

Livestock & Predation management



Predation Management South Africa

2008 – 2020

Monitor farms

*to assess management tools in support of predation
management training in South Africa*

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Foreword

This report will give feedback on the endless battle of livestock producers to protect their livestock against predators, as the conflict between humans and wildlife is as persistent as always. Livestock farmers have their challenges and with the assistance of Predation Management SA (PMSA) monitor farms, a standard has been set to assist and train producers to reduce the impact of predation, whilst still being financially viable.

With the drought persisting in many areas taking its toll now more than ever before on vegetation, animals and producers, predation is not the only concern for the livestock sector. The year 2020 will surely be written down in history as the “game changer”, the “Covid year”, the year which has turned the daily livelihood of humans’ worldwide into something never experienced before. With millions of people globally who lost their lives, and the world literally forced to a standstill, everybody depended on the agricultural sector to carry humanity through this worldwide crisis. Agricultural producers were fundamental in maintaining food security, preventing an even bigger crisis than the one already at hand. Realizing now, better than ever before, that the agricultural industry is the backbone of every economy and a fundamental pillar securing human existence. Investment in the agricultural sector ensures economic security and stability, as well as a guaranteed survival of humankind.

The question arises: How did South African agriculture handle this most unsuspected and unpredictable year?. Well, the answer lies in the support provided through organized agriculture, who believed in their industry and their members.

This report will give in-depth feedback on how information gathered from the monitor farms, with appropriate predation management specialist support, contributed towards training, guiding, and providing relevant information to producers to manage the predation threat on their farms.

Monitor farms.

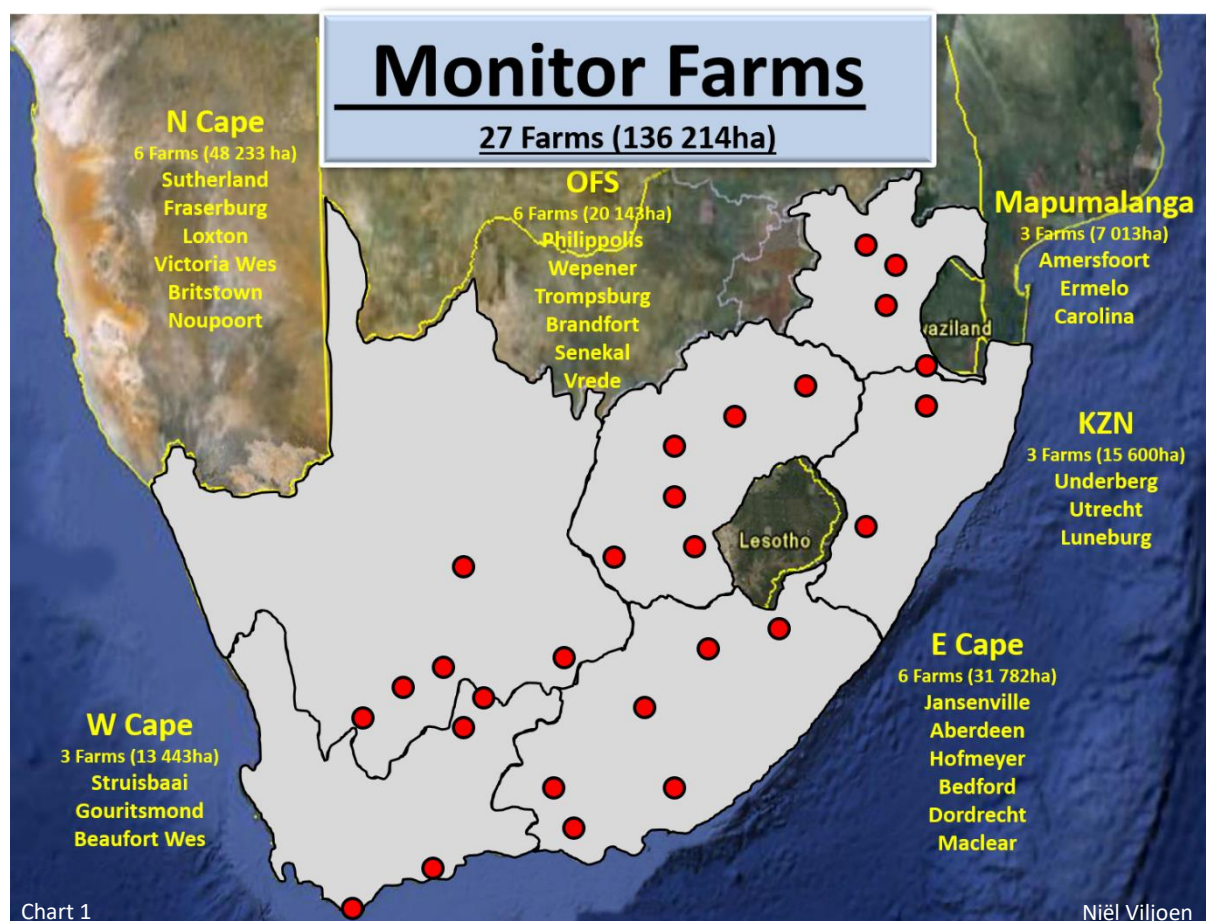
Monitor farms were initiated by the National Woolgrowers' Association of South Africa (NWGA) in 2008 to create a sustainable platform where continuous impacts on livestock in different production environments could be measured, monitored and new ideas be developed and implemented towards securing a viable and sustainable livestock industry.

Monitor farms were established and are also used as a scientific research platform to:

- guide and inform the livestock industry,
- inform and update training programmes for farmers, farm workers and professional predation management specialists, and
- secure a good and healthy biodiversity.

This report will give feedback on the twenty-seven monitor farms distributed throughout six of the provinces, covering a total of 136 214 hectares.

On the map below, locations of the different monitor farms are indicated.



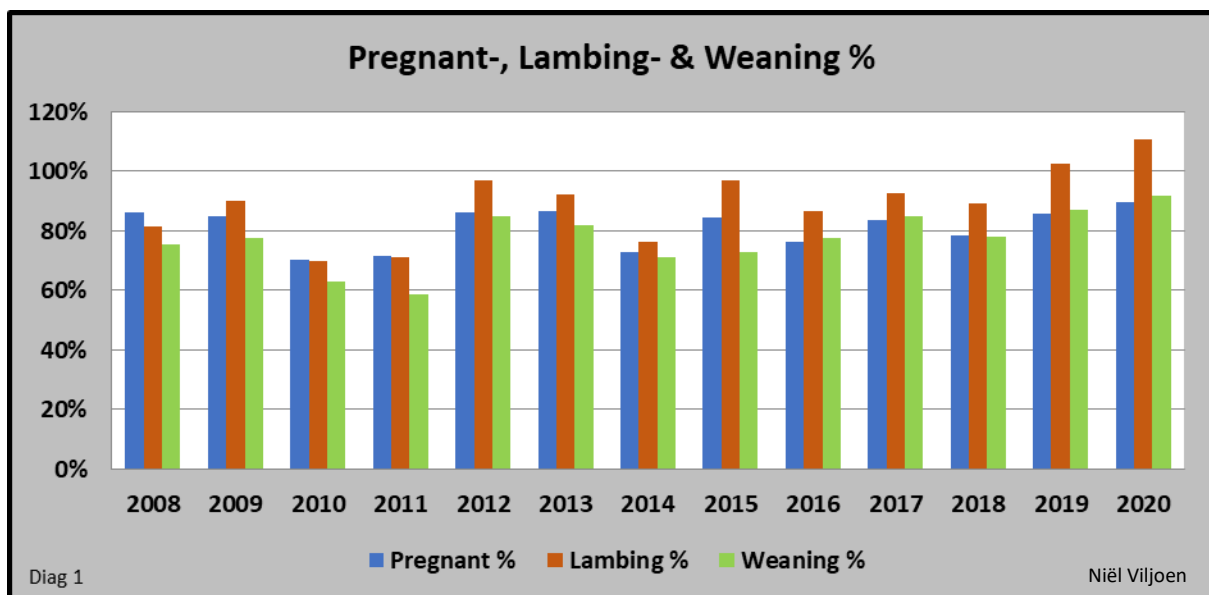
To indicate the value of a monitor farm in respect of research, information and training, an example was selected and the challenges, findings and goals that were recorded on this farm are herewith discussed.

The urge to set boundaries (be it human boundaries or animal territories), is something that has evolved for as long as we can recall and will continue for decades to come. This urge is an absolute necessity to secure the survival of a specific species. An imbalance between different species will lead to a definite conflict situation, as is the case with the human population that has skyrocketed over the past number of decades. Human-wildlife conflict is inevitable, and food security will always be important.

Agriculture is one of the most important industries to balance this scale. If balanced, biodiversity is secured and if biodiversity is secured, life on this planet will be protected.

One of the biggest issues facing every livestock farmer includes livestock losses caused by predators. These losses must be kept to an absolute minimum to ensure survival and financial security. For the livestock farmer this means that every ewe that has been scanned to be pregnant must raise and wean at least one lamb. This should be the goal for any livestock farmer.

In the diagram below (Diag. 1) the lambing percentages over the past thirteen years are shown as an example from one the monitor farms.

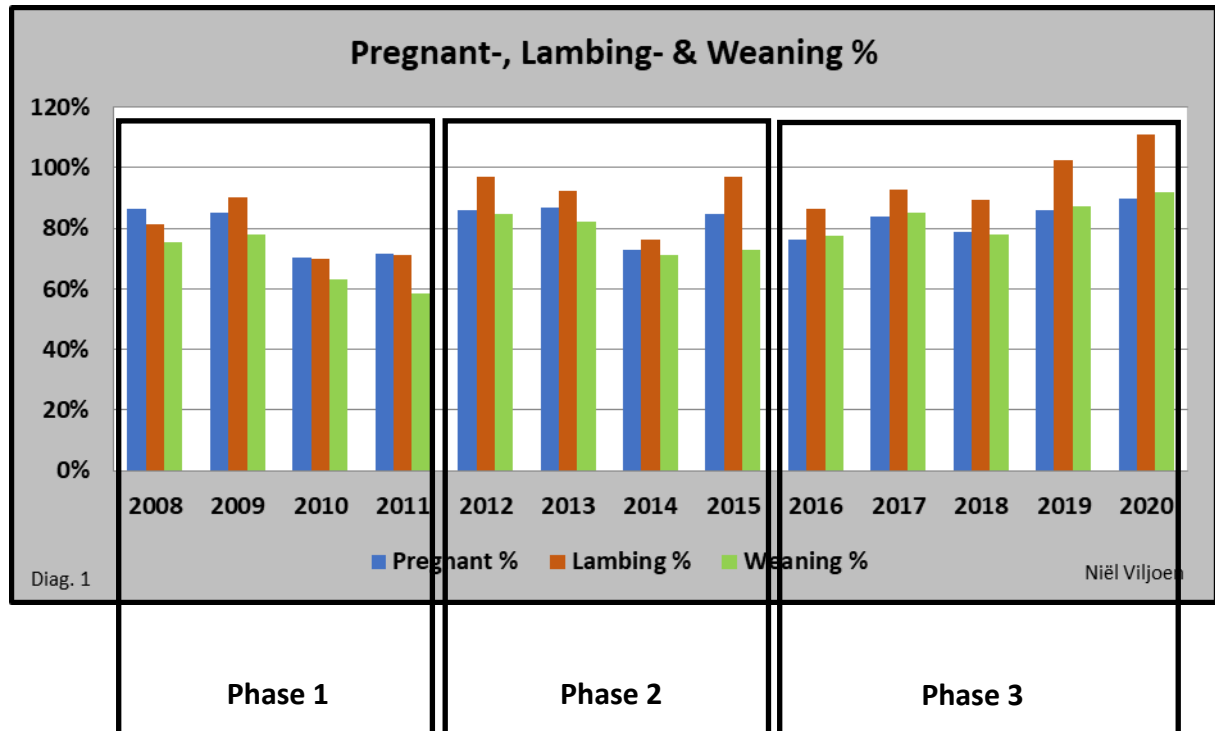


- Blue = percentage of ewes from flock that were scanned pregnant.
- Brown = percentage lambs born. (if higher than blue – twins, triplets)
- Green = percentage of lambs weaned.

