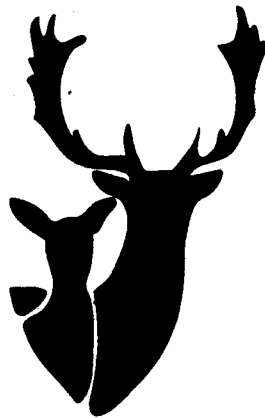


**TASMANIAN DEER ADVISORY
COMMITTEE INC.
FALLOW DEER PROJECT
(1993-1997)**

FINAL REPORT



By:

Brian P. Murphy
TDAC Project Officer

TASMANIAN DEER ADVISORY COMMITTEE INC.

FALLOW DEER PROJECT
(1993 - 1997)

FINAL REPORT

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FORWARD


The success of the Tasmanian Deer Advisory Committee Inc. (TDAC) Fallow Deer Project or as I knew it, the Tasmanian Quality Deer Management (QDM) Project is a credit to all participants and in particular to the efforts of Project Officer, Brian Murphy.

On becoming Minister for National Parks and Wildlife in early 1992, I was faced with total conflict and open hostility between landowners, deer hunters and officers of the Department. The proposal put forward by TDAC delegates in 1992 to employ a wildlife (game) biologist to develop a QDM program for Tasmania provided a solution I was happy to support. Although initially there was some difference of opinion and criticism of using the Game Management Trust Fund for this purpose, it was not long before most were prepared to give their support.

It was to Brian Murphy's credit that within a short period of his appointment he had managed to meet with the major stakeholders, earn their respect and generate overwhelming support for the project. Quality Management is a principle that has a wider application in all areas of wildlife, game and fish management. It provides an opportunity to resolve difficult management issues by bringing all groups together and using factual scientific information to develop management plans that provide positive outcomes for all stakeholders.

I was also encouraged that during the project the Tasmanian Farmers and Graziers Association made representation to extend the principles of the TDAC project to other wildlife in the State through the development and implementation of Property-based Game Management (PBGM). The establishment of the Game Management Unit within the Parks and Wildlife Service in 1996 to further the PBGM program was an important step along the road to Quality Management of all game and wildlife species in Tasmania. Also, a recent review into the management of Inland Fisheries in Tasmania has endorsed the principles of Quality Management.

The TDAC Deer Project has led the way in showing how difficult management issues can be resolved. The success of the Project is a tribute to Brian Murphy and we are all sorry that his time in Tasmania has come to a close. There is still much work to be done to extend the principles of this important project to all areas of game and wildlife management.



John Cleary
Minister for National Parks and Wildlife
(1992-1996)

ACKNOWLEDGMENTS

The success of the Tasmanian Deer Advisory Committee Inc. (TDAC) deer management project was due largely to the substantial level of cooperation and participation by all major stakeholders. Consequently, many individuals and organisations are deserving of recognition.

The Project Officer would first like to thank all TDAC member organisations and representatives. TDAC Executive members Garry Bowden, John Toohey, Kerry Riley, David Randall, Malcolm Cleland and Dale Abblitt deserve recognition for their support, guidance and contribution to the project. In particular, gratitude is expressed to Treasurer and Public Officer, Garry Bowden, for his dedication and commitment to the project which were well above the "call of duty".

Special thanks goes to the Hon. John Cleary, MHA, Minister for National Parks and Wildlife (1992-1996) who was responsible for transferring the Game Management Trust Fund to the TDAC to undertake this important project. Minister Cleary actively supported the project during his term in office and can be credited with establishing a Game Management Unit within the Parks and Wildlife Service to continue many of the TDAC initiatives.

The TDAC would like to acknowledge the support of the Tasmanian Farmers and Graziers Association (TFGA) and a number of individual landowners. Without the active and ongoing support of the TFGA and landowners in general, the TDAC project would not have succeeded. In particular, TFGA Representative, Malcolm Cleland, deserves acknowledgment for his contribution to the development and implementation of Property-based Game Management (PBGm). A number of individual landowners and managers also deserve recognition including: Roderic O'Connor, Kenneth and Julian von Bibra, Peter Downie, Donald Cameron, Allan Hastrup, Frank O'Connor, Warwick O'Connor, Michael Legge, David Gatenby, Peter Gatenby, Knox Heggaton, Ray Peters, Rex Kemp, Peter Hazell, Scott Reardon and Andrew Campbell.

Many hunting clubs and property hunting groups are also deserving of special recognition including: the Fallow Deer Club of Tasmania Inc., the Australian Deer Association (Tasmania Branch) and the Connorville Hunters Club Inc. Other groups deserving thanks include members of the ALMA Wildlife Co-operative, the Charlton Hunters Club Inc., the Benham Hunters Club, the Fordon Hunters Club, the View Point Hunters, the Bicton Hunters Club, the Hanleth Hunters, the Mt. Morriston Hunters, the Beaufront Hunters, the Windfall/Plain Game Management Group and the Quoin Practical Shooting Club.

The Australian Deer Association (National Association) and the Australian Deer Research Foundation Ltd. (ADRF) deserve recognition for their vision to bring U.S. wildlife biologist Joe Hamilton to Australia in the late 1980s to provide advice on deer management. This move provided the necessary impetus and direction for the eventual development of the TDAC project.

The TDAC also wishes to thank the ADRF for their financial support of the project through the donation of substantial computer and office equipment.

Other groups deserving thanks include the Deer Farmers Council of Tasmania, Forestry Tasmania, the Parks and Wildlife Service and the Wildlife Rangers. Each of these organisations or groups contributed greatly to the overall success of the project.

Finally, the Project Officer would like to thank his wife Heidi who supported his active involvement in the project even though this required substantial time away from home and considerable disturbances to their personal life. For these reasons, Heidi's contribution is perhaps the most significant.

TABLE OF CONTENTS

1. REPORT OVERVIEW	1
2. HISTORY, POPULATION, DISTRIBUTION AND VALUE OF FALLOW DEER IN TASMANIA	1
2.1 <u>History</u>	1
2.2 <u>Population Size</u>	1
2.3 <u>Distribution</u>	2
2.4 <u>Value of Deer and Deer Hunting in Tasmania</u>	3
2.4.1 Economic Value of Recreational Deer Hunting	3
2.4.2 Recreational Value of Deer Hunting	3
2.4.3 Cultural and Social Values of Deer Hunting	4
3. DEVELOPMENT OF THE TDAC DEER MANAGEMENT PROJECT	4
3.1 <u>Project Background</u>	4
3.2 <u>TDAC Organisational Structure</u>	6
3.3 <u>Aims and Objectives of the TDAC Project</u>	7
3.4 <u>Appointment of a Project Officer</u>	8
4. IMPLEMENTATION OF THE TDAC PROJECT	8
4.1 <u>Stakeholder Consultation</u>	8
4.1.1 Summary of Stakeholder Consultation	10
4.1.2 Identification of Stakeholder Concerns and Information Deficiencies ...	11
4.1.3 Conclusions of Stakeholder Consultation and Suggested Actions	12
4.2 <u>Development and Implementation of Property-based Game Management and Quality Deer Management</u>	13
4.2.1 Property-based Game Management	14
4.2.2 Quality Deer Management	17
4.2.3 Deer Management Strategies	18
4.2.4 Hunter Management Strategies	22
4.3 <u>TDAC Hunter and Landowner Survey</u>	27
4.3.1 Hunter Survey Results	27
4.3.2 Landowner Survey Results	39
4.4 <u>Changes to the Hunting Season, Licence and Regulations</u>	42
4.4.1 Hunting Season Options	43
4.4.2 Hunting Licence Options	46
4.4.3 Hunting Regulation Options	46
4.5 <u>Policies on Live Capture, Release and Importation of Mesopotamian Fallow Genetic Material</u>	48
4.5.1 Policy for the Live Capture of Wild Deer	48
4.5.2 Policy for the Release of Farm Deer into the Current Deer Range	49
4.5.3 Policy on the Importation of Mesopotamian Fallow Genetic Material ..	50
4.5.4 Outcomes of the TDAC Policies	52
4.6 <u>Education Program</u>	53
4.6.1 Informative Presentations	53
4.6.2 Publications	55

4.6.3	TDAC Training Courses	57
4.6.4	Field Supervision/Training	57
4.7	<u>Media, Marketing and Public Relations Program</u>	58
4.7.1	Media Involvement	58
4.7.2	Marketing	59
4.7.3	Public Relations	60
4.8	<u>Initiatives to Reduce Illegal Hunting Activities In Tasmania</u>	60
4.8.1	Investigation into Wildlife Offences in Tasmania (1983-1995)	60
4.8.2	Statewide Survey on Deer Poaching Activities	61
4.8.3	Statewide Survey on Community Attitudes Towards Deer Offences	65
4.8.4	Publication of Offenders Names and Fines	69
4.8.5	TDAC "Dob In a Poacher" Program	69
4.8.6	Cooperative Law Enforcement Activities	69
4.8.7	Conclusions of Initiatives to Reduce Illegal Hunting Activities	70
5.	STATEWIDE DEER DATA COLLECTION PROGRAM	72
5.1	<u>Objectives</u>	72
5.2	<u>Methods</u>	72
5.3	<u>Statewide Deer Results</u>	76
5.3.1	Statewide Deer Harvest by Sex	76
5.3.2	Statewide Deer Harvest by Year	77
5.3.3	Deer Management Regions	78
5.3.4	Statewide Deer Harvest by Region	79
5.3.5	Property Distribution of the Statewide Deer Harvest	80
5.4	<u>Male Deer Results</u>	80
5.4.1	Buck Harvest by Region	80
5.4.2	Buck Harvest by Year	81
5.4.3	Buck Harvest Dates	82
5.4.4	Buck Harvest Per Hunter (Hunter Success)	83
5.4.5	Statewide Buck Harvest by Age Class	84
5.4.6	Statewide Buck Age Structure Gains	85
5.4.7	Statewide Buck Colour Varieties	86
5.4.8	Buck Colour Varieties by Region	87
5.4.9	Buck Mean Live Weight	88
5.4.10	Buck Mean Dressed Weight	89
5.4.11	Relationship Between Buck Mean Live and Dressed Weight	90
5.4.12	Buck Mean Lower Jaw Length	91
5.4.13	Mean Number of Antler Points	92
5.4.14	Mean Antler Circumference	93
5.4.15	Mean Antler Length	94
5.4.16	Relationship Between Antler Spread and Span	95
5.4.17	Mean Palm Width Without Points	96
5.4.18	Mean Quality Scores	97
5.4.19	Percentage of Bucks in Harvest With a Quality Score of 200 or Greater	98
5.4.20	Distribution of Quality Scores by Age Class	99
5.4.21	Top 50 Bucks (by Quality Score)	103

