

### MODULE 3.4, HANDOUT #1: Mean sustainable yield from population growth rates and % of trophy animals

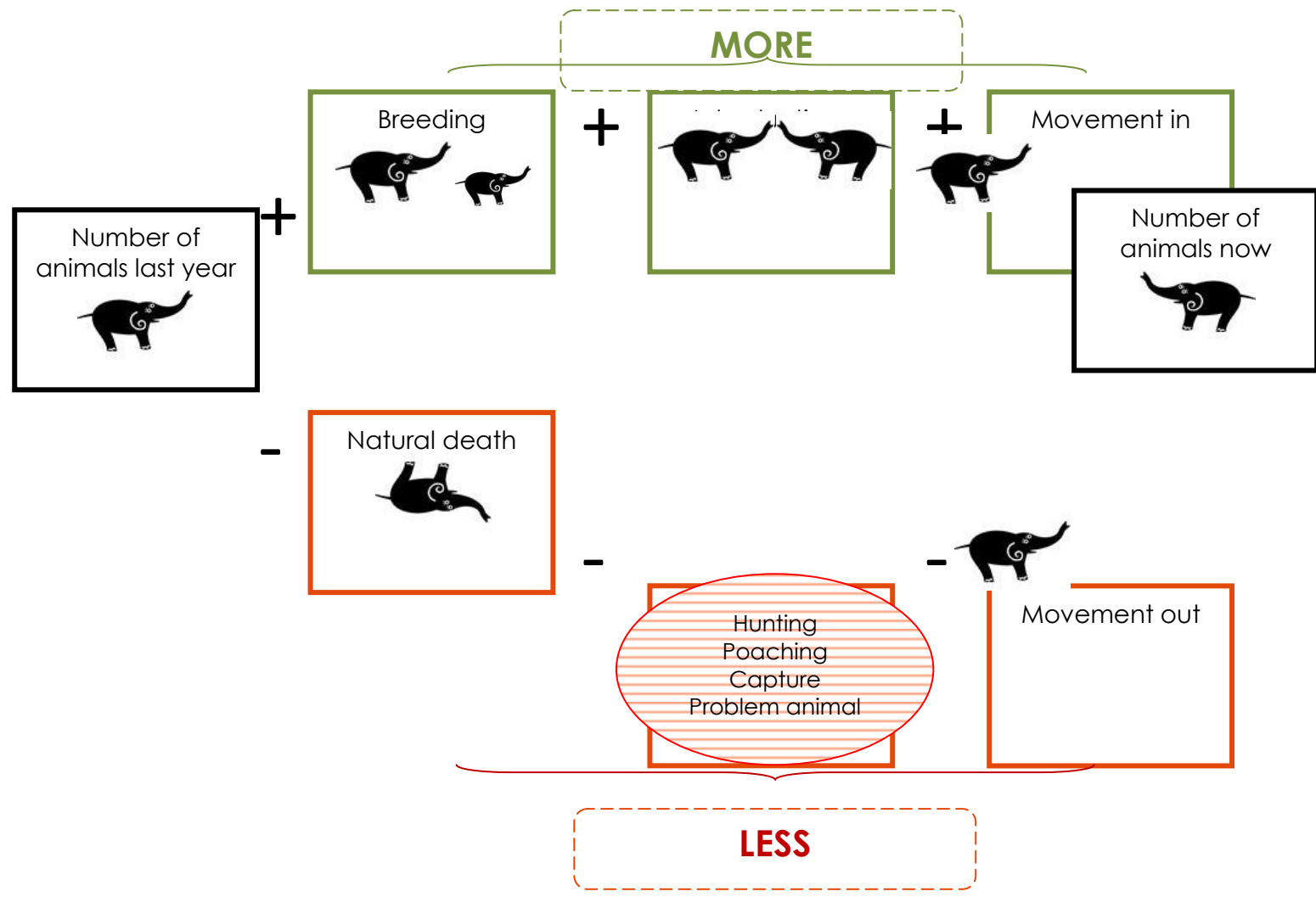
**Note:** Bigger animals do not breed as fast as smaller animals and therefore require lower off-take rates. The following table shows estimated population growth and percentage of a population that comprises trophy animals. The 'recommended' column is appropriate for Namibian conservancies.