As explained, the improvement of the green bar from the diagram above (Diag. 1) should be the goal for any livestock farmer. More lambs weaned than pregnant ewes will guarantee very positive financial benefits. Initially in 2008 the weaning percentage of this farm was 75.3% and has improved to a weaning percentage of 91.7% in 2020. Thus, not yet the desired outcome, but certainly good progress coming from years of experimenting and gaining experience.

How did we go about in achieving this result? It remains a learning experience, with a lot of effort from both farmer and farmworkers, spending hours of learning and

experimenting with different livestock management strategies, grazing systems, and predator management approaches. Three different phases of integrated management systems were implemented over the past thirteen years. The same diagram as above (Diag. 1) is used to indicate these different stages.



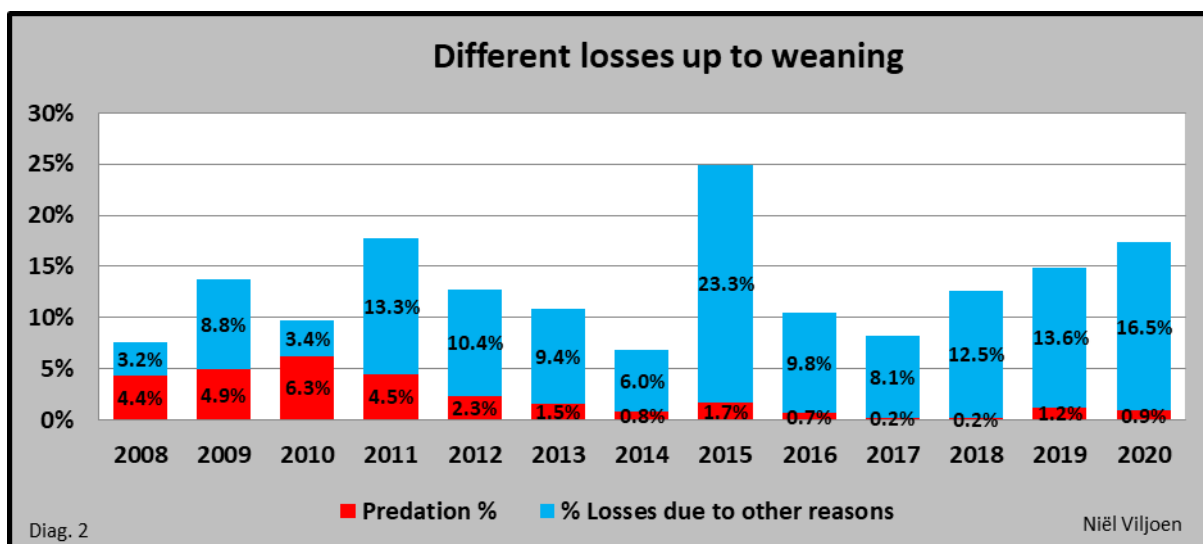
Phase 1: The introduction phase, where everything needs to be explored and understood first before any management plans could be considered. Serious losses were experienced due to predation. The initial strategy was to manage livestock losses through lethal control of predators. Call-and-shoot was the main method implemented during this phase, but the figure told us in 2011 that this approach was not working, and the time had come for drastic adjustments.

Phase 2: This phase was a roller-coaster, with some highs and some lows. Attention moved away from predators and it was decided to concentrate more on livestock management strategies. A huge contribution and trust from the farmers side came when it was proposed that the best option would be to isolate some of the livestock, especially ewes, during the lambing season, with an electric fence. Construction took almost two years and during this phase predators still had the upper hand. Even after completion of some of the electric fences, predators just moved to where there was no protection yet.

Phase 3: It was during this phase where things started to improve significantly. Spending a lot of time on livestock management, it was decided to shift the focus to predator management. Predator numbers increased dramatically, and they were seen roaming around even during daytime. The decision was made that the control method used during

the first phase would be reintroduced in phase 3 and predators that were identified in proximity of livestock were removed. During 2016 the breakthrough came for the first time in nine years of monitoring, when the weaning percentage improved to above the conception rate of the ewes. From 2016 a stable positive increase in the weaning percentage of lambs on this farm was recorded, indicating that something was working. Up to date this strategy, focusing on livestock management as well as predator management, is still reaping positive results. With this continued annual improvement, the focus could now be shifted to other management aspects, like further improvement in livestock management, endeavouring to furthermore improve livestock performance (i.e., conception rate), etc.

In the diagram below (Diag. 2) the impact of the different approaches in the previous three phases can be seen clearly. The red bar indicates the percentage losses due to predators, while the blue bar represents any other losses (weather, disease, etc.).



The past five years were remarkable where losses due to predation had never exceeded 1.7%. An extraordinary achievement and surely a figure that should be acceptable for any livestock farmer.

To summarize, the achievements over the past thirteen years on this monitor farm were truly an unforgettable experience. All efforts were based on trust and total devotion by all the different stakeholders involved to accomplish these magnificent results. With the necessary training, assistance and support, dreams can be turned into realities that will positively impact on the livestock industry and the economy of the country.

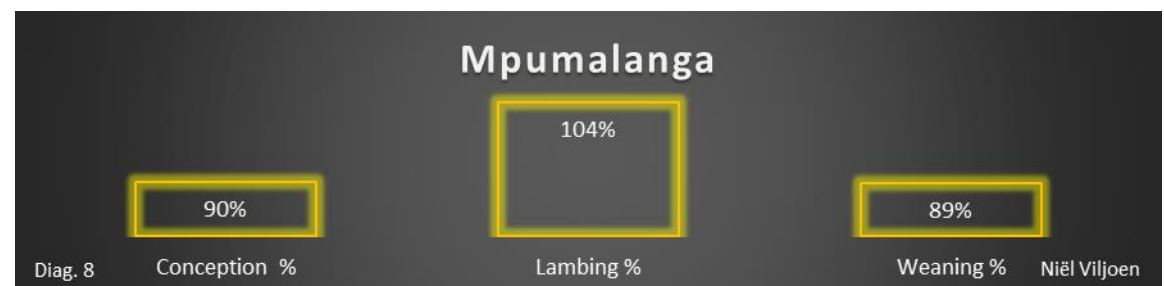
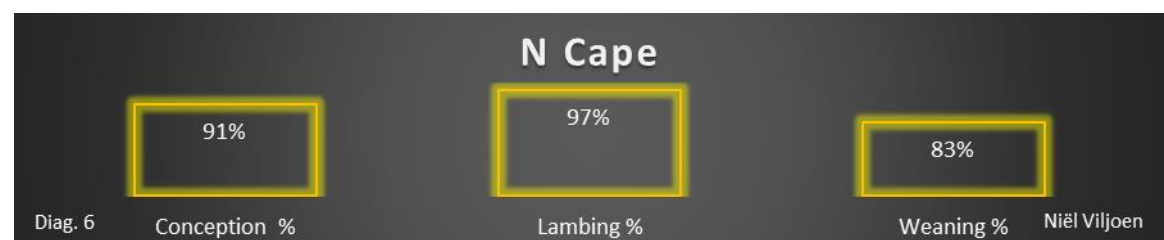
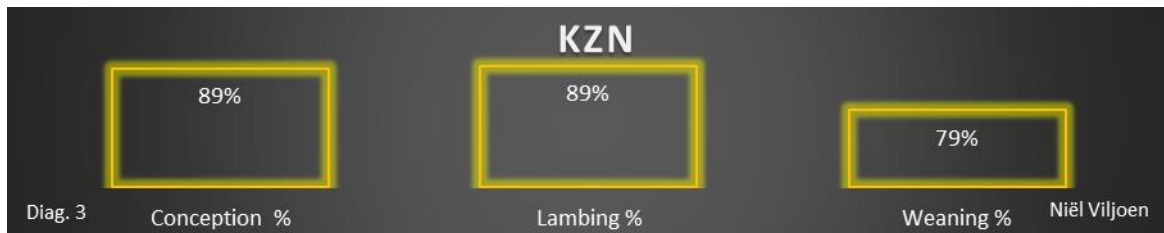
Provincial results

To better understand the results that have been achieved in the different provinces, the provinces will not be discussed individually but a comparison by means of different graphs will be used to explain the results.

The following graphs will be used to indicate program outcomes:

- Pregnancy/conception, lambing and weaning results;
- Reasons for losses up to weaning;
- Predation impacts on livestock pre- and post weaning;
- Impact of management strategies on livestock;
- Impact of management strategies on predators; and
- Financial implications.

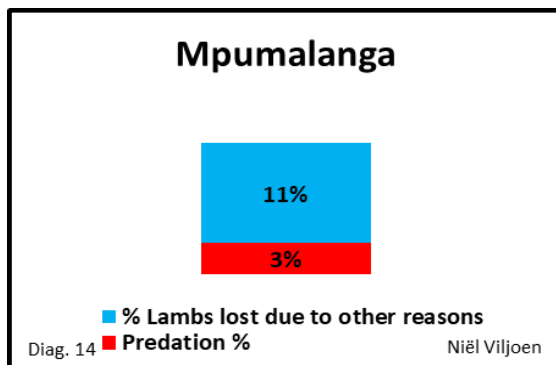
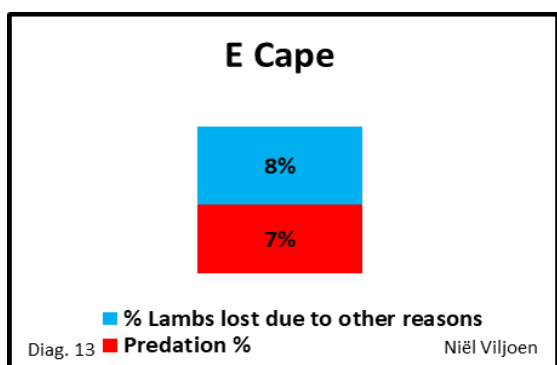
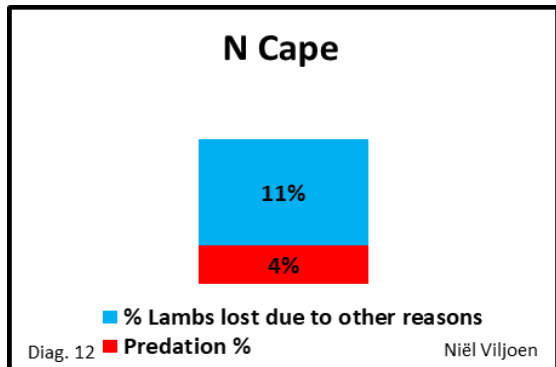
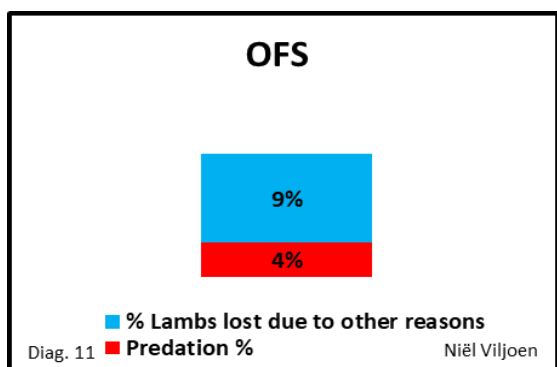
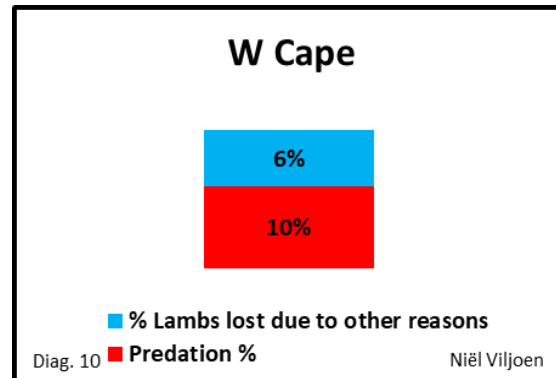
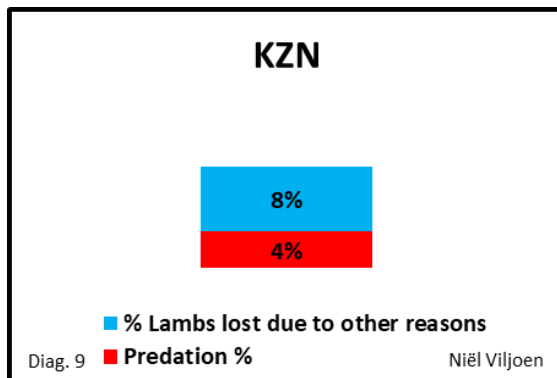
Pregnancy, lambing and weaning results.