5.5	<u>Female Deer Results</u>	104
5.5.1	Doe Harvest by Region	104
5.5.2	Doe Harvest by Year	105
5.5.3	Statewide Doe Harvest by Age Class	106
5.5.4	Statewide Doe Colour Varieties	107
5.5.5	Doe Colour Varieties by Region	108
5.5.6	Doe Mean Live Weight	109
5.5.7	Doe Mean Dressed Weight	110
5.5.8	Relationship Between Mean Live and Dressed Weight	111
5.5.9	Doe Mean Lower Jaw Length	112
5.5.10	Statewide Doe Conception Dates	113
5.5.11	Conception Dates (QDM vs. Non-QDM Properties)	114
5.5.12	Statewide Doe Parturition Dates	115
5.5.13	Foetal Sex Ratio	116
6.	FINANCIAL REPORT	117
6.1	Summary of Receipts and Payments	117
6.2	Statement of Financial Position	118
7.	KEY OUTCOMES OF THE TDAC PROJECT	118
8.	FUTURE DEER RESEARCH NEEDS	120
9.	FUTURE MANAGEMENT RECOMMENDATIONS	123
10.	REFERENCES	125

1. REPORT OVERVIEW

The following report is a summary of the activities and achievements of the statewide fallow deer project undertaken by the Tasmanian Deer Advisory Committee Inc. (TDAC) from 13 August 1993 to 30 June 1997. This report is not intended to be a comprehensive review of fallow deer history, biology, ecology or management but rather a detailed account of the project itself, the outcomes and the implications for the State's deer and major stakeholders. The sections on history, population size, distribution and value are provided at the beginning of the report to provide a general starting point whereas topics relating to biology and management are discussed later in the report in conjunction with the results of the data collection program in order to provide their relevance to the Tasmanian situation.

2. HISTORY, POPULATION SIZE, DISTRIBUTION AND VALUE OF FALLOW DEER IN TASMANIA

2.1 History

Several species of deer were introduced into Tasmania during the 1800s, although only European fallow deer (*Dama dama*) were successful in becoming established. There is, however, some confusion surrounding their date of initial introduction. Wapstra (1973) states that fallow were first introduced in 1829 while Bentley (1978) suggests that these animals were not fallow, but rather axis deer or chital (*Axis axis*). According to Bentley, the first confirmed record of fallow deer in Tasmania was published in *The Hobart Town Courier* on 9 December 1836 (Bentley 1978). This article states that 12 fallow deer (six bucks and six does) were imported from England to Tasmania on the ship *Wave* (Bentley 1978). These animals were kept in captivity for nearly 20 years until they numbered about 100 at which time they were released into the wild. During this period, additional fallow deer were imported from England by the early settlers for hunting in game parks. Some of these animals escaped during hunts and others were released intentionally as the captive herds increased.

2.2 Population Size

The first documented estimate of fallow deer numbers in Tasmania was provided by the Acclimatisation Society of Victoria in 1863 when it was estimated that there were approximately 600-800 fallow deer "running wild" in Tasmania (Bentley 1978). In 1973, over 100 years later, Wapstra conservatively estimated the population at 8,000 animals (Wapstra 1973). In 1988, Caughley reported that Tasmania "can confidently be expected to have a population size within double and half of 10,000" (Caughley 1988). This equates to an estimate of approximately 12,500. Based on hunter license returns, Caughley further concluded that the herd was stable and had been at least since 1980 (Caughley 1988).

The statewide population during the project was estimated to be approximately 15,000 and reasonably stable (Murphy 1997). This number is considered to be down slightly from a high during the late 1980s and early 1990s when deer, particularly females, were actively protected by landowners due to their considerable economic value as breeding animals for the newly emerging deer farming industry. During the project, there were approximately 3,000 licensed deer hunters who harvested approximately 1,000-1,500 deer (male and female) annually during the legal hunting seasons with an additional 500-1,000 does harvested under crop protection permits (Tasmanian Parks and Wildlife Service records).

2.3 Distribution

Fallow deer can be found on more than 150 private properties spread across nearly one-third of the State centred around the Midlands (Fig. 1). Collectively, these properties represent a total area of approximately 750,000 ha. Throughout their range, populations are unevenly distributed and local densities vary considerably from a few animals to several hundred.

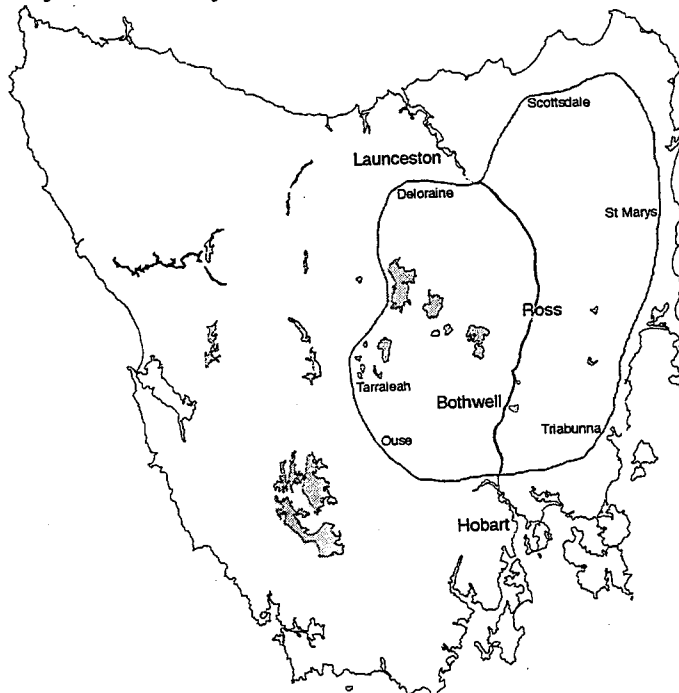


Figure 1. Distribution of the fallow deer range in Tasmania.

While the deer range during this project was similar to that reported by Wapstra in 1973, it is evident that fallow have expanded their distribution, particularly west and northwest of Bothwell where deer were rare or absent in the 1970s (Wapstra 1973). Many properties in this region now contain moderate to high populations of wild deer. It is likely that this spread began in the late 1960s or early 1970s as evidenced by Wapstra's comments that, "Reports of deer seen west of the Interlaken area have been received in sufficient numbers to suggest that deer are extending their distribution in a westerly direction" (Wapstra 1973).

This rate of spread would equate to a distance of approximately 30 km over the ensuing 20 years or 1.5 km per year. This rate of spread is greater than 0.8-0.9 km per year which is considered the maximum for fallow -- the deer species with the slowest recorded rate of natural dispersal (Challies 1985). Possible causes for this include escape and release from deer farms, suitable habitat in these areas and increased hunting pressure on does causing more rapid dispersal (Murphy 1995). It is believed that any further spread in a westerly direction will be limited due to a lack of suitable habitat.

Observational information suggests that the statewide herd is also expanding its range in the Northeast near Derby and Scottsdale and in the East near Bicheno and St. Helens. While populations in these areas during the project were sparse, it is likely they will continue to expand, particularly in areas of suitable habitat (improved pasture and agriculture).

2.4 Value of Deer and Deer Hunting in Tasmania

2.4.1 Economic Value of Recreational Deer Hunting

The economic value of recreational deer hunting in Tasmania is considerable. An economic survey conducted in 1990 reported that approximately 3,200 fallow deer hunters in Australia contribute between \$2.2-6.0 million per annum to the national economy (Cause 1990). Since there are nearly 3,000 licensed deer hunters in Tasmania, this figure is the best available estimate of the value of deer hunting to the Tasmanian economy. However, this figure would be conservative because it does not include payment to landowners by hunters for property access of which many landowners receive between \$5,000-10,000 annually (B. Murphy pers. obs.). Government revenue from hunting licence sales, which exceeds \$120,000 per annum, is also not considered in this figure (Parks and Wildlife Service records). Although difficult to quantify, the estimate also does not take into account the value of deer hunters and deer hunting in an overall crop protection strategy which saves landowners thousands of dollars each year. Clearly, deer hunting contributes significantly to local, State and national economies.

2.4.2 Recreational Value of Deer Hunting

Deer hunting provides recreation for approximately 3,000 Tasmanians each year. Tasmania has the second highest number of deer hunters in Australia (next to Victoria) and the highest per capita deer hunting population. A survey conducted by the TDAC in 1994 indicated that the average deer hunter spends between 11-20 days hunting each year (TDAC 1994). When extrapolated to all deer hunters, this equates to approximately 45,000 hunter-days. This figure would be conservative because it does not include time spent during the non-hunting season. This period of the year is equally if not more important than the hunting season itself because it

provides the opportunity to view deer, assess management progress and prepare for the next hunting season. As a result, fallow deer hunting is a year around activity for thousands of Tasmanians and is among the most participated consumptive recreational pursuits in Tasmania.

2.4.3 Cultural and Social Values of Deer Hunting

“The pleasure of the sportsman in the chase is measured by the intelligence of the game, its capacity to elude pursuit and in the labour involved in the capture. It is a contest with sharp wits where satisfaction is mingled with admiration for the object overcome”.

-- John Dean Canton (1877)

As the only big game species in Tasmania, fallow deer hold a special attraction for many Tasmanian hunters. Deer hunting has taken place in Tasmania for more than 100 years and has become a tradition and important cultural activity in many families. Hunting also provides an opportunity to escape from the hectic pressures of daily life and spend time relaxing in the bush with family and friends. As society becomes more urbanised, this benefit will become increasingly important.

