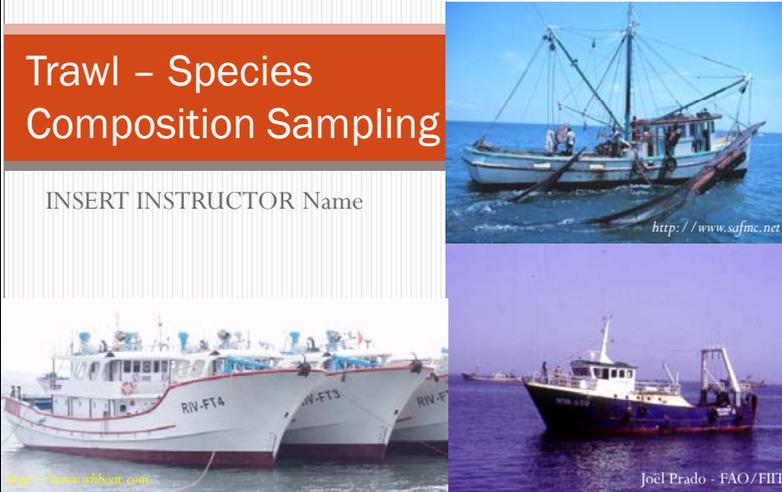


## Trawl – Species Composition Sampling

INSERT INSTRUCTOR Name



<http://www.safmc.net>

<http://www.safmc.net>

Joël Prado - FAO/FIIT

## Sampling Priorities

1. Collect information on fishing effort
2. **Randomly sample for catch composition**
3. Record gear characteristics
4. Collect length-frequency data on target and non-target catch

## Objectives

- List 4 things that can effect species composition sampling
- Demonstrate ability to select & describe appropriate sampling method
- Demonstrate ability to complete the Catch Composition form

## Effects on sampling

1. Vessel size / layout
2. Tow duration
3. Catch size
4. Catch composition - target
5. Sorting techniques

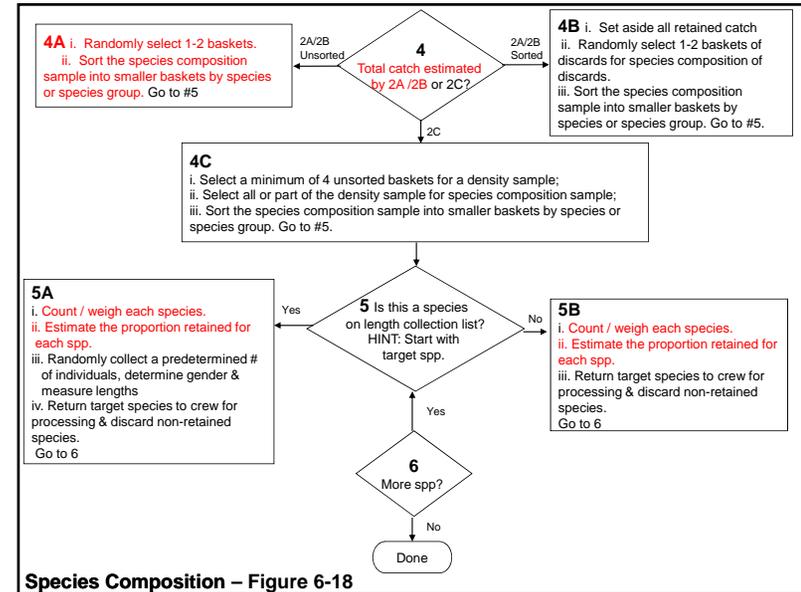


Shrimp trawl  
(Madagascar)  
<http://www.ird.fr>

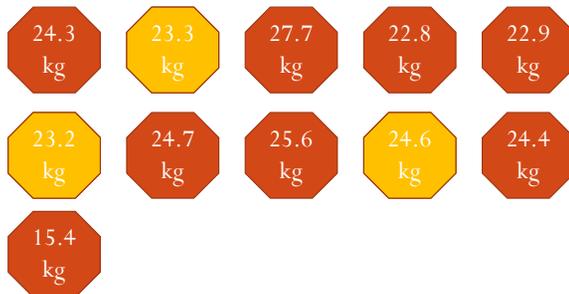
## Catch composition

- Multiple sets/day – how to choose?
- **Observer logbook**
- **Sets/day**      **Random sample table (RST)**