	% Population growth			% Trophy animals	
	ABSA	Furstenberg	Recommended	Bothma	Recommended
Giraffe	15	12	12	-	2.5
Eland	20	20	20	13	10
Roan	20	-	20	-	5
Sable	20	20	20	6	5
Hartmann's zebra	20	25	20	-	10
Burchell's zebra	25	25	25	-	10
Blue wildebeest	25	30	25	11	5
Kudu	20	19	20	-	5
Oryx	25	15	20	-	10
Hartebeest	20	23	20	14	7.5
Waterbuck	20	-	20	12	5
Black-faced impala	35	30	35	-	10
Common impala	20	30	35	-	10
Tsessebe	20	-	20	-	5
Springbok	40	33	40	12	10
Warthog	20	120	50	12	5
Ostrich	50	40	40	-	10
Duiker	20	45	30	-	10
Steenbok	20	30	30	-	10
Damara dik-dik	-	-	30	-	10
Klipspringer	20	30	30	-	10

## MODULE 3.4, HANDOUT #2: Principles and rules of quota setting

1. Quotas **MUST** take into account the previous quotas and whether they were achieved.
2. **ALWAYS** consider quotas in relation to population numbers and trends for each species.
3. Objectives for each species **MUST** be considered when calculating off-take rates (i.e., whether the intention is to encourage a population to increase, be maintained at current levels, or be reduced).
4. It should use all information available (e.g., Event Books, game counts, research, surveys etc.) particularly population and trophy quality trends.
5. There must be viable populations of those species for which a quota has been requested.
6. Quota setting needs to be based on transparent and defensible principles.
7. Quotas should be reasonably stable over a number of years to facilitate marketing, but also dynamic to allow rapid response to changes shown by monitoring data or events such as droughts.
8. It is a participatory activity with all stakeholders contributing.
9. It is the responsibility of individual conservancies but MET has the overall responsibility to ensure that quotas are reasonable.
10. It should not ignore local knowledge about wildlife populations.
11. Off-take should not be given priority as a form of utilisation if there are other non-consumptive options that provide significant benefits to the conservancy (such as photographic tourism).
12. Take neighbouring conservancies into consideration when setting quotas where game populations are able to move freely between conservancies.
13. For high-value species, whose quotas are likely to be very small and whose home ranges cover a number of conservancies, communities will need to share in the quota benefits based on the proportion that each area contributes to maintaining that population.
14. If wildlife are unable to migrate (e.g., in fenced areas) or during droughts, make sure populations do not exceed stocking rates that could lead to mass mortalities.
15. Monitor trophy quality and reduce quotas of trophy animals if there is a decline, to ensure that Namibia remains a favoured destination for safari hunters.
16. Create non-hunting zones where animals can breed and feel secure to ensure that they remain in the area – such areas can provide other forms of wildlife utilisation.
17. Problem animal quotas should be treated as 'own use', not trophy.

# MODULE 3.4, HANDOUT #3: Impact of off-take on wildlife populations



## MODULE 3.4, HANDOUT #4: Benefits and threats of different types of off-take

BENEFIT/IMPACT	Trophy hunting	Premium hunting	Shoot and sell hunting	Own-use hunting	Live capture
<b>Benefits:</b>					
Cash income to conservancies (and potentially members)	✓✓✓	✓	✓	○	✓
Easy to establish and implement	✓✓	✓✓	✓	✓	✓
Gives employment	✓	✓	○	○	○
Gives training	✓	✓	○	✓	○
Provides meat to community	✓	✓	○	✓✓	○
Reduces poaching (meat provided)	✓	✓	○	✓	○
<b>Negative impacts:</b>					
Wounding animals common	○	○	X	XX	○
Expensive for community to undertake	n/a	X	X	X	○
Trophy quality decreases (young males removed)	n/a	X	X	X	X
Wildlife populations decline (females removed)	n/a	n/a	X	X	X X
Lion/hyaena populations decline (social structure impacted)	XX	n/a	n/a	n/a	X
Habitats/scenery damaged	X	X	XX	XX	XX
Game viewing damaged	○	○	XX	XX	XX
Tourists upset	XX	XX	XXX	X	○