3. DEVELOPMENT OF THE TDAC DEER MANAGEMENT PROJECT

3.1 Project Background

The Tasmanian Parks and Wildlife Service (PWS) has managed wild fallow deer in Tasmania for over 50 years with hunters contributing since 1977 through the medium of the Tasmanian Deer Advisory Committee (TDAC). In the early days, the TDAC consisted solely of hunter and PWS representatives who often held opposing views on deer management. The Committee regularly provided advice to the Government on deer season dates, duration, bag limits, live capture and a variety of other issues. While a number of changes were trialed, none substantially improved the quality of the herd or the hunting experience. Advice provided by hunter representatives was generally acted on by a Government eager to escape criticism from hunters. Unfortunately, it was often advice offered without landowner support and scientific validity.

A visit to Tasmania in 1988 by U.S. wildlife biologist, Joe Hamilton, provided the necessary impetus for change. The essence of Hamilton's message was that the solution to the Tasmanian deer "problem" rested in the adoption of Quality Deer Management (QDM) and Property-based Game Management (PBGGM).

In the late 1980s, discussion at TDAC meetings focussed on monies held in the Game Management Trust Fund (GMTF). The fund was established from royalties derived from the wild deer capture program that took place during the late 1980s to establish a deer farming industry. Participating landowners were obligated to pay the Government a royalty fee for each deer captured or purchased from another landowner. These royalties were placed into the GMTF which, by the early 1990s, exceeded \$200,000. Several attempts by the PWS to report financial activity on the fund attracted criticism, partly due to gross inaccuracies and a lack of satisfactory explanation regarding expenditures, current balance and outstanding monies.

During the early 1990s, the TDAC suffered instability and a lack of strategic direction and commitment to any clear goals. Opinion within the Committee was divided as to the most appropriate use of the GMTF. About this time, a faction within the TDAC began to lobby that the Hamilton initiatives needed recognition in Tasmania which would require the services of a qualified and competent wildlife (game) biologist with specific experience with deer. Funding was the major obstacle; so these representatives began an aggressive lobby effort to ensure that the GMTF was used for this purpose. In July 1990, TDAC representative, Garry Bowden, began to lobby for the cash granting of the GMTF to the TDAC to initiate a project and employ a game biologist. This lobbying continued for more than 12 months during which Bowden agreed to act as Project Treasurer/Coordinator.

In June 1991, an uncommissioned and independent report entitled: *Fallow Deer in Tasmania - What Future?* by John Toohey and Ken Orr was tabled for consideration by the TDAC. The report consolidated many of the key issues and provided an increased focus within the TDAC. In July 1991, Toohey and Orr were invited to address their report at a TDAC meeting. The main benefit of the report was that it provided the avenue to re-open discussions with the Tasmanian Farmers and Graziers Association (TFGA) which, at that time, had expressed extreme discontent with the overall deer situation and had commenced active political lobbying for deregulation. The accumulated frustration of 25 years of mismanagement was becoming apparent. A sub-committee of the TDAC was approved to meet with the TFGA with a view of reaching agreement on issues including hunting seasons, doe culling and live trapping. It was agreed that Garry Bowden and Roger Freeman of the TDAC, together with John Toohey and Ken Orr, would meet with TFGA representatives. Over a period of months, negotiations with the TFGA deteriorated and, in June 1992, officially broke down. The involvement by the PWS throughout this period could only be described as unhelpful with a clear failure to communicate adequately on the issues or assist in the development of a suitable compromise.

The TDAC considered the threat of deregulation extremely serious and approved a delegation to meet with the Hon. John Cleary, MHA, Minister for National Parks and Wildlife. The delegation was charged with negotiating an alternative to deregulation which included presenting a proposal

to use the GMTF to appoint a qualified deer biologist managed by the TDAC. The meeting with the Minister occurred on 4 September 1992 and resulted in a favourable outcome for the TDAC proposal.

3.2 TDAC Organisational Structure

Following the Minister's approval, the TDAC implemented the necessary administrative and structural changes to undertake the employment of a game biologist to implement a statewide deer management project. The TDAC also became an incorporated body and expanded its membership to include all stakeholders with an interest in wild deer. During the course of the project, the TDAC was comprised of both a General and Executive body. Executive Committee members were appointed from the General body to oversee the appointment of the Project Officer and to steer the project. The General body during the project consisted of representatives from the following groups:

Hunting Organisations

Sporting Shooters Association of Australia
Australian Deer Association
Steppes Wildlife Trust
Tasmanian Field and Game Association
Tasmanian Deer Stalkers Association
Connorville Hunters Club Inc.
North West Deer Stalkers Association
Fallow Deer Club of Tasmania Inc.
Non-Associated Hunters

Other Organisations

Tasmanian Farmers & Graziers Association
Tasmanian Deer Farmers Council
Tasmanian Parks and Wildlife Service
Forestry Tasmania

The Executive Officers during the project included:

<u>Officer</u>	<u>Position</u>
Mr. Dale Abblitt (1993-97)	Chairperson
Mr. Kerry Riley (1993-97)	Vice Chairperson
Mr. Brian Murphy (1993-97)	Secretary/Project Officer
Mr. Garry Bowden (1993-97)	Treasurer/Public Officer
Mr. David Randall (1993-97)	Parks and Wildlife Service Representative
Mr. Malcolm Cleland (1993-97)	Tasmanian Farmers & Graziers Assoc. Representative
Mr. Richard Bowden (1993-94)	Tasmanian Deer Farmers Council Representative
Mr. Gerry Phillips (1995-97)	Tasmanian Deer Farmers Council Representative

Mr. Islay Robertson (1993-94)	Forestry Tasmania Representative
Mr. Tom McCoy (1995-97)	Forestry Tasmania Representative
Mr. John Toohey (1993-96)	Non-Associated Hunters Representative

3.3 Aims and Objectives of the TDAC Project

Aim

- *To develop a practical, strategic plan for Tasmania's wild fallow deer that most closely meets the needs of the Tasmanian community and maximises the biological, social and economic potential of the herd.*

Objectives

- *To develop and promote an appropriate ongoing management program for wild fallow deer in Tasmania that most closely meets the long term expectations of the Tasmanian community.*
- *To employ or engage, as required, suitably qualified persons to implement such activities.*
- *To conduct and facilitate any such research into wild or domestic fallow deer as may be necessary to develop, manage or maintain a Tasmanian wild deer management program.*
- *To actively promote the role of ethical hunting as a principal tool in a Tasmanian wild deer management program.*
- *To improve communication and understanding between hunters, landowners, government agencies, deer farmers, and the community on issues concerning deer management in Tasmania through educational seminars, written literature, informal meetings, interviews (television, radio and newspaper) and any other means deemed appropriate by the Committee.*
- *To advise the Department administering the National Parks and Wildlife Act 1970, the Secretary of the Department and/or the Minister on issues concerning the fallow deer resource of Tasmania.*
- *To foster and promote public awareness of the value of wild fallow deer in Tasmania.*

3.4 Appointment of a Project Officer

In an attempt to attract a suitably qualified Project Officer with particular skills in deer biology and management, in late 1992, the TDAC advertised the position throughout Australia and in the U.S. After review of several candidates, the TDAC selected wildlife biologist Brian Murphy from Georgia in the U.S. Brian holds a B.S. in Range and Wildlife Habitat Management from Texas Tech University and a M.S. in Wildlife and Forestry from The University of Georgia. Brian's extensive experience in deer research and management, especially with fallow and white-tailed deer, made him the most qualified applicant. The initial term of his appointment was for two, possibly three years subject to funding. However, due to cost containment and fundraising measures, the TDAC was able to extend his appointment to four years (see Section 6). Consequently, the TDAC project ran from 13 August 1993 to 30 June 1997.

Brian's primary tasks were to:

1. Prepare a practical strategic plan for wild fallow deer in Tasmania providing for:
 - a. different management for unique segments within the total wild deer range;
 - b. sustainable harvesting;
 - c. protection of farming interests through the harvesting of deer and other wildlife;
 - d. and examine legislative controls for deer hunting and recommend desirable changes.
2. Act as liaison between landowners, hunters, deer farmers and government agencies.
3. Initiate and facilitate the development of Property-based Game Management Plans between hunters and landowners.
4. Participate in the education of hunters, landowners and the public in sound, practical game management principles with specific reference to fallow deer.
5. Recommend and facilitate the conduct of research into the Tasmanian wild fallow deer herd.

4. IMPLEMENTATION OF THE TDAC PROJECT

4.1 Stakeholder Consultation

The first objective of the project was to meet and consult with the major stakeholders involved in the management and/or control of wild fallow deer in Tasmania. Since the majority of wild fallow deer occur on private land, private landowners and recreational hunters were seen as the two most important stakeholder groups. Other key stakeholders included the Parks and Wildlife Service, Forestry Tasmania, deer farmers, conservation groups, politicians and various biologists and scientists. Below is a summary of the activities of the Project Officer with regard to stakeholder consultation during the project.

Landowner/Property Contacts

Activity	1993/94	1994/95	1995/96	1996/97	Total
Distance travelled (kms)	40,696	34,661	31,157	30,772	137,286
Trips to the deer range	82	61	55	31	229
Property/landowner contacts	60	71	84	58	273

Explanation of Activities

Distance travelled (kms) - Distance travelled by the Project Officer during the project.

Trips to the deer range - Number of trips of 200 km or more to the deer range made by the Project Officer from his residence (Hobart) during the project.

Property/landowner contacts - Number of unscheduled property or landowner visits when contact was made with a landowner, manager or hunter. This figure does not include pre-arranged meetings.

Meetings Attended

Meeting Type	1993/94	1994/95	1995/96	1996/97	Total
Landowner	9	12	17	18	56
Hunter	31	24	20	13	88
Landowner and hunter	4	14	19	24	61
Public	8	28	14	0	50
Academic/scientific	2	2	3	4	11
Other	13	18	21	23	75
Total	67	98	94	82	341

Explanation of Meeting Type

Landowner - Meetings with individual landowners or managers, landowner groups or committees, or individuals within the Tasmanian Farmers and Graziers Association.

Hunter - Meetings with hunting organisations, property hunting groups or other groups of hunters.

Landowner and hunter - Meetings involving both landowners and hunters such as property management meetings, permit days and meetings to develop Property-based Game Management Plans.