Due to the different climatic and environmental conditions, it would be unfair to compare provinces with each other. It is however interesting to note the differences.

Best conception percentage was Western Cape (Diag. 4), best lambing- and weaning percentage Mpumalanga (Diag. 8).

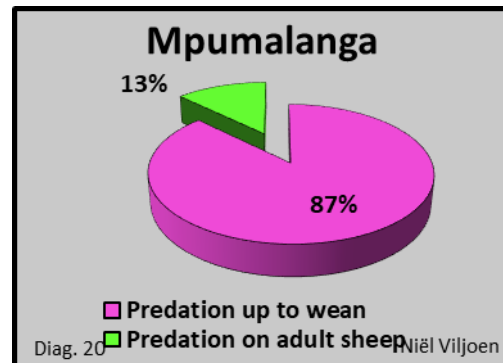
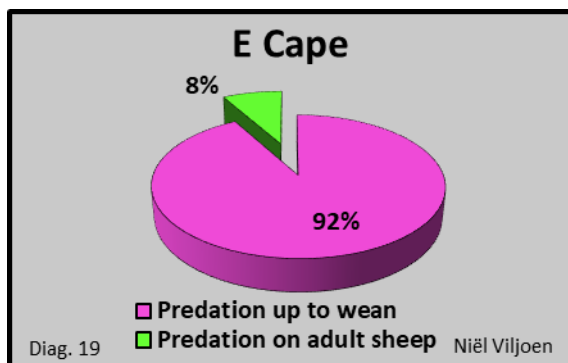
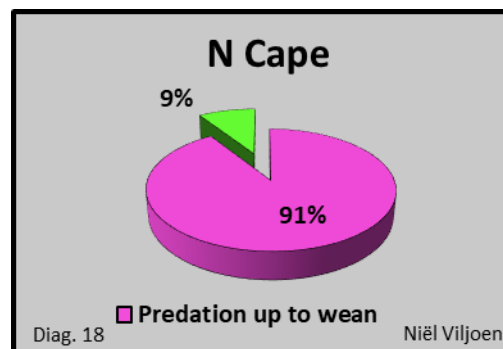
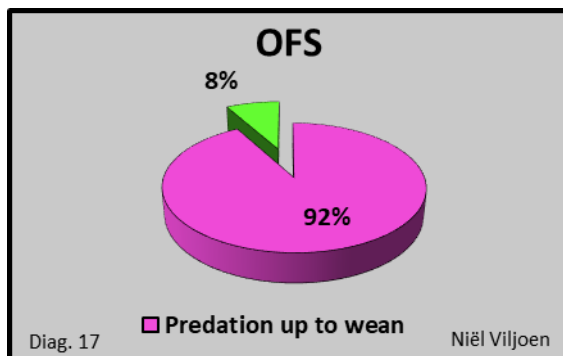
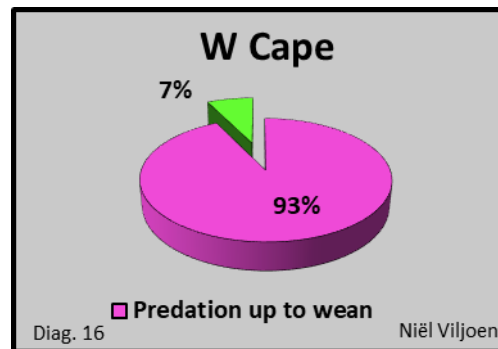
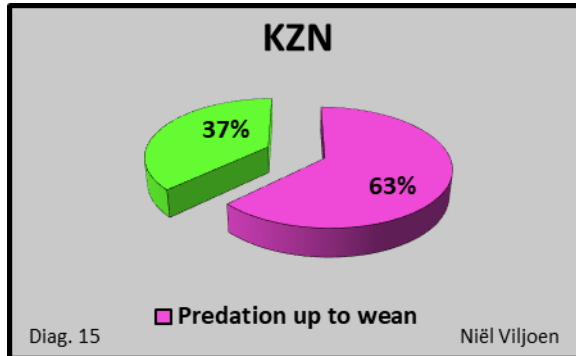
Reasons for losses up to weaning (average for past 13 years)



The graphs above show the average percentage of losses per province over the past thirteen years. The red bar indicates losses due to predators, mainly due to black backed jackal and caracal, while the blue bar indicates other losses (i.e., extreme weather conditions, disease, stock theft, etc.).

The Western Cape (Diag. 10) was struggling the most with predators and Mpumalanga (Diag. 14) the least on average over the thirteen-year period.

Predation impacts on livestock pre- and post-weaning.



These are the results of the two most important predators causing losses on monitor farms, namely the black backed jackal and caracal.

The two most northern provinces of South Africa where the monitor farms are situated, namely KZN (Diag. 15) and Mpumalanga (Diag. 20), have many more losses due to predation on their adult sheep than the other provinces. A possible reason could be the bigger populations of jackal. This phenomenon results in them hunting in numbers (packs) and therefore the size of the prey base is not that much of a factor. Another reason is that there are not a lot of man-made obstacles like jackal proof- and electric fences, which don't interfere with their hunting strategies and overall movement.

Impact of management strategies on livestock losses (2008 to 2020)

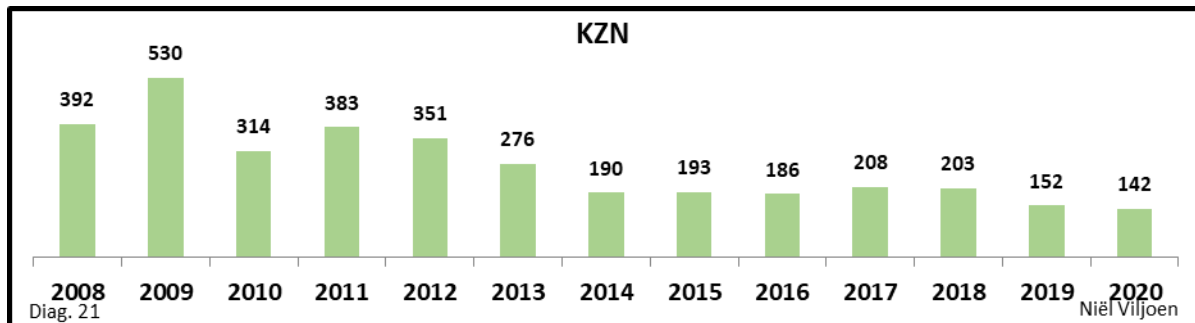
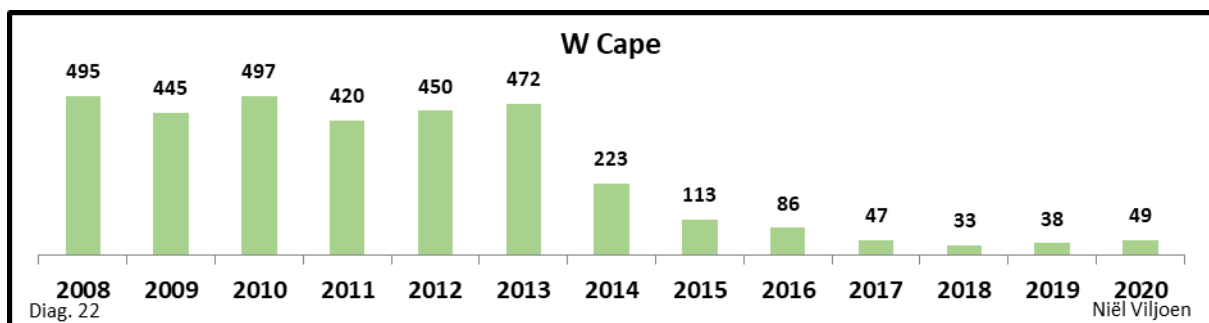
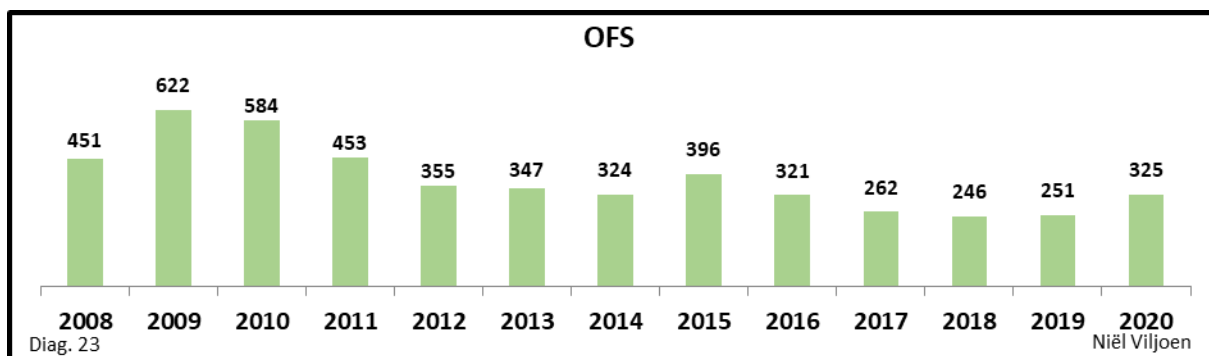


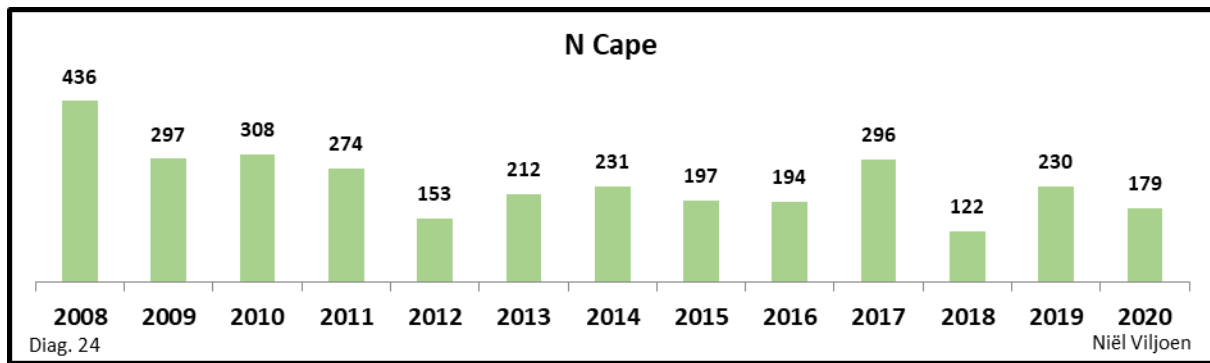
Diagram 21 shows the actual number of livestock losses due to predators for the different years from 2008 up to 2020 in KZN. In 2008 the number of losses recorded were 392 animals and in 2020 the number decreased to 142 animals. This is an improvement of 250 animals less caught by predators, or 63,8% overall.



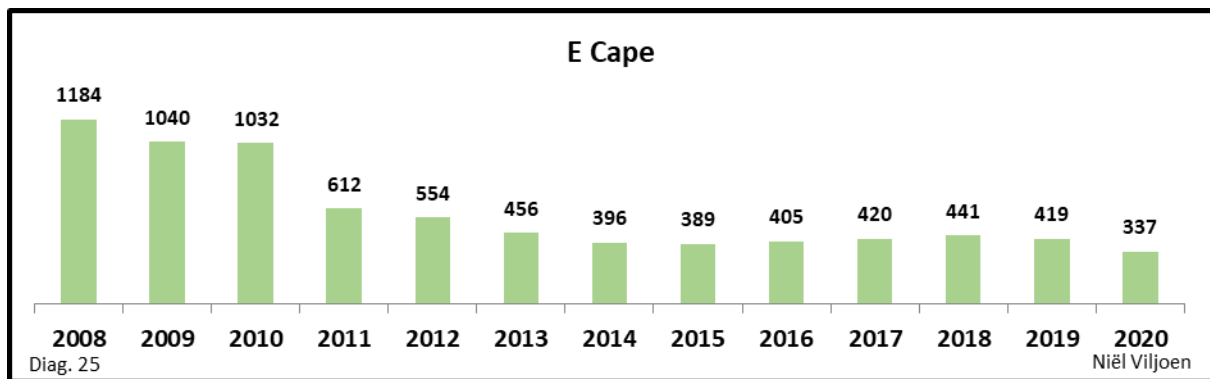
In 2008 the losses recorded in W Cape were 495 animals and in 2020 this decreased to 49 animals. This is an improvement of 446 animals less caught by predators, or 90.1% overall.



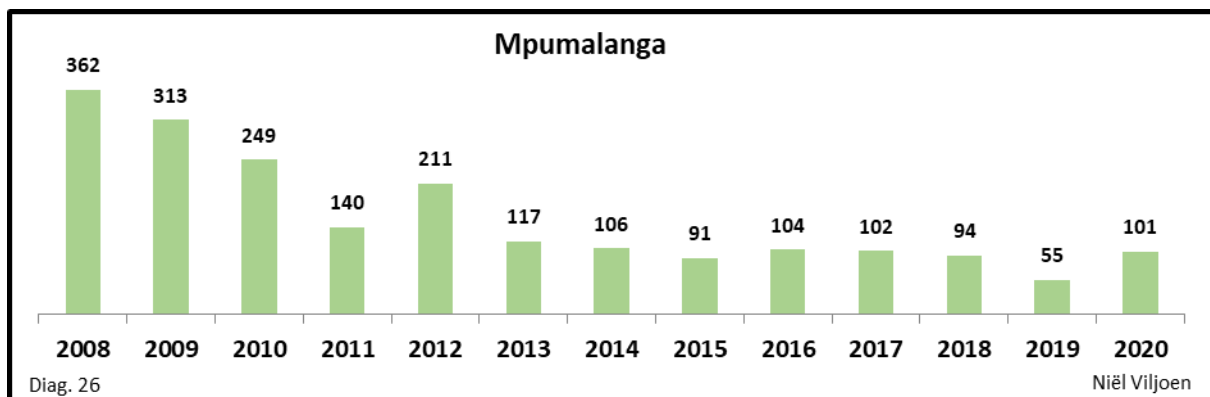
In 2008 the losses recorded in OFS were 451 animals and in 2020 the number decreased to 325 animals. This represents an improvement of 126 animals less caught by predators or 27.9% overall.



In 2008 the number of losses recorded in N Cape were 436 animals and in 2020 the number decreased to 179 animals. This is an improvement of 257 animals less caught by predators or 58.9% overall.

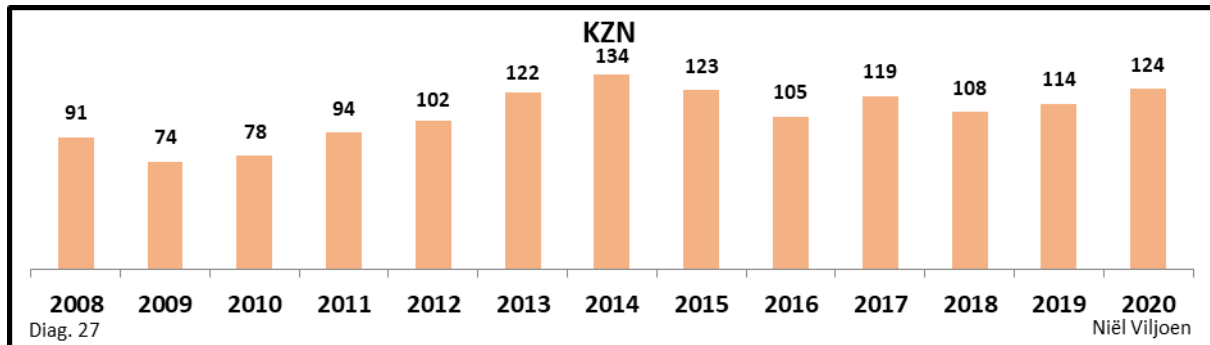


In 2008 the number of losses recorded were 1184 animals and in 2020 the number did decrease to 337 animals. This is an improvement of 847 animals less caught by predators or 71.5% overall.

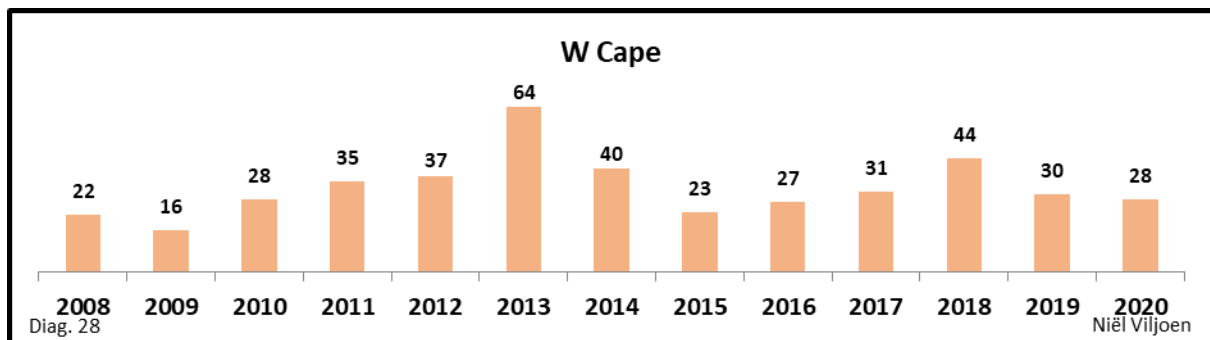


In 2008 the number of losses recorded were 362 animals and in 2020 that number decreased to 101 animals. This is an improvement of 261 animals less caught by predators or 72% overall.

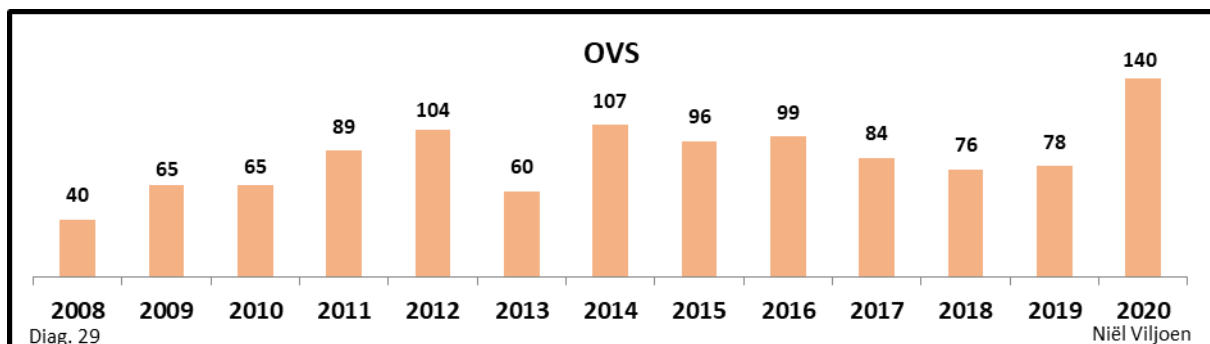
Impact of management strategies on predators (2008 to 2020)



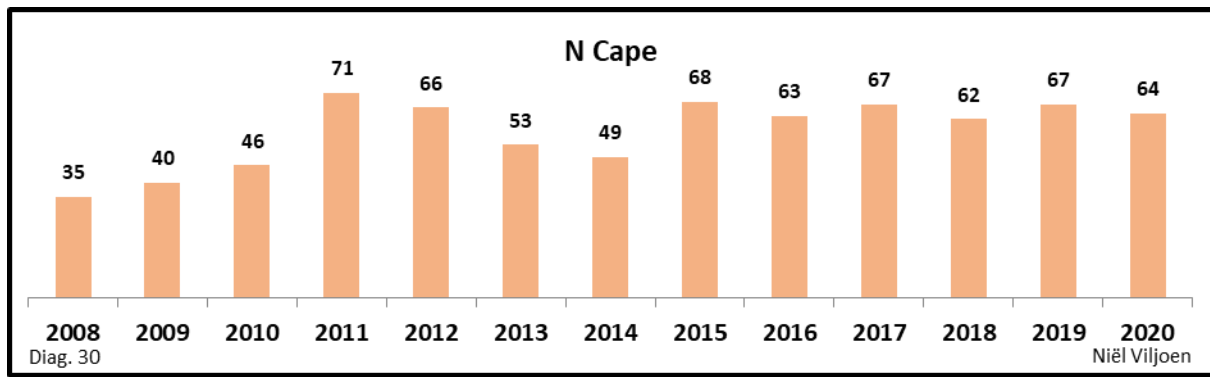
In 2008 a total of 91 unwanted predators were eliminated. In 2020 the number increased to 124 predators. This represents an increase of 33 problem predators or 36.3% removed.



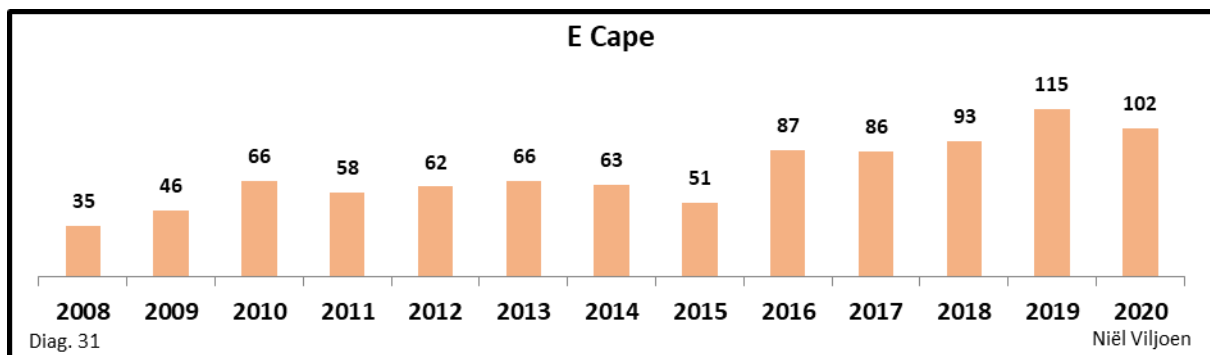
In 2008 a total of 22 unwanted predators were eliminated. In 2020 the number increased to 28 predators. This represents an increase of 6 problem predators or 27.3% removed.



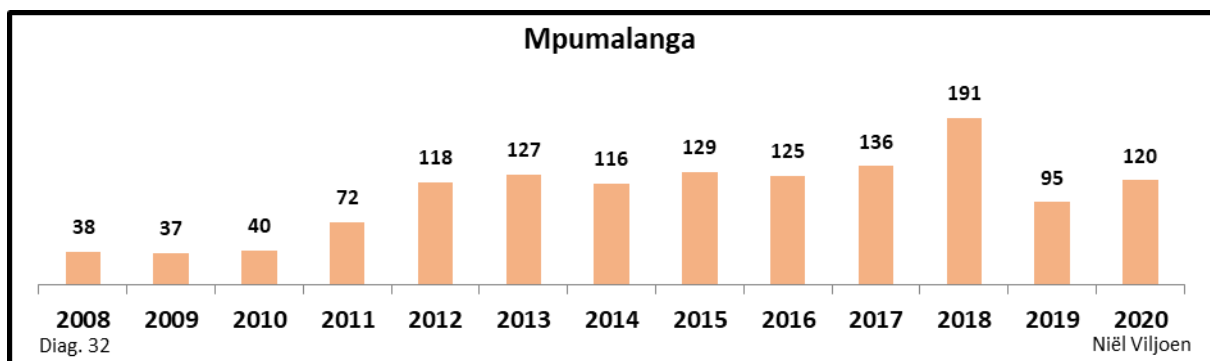
In 2008 a total of 40 unwanted predators were eliminated. In 2020 the number increased to 140 predators. This represents an increase of 100 problem predators or 250% removed.



In 2008 a total of 35 unwanted predators were eliminated. In 2020 the number increased to 64 predators. This represents an increase of 29 problem predators or 82.9% removed.

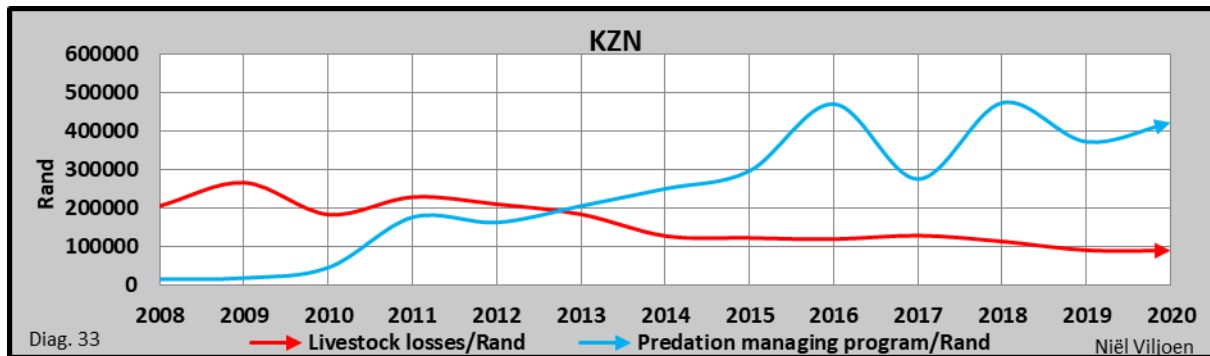


In 2008 a total of 35 unwanted predators were eliminated. In 2020 the number increased to 102 predators. This represents an increase of 67 problem predators or 191.4% removed.

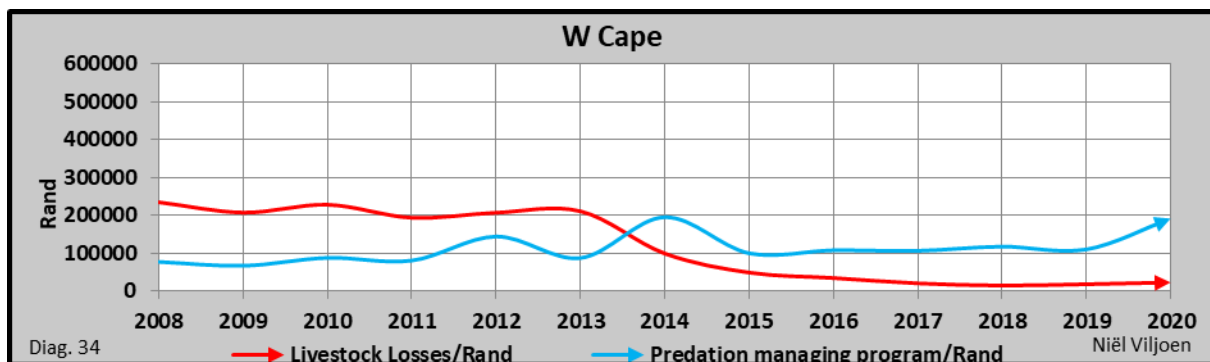


In 2008 a total of 38 unwanted predators were eliminated. In 2020 the number increased to 120 predators. This represents an increase of 82 predators or 215.8% removed.

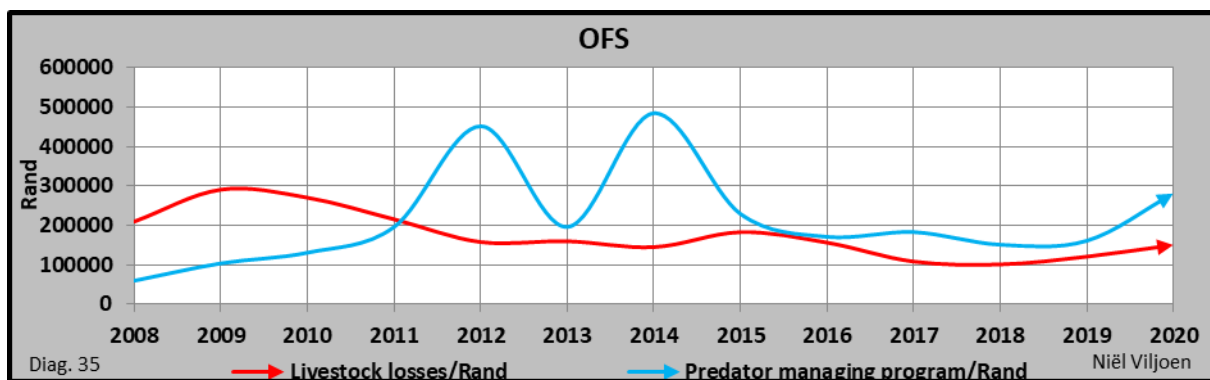
Financial implications



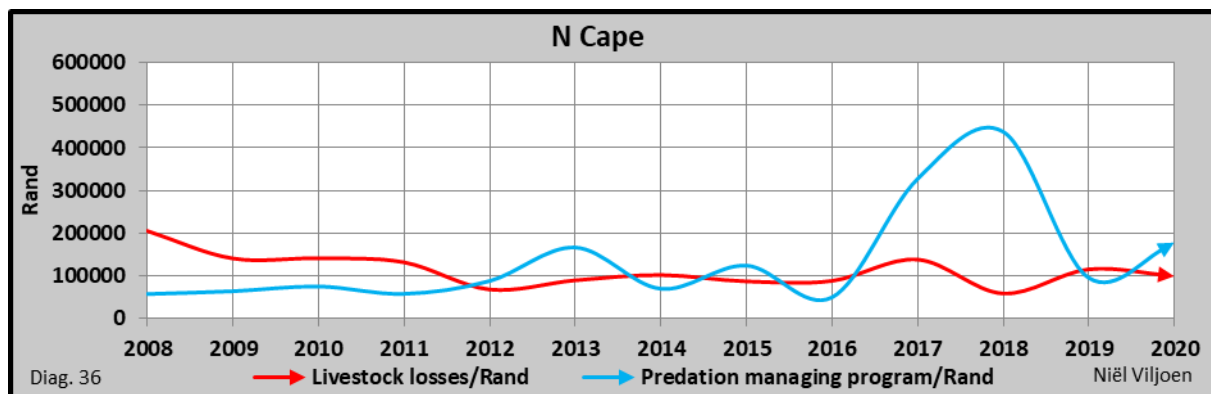
In the figure above, (Diag. 33) there are two distinctive spikes in the financial input during 2016 and 2018 in KZN. This represents two years of farmers investing in costly electric- and jackal proof fencing. Electric fencing aimed to protect specific areas or parts of the farm from predators, while jackal proof fencing was erected generally to secure lambing areas.



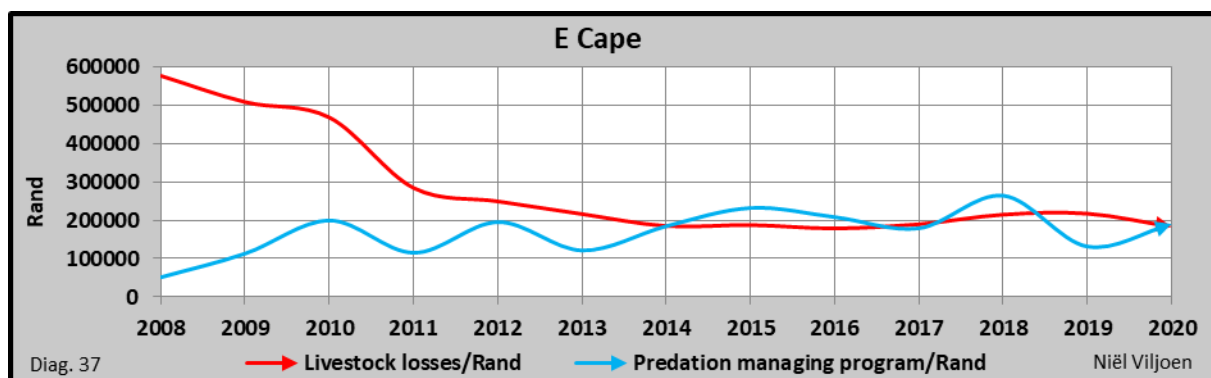
The figure above, (Diag. 34) indicates an increase in investment in the predator management program between 2014 and 2020 in the Western Cape. In 2014 the investment was made in a non-lethal control method, namely the purchasing of alpaca. The 2020 investment was on another non-lethal control method, namely cellphone collars. Another monitor farm implemented lethal control by means of areal hunts by means of a helicopter.



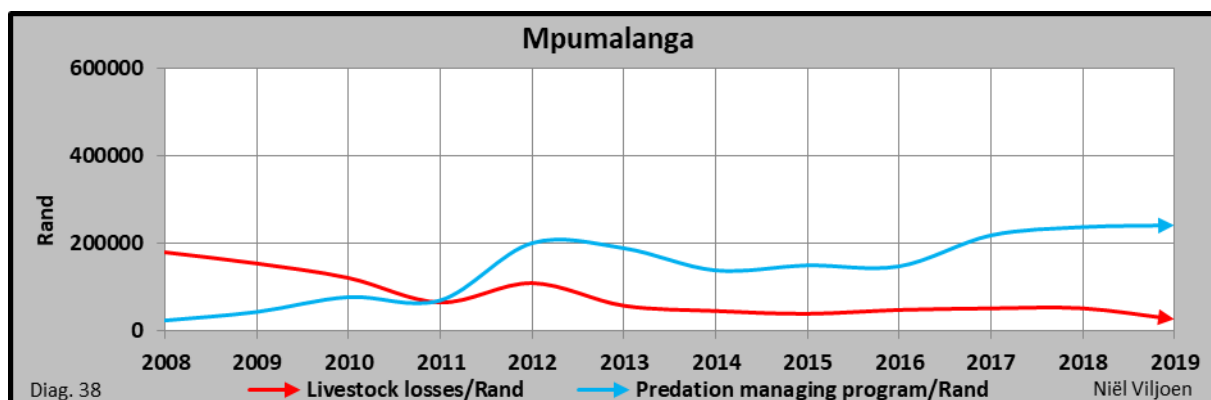
The figure above, (Diag. 35) two distinctive increases in financial investment during 2012 and 2014 in the Orange Free state. Both were investments in non-lethal control methods, namely the construction of electric- and jackal proof fencing.



In the figure above, (Diag. 36) there was a huge positive spike in during 2017 and 2018 on Northern Cape monitor farms. This expenditure was mainly on the construction of new electric- and jackal proof fences.



The figure above, (Diag. 37) indicates an increase in expenditure during 2018 in the Eastern Cape. This was due to a combination of lethal as well as non-lethal control methods. Lethal was for a pack of hunting dogs and a trapper. Non-lethal methods were involved cellphone collars and electric fencing.



The figure above, (Diag. 38) indicates a gradual increase in the financial investment in predation management from 2017 to 2020 in Mpumalanga. Investment in non-lethal control methods was the construction of safer lambing areas, as well as investment in cell phone collars. The investment in lethal control methods was spent on organized hunting with dogs.

National Results

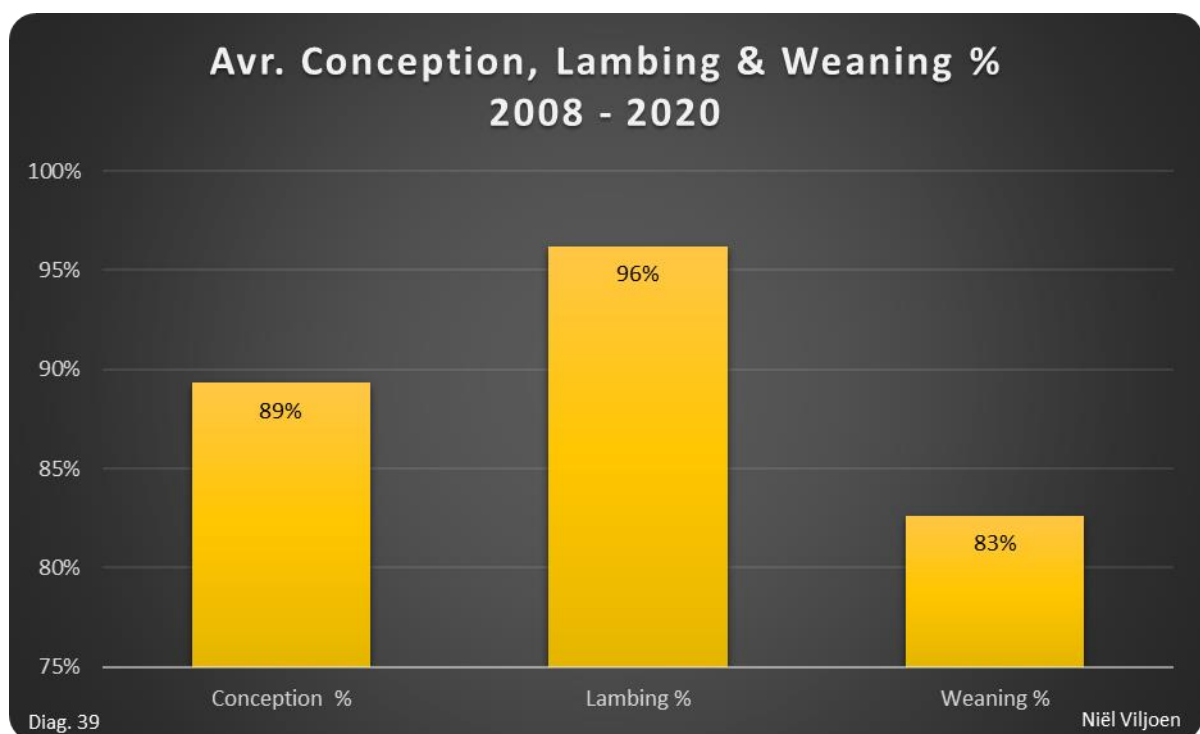
Similar statistics will be used for the national results to those used for provinces.

The following graphs will be used to indicate national programme outcomes:

- Pregnancy/conception, lambing and weaning results;
- Reasons for losses up to weaning;
- Predation impacts on livestock pre- and post weaning;
- Impact of management strategies on livestock;
- Impact of management strategies on predators; and
- Financial implications.

Please note that these graphs will reflect recorded statistics of the thirteen-year period from 2008 to 2020.

Pregnancy/conception, lambing and weaning results.



The graph above, (Diag. 39) shows the average national results over the thirteen-year period for the twenty-seven monitor farms, spread over six provinces throughout South Africa.

The average conception rate of 89% is good and acceptable, especially if we take into consideration that high percentages of conception is due to artificial insemination and laparoscopy. Most farmers however still implement natural mating practices.

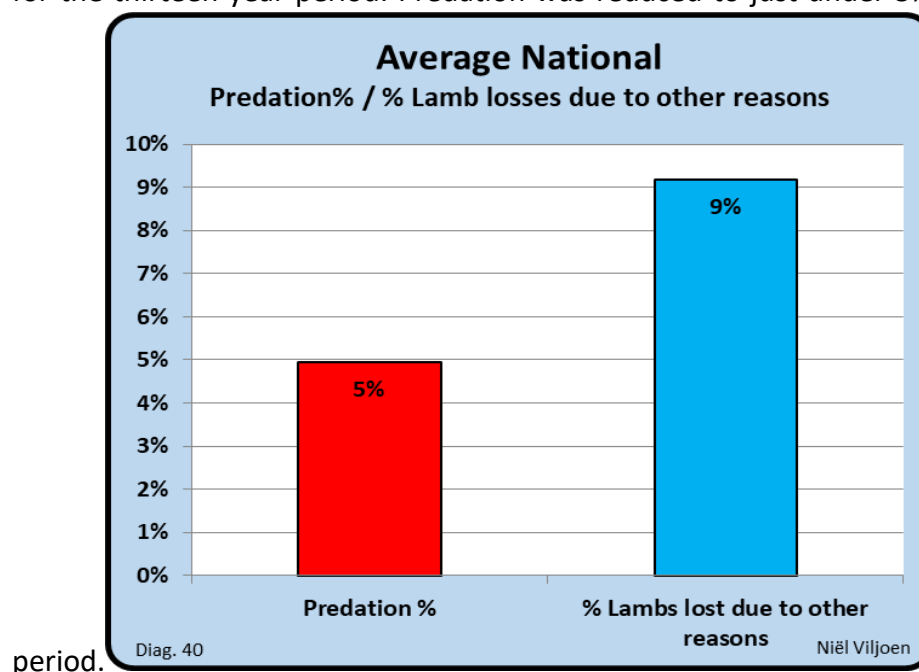
The average lambing percentage for the twenty-seven farms over a thirteen-year period is also an acceptable figure (96%). The reason why the lambing percentage is higher than the conception rate is due to the number of twins and triplets that have been born.

The weaning percentage on average (83%) is most probably the biggest concern because it is six percent below the conception rate of 89%. However, it is important to remember that the weaning percentages do have a lot of different factors contributing towards the final weaning percentage. Predators alone do not only impact on weaning percentages. Many other factors like animal diseases, environmental conditions (colds, fires, droughts, floods) and stock theft also impacts on production performance statistics.

Reasons for losses up to weaning.

One of the biggest challenges for any livestock farmer is the goal to improve the survival rate of lambs to equal that of the number of fetuses scanned in ewes before birth.

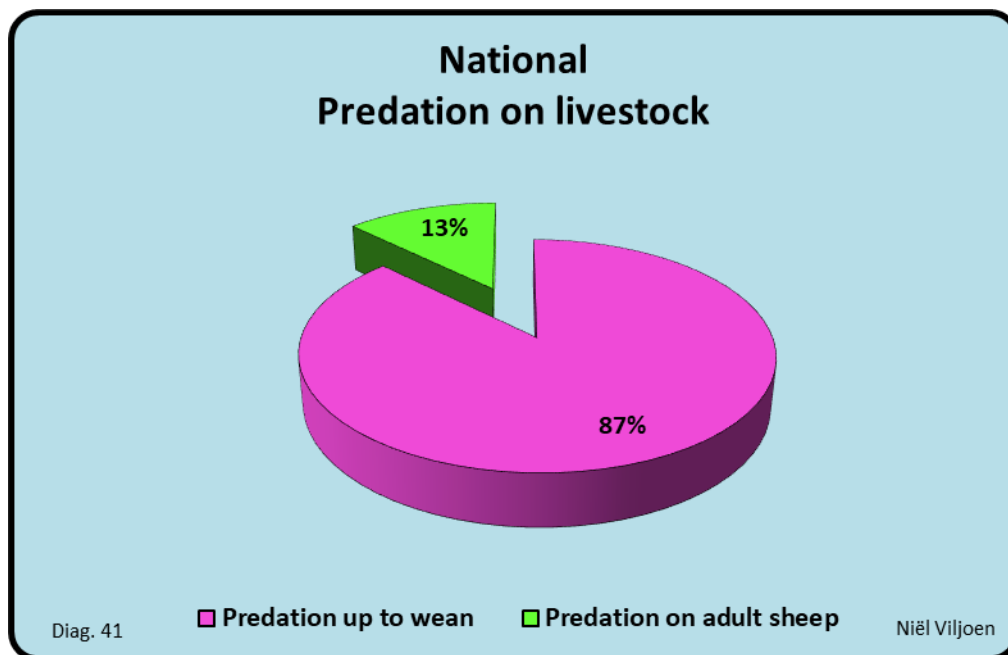
The graph below, (Diag. 40) illustrates the average losses due to predation vs other causes for the thirteen-year period. Predation was reduced to just under 5% on average over this



Predation impacts on livestock pre- and post-weaning.

The graph below, (Diag. 41) gives a clear indication on the type of prey (lambs vs adult sheep) that predators prefer.

Predators in question are mainly the black backed jackal and caracal. 87% of all losses due to predation are lambs (up to weaning). Predation levels on the adult sheep is only about 13%.

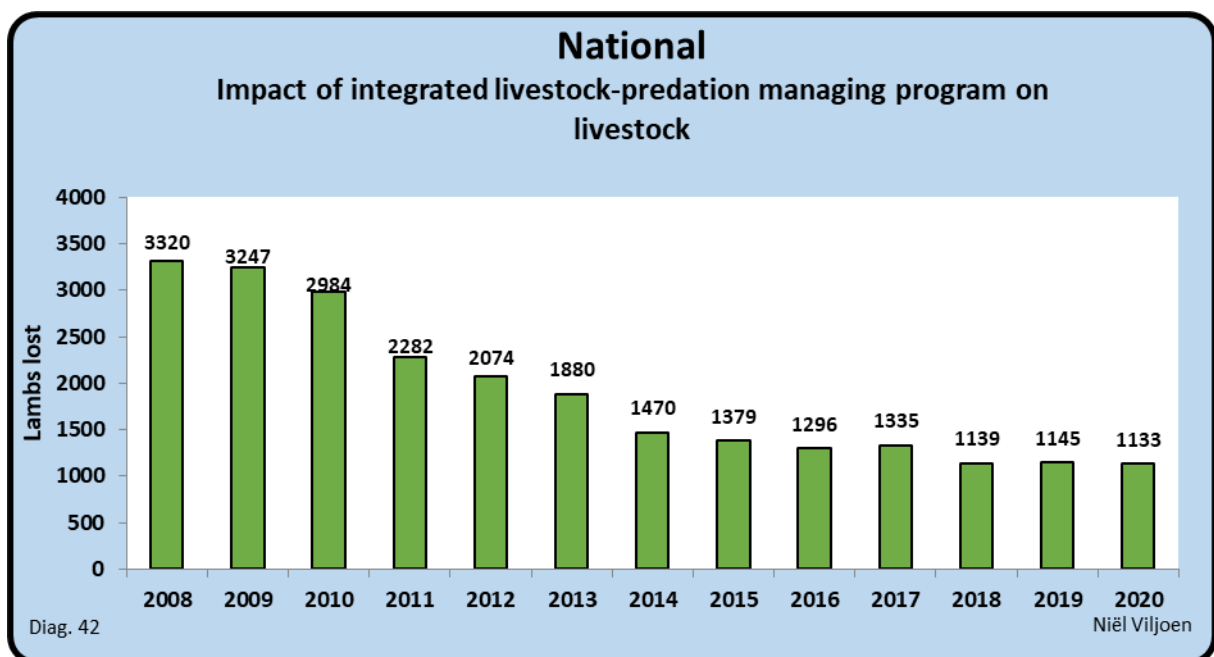


Impact of predation management on livestock

In the graph below, (Diag. 42) the results of the predation management program on livestock losses on a national base are clearly visible.

A total of 3 320 lambs were lost due to predators in 2008. With good predation management strategies, the number has gradually declined to 1 133 lambs lost in 2020.

This represents a decrease in losses of 2 187 animals, or an improvement of 65.9% in our overall national predation management program on the twenty-seven monitor farms.

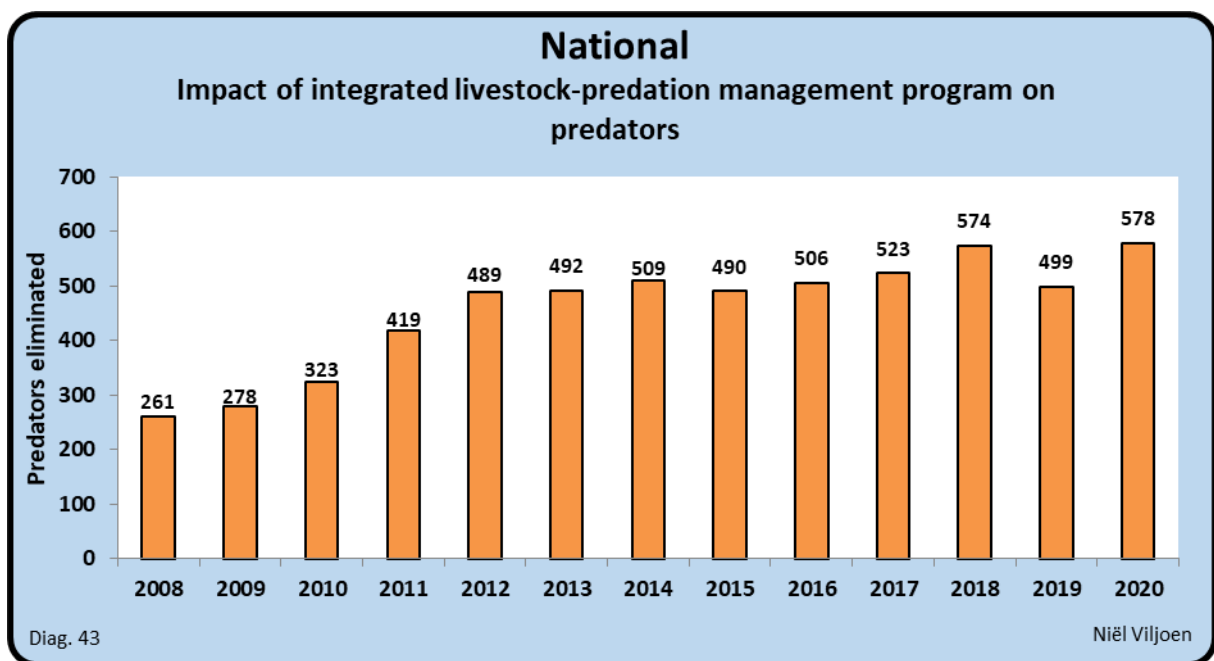


Impact of livestock predation management on predators

The impressive results that the predator management program had on livestock has been a good improvement to prevent livestock losses.

The diagram below, (Diag. 43) indicates the impact of the program on predators. In achieving the results to prevent livestock losses and to protect livestock from unwanted predators, the number of unwanted predators eliminated annually remains relatively high.

The biggest increases were during 2010, 2011 and 2012, after which the average of damage causing predators eliminated, remained around 520 predators annually.



According to the graph above, (Diag. 43) a total of 261 damage-causing predators were eliminated on the monitor farms during 2008.

The number increased to 578 predators in 2020, resulting in an increase of 317 more predators (122%). These predators included both black backed jackal and caracal).

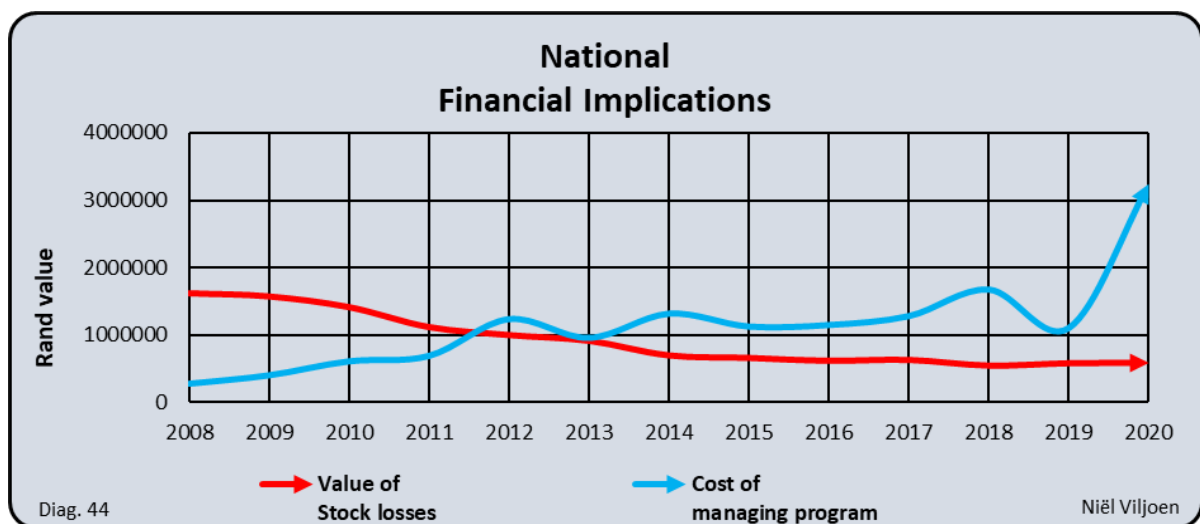
Financial implications

Diagram 44 below indicates the cost of the livestock-predation management programme over a thirteen-year period.

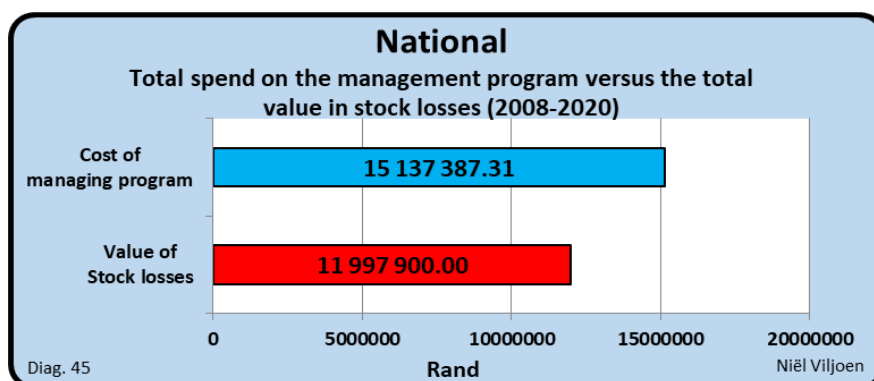
The annual decrease in the value of livestock losses over thirteen years is clearly visible. Achieving these decreases in livestock losses also comes with an increase in cost. Different management strategies were responsible for these increases in managing the programme, mainly because of the construction of electric- and jackal proof fences.

An increase in expenses to manage the threat of predation during 2018 and 2020 is shown in diagram 44 below, with no immediate visible effects seen on the value regarding stock losses.

This should, however, be seen as a longer-term investment (i.e., fencing, collars, etc.) that will result in better returns for many years to follow. Also in diagram 45, the total cost of the management program must be seen as an investment, with returns and positive results to follow in years to come.



The diagram below, (Diag. 45) indicates the total cost of the livestock management programme over thirteen years.

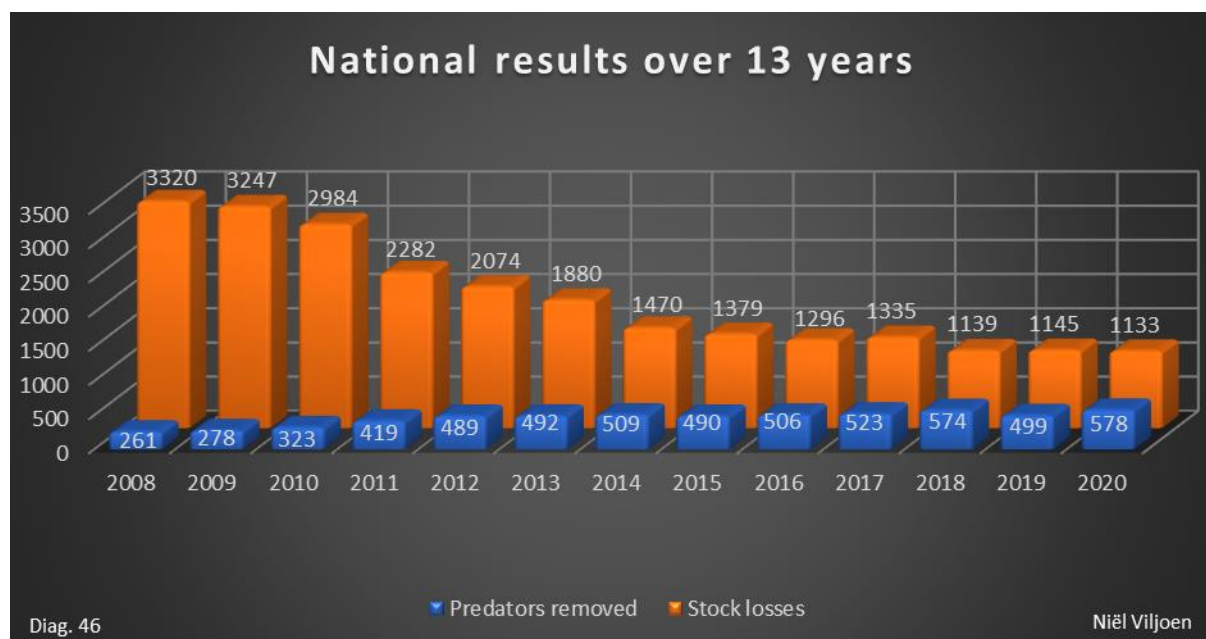


Summary

Summarizing this report, and to finalize the extraordinary results that have been accomplished from the integrated livestock predation management programme, see diagram 46 below.

Diagram 46 tells the story of a thirteen-year journey with these monitor farms. The impact that management has had on both livestock and predators is clearly visible. In 2008 there were 3 320 livestock losses due to predators, a substantial loss for farmers and the livestock industries, both meat and wool.

Over the thirteen-year period these losses were gradually reduced to 1 133 animals by 2020, a remarkable improvement of 65.9%.



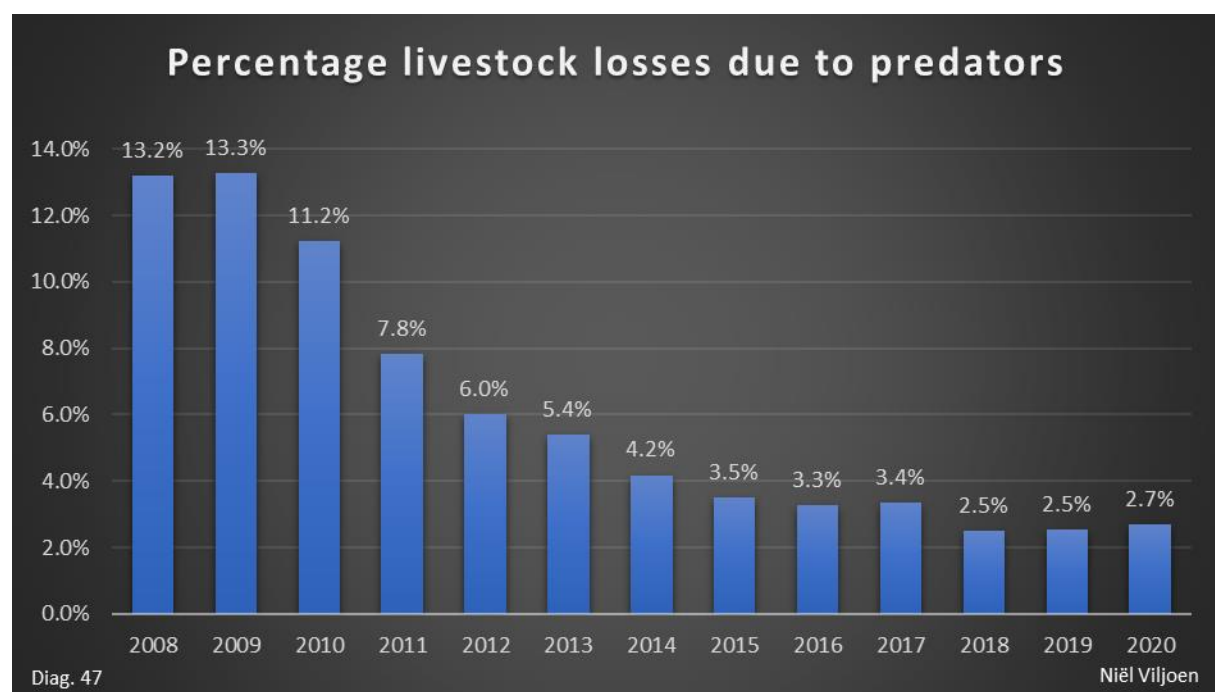
At the start of the programme in 2008 there was a total elimination of 261 damage causing predators on these farms, which increased to 578 in 2020. This represents 317 more predators removed in 2020 compared to 2008, an increase of 121.5%.

It is important to emphasize that the programme involves not only the management of predators, but also the removal of unwanted predators where necessary. This would normally be predators that cause losses on a continuous basis. Examples are both the black back jackal and caracal, that have learnt quickly that livestock kept in smaller enclosures during the night are easy prey.

Another example is where the black backed jackal gets used to the existence of Anatolian guard dogs and they simply outnumber and outsmart these dogs during daytime, causing substantial losses amongst the livestock.

Predation management is therefore not about eliminating all predators (generally referred to as predator control), but rather predation management. This involves utilizing all available methods, lethal as well as non-lethal, implying to firstly manage livestock and then control and manage predators. The objective is to assist farmers to minimize their losses due to predation, increase weaning percentages and consequently financial benefits which then contribute to a financially viable farming enterprise.

Diagram 47 below indicates the very positive impact of the livestock and predation management program on livestock losses caused by predators. The reduction of losses due to predation is a remarkable achievement. On the twenty-seven monitor farms, average livestock losses were recorded at 13.2% in 2008. With good management losses due to predation were to only 2.7% in 2020. Although maybe not perfect, this is surely a more acceptable and affordable figure for any livestock farmer.



The results of what has been achieved and learnt, and what would be good indicators for future use and management recommendations, is summarized in the table below.

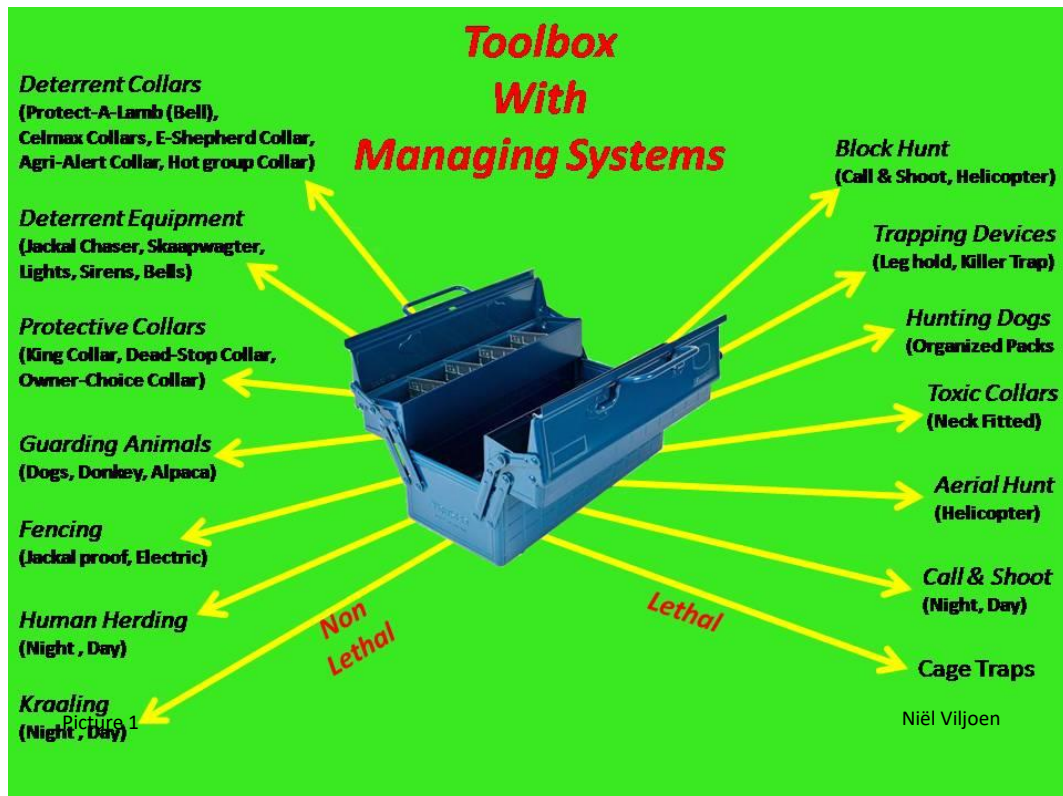
| Livestock Management | Predator management |
|--|--|
| Training in Livestock management | Training in predation management |
| Time of year for lambing season | Knowledge of predator behavior and biology |
| Selected area on farm for lambing (topography) | Knowledge of predator species present in area |
| Size of flock during lambing | Knowledge of predator preferences & habitats |
| Size of lambing area | Knowledge of predator killing & eating patterns |
| Daily livestock inspection during lambing season | Understanding the toolbox with all the control methods |
| Isolation by means of jackal proof fencing | Method - Implement, manage, measure continuously |
| Isolation by means of electric fencing | Alternate predator management strategies |
| Thorough record keeping system | Preventive predation management |
| Continuous evaluation of management | Continuous evaluation of management |

The achievements in livestock- and predation management were accomplished by means of the three fundamental pillars directly responsible for this success story:

- Experimenting (with management strategies and control methods in the toolbox)
- Training
- Research

Experimenting:

The advantage that farmers have to the broad diversity of different management strategies, both lethal and non-lethal, could not be emphasized enough. Referred to as the toolbox of control methods (Picture 1), this provides any livestock farmer endless opportunities to test, experiment, combine, rotate, and evaluate the different methods to find what is best suited under given environmental conditions and management.



Over the thirteen-year period, the monitor farms experimented with various control methods. This was all necessary to find the best method/combination of methods and strategies with the best results.

The success and outcome of any control method is solely dependent on the management ability of the farmer. Just as important as matching the farmer with workable control methods, is to realize that today's success might become tomorrow's failure. Adaptability of predators is key to their survival. Farmers must adapt with their management strategies just as quickly (or even quicker) than predators in order to have success with predation management. Preventive predation management combined with alternating between different control methods which are well managed within one lambing season, is key in achieving a good weaning percentage.

Training:

The National Woolgrowers' Association under the auspices of PMSA is the only organization in South Africa that provides unremitting predation training to farmers and farmworkers, as well as predation management specialists throughout South Africa.



Picture 2

Niël Viljoen

The livestock industry suffers tremendous losses due to predators. The importance of trained and skilled farmers and farm workers is crucial not only to address this problem and to assist in protecting livestock, but also to protect and conserve the environment, ensuring a good and healthy biodiversity, as well as job creation and food security.



Picture 3

Niël Viljoen

Research

The consistent adaptability of predators, especially the black backed jackal, necessitates that farmers be informed and be on the front foot to also be able to adapt and manage their farming enterprises. Continued research will provide the technology so that farmers are able to alter their approaches to predation accordingly and still be able to understand and manage their livestock predation management programme in support of a sustainable and viable business.

The consistency and the availability of the monitor farms provide such a research platform, whereby farmers can experience firsthand information and advice from skilled specialists on new technology and management skills regarding predators, their adaptable behavior and how to incorporate new livestock managing skills, ensuring a sustainable environment.

Monitor farms also provide research opportunities and information to tertiary institutions throughout South Africa, and their participation, contribution and assistance is welcomed, with advice and guidance from well trained and professional specialists.

The success of the monitor farm-approach is proudly South African and has now also drawn international interest.

Acknowledgement

A sincere word of appreciation to PMSA and specifically the RPO and NWGA for their generous financial contribution towards this very important program.

Livestock and wildlife losses due to predation exceed R2 billion per annum.

Signed:

Niël Viljoen: Predation Specialist

Date: `