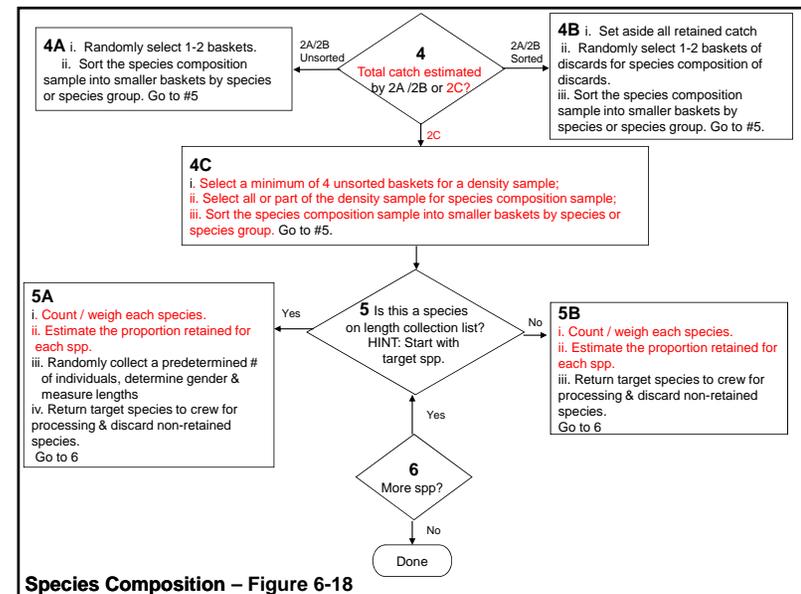
1-2	None – Sample all sets
3-4	RST#1
5+	RST#2
- How much to sample?
  - Diversity of catch (size, # species)
  - Time before next haulback



## Weight all catch – no sorting



- $\Sigma$  basket weights = 258.9 kg
- Randomly select 3 baskets for spp comp – sample weight = 71.1 kg



## Catch composition – sorted catch

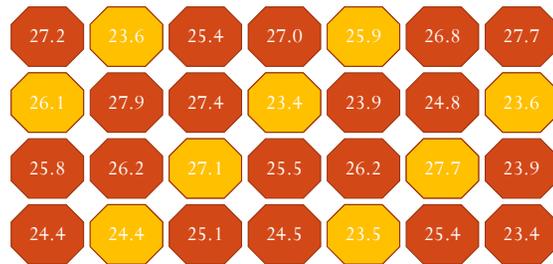
- Weigh all retained
  - By species (sample type 3A)
  - Mixed bags (sample type 3B)
- Subsample discards for composition
  - Weigh all baskets
  - Weigh subsample of baskets
  - Randomly select a few baskets for spp comp of discards (sample type 3C)

## Weigh all catch – sorting

Retained – spp known		Retained – mixed		Discard	
Spp A 59.3 kg	Spp E 7.6 kg	18.4	20.1	18.4	20.1
Spp B 45.5 kg	Spp F 6.8 kg	22.6		22.6	27.3
Spp C 25.2 kg	Spp G 4.3 kg	23.4		23.4	21.9
Spp D 20.3 kg	Spp H 1.5 kg	22.2		22.2	24.3

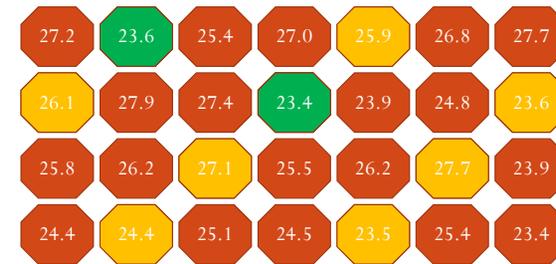
- Total catch =  $\Sigma$  retained +  $\Sigma$  discard = 277.2 + 180.2 = 457.4
- Sample Type (ST) 3A = 170.5 kg
- ST 3B = 23.4 (of 106.7 in the mixed baskets)
- ST 3C = 24.3 (of 180.2 in discard baskets)

