded on fish morphology data sheets except for stomach content information which is recorded on separate diet data sheets.