



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 impact catch 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

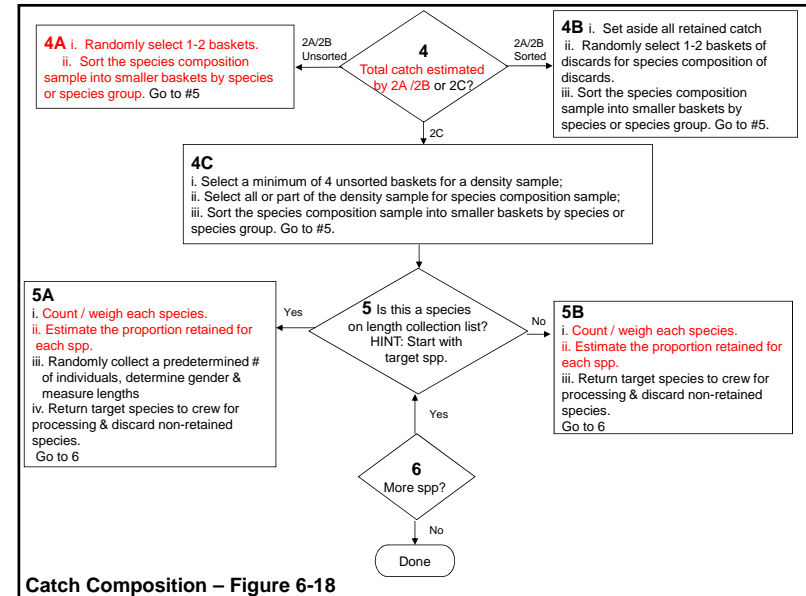


Shrimp trawl
(Madagascar)
<http://www.ird.fr>

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 retrieval

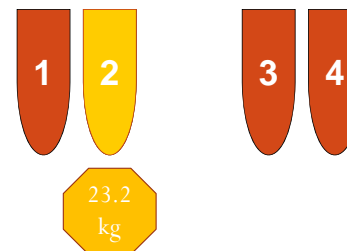


Weigh all catch – no sorting



- Σ basket weights = 258.9 kg
- Randomly select 3 baskets for catch composition (ST=2) – sample weight = 71.1 kg

Sample 1 net – no sorting (ST=2)

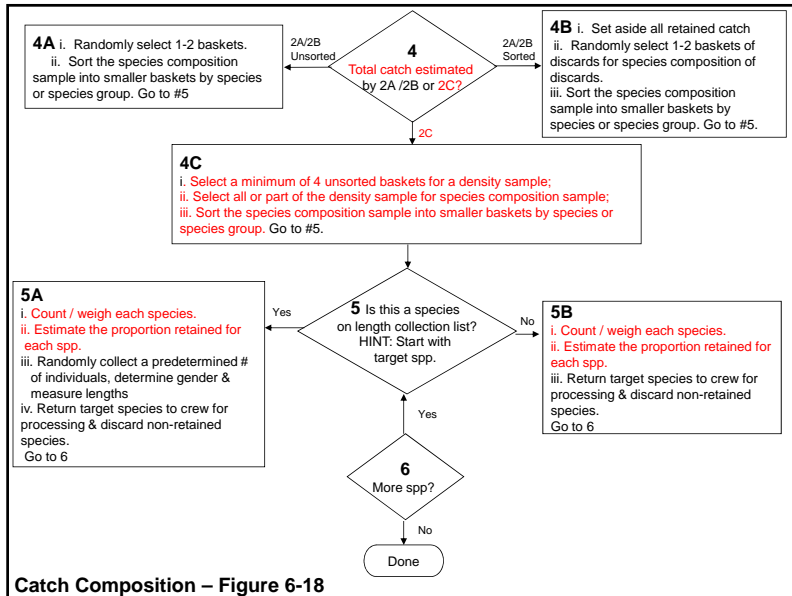


Catch Composition

- Select random # between 1 and total number of nets
- Collect 1 basket from selected net as it's opened
- Sort to species, count, weigh, determine discard percent