## Discards



- Fill evenly – randomly select 10 for weight sample & 3 for spp comp
- $\Sigma$  basket weights / # baskets weighed = 225.3 / 9 = 25.0333
- Total count \* average = 28 \* 25.0333 = 700.93 kg
- Actual = 713.7 kg

## Discards



- Select 2 baskets for discard composition
- ST 3C = 23.6 + 23.4 = 47.0 kg

## Catch composition – helpful hints

- Remember to include any items or specimen removed prior to taking the catch composition sample on the catch composition form as sample type 1 or 8
- If the vessel is changing nets throughout a trip, it may be helpful to mark nets for easy identification

## Sampling description

- Most trawl samples require extensive subsampling
  1. Systematic spatial with a random start;
  2. Random spatial
  3. Systematic Temporal and
  4. Random Temporal

## Sampling description

- Most trawl samples require extensive subsampling
  1. Systematic spatial with a random start;
  2. Random spatial
- Observer logbook - p 12
  - Define population
  - Describe sample frame type & units
  - Describe how random numbers were generated
  - Describe the sample method
- Multiple levels

## Sampling description

### 2. Within Haul Composition Sampling:

Population: individuals in a haul (all codends combined)

Sampling Frame Type and Units: Spatial sample frame – baskets; divide all mix or all discards into equal size baskets and select one or more baskets for comp. sample.

Expected number (range) of sampling units in population: sorted retained – all weights verified, counts from crew; mixed species retained catch (small fish) – 2-6 baskets; discard catch – 8-20 baskets

Random numbers generated by: dice, Random number table

Sampling Method: All of the larger fish & shrimp were sorted/weight by species and their weights are verified/recorded. Smaller fish and discards are subsampled for composition. For mixed fish retained sample, randomly select 1 bag/basket of 4-6 total for species specific assessment; for discard sample, randomly select 1 basket of 8-20 baskets for composition sample.

Describe any factors that affected your random sample: 1-crew sometimes forgot to keep all discards and threw some things overboard as they were sorting; 2-shovels are small so sometimes the larger discards get pushed around before they are eventually lifted into the discard baskets;





## Trawl Catch Composition Sample – Activity

Name:

What you need: pencil, blank Catch Composition form, sample description form to describe sampling procedures, calculator, ruler, bin or codend full of catch

Gather in groups to decide on a sampling strategy for unsorted catch, make measurements and sample for catch composition. The catch is highly diverse. Scale your measurements from 1 cm measured to 10cm actual.

Each of you will complete the sampling description template and calculate a Total Catch estimate.

Your Observer code: FS345, Vessel code: LIB9997, Trip #7, retrieval date: 5/17/11, Haul 45 was not mixed. Average weights for the various types of ‘fish’ are listed at the end of the handout.

Haul #: Total catch WT:	Total Weight Calculation
Density Calculation  = 0.9875 mt/m <sup>3</sup>	

**Sampling Description**

Briefly describe the flow of fish:

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Please describe each element of your sample design at each level of sampling.

**1. Haul-level Sampling:**

Population: \_\_\_\_\_

Haul selection: \_\_\_\_\_

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**2. Within Haul Composition Sampling:**

Population: \_\_\_\_\_

Sampling Frame Type (spatial, temporal, other) and Units (include typical size of sample unit):

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Expected number (range) of sampling units in population: \_\_\_\_\_

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Random numbers generated by: \_\_\_\_\_

Sampling Method: \_\_\_\_\_

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Describe any factors that affected your random sample (e.g. sorting, limited access, etc.):

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For the purpose of the catch composition form, use the following weights:

<b>Fish</b>	<b>Weight (kg)</b>	<b>Retained/Discard</b>
red bead	0.25	Retained
white bead	0.8	Retained
yellow bead	0.55	Retained
green bead	0.4	Retained
sm white button	0.05	Discard
foam (misc. shapes)	0.3	Discard
sm black button	0.3	Discard
red button	0.85	Discard
black faceted bead	1.75	Discard
yellow buttons	0.3	Discard
black puff balls	0.4	Discard
large black button	1.1	Retained
sparkly squares	0.65	Retained
large white button	1.5	Retained
big tortoise buttons	4	Retained
black button	5.4	Retained
green tri-bead	2.75	Retained
orange tri-bead	1.2	Retained
flower button	10.9	Discard
shark/diver/whale/pirate	40.1	Discard