Public - Meetings that were advertised and open to the general public.

Academic/scientific - Meetings involving academic and/or scientific participants such as scientific conferences, meetings with local and interstate Parks and Wildlife Service staff, other agency staff, Government advisory committees and training seminars.

Other - Meetings with deer farmers, wildlife officers, politicians, Landcare groups, Government departments, official launches/events and young hunter training courses.

4.1.1 Summary of Stakeholder Consultation

The process of active consultation, while extremely time and labour intensive, proved essential in understanding the objectives and concerns of key stakeholders and in gaining their confidence. This was particularly true in the case of landowners who, in the early stages, were more sceptical and critical of the project than were hunters. As a general rule, landowners were also less inclined to schedule or attend meetings regarding deer management as indicated by the lower number of meetings attended by the Project Officer for landowners than for hunters. However, this pattern changed significantly during the course of the project until 1996 when the number of landowner meetings actually exceeded the number of hunter meetings.

Another positive result was the increasing number of meetings which involved both landowners and hunters. During the first two years of the project only 11% of the meetings involved both landowners and hunters, whereas 24% of the meetings involved both parties during the last two years of the project. By the end of the project, this type of meeting was the most prevalent and clearly indicated an increasing level of cooperation between landowners and hunters.

An interesting result was the pattern of attendance at public meetings. During the first two years of the project, the attendance at public meetings averaged 50-100 people. However, the attendance declined rapidly during 1995-96 until the average was fewer than 20 people. As a result, the TDAC discontinued public meetings in 1996. The most likely explanation for the rapid drop in attendance is that contentious issues such as possible deregulation, season changes, hunting license changes and hunting regulation changes were resolved during the meetings held in 1993-94. It appeared that once landowners and hunters were generally satisfied with the direction of deer management, they attended fewer meetings. Another contributing factor was that, as the project progressed, the Project Officer

attended frequent meetings with hunters (formal clubs and property groups) and kept them abreast of the current issues. For many, this negated the need to attend public meetings.

4.1.2 Identification of Stakeholder Concerns and Information Deficiencies

During the consultation process, the Project Officer identified a number of concerns held by stakeholders and a number of areas where there was insufficient information or knowledge.

All Stakeholders

- Distrust of Government and outside "experts"
- Concern over the level of illegal hunting activities
- Fear of change from traditional practices
- Lack of knowledge of basic deer biology and deer management

Hunters

- Distrust of other hunters and landowners
- Concern over possible deregulation
- Concern over declining deer herd quality
- Concern over the impact of the deer farming industry on the wild herds
- Opposition to the timing and length of the hunting seasons, particularly for female deer
- Concern over the possible importation of Mesopotamian fallow deer

Landowners

- Distrust of hunters
- Lack of recognition of the value of deer and deer hunters in overall property management
- Concern regarding the level of crop and property damage caused by deer
- Opposition to crop protection permit requirements for female deer
- Support by some for deregulation

Deer Farmers

- Support by some for continued live capture of wild deer
- Support by some for the importation of Mesopotamian fallow deer

State and Private Forestry

- Concern over the management of deer hunting on certain forest areas, particularly those adjoining private lands

Concern over deer damage in a few isolated forest areas
Concern over the possible introduction of Mesopotamian fallow deer

Parks and Wildlife Service

Concern over total deer numbers, particularly in non-traditional deer areas
Concern over the ongoing conflicts between stakeholders
General support for deregulation and the termination of deer management responsibilities
Lack of recognition of the potential value of deer and deer hunters in overall property management, browsing animal control and farm economics

4.1.3 Conclusions of Stakeholder Consultation and Suggested Actions

Following the process of active stakeholder consultation, the Project Officer reached the following conclusions. Below each conclusion is the course of action developed by the TDAC. Collectively, these conclusions and actions comprise the core of the TDAC project.

1. Conclusion: There was general distrust among and between major stakeholder groups and a fear of change from traditional practices.

Suggested Action: To continue consulting widely with key stakeholder groups to obtain their trust and support for necessary changes. This process should involve the conduct of numerous meetings involving multiple stakeholder groups to enable improved communication, understanding and willingness to compromise.

2. Conclusion: There was a lack of reliable background information on the major stakeholders, particularly deer hunters and landowners with wild deer on their properties.

Suggested Action: To conduct appropriate landowner and hunter surveys to obtain such information.

3. Conclusion: There were certain policies and regulations in place which impeded progress in the area of deer management.

Suggested Action: To review all deer management policies and regulations, particularly those which were contentious and suggest possible changes and/or alternatives.

4. Conclusion: There was a general lack of knowledge of basic deer biology and modern management techniques by all stakeholders, particularly landowners and hunters.

Suggested Action: To implement an appropriate education program consisting of informative presentations, formal and informal publications, "hands on" training courses and field supervision/training.

5. Conclusion: There was a lack of reliable information on the timing, distribution and severity of illegal hunting activities in Tasmania as well as a lack of knowledge on the available penalties and the number of persons convicted annually.

Suggested Action: To conduct appropriate surveys and investigations to obtain reliable information on illegal hunting activities and to use this information to develop and implement strategies to reduce these activities.

6. Conclusion: There was a lack of reliable biological information on the wild fallow deer herd in Tasmania from which to formulate an appropriate management plan.

Suggested Action: To develop and implement a comprehensive statewide deer data collection program that involved the active participation of landowners and hunters.

As the human dimension of deer management is generally the most important, yet the most difficult to achieve, it was necessary to address and resolve (where possible) stakeholder concerns and deficiencies before a deer management plan suitable to all parties could be developed. Stakeholder distrust and fear of change were among the most difficult issues to resolve. As a result, gaining the trust of the various groups occurred over time and required a great deal of patience and persistence. Based on the outcomes of the project, the Project Officer found the following items essential in obtaining stakeholder trust and addressing the range of concerns and deficiencies.

- Independence from normal Government structures
- Technical knowledge of wildlife, particularly in deer biology and management
- Strong interpersonal skills
- Credibility with hunters and landowners
- Neutrality
- Commitment, motivation and patience
- Flexible working arrangements

4.2 Development and Implementation of Property-based Game Management and Quality Deer Management

During the early stages of stakeholder consultation it became evident that there was a need for an integrated approach to game management in Tasmania that facilitated cooperation between

landowners and hunters, provided benefits to both parties, reduced browsing animal damage and improved deer herd quality. As a result, in late 1993, the TDAC introduced two game management strategies: Property-based Game Management (PBGM) and Quality Deer Management (QDM).

The concept of PBGM developed over a number of years in Tasmania, although it was not clearly defined or formalised until 1994 through the TDAC project. The concept of QDM originated in the U.S. where it has proven successful at resolving conflicts between landowners, hunters and deer similar to those which existed in Tasmania prior to the TDAC project. Collectively, these programs became the main thrust of the TDAC project and were largely responsible for the successful outcomes.

4.2.1 Property-based Game Management

Introduction

Tasmania's varied topography, temperate climate, fertile soils and pattern of land settlement provide favourable conditions for both native and introduced mammalian herbivores (Statham and Rayner 1995). In particular, the pattern of land use produced a mosaic of habitat types including native forest, plantation forest, remnant vegetation, open pasture and agriculture. Since the early 1980s, declining wool prices and frequent droughts caused many landowners to diversify their farming operations resulting in a rapid and dramatic altering of the landscape (Murphy 1995). Some landowners cleared land to increase livestock numbers while others converted marginal lands into agriculture or forestry. The predominant land use change, however, has been towards improved pasture (Commonwealth of Australia 1984). These land use changes, in conjunction with a sharp decline in the commercial harvesting of brushtail possums (*Trichosurus vulpecula*), Bennett's wallaby (*Macropus rufogriseus*) and Tasmanian pademelons (*Thylogale billardierii*) due to low international fur prices, resulted in marked increases in native herbivore numbers and, to a lesser extent, introduced herbivore numbers (Driessen and Hocking 1992). Collectively, these animals pose an increasingly serious and persistent management problem for resource agencies, primary producers, the forest industry and the wider community.

Development of Property-based Game Management

Initially, the TDAC project was concerned primarily with the management of wild deer. However, it soon became evident that many wildlife management concerns were interrelated and should be addressed collectively. As a result, in late 1993, the TDAC began working cooperatively with the Tasmanian Farmers and Graziers Association (TFGA) to develop and refine the concept of Property-based Game Management (PBGM). TFGA representative, Malcolm Cleland, played the most significant role in the formalisation of this process.

PBGM is an innovative approach to land management that takes a holistic view of a property or region and its associated wildlife resources, problems and concerns. It utilises a partnership arrangement between landowners and hunters to achieve desired property outcomes. In particular, PBGM addresses all issues pertaining to game and pest species and the role of the various stakeholders in their management and/or control. This community-inclusive approach has proven highly effective and appears to be the only process capable of achieving equitable, long-term solutions to game and pest management in Tasmania.

Implementation of Property-based Game Management

The concept of PBGM was trialed on private properties in Tasmania through the development and implementation of Property-based Game Management Plans (PBGMPs). PBGMPs are property-specific written agreements developed through consultation between a landowner and a group of hunters assisted by a neutral facilitator such as the TDAC Project Officer. PBGMPs aid landowners and hunters in the planning of an integrated approach to property management that maintains wildlife at acceptable levels while achieving other property and conservation objectives.

A wide range of topics is covered in the plan. Perhaps most important is the identification of current and expected uses of the property such as grazing, agriculture, forestry, hunting, fishing and ecotourism. Other items include: landowner and hunter objectives, property description, harvest goals, harvest monitoring, hunter group management, hunter safety, hunter ethics, property rules, legal protection for the landowner and land conservation issues. PBGMPs also identify when problems involving wildlife, such as browsing damage to crops or trees, are likely to occur and methods available to minimise this impact. Under the PBGM approach, hunters typically provide both an economic return to landowners for hunting and the labour needed to accomplish wildlife damage control and/or other property objectives.

Principles of PBGMP

PBGMPs have proven successful because they provide beneficial outcomes for the key stakeholders. Essentially, landowners enter into barter arrangements with hunters where they trade a commodity (recreational hunting opportunity) for financial compensation or compensation through other activities such as strategic pest animal control or other property services. These barter agreements become successful when the commodities traded between participants reach an equitable balance. The perceived value of the commodity (hunting opportunity) by potential clients (hunters) is related to many factors including size and location of the property, the quantity and quality of game animals present, conditions for property access and other factors such as access to fishing, firewood and accommodation. Barter agreements are unique to each property and group of participants and, for the first time, have been formalised in written management plans.

In Tasmania, fallow deer are regarded by the majority of hunters as the most desirable game animal and, therefore, the highest value commodity to barter. They are generally followed in desirability by eastern grey kangaroos, wallabies, rabbits, hares and brushtail possums (Murphy pers. obs.). This level of desirability to hunters dictates the level of compensation (financial or labour) landowners might receive. For example, landowners with a high quality deer herd can expect both a reasonable financial return and substantial effort from their hunting group to perform nominated property services in return for hunting access. Conversely, landowners with only possum hunting to barter may have to provide additional incentives such as ammunition or firewood just to encourage hunters to perform pest control duties.

Since fallow deer are perceived by hunters as a high-value resource, they are a key element in many PBGMPs. Consequently, PBGMPs seek strategies to improve deer herd quality for hunters. In some cases these strategies result in a lower overall herd size. Prior to PBGM, any herd reduction initiated by landowners would have resulted in a serious conflict with hunters. This is an example of the complex outcomes achievable through the PBGM process.

Conservation and Property Benefits of PBGM

Landowners involved in PBGMPs are beginning to take advantage of the previously unrecognised potential of hunting groups to achieve a broad range of conservation and other property objectives. A key element in PBGMPs is the monitoring of all game and pest species and, in some cases, threatened or specially protected species. This is accomplished through the use of property log books which hunters are required to complete during each trip to the property. The log books detail the date, time (day or night), species and number taken, and the number of hours spent hunting. In the case of threatened or protected species, hunters record the number seen rather than culled. By dividing the number of a particular species taken (or observed) by the number of hours spent shooting or observing, a simple index of relative abundance can be calculated. This information provides general trends in abundance for both game and protected species.

Landowners are also using hunters to achieve land and property conservation objectives. On average, properties in Tasmania involved in PBGM have 20-30 hunters, although some have 100 or more. Some landowners have elected to use this substantial labour force to plant trees, remove exotic weeds and plants from their paddocks, or place metal bands around trees to prevent damage by brushtail possums. Other landowners have elected to use hunter labour to accomplish other types of property improvements such as building fences, repairing existing structures (huts, barns, etc.) or removing fallen timber from paddocks.

4.2.2 Quality Deer Management

A simple working definition of Quality Deer Management (QDM) is the use of restraint in harvesting young bucks combined with an adequate harvest of antlerless deer, particularly adult does, necessary to maintain a healthy population in balance with existing habitat conditions (Hamilton 1987). This level of deer management involves the production of quality deer (bucks, does and fawns), quality deer habitat, quality deer hunting and most importantly, quality deer hunters. Hunters involved in QDM undergo a transformation from mere consumers to managers. The progression from education, through awareness, to understanding and finally to respect for the deer bestows an ethical obligation upon the hunter to practice sound deer management. The following passage illustrates the change in hunter mentality necessary to succeed in a QDM program.

"Quality deer management is first and foremost an attitude, a means of self-expression. The hunter views the deer not just as a resource for recreation and food, but as a part of nature which he or she willingly belongs. A self-imposed restriction to take an antlerless deer while allowing young antlered bucks to pass provides the hunter with opportunities to study deer, learn their behaviours and sharpen hunting skills. Deer hunting is the experience of giving to as well as taking from the deer."

-- Dr. David Guynn, deer researcher/hunter, U.S.

Individual property management guidelines are formulated according to particular desires, goals and limitations. Hunters participating in QDM enjoy the tangible benefits such as improved deer herd quality, larger antlered bucks and more venison for the freezer, but more importantly, they enjoy the intangible benefits including an increased knowledge of deer, respect and satisfaction. Pleasure is derived from each hunting experience regardless of whether a shot is fired or an animal harvested. For an increasing number of hunters, the opportunity to match their hunting skills with a mature buck is more important than the actual harvest. When a quality buck is taken under a QDM program, the pride can be shared by all property hunters because it may have been them who produced it by allowing it pass as a younger animal.

History of QDM in the United States

The concept of QDM originated during the 1960s and 70s in the brush country of southern Texas; an area home to some of the best white-tailed deer hunting in the U.S. This concept was created by two wildlife biologists, Al Brothers and Murphy E. Ray, Jr., who were among the early pioneers in deer management in the U.S. The publication of their 1975 book, *Producing Quality Whitetails*, enabled other states the opportunity to consider this novel approach. Less than a

decade later, many other southern states followed suit and gave QDM a try. This was the beginning of what now is considered a QDM "movement" in the U.S. which involves many thousands of landowners and hunters and several million acres of private and public land.

History of QDM in Australia

In 1986, U.S. wildlife biologist Joe Hamilton first visited Australia as the invited guest of the National body of the Australian Deer Association (ADA). During this trip, Joe gave numerous presentations on QDM to mainland hunting groups. These presentations generated substantial interest from hunters and resulted in two subsequent trips in 1988 and 1990. During 1988, Joe also visited Tasmania where he recognised the potential of QDM to resolve many of the biological and social problems relating to the wild deer herd and key stakeholders. During his travels and numerous public engagements, Joe convinced a few key hunters and hunting organisations to pursue the implementation of a QDM program in Tasmania. This concept remained a dream until 1993 when the TDAC obtained funding to initiate this project.

4.2.3 Deer Management Strategies

While QDM was the primary approach promoted during the TDAC project, a number of other approaches were and continue to be used by landowners and hunters in Tasmania. Developing a PBGMP involving wild deer involves deciding whether the herd will be managed for quantity, quality or a combination of both. Most deer hunters would like to have both a high deer population and a large number of trophy bucks. Unfortunately, even under the best deer management program, this situation is rarely achieved. Deer management requires a number of tradeoffs. Listed below are a range of deer management strategies used in Tasmania with the advantages and disadvantages of each. It is recognised that this list of strategies is not exhaustive and that one strategy is not necessarily mutually exclusive of another.

Deer Management Strategies

1. Maximum Population Strategy

The Maximum Population Strategy results in the largest deer herd possible for a given property. This situation is unstable because the herd is held at or above the carrying capacity of the habitat and is greatly influenced by seasonal conditions. This type of management results in a deer herd that is in poor physical condition with a low reproductive rate and poor antler development. The Maximum Population Strategy is achieved by harvesting the majority of legal bucks and few, if any, does.

Advantages:

- A). A large number of deer is seen while hunting

Disadvantages:

- A). Poor antler development
- B). Decreased reproduction and recruitment
- C). Sex ratio highly skewed towards does
- D). Severe habitat and crop damage in some years
- E). Fewer deer harvested than under Strategy 2 or 3 due to decreased reproduction and recruitment

2. Maximum Harvest Strategy

The Maximum Harvest Strategy achieves the highest sustainable deer harvest for a given property. The harvest is comprised of nearly every legal buck and a low to moderate number of female deer. The desired number of deer to be harvested each year is set equal to the number of new fawns recruited into the herd.

Advantages:

- A). Large number of deer harvested each year
- B). Young bucks are in good physical condition and exhibit good antler development
- C). Little or no habitat damage or damage to long term food supply

Disadvantages:

- A). Fewer deer seen while hunting than under Strategy 1
- B). Few trophy bucks harvested because most bucks are taken at a very young age
- C). More crop damage than under Strategy 3 or 4

3. Quality Deer Management Strategy

The Quality Deer Management Strategy achieves both a relatively high deer harvest and quality bucks. This approach is similar to Strategy 2 except that hunting pressure is reduced on the young bucks and slightly increased on the does. It involves passing young bucks (first and some second heads) to allow more to mature. As in Strategy 2, the number of deer harvested each year

is set equal to the number of new fawns recruited into the herd (assuming the herd is at the desired population size).

Advantages:

- A). Relatively large number of deer are harvested
- B). Bucks have good antler development and body weights
- C). Better buck:doe ratio within the herd
- D). Improved buck age structure (more trophy bucks harvested)
- E). Less crop damage than Strategies 1 or 2

Disadvantages:

- A). Fewer deer seen while hunting than Strategy 1
- B). Some nice young bucks must be passed up while hunting
- C). Much of the harvest is comprised of does

4. Trophy Management Strategy

The Trophy Management Strategy produces bucks with maximum antler development. This approach involves the harvest of only the fully mature bucks (6.5-9.5 years old) and large numbers of female deer. The total deer herd must be kept at a low level to ensure maximum availability of quality forage for every animal in the herd.

Advantages:

- A). Antler development of bucks is maximised
- B). Buck age structure is maximised
- C). Very even buck:doe ratio within the herd
- D). Least crop damage of available strategies

Disadvantages:

- A). Very few deer seen while hunting
- B). Relatively low total deer harvest (after first few years)
- C). Many bucks must be passed up while hunting
- D). More bucks die of natural causes and poaching
- E). Accurate field judging of antlers is required

- F). Very large areas (over 4,000 ha) are generally required
- G). Strict penalties for violating harvest rules must be imposed and enforced

Once a deer management strategy has been selected, an appropriate harvest plan must be designed. There are essentially two ways for landowners and hunters to manage deer herds -- habitat management and harvest management.

1. **Habitat Management** involves the manipulation of the land to improve its ability to increase the quantity or quality of the deer on the property. Habitat management involves activities such as planting crops for deer, fertilising native vegetation, strategic burns and timber stand manipulation. These activities have associated costs and, in many cases, are not economically feasible.

2. **Harvest Management** involves the manipulation of the deer harvest to achieve pre-determined herd objectives. This is achieved by controlling the number of hunters, number of deer taken or the timing and length of the hunting period. As a general rule, 20-25% of a fallow deer herd can be harvested each year to maintain a stable population.

There are three general harvest strategies available to manipulate the size of a deer herd.

- 1. **Increase** herd size by harvesting no does or limiting the doe harvest to a level below the annual fawn recruitment.
- 2. **Decrease** herd size by increasing the doe harvest to a level that exceeds the annual fawn recruitment.
- 3. **Stabilise** the herd by using a balanced harvest of bucks and does where the total harvest equals the annual fawn recruitment.