Total catch estimate

- $= \Sigma$ retained + Σ discard
- Obtain retained from production counts
- Obtain discards from basket counts & ave. wt of discard baskets



- ### Catch composition – sorted catch (ST=3)
- Weigh all retained
 - By species (sample type 3A)
 - Mixed bags / samples (sample type 3B)
 - Subsample discards for composition
 - Weigh all baskets
 - Weigh subsample of baskets
 - Randomly select a few baskets for catch composition of discards (sample type 3C)

Weigh all catch – sorting

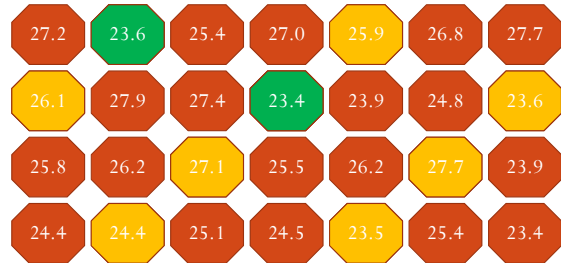
Retained – spp known		Retained – mixed		Discard	
Spp A 59.3 kg	Spp E 7.6 kg	18.4	23.4	18.4	20.1
Spp B 45.5 kg	Spp F 6.8 kg	22.6		22.6	27.3
Spp C 25.2 kg	Spp G 4.3 kg	20.1		23.4	21.9
Spp D 20.3 kg	Spp H 1.5 kg	22.2		22.2	24.3

- Sample Type (ST) 3A = $59.3+45.5+25.2+20.3+7.6+6.8+4.3+1.5=170.5$ kg
- ST 3B = 20.1 (of 106.7 in the mixed baskets)
- ST 3C = 24.3 (of 180.2 in discard baskets)
- **Total catch**= Σ retained + Σ discard= $277.2 + 180.2=457.4$ kg

Discards – 28 total baskets

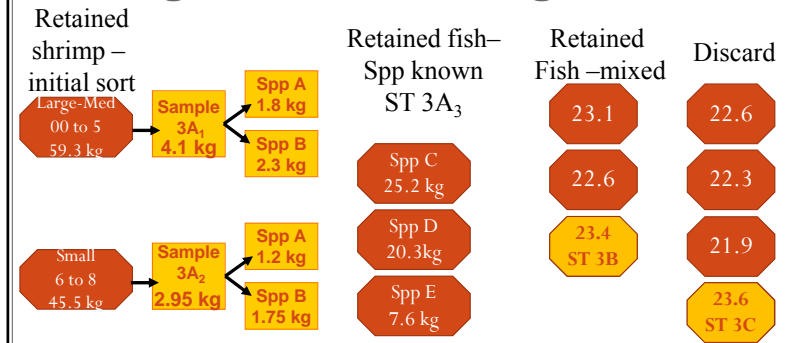
- Fill evenly – randomly select 9 for average weight sample & 3 for catch composition
- Σ basket weights / # baskets weighed = $225.3 / 9 = 25.0333$
- Total count * average = $28 * 25.0333 = 700.93$ kg
- Actual = 713.7 kg

Discards



- Select 2 baskets for discard composition
- $ST\ 3C = 23.6 + 23.4 = 47.0\text{ kg}$

Weigh all catch – sorting



- Sample size of $ST\ 3A_1 = 4.1\text{ kg}$ of 59.3 kg
- $ST\ 3A_2 = 2.95\text{ kg}$ of 45.5 kg
- $ST\ 3A_3 = 53.1\text{ kg}$
- $ST\ 3B = 23.4$ of 69.1 kg in the mixed baskets
- $ST\ 3C = 23.6$ of 90.4 kg in discard baskets
- Total catch = Σ retained + Σ discard = $227.0 + 90.4 = 317.4\text{ kg} = 0.32\text{ mt}$

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 with a random start and
 4. Random temporal

References

- Pauly, D. 1984. Some simple methods for the assessment of tropical fish stocks. FAO Fish. Tech. Paper 234, FAO, Rome.

Trawl – Catch Composition

January 19, 2012

**Trawl Catch Composition Sample
Activity #1 – Unsorted catch**

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. The catch is highly diverse.
- Make measurements of the codend or the bin and sample for catch composition. Scale your measurements from 1 cm measured to 10cm actual. Use the bin/codend volume and density given below to estimate total catch weight. Put your calculations in the table below.
- Each of you will complete the sampling description template
- Complete the catch composition form based on the information provided and your group’s sample counts. Use the average weights for the various types of ‘fish’ listed at the end of the handout to calculate weights on the catch composition form.
- Record 0% or 100% in the percent retained column as appropriate. Reasons are also provided for the various species.

Your Observer code: FS345, Vessel code: LIB9997, Trip #7, retrieval date: May 17, 2011, Haul 45 was not mixed.

Haul #: Total catch WT:	Total Weight Calculation
Density / Other Calculation = 0.9875 mt/m ³	

2. Within Haul Composition Sampling:

Population: _____

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

Expected number (range) of sampling units in population: _____

Random numbers generated by: _____

Sampling Method: _____

Trawl – Catch Composition

January 19, 2012

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

Catch	Average weight per individual (kg)	Retained/ Discard	Discard reason
red bead	0.25	Retained	
yellow bead	0.65	Retained	
sparkly squares	0.85	Retained	
big tortoise buttons	4.15	Retained	
tri-bead (multi-color)	2.75	Retained	
white bead	0.8	Discard	Market
green bead	0.4	Discard	Market
white button	0.05	Discard	Market
foam (misc. shapes)	0.4	Discard	Market
black button/beads	0.5	Discard	Market
black faceted bead	1.75	Discard	Market
blue button	1.8	Discard	Other
red button	0.85	Discard	Market
yellow buttons	0.3	Discard	Market
puff balls	0.7	Discard	Regulation
flower button	10.9	Discard	Market
shark/diver/whale/ pirate/turtle/marble	40.1	Discard	Regulation

Trawl – Catch Composition

January 19, 2012

**Trawl Catch Composition Sample
Activity #2 – Sorted catch**

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. Sort “discards” from retained catch & set retained catch aside. You don’t need the retained for this activity.
- Decide on a sampling strategy for discards (ideally sample ~20%). Each of you will complete the sampling description template (Question #2 only).
- Use the mean carton weight (20.0kg) and the counts to calculate sample weights of retained species.
- Complete the catch composition form based on the information provided for retained and your groups discard sample counts. Use the average weights provided for the various types of ‘fish’ listed at the end of the handout to calculate weights on the catch composition form.
- Record 0% or 100% in the percent retained column as appropriate. Reasons are also provided for the various species.
- Put your calculations for total catch weight in the table below.

Your Observer code: G027, Vessel code: GAB38, Trip #2, retrieval date: March 18, 2011, Haul 41 was not mixed.

Haul #: Total catch WT:	Total Weight Calculation
Density / Other Calculation	

2. Within Haul Composition Sampling:

Population: _____

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

Expected number (range) of sampling units in population: _____

Random numbers generated by: _____

Sampling Method: _____

Trawl – Catch Composition

January 19, 2012

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

Catch	Average weight per individual (kg)	Retained/Discard	Discard reason	# cartons
red bead	0.25	Retained		5.00
yellow bead	0.65	Retained		3.50
sparkly squares	0.85	Retained		0.25
big tortoise buttons	4.15	Retained		1.25
tri-bead (multi-color)	2.75	Retained		1.00
white bead	0.8	Discard	Market	
green bead	0.4	Discard	Market	
white button	0.05	Discard	Market	
foam (misc. shapes)	0.4	Discard	Market	
black button/beads	0.5	Discard	Market	
black faceted bead	1.75	Discard	Market	
blue button	1.8	Discard	Other	
red button	0.85	Discard	Market	
yellow buttons	0.3	Discard	Market	
puff balls	0.7	Discard	Regulation	
flower button	10.9	Discard	Market	
shark/diver/whale/ pirate/turtle/marble	40.1	Discard	Regulation	