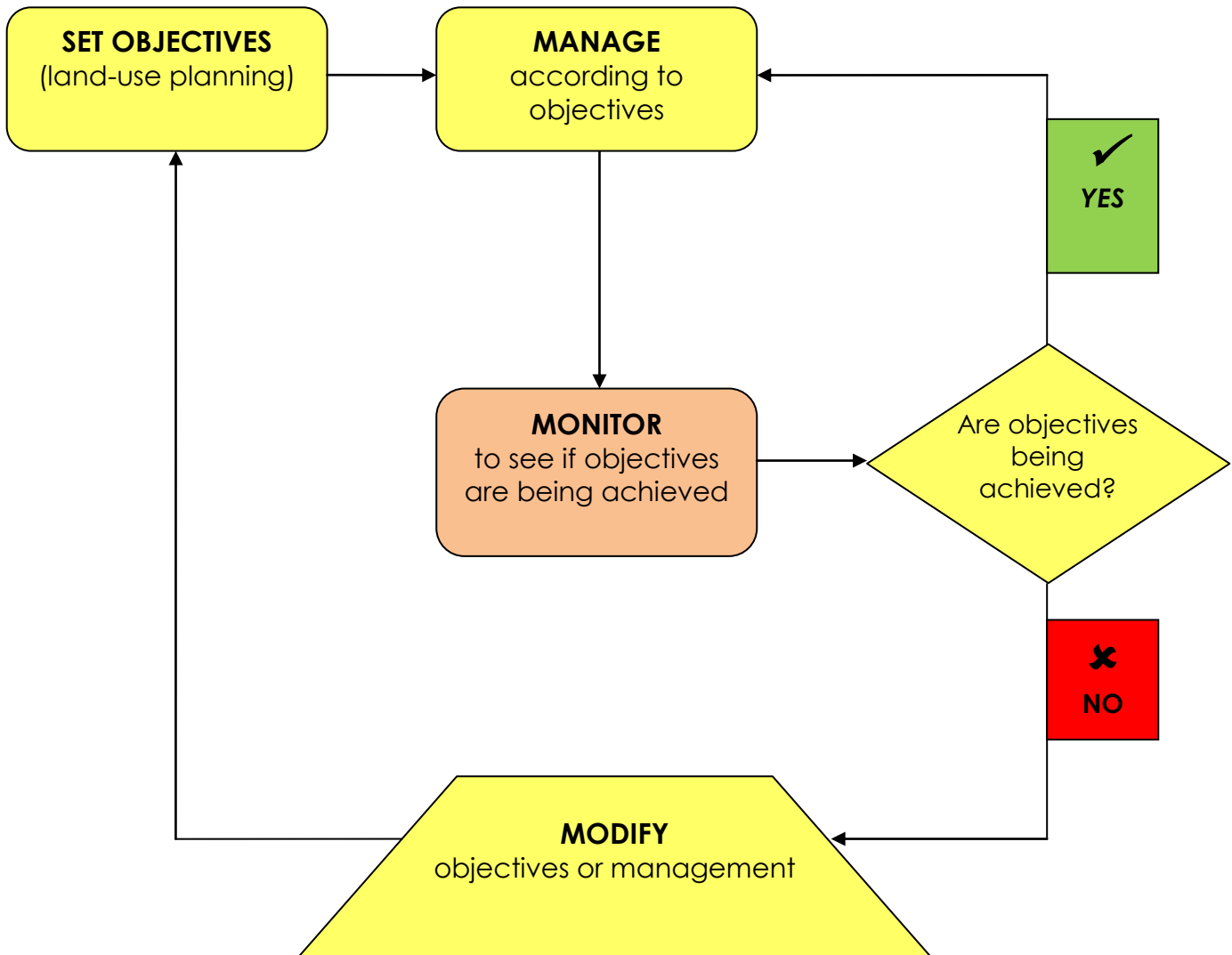
### KEY

Off-take method has <u>positive</u> benefit	✓
Off-take method has <u>negative</u> impact	X
Off-take method does not have this effect	○
Not applicable to this off-take method	n/a

## MODULE 3.4, HANDOUT #5: Off-take information

Type of off-take	Numbers to be taken (for sustainability)	Sex of animals to be taken	Impact on remaining wildlife population
Trophy hunt	Few	Male	Small
Premium hunt	Few	Male	Small
Shoot and sell	Few/Many	Non-trophy male	Can be large
Own use	Few/Many	Non-trophy male Some females	Large
Problem animals	Few	Either	Small
Live capture	Many	Female, few males	Large
Disturbance hunt	Few	Either	Large

**MODULE 3.4, HANDOUT #6: Adaptive management – diagrammatic explanation**



## MODULE 3.4, HANDOUT #7: Calculating the target wildlife numbers

It's easier to grasp wildlife numbers by imagining them on a 5,000ha farm. Use an index for the desired densities (numbers/5,000ha) for this farm (Table 7.1) and then multiply up by the size of the conservancy to calculate the numbers that would comprise the desired populations.

**Table 7.1: Target indices**

SPECIES	Index for desired densities (numbers/5,000 ha)
Baboon	10
Cheetah	0.5
Duiker	2
Eland	3
Elephant	0.5
Gemsbok	40
Giraffe	1
Hartebeest	3
Hyaena S	5
Impala (BF)	3
Jackal	2
Klipspringer	2
Kudu	10
Leopard	1
Lion	0.2
Rhino	0.3333
Springbok	<b>100</b>
Steenbok	10
Warthog	0.2
Zebra	13
Ostrich	13

Therefore, for a conservancy that is 2,000 km<sup>2</sup> (200,000 ha), the desired number of springbok would work out to be:

$$100 \times 200,000 / 5,000 = 4,000 \text{ animals}$$

(index x conservancy area in ha / 5,000 ha)

## MODULE 3.4, HANDOUT #8: Selecting the appropriate utilisation strategy (page 1 of 3)

(Handout # 7 gives details for completing the template)

### 1. Target wildlife numbers

- The present population is obtained from the best available information (see Handout #7).
- The desired population is calculated from the index for the relevant species in Table 7.1 (Handout #7).
- Place this information in Table 8.1 as a guide for selecting suitable population targets (desired numbers) (see Handout #7 for calculations).

**Table 8.1: Information for selecting population targets**

Species	Present population	Desired population	Density index for desired population
			Numbers per '5,000ha farm'
Elephant			
Rhino			
Springbok			

Compare the population you have with the desired population in the third column of the table to see if the species population has reached its threshold.

### 2. Harvesting guidelines

- For each of the species to be hunted, Tables 8.2 and 8.3 will provide a useful guide.
- Game harvesting rates need to account for where the current population is relative to the target population:
  - a. If the **current population is well below the target**, it is possible to have some trophy hunting and some modest own-use hunting as long as only male animals are hunted.
  - b. As the **population increases towards the desired numbers**, off-takes can be increased and both sexes can be hunted.
  - c. When the **current population is the same as the desired population**, both males and females can be harvested at the same rate as the breeding rate – in this case, numbers will theoretically be held at the desired level.
  - d. When the **population increases above the desired level**, it may be necessary to reduce numbers to reduce competition with other species (including domestic livestock) and to prevent over-grazing and veld degradation. In this case, it is advisable to consult an expert to set appropriate off-take quotas.



## MODULE 3.4, HANDOUT #8: Selecting the appropriate utilisation strategy (page 2 of 3)

Table 8.2: Guidelines for quotas

Population objective	Description	E.g., standard quota rate	Guiding notes	Utilisation strategy
++	Population well below target (<50% of target)	2%	Males only	Only trophy hunting.
+	Population slightly below target (50% - 80% of target)	8%	Males only	Harvest at ½ mean sustainable yield but only take males or very old females.
#	Population on target (± 20% within target)	16%	Males and females	Harvest at mean sustainable yield. Capture and sale now viable.
---	Population in excess of target (>120% of target)	Ask an expert!	Males and females	Reducing populations is a drastic step and needs to be considered carefully for each case.

**NB:** In the case of droughts, off-take levels can be increased but should focus on less valuable species (and this is best done with expert advice).

## MODULE 3.4, HANDOUT #8: Selecting the appropriate utilisation strategy (page 3 of 3)

Table 8.3: Suggested % off-take rates for populations at different stages relative to desired population sizes

Population objective	Description	Guiding notes	Utilisation strategy	Giraffe	Eland	Roan	Sable	Zebra (H)	Zebra (B)	Wildebeest	Kudu	Oryx	Hartebeest	Waterbuck	Impala (BF)	Impala (common)	Tsessebe	Springbok	Warthog	Ostrich	Duiker	Steenbok	Dik-dik	Klipspringer
++	Population well below target (<50% of target)	Males only	Only trophy hunting.	2	3	2	2	5	5	3	3	3	3	2	5	5	3	4	5	5	5	5	5	3
+	Population slightly below target (50% - 80% of target)	Males only	Harvest at ½ mean sustainable yield but only take males or very old females.	5	7.5	7.5	7.5	10	10	10	7.5	10	10	10	10	10	7.5	13	13	13	5	7.5	5	5
#	Population on target (± 20% within target)	Males and females	Harvest at mean sustainable yield. Capture and sale now viable.	10	15	15	15	20	20	20	15	20	20	20	20	20	15	25	25	25	10	15	10	10
---	Population in excess of target (>120% of target)	Males and females	Reducing populations: consider each case carefully.	Consult an expert!																				

**MODULE 3.4, HANDOUT #9: Example of a conservancy quota-setting sheet**  
**Conservancy quota-setting sheet**

**Ozondundu 2010**

Table 9.1

Species	Current vs desired density <sup>a</sup>		Population trend <sup>b</sup>	HWC incidents <sup>c</sup>	Population estimate		Past quota use			Trophy quality	Harvest rates <sup>f</sup>		Suggested quota		Requested quota		
	Theoretical	Conservancy			Latest <sup>d</sup>	3yr average <sup>e</sup>	Set quota	Non-trophy	Trophy	% qualified	Total off-take	Trophy off-take	Total <sup>g</sup>	Trophy <sup>h</sup>	Total	Trophy	Other <sup>i</sup>
Cheetah			↓		17	17					%	%					
Gemsbok	Increase		≈		83	48					3%	3%	1	1			
Giraffe	Increase		≈		41	41					1%	1%	0	0			
Kudu	Increase		↓		222	125					2%	2%	2	2			
Ostrich	OK		≈		41	68					18%	5%	12	3			
Springbok	Increase		↓		63	201					3%	3%	6	6			
Steenbok	decrease		↓		157	230					12.5%	2%	29	5			
											%	%					
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 Signature MET Field Facilitator

Date: \_\_\_ / \_\_\_ / \_\_\_\_\_ Name Chairperson  
 Signature MET Field Facilitator

- a. Actual vs preferred density. 'Increase' represents a difference of <80%; 'OK' a difference of 80 – 120%; 'Decrease' a difference of >120%.
- b. Trend calculated from the slope of a fitted line (using data from the last 3 years) for each of the 4 Carrying Capacity Zones assigned in the game count area.
- c. Number of human wildlife conflict incidents caused by that species.
- d. Agreed population estimate for most recent year.

- e. Average population estimate over last 3 years. Populations with 'increase' only receive trophy off-take quotas.
- f. Total off-take = trophy off-take.
- g. Calculated as (off-take rate) x (population average).
- h. Calculated as (trophy rate) x (population average).
- i. 'Other' includes shoot and sell, traditional authority, own use, capture.

## MODULE 3.4, HANDOUT #10: Explanation of the conservancy quota-setting sheet (page 1 of 3)

### 1. Current vs desired density (theoretical) (column 2)

The theoretical density is calculated from regional scientifically-based counts. Where it is considered that the population is below carrying capacity, it is allocated 'increase'. If the population is at carrying capacity it is 'OK' and if above carrying capacity, it should be 'decreased'.

### 2. Current vs desired density (conservancy) (column 3)

Here the conservancy is able to say, on the basis of local knowledge and the conservancy monitoring system, whether the populations can be increased, decreased or maintained at the current level.

**NB:** *If the Conservancy disagrees with the theoretical relationship with targets (i.e., increase/decrease/OK) there should be a statement to support this opinion.*

### 3. Trend (column 4)

Trends are calculated from regional density estimates from the past three years for each of the Target Zones.

**NB:** *Populations that need to be increased should ONLY be allocated trophy quotas.*

### 4. HWC (column 5)

Human wildlife conflict incidents recorded in the conservancy monitoring system for that particular species are inserted here. This will influence the conservancy's desired densities for those species that can be a problem.

### 5. Population estimates (latest) (column 6)

Estimates are arrived at by combining information about population sizes from surveys, local monitoring and local knowledge.

## MODULE 3.4, HANDOUT #10: Explanation of the conservancy quota-setting sheet (page 2 of 3)

### 6. Population estimates (3 year average) (column 7)

These are calculated as the average of the estimates from the past three years, to smooth out apparent anomalies that could be caused by movement of animals in or out of the conservancy.

### 7. Past quotas\*\*\* (column 8 - 10)

The set quota is the one that was allocated for the previous season, while the non-trophy and trophy quotas refer to the numbers of these animals taken.

**NB:** *This an important source of information to indicate whether quotas have been realistic or not. If the non-trophy and trophy off-takes were less than the set quota, it is likely that the quota was too high. In this case, requested quotas should be lower than previously or at the very least, they should not exceed previous quotas – even if population estimates and trends indicate otherwise.*

### 8. Harvest rates

These are obtained from the maximum sustainable yield for the species adjusted for population trends as shown in Handout #8 (tables 8.2 and 8.3).

### 9. Suggested quotas

Multiplying the harvest rate by the 3-year population average provides the suggested quota.

### 10. Requested quotas

Requested quotas are those that the conservancy requests.

## MODULE 3.4, HANDOUT #10: Explanation of the conservancy quota-setting sheet (page 3 of 3)

It is more likely that a conservancy would request high quotas than low, and it is important that they are reviewed in relation to the target densities, population trends, average population estimates, and harvest rates.

**Table 10.1:** Example of a quote-setting sheet, using imaginary data

SPECIES	Trend	Population estimate	Past quota	Off-take achieved	Requested quota	Comment
Oryx	↓	200	6	6	2 (trophy)	Reasonable for a declining population
Giraffe	↓	20	0	0	2	Inadvisable for small population
Kudu	↑	200	4	4	20	Unrealistic to take 50%, even though increasing
Ostrich	≈	100	18	2	40	Unrealistic – off-take not achieved previously and high for small population
Springbok	↓	1,000	30	30	90	Too high for declining population although quota achieved previously

### MODULE 3.4, HANDOUT #11: Event Book monitoring system off-take records

These modules have similar data sheets to record the following:

MODULE	DATE	LOCATION/SOURCE	SPECIES	TOTAL NO. OF ANIMALS	SEX/NO. OF FEMALES	ANIMAL AGE	REMOVAL METHOD	WHO RECEIVED MEAT	TROPHY SIZE/HORN MEASUREMENTS	INCOME RECEIVED	CLIENT NAME	PH NAME	HUNTER/OPERATOR NAME	PERMIT NO.	ANIMAL DEATH/INJURY
Own-use	✓	✓	✓	✓	✓			✓					✓		
Premium	✓	✓	✓		✓			✓	✓	✓	✓	✓		✓	
Shoot and sell	✓	✓	✓	✓	✓			✓		✓		✓	✓	✓	
Trophy	✓	✓	✓						✓		✓	✓			
Problem animal	✓	✓	✓				✓	✓							
Captures	✓	✓	✓	✓	✓	✓							✓		✓
Introductions	✓	✓	✓	✓	✓	✓							✓		✓

## **MODULE 3.4, HANDOUT #12: Self-assessment evaluation for participants**

Participants receiving training in Module 3.4 are not subject to formal assessment. However, in order for you to assess the knowledge and skills you have acquired on quota setting, and for the trainer to ascertain how effective the training has been, you are encouraged to answer for yourself the following questions and discuss your answers – as part of a group or individually – with your trainer.

- 1. Can I say what a quota is?**
- 2. Do I know why it is necessary to set quotas?**
- 3. Can I say what a sustainable quota is?**
- 4. Can I explain what is meant by 'trophy quality'?**
- 5. Can I say what sustainable off-take calculations are based on?**
- 6. Can I say what different types of off-take there are?**
- 7. Do I know what is important for setting off-take quotas?**
- 8. Do I understand what is meant by adaptive management?**
- 9. Can I list the most important quota-setting rules?**
- 10. Do I know when a quota should be reduced?**