Summary

There are a wide range of deer management strategies employed in Tasmania and each has advantages and disadvantages. Of these, QDM appears the most capable of meeting the needs of landowners, hunters and the deer herd. As such, involvement in QDM increased significantly during the project and was the most common management approach used in Tasmania at the end of the project.

4.2.4 Hunter Management Strategies

After an appropriate *deer* management strategy has been selected, an appropriate *hunter* management strategy should also be selected. Two important issues to consider are whether to use an organised group of hunters or individual hunters and what type of fee access system (year around, seasonal or daily) is most appropriate.

Organised Hunting Groups vs. Individual Hunters

To achieve the objectives of a PBGMP, hunting clubs or organised groups of hunters are generally preferable to individual hunters. Where individual hunters already have access to a property, every effort should be made to organise them into a group before seeking outside hunters. Organised hunting groups provide a stable contingent of dedicated hunters, while individual hunters are generally less dedicated and have a higher annual turnover rate. Hunting groups provide a source of cohesion between individuals which instils a sense of unity and dedication to a management program. Furthermore, organised hunting groups typically engage in annual or season-long property access agreements which fosters a sense of commitment to the property and long term outlook. Individual hunters, on the other hand, often have a "me this year" attitude. There is little incentive for these hunters to participate in a management program because they often know few other hunters on the property, may only be on the property a few days each year and may never have the opportunity to hunt on the property again. Hunting groups also have the infrastructure to perform many of the administrative duties (meeting organisation, member mailings, etc.) generally undertaken by the landowner.

Types of Fee Access Systems

There are many types of fee access systems used by landowners in Tasmania to grant hunters access to their properties for hunting. The most common systems are listed below.

1). Annual Agreements/Access Fees

Annual agreements or annual access fees are agreements between landowners and hunters which grant specific rights for activities on the landowner's property during the entire year. However, certain periods of the year, such as lambing, may be excluded. Hunting clubs or groups of individual hunters are most commonly involved in this type of arrangement. This fee arrangement typically grants hunters access to hunt a range of specified game and pest species but may also include fishing, camping, accommodation and firewood collection. The access fee is generally charged on a per hunter basis, per acre basis or on a perceived value related to the number and quality of deer and other game present on the property. Typically, greater fees can be charged for

annual access than for other arrangements. The three most commonly used approaches to annual agreements include:

- A. Gentleman's agreements
- B. Informal written agreements
- C. Formal (legal) agreements

Gentleman's agreements are verbal agreements between hunters and landowners that specify the type and level of compensation, conditions for hunting and property access and other activities allowed on the property. *Informal written agreements* are similar to gentleman's agreements except that the details of the agreement are specified in writing. *Formal (legal) agreements* are similar to informal written agreements except that the details of agreement are generally designed by a solicitor to provide a measure of protection for both the landowner and hunter. When used in conjunction with the appropriate insurance cover, this type of agreement provides the landowner with the greatest measure of legal protection available. Although gentleman's agreements are most commonly used, informal or formal written agreements are recommended. The process of defining property objectives, property rules and codes of conduct increases safety and reduces confusion, misunderstandings and the need for landowners to verbally inform each hunter of his/her responsibilities while on the property.

Advantages of Annual Agreements:

- A). Better control of trespassers through the active involvement of legal hunters throughout the year
- B). Greater degree of concern shown by hunters towards the property (provides sense of pride and commitment)
- C). Better cooperation from hunters and work crews
- D). Maximises hunting income
- E). Better quality hunting resource
- F). Provides quality recreation for a relatively large number of hunters
- G). Less time consuming for landowners compared to other fee access systems
- H). Landowners know exactly who is allowed on the property and what areas and period of year certain activities can occur

Disadvantages:

- A). Provides recreation for fewer hunters than some access systems
- B). Some hunters may begin to feel that they own the property and interfere with the landowner's management activities

- C). Hunters have access to the property during the entire year (except at certain times such as lambing, planting, etc.)

2). **Season Agreement/Access Fees**

Season agreements are similar to annual agreements except that hunters are permitted on the property only during specified hunting seasons. This may be for a single species such as deer or a combination of species such as deer, wallabies and ducks. This type of arrangement can be utilised by either hunting clubs or individual hunters.

Advantages of Season Agreements:

- A). Hunters have access to the property for specified periods only
- B). Requires little time and effort from landowner
- C). Ability for landowner to provide a quality hunting resource
- D). Landowners know exactly who is allowed on the property and what areas and period of year activities can occur

Disadvantages:

- A). Property hunting revenue is generally decreased (compared to annual agreements)
- B). Ability to control poaching is less than with annual agreements
- C). Sense of property ownership and pride is not as high as with annual agreements
- D). Provides fewer recreational hunting opportunities than annual agreements

3). **Daily Permits/Access Fees**

In this situation, landowners issue individual permits to hunters which allow hunting for a specified number of days during the hunting season. Permits can also be used to restrict hunters to specific areas (runs) of the property, although hunters can be restricted under the other access systems. Typically, the permit system maximises the hunter effort (number of hunters) on a given property. However, if the number of hunters is not wisely regulated, the hunting pressure can often exceed the capability of the herd and few bucks will reach the older age groups where "trophy" antlers are produced. The permit system therefore generally caters to the Maximum Harvest Strategy rather than the Quality Deer Management Strategy. This system is used almost exclusively for individual hunters rather than hunting groups. The fee charged per individual is generally lower under this system while the total number of hunting hours on the property is higher than under other fee access systems.

Advantages of Daily Permits:

- A). Landowners have the ability to regulate hunter numbers in specific areas during the hunting season which reduces the possibility of hunting accidents
- B). Landowners know who is on their property at all times
- C). Provides reasonable economic return from hunting
- D). Provides hunting opportunities for a larger and more varied group of hunters

Disadvantages:

- A). Most time and labour intensive fee access system
- B). Variable annual hunting income
- C). Less control over the quality of hunters
- D). Difficult to achieve objectives of a PBGMP
- E). Often leads to an over-hunted, poor quality hunting resource

4). **Guided Hunting**

Guided hunting operations cater for a small segment of the hunting community, typically those from interstate and overseas with an above average disposable income. Special amenities and services are generally associated with guided hunts including transportation, lodging, meals, guides, game processing and even entertainment. Guided operations require a high quality hunting resource with adequate numbers of mature bucks available for harvest. Intensive habitat and harvest management are often needed to achieve and maintain deer herds of this quality. This type of operation should only be considered on large properties where illegal hunting activities can be minimised.

Advantages of Guided Hunting:

- A). Substantial economic return during some years
- B). High hunter success
- C). High quality deer herd

Disadvantages:

- A). Substantial economic investment often required by the landowner
- B). Caters to the fewest number of hunters
- C). Difficult to control poaching
- D). Extremely time and labour intensive

- E). Variable annual income
- F). Often results in poor relations with neighbouring landowners and hunters
- G). Little or no wildlife/pest control by paying clients

Summary

Wild fallow deer are a valuable public resource and the key component in many PBGMPs. There are numerous approaches to managing both the deer herd and deer hunters on a given property and each has advantages and disadvantages. However, written agreements with organised hunting groups operating under a QDM program generally meet the widest range of landowner and hunter needs. This combination of approaches has the potential to provide a balanced economic return while requiring the least amount of time and labour from the landowner compared to other management options. It also ensures that the quality of the deer herd is maximised while the damage caused by deer and other wildlife is minimised. Since PBGMPs are tailored to specific property and landowner needs, they provide landowners with the best opportunity to make the wild game on their property an asset rather than a liability.

4.3 TDAC Hunter and Landowner Survey

In an attempt to better understand the two key stakeholder groups -- hunters and landowners -- the TDAC conducted the following survey in July 1994. The survey was conducted during a series of 12 meetings (11 public and 1 landowner) across Tasmania that were attended by approximately 750 landowners, hunters, deer farmers and members of the public. Several meetings attracted more than 100 people and collectively represent the largest turnout of deer hunters to date in Tasmania. Below are the results of the survey summarised by stakeholder group.

4.3.1 Hunter Survey Results

1. Sex (male/female)

Sex	No. Respondents	Percentage (%)
Male	509	99
Female	7	01
Total	516	100

2. How old are you?

Age (years)	No. Respondents	Percentage (%)
< 20	39	07
20-29	108	18
30-39	181	31
40-49	174	30
50-59	61	10
60-69	19	03
70 +	6	01
Total	588	100

3. How many years have you hunted deer in Tasmania?

Experience (years)	No. Respondents	Percentage (%)
0-2	41	07
3-5	87	16
6-10	100	18
11-20	158	28
21-30	115	20
>30	64	11
Total	565	100

4. Would you consider yourself a: (A) trophy hunter only (B) trophy hunter first, then a meat hunter (C) meat hunter only (D) other?

Hunter Type	No. Respondents	Percentage (%)
A. Trophy hunter only	96	22
B. Trophy hunter first, then a meat hunter	276	62
C. Meat hunter only	54	12
D. Other	20	04
Total	446	100

5. Do you hunt on: (A) land you own (B) land your family owns (C) land a friend owns (D) land a farmer owns (E) timber company land (F) State Forest or (G) other?

(a). Analysis of hunters with only one area to hunt.

Hunting Location	No. Respondents	Percentage (%)
A. Land you own	3	01
B. Land your family owns	8	02
C. Land a friend owns	25	06
D. Land a farmer owns	310	73
E. Timber company land	33	08
F. State Forest	30	07
G. Other	12	03
Total	421	100

(b). Analysis of hunters with two or more areas to hunt.

Hunting Location	No. Responses	Percentage (%)
A. Land you own	6	02
B. Land your family owns	13	04
C. Land a friend owns	40	14
D. Land a farmer owns	105	35
E. Timber company land	26	09
F. State Forest	100	34
G. Other	7	02
Total	297 responses from 138 respondents	

6. Have you had difficulty finding a property to hunt deer on during the past five years (1989-1994)?

Response	No. Respondents	Percentage (%)
Yes	358	63
No	206	37
Total	564	100

7. How many properties (areas) do you currently hunt deer on?

No. Properties	No. Respondents	Percentage (%)
0	16	03
1	287	51
2	165	29
3	68	12
4	10	02
5	12	02
>5	8	01
Total	566	100

8. (a). How many days do you spend deer hunting during an average year?

No. Days	No. Respondents	Percentage (%)
0-5	44	08
6-10	180	33
11-20	224	42
21-30	60	11
31-40	17	03
>40	16	03
Total	541	100

(b). How many deer hunting trips do you take during an average year?

No. Trips	No. Respondents	Percentage (%)
1-3	139	26
4-6	228	42
7-9	52	10
10-12	54	10
13-15	23	04
>15	44	08
Total	540	100

9. (a). How many deer would you estimate are on the property you hunt?

No. Deer	No. Respondents	Percentage (%)
0-100	160	41
101-200	67	17
201-300	34	09
301-400	20	05
401-500	26	07
501-1000	48	12
>1000	33	09
Total	388	100

(b). Has the number of deer on your property increased or decreased during the past five years (1989-1994)?

Status of Herd	No. Respondents	Percentage (%)
Increased	93	21
Decreased	280	64
Remained Stable	65	15
Total	438	100

10. (a). Do you currently pay a landowner to hunt deer?

Response	No. Respondents	Percentage (%)
Yes	277	49
No	283	51
Total	560	100

(b). If yes, how much (\$) do you pay?

Amount Paid (\$)	No. Respondents	Percentage (%)
1-50	112	42
51-100	58	22
101-150	54	20
151-200	30	11
201-250	7	03
>250	4	02
Total	265	100

11. (a). Do you help the landowner control vermin (browsing animals)?

Response	No. Respondents	Percentage (%)
Yes	494	89
No	64	11
Total	558	100

(b). If yes, about how many trips do you make per year for vermin (browsing animal) control?

No. Trips	No. Respondents	Percentage (%)
1-5	123	26
6-10	150	32
11-15	44	09
16-20	50	10
21-25	18	04
>25	90	19
Total	475	100

12. In the past five years (1989-1994), how many times have you hunted interstate or overseas?

(a). Analysis of all hunters.

No. Trips	No. Respondents	Percentage (%)
0	322	65
1 or more	174	35
Total	496	100

(b). Analysis of hunters with one or more trips during past five years (1989-1994).

No. Trips	No. Respondents	Percentage (%)
1	58	33
2	37	21
3	19	11
4	19	11
5	13	08
>5	28	16
Total	174	100

13. (a). Are you a member of a deer hunting club or organisation?

Response	No. Respondents	Percentage (%)
Yes	227	40
No	339	60
Total	566	100

(b). If yes, how many?

No. Deer Clubs	No. Respondents	Percentage (%)
1	170	82
2	35	16
3	2	01
4	1	01
Total	208	100

14. (a). Are you a member of any other hunting organisations?

Response	No. Respondents	Percentage (%)
Yes	89	16
No	451	84
Total	540	100

(b). If yes, how many?

No. of Other Clubs	No. Respondents	Percentage (%)
1	55	67
2	20	26
3	3	04
Total	78	100

15. (a). Have you shot any female deer in the past five years (1989-1994) either under permit or licence?

Response	No. Respondents	Percentage
Yes	374	67
No	184	33
Total	558	100

(b). If yes, how many total, under licence and under permit?

(i). Number of does taken under licence during the past five years (1989-1994).

No. Does Taken	No. Respondents	Percentage (%)
1	61	26
2	82	35
3	48	20
4	12	05
5	34	14
Total	237	100

(ii). Number of does taken under crop protection permits during the past five years (1989-1994) .

No. Does Taken	No. Respondents	Percentage (%)
1-5	99	73
6-10	16	12
11-15	7	05
16-20	3	02
21-25	5	04
>25	6	04
Total	136	100

16. How many bucks have you taken in the past five years (1989-1994) that had:

No. Antler Points	No. Bucks Taken	Percentage (%)
6 or less	15	01
7-10	110	09
11-14	559	43
15-18	437	34
19-21	116	09
22-25	45	03
>25	10	01
Total	1292 from 438 hunters	100

17. Would you like a Quality Deer Management program on your hunting property?

Response	No. Respondents	Percentage (%)
Yes	401	80
No	23	05
Unsure	77	15
Total	501	100

18. (a). How would you rate the progress of the TDAC project so far (1993-1994) on a scale from 1-10?

Overall approval rating = 7.54 or 75%

(b). Would you support the continuation of the TDAC project?

Response	No. Respondents	Percentage (%)
Yes	473	91
No	2	01
Unsure	42	08
Total	517	100

Conclusions of Hunter Survey

Who are Tasmanian Deer Hunters?

The survey indicated that the average deer hunter in Tasmania was male between 30-50 years of age, had more than 10 years of hunting experience and nearly 40% were members of a deer hunting club or organisation. The majority (62%) were interested in both harvesting a quality buck for the wall and obtaining venison for the freezer and 80% were interested in participating in a deer management program. These results suggest that deer hunters are more involved and informed about game management and conservation than previously believed.

A national hunter survey conducted by Cause (1994) involving more than 1,400 Australian deer hunters provided additional information on hunter demographics. This survey indicated that only 4% of hunters were unemployed, well below the national average. Of the remaining hunters, approximately 50% were employed in blue collar occupations, 36% in white collar occupations and 9% were farmers. The average annual household income of respondents was between \$20,000-40,000. The study further indicated that approximately 27% of hunters had completed grade 12 and 17% had a university or vocational qualification; both of which are above the national average. Both surveys indicate that the average deer hunter is mature, experienced, involved and possesses an above average level of education and an above average household income.

Where do Tasmanian Deer Hunters Hunt Deer?

The survey revealed that the majority of deer hunting in Tasmania occurs on private land. An analysis of hunters with only one property on which to hunt deer revealed that 82% hunted on private land, 15% on State forest, Crown land or timber company land and 3% on other lands. This compares to 55% private land, 43% State forest, Crown land, or timber company land and 2% other lands for hunters with two or more properties or areas on which to hunt deer. This finding suggests that many hunters are using State forest and Crown land as a "backup" and means of increasing their time afield and opportunity to harvest a deer. This is supported by the finding that 63% of hunters reported having difficulties locating private properties on which to hunt deer during the past five years. These results suggest that the demand for deer hunting currently exceeds the availability of properties on which to hunt deer.

The survey also indicated that approximately 50% of deer hunters pay a landowner to hunt deer and this percentage is increasing. Hunting access fees during the project ranged from \$0-\$250.00+ per annum with an average of about \$100-\$125. In addition to a monetary payment, 89% of deer

hunters reported participating in browsing animal control programs on their hunting properties by making an average of 6-10 trips for pest control per year.

4.3.2 Landowner Survey Results

1. (a). How many deer would you estimate are on your property?

No. Deer	No. Respondents	Percentage (%)
1-100	22	55
101-200	8	20
201-300	3	08
301-400	3	08
401-500	2	05
501-1000	1	02
>1000	1	02
Total	40	100

(b). Has the number of deer increased or decreased during the past five years (1989-1994)?

Status of Herd	No. Respondents	Percentage (%)
Increased	19	51
Decreased	8	22
Remained Stable	10	27
Total	37	100

2. How many people currently hunt deer on your property?

No. Hunters	No. Respondents	Percentage (%)
1-10	19	53
11-20	7	19
21-30	5	14
31-40	1	03
41-50	0	0
51-100	2	06
>100	2	06
Total	36	100

3. Have you experienced an increased demand by hunters during the past five years (1989-1994) for deer hunting opportunities?

Response	No. Respondents	Percentage (%)
Yes	24	61
No	14	36
Remained Stable	1	03
Total	39	100

4. (a). Are you currently involved with a deer management program for your property?

Response	No. Respondents	Percentage (%)
Yes	22	45
No	18	55
Total	40	100

(b). If no, would you be interested in learning more about a deer management program?

Response	No. Respondents	Percentage (%)
Yes	10	36
No	11	39
Unsure	7	25
Total	28	100

5. Do you currently charge hunters to hunt deer on your property?

Response	No. Respondents	Percentage (%)
Yes	8	21
No	31	79
Total	39	100

6. On a scale from 1-10, how would you rate the damage done to your crops, trees and paddocks by the following animals?

Species	Average Level of Damage (1-10)
Brushtail possums	8.1
Wallabies/kangaroos	7.4
Fallow deer	4.7
Rabbits/hares	3.5

Conclusions of the Landowner Survey

The results of the survey indicated that 75% of landowners believed they had fewer than 200 deer on their property compared to only 58% of hunters who reported having fewer than 200 deer on the property they hunted. It is interesting that landowners reported a lower number of deer when over half (51%) stated that their deer herds were increasing while less than one quarter (21%) of hunters reported increasing deer numbers. Clearly, estimates of deer numbers are influenced by personal perception. The majority of landowners (72%) reported having fewer than 20 deer hunters on their property although 12% had more than 50 hunters. Another interesting finding was that only 21% of landowners reported charging hunters for property access while nearly 50% of hunters reported paying for such access.

When asked to estimate the level of property damage caused by browsing animals on a scale from 1-10 (with 10 being extensive damage), landowners rated brushtail possums highest with a score of 8.1 followed by wallabies/kangaroos (7.4), fallow deer (4.7) and rabbits/hares (3.5). These results suggest that the majority of browsing damage within the deer range is caused by native, rather than introduced species.

4.4 Changes to the Hunting Season, Licence and Regulations

Following the results of the first year (1994) of the statewide data collection program, it was evident that changes to the hunting season, licence and regulations were necessary to improve the quality of the deer herd and provide more flexibility within management programs. In response, the TDAC developed a range of options for possible changes which were presented to hunters, landowners, deer farmers and the public during the series of public meetings held in July 1994 when the TDAC Landowner and Hunter Survey was conducted (see Section 4.3).

At these meetings, the results of the 1994 data collection program were presented and ballot forms were distributed to all in attendance. Listed on the ballot form were five hunting season options, two hunting licence options and two hunting regulation change options. The advantages and disadvantages of each option were discussed at length after which each attendee was given the opportunity to vote. It is believed that this was the first time that hunters and landowners in Australia had ever had the opportunity to vote on changes regarding the future management of wild deer. A positive result was that all groups voted the same on all issues. All of these recommendations were accepted by the Tasmanian Government and implemented prior to the 1995 male deer season. The end result was a more flexible and equitable system that enabled landowners and hunters to better achieve their management objectives. Below is a breakdown, by community group, of the those who attended the meetings and voted on the changes.

Community Group	Number Attending	Percentage (%)
Hunters	612	83
Landowners with deer	46	06
Deer farmers	27	04
Other*	52	07
Total	737	100

* The category "Other" includes the general public, landowners without deer and un-labelled ballot forms.

4.4.1 Hunting Season Options

Below are the options for changes to the male and female deer hunting season presented to those who attended the series of public meetings held in 1994. Also listed are the advantages and disadvantages of each option.

1. **No change. Maintain the current hunting season for both bucks and does.** (note: in 1994 the hunting season for bucks was a four week season from late February to late March and the season for does was a five month season from early May to late September).

Advantages:

- A. The traditional buck season remains in place (meat and cape quality is high).
- B. The long doe season allows landowners the opportunity to use licenced hunters for doe control over a longer period of the year rather than relying solely on crop protection permits.

Disadvantages:

- A. Hunters must harvest a buck, regardless of size, during the male deer season to have venison or wait three months for the doe season to begin.
- B. The long doe season allows hunters to legally be in the bush with high-powered rifles for five months of the year. Anecdotal evidence suggests that many are shooting bucks and more than one doe during this period.
- C. On some properties, too many does are being shot. However, regardless of season length, this is ultimately up to the landowner to decide.

2. **Leave the current buck season alone but completely close the doe season.**

Advantages:

- A. The traditional buck season remains in place (meat and cape quality is high).
- B. No doe season might increase the number of deer on a few fringe properties, but many landowners would simply obtain more crop protection permits or suffer extensive crop damage.

Disadvantages:

- A. Hunters must harvest a buck during the season to have meat, or get a crop protection permit. There is no incentive for hunters to pass young bucks because they will go without meat if they do.
- B. All does would be taken under crop protection permits which would allow a minority of hunters to shoot the majority of the does.

3. **Leave the current buck season alone but allow does to be taken during the last two weeks of the buck season. A second 3-4 week doe season would also take place in May or June.**

Advantages:

- A. The traditional buck season remains in place (meat and cape quality is high).
- B. The overall length of the doe season is reduced from five months to six weeks which reduces the illegal take of both bucks and does and allows some fringe properties to increase deer herds.
- C. It allows both the trophy hunter and meat hunter the opportunity to shoot a doe for meat rather than a young buck. This would increase the number of trophy bucks available to hunters.
- D. More young bucks would be left for the rut which would increase the competition for females and ensure long term herd quality.
- E. This option would help disperse the large doe herds in March and again in May-June which would help reduce crop damage during these critical times for farmers.

Disadvantages:

- A. A large number of bucks would still be taken before the rut.
- B. A few large properties would still have to get crop protection permits to control does during the rest of the year. As a result, it might slightly increase demand for permits as compared with the current season.

4. **A five week season for both bucks and does after the rut beginning in July.**

Advantages:

- A. Maximises herd quality by allowing all bucks to participate in the rut. This would increase the competition for does and allow the dominant bucks to do the majority of the breeding.
- B. Hunters would not have to endure flies and hot temperatures while hunting.
- C. Does and bucks would be hunted together, allowing hunters to be selective.
- D. The threat of fires would be reduced for landowners.
- E. The meat condition of does is optimum at this time.

Disadvantages:

- A. Meat and cape quality of bucks would be reduced.
- B. In the short term, poaching both before and during the rut might increase.

5. **Total de-regulation. Continuous open season with sex or age restrictions or bag limits.**

Advantages:

- A. Benefits landowners who wish to eliminate or greatly reduce deer numbers.
- B. Benefits a small number of properties which might want to selectively harvest animals during the entire year.

Disadvantages:

- A. Could cause a significant reduction or even the extirpation of some deer herds in Tasmania.
- B. Many others, too numerous to list.

Results

Listed below is a breakdown of the total number of votes, by community group, received for each option. Participants who selected more than one category (e.g., landowner with deer and hunter) were given a vote in each group.

Community Group	Option 1	Option 2	Option 3	Option 4	Option 5
Hunters	36 (06%)	17 (03%)	391 (64%)	165 (27%)	0 (0%)
Landowners with deer*	(06%)	(08%)	(47%)	(08%)	(31%)
Deer farmers	3 (11%)	0 (0%)	18 (67%)	4 (15%)	2 (07%)
Other	1 (02%)	2 (04%)	39 (76%)	8 (16%)	1 (02%)

* Due to the poor attendance at the landowners only meeting held in Ross (see Section 4.3), two concessions were made for landowners including: (1) the option to vote by mail and (2) the ability to rank the five options in order of preference from 1-5 instead of selecting only the most preferred. Consequently, a different method of analysis was used. The figures listed above for landowners represent the percentage of the total number of points accrued for each option.

The preferred hunting season option (Option 3) consisted of a four week buck season in March that allows does to be taken during the last two weeks followed by a second one month doe-only season beginning in May. This change allows hunters to harvest a doe during the buck season which they were previously not allowed to do. It is believed that over time many hunters will take advantage of this opportunity and elect to shoot a doe for meat instead of a young buck. This season change benefits landowners by helping disperse the large doe herds before they begin congregating on pasture and crops during April and May. It should be noted that none of the season options presented affected a landowner's ability to obtain crop protection permits.

4.4.2 Hunting Licence Options

Below are the options for changes to the hunting licence presented to those attending the meetings.

Options:

1. No change. Keep the separate \$30 licence for both bucks and does.
2. Combine the separate hunting licences for bucks and does into a single "deer" licence but reduce the combined price for the licences from \$60 to \$45. This licence would allow hunters to take one buck and one doe during the legal seasons.

Community Group	Option 1	Option 2	No Response	Total
Hunters	69 (11%)	540 (88%)	3 (01%)	612
Landowners with deer	15 (33%)	27 (59%)	4 (08%)	46
Deer farmers	7 (26%)	18 (67%)	2 (07%)	27
Other	6 (12%)	45 (86%)	1 (02%)	52
Total	103 (14%)	630 (85%)	11 (01%)	737

The hunting licence option chosen by all groups was Option 2. This option consisted of a combined hunting licence for both bucks and does. With this option, hunters purchase a single deer licence for \$45 that allows them to harvest one buck and one doe. Prior to this change, the male and female licences were sold separately for \$30.00 each. The purpose of this change was not to save \$15 for those who purchased both licences, but rather to implement a strategy that would slowly change the mentality of "buck only" hunters. As long as buck licences were sold separately, the belief that any buck, no matter how young, was preferable to a doe would have been perpetuated. If these "buck only" hunters were required to purchase a licence that includes a doe tag, it was hoped that many would eventually elect to take a doe instead of a young buck. The combined hunting season and combined hunting licence go hand in hand and provide the mechanism for an improvement in deer herd quality.

4.4.3 Hunting Regulation Options

Below are the hunting regulation change options presented to those attending the public meetings.

1. **(yes/no) With a permit from Parks and Wildlife, anyone, even without a medical disability, can sever the body of their deer for transport out of the bush.**

Results (regulation 1):

Community Group	Yes (support)	No (reject)	No Response	Total
Hunters	554 (91%)	52 (08%)	6 (01%)	612
Landowners with deer	26 (56%)	15 (33%)	5 (11%)	46
Deer farmers	22 (82%)	3 (11%)	2 (07%)	27
Other	41 (79%)	9 (17%)	2 (04%)	52
Total	643 (87%)	79 (11%)	15 (02%)	737

2. (yes/no) Change the term "female deer" to "antlerless deer" in the Regulations. This would allow mistakenly shot buck fawns to be utilised rather than left in the field to waste.

Results (regulation 2):

Community Group	Yes (support)	No (reject)	No Response	Total
Hunters	442 (72%)	162 (26%)	8 (01%)	612
Landowners with deer	27 (59%)	15 (33%)	4 (08%)	46
Deer farmers	18 (67%)	8 (29%)	1 (04%)	27
Other	35 (67%)	15 (29%)	2 (04%)	52
Total	522 (71%)	200 (27%)	15 (02%)	737

Both hunting regulation changes were supported by the vast majority of all groups. Regulation change 1 enables hunters to sever the body of their deer to enable transport out of the bush or to be packed away in cool storage to prevent spoilage while away from their primary residence. Prior to this change, only hunters with a medical disability could obtain such a permit.

The second regulation changed the term "female" deer to "antlerless" deer in the hunting regulations. The definition of an antlerless deer is one without hardened antler on its head. This change allows mistakenly shot buck fawns to be tagged as does and utilised for meat rather than left in the bush. Research from other deer herds indicates that, on average, approximately 5-10% of animals shot as does are in fact buck fawns. This means that prior to this change, a substantial

number of mistakenly shot buck fawns were left in the field to waste. This change only covers buck fawns, not spikies, and in no way condones the harvest of buck fawns.

4.5 Policies on Live Capture, Release and Importation of Mesopotamian Fallow Genetic Material

During the first two years of the project, the issues of live capture and release of European fallow deer and the possible importation of Mesopotamian fallow (*Dama dama mesopotamica*) genetic material (semen and live animals) proved among the most contentious and difficult to resolve. As a result, the TDAC consulted widely and developed the following policies.

4.5.1 Policy for the Live Capture of Wild Deer

Policy:

The TDAC supports the live capture of wild deer for a three year trial period beginning in 1995 under a property-based game management plan if the following conditions are met:

General conditions:

1. Where it can be demonstrated that the wild herd can sustain the removal of female deer.
2. Where recreational hunting for both male and female deer remains a major component in an overall deer management strategy.
3. Where live capture serves as a substitute for culling under crop protection permits.
4. Where the number of deer available for capture does not exceed 50% of that which can be considered reasonable under crop protection permits.
5. Where the property agrees to limit live capture (upon approval) to no more than two years of the three year trial program.
6. Where the trapping program is overseen by the appropriate Government departments or appointed persons.

Conditions on landowners and hunters:

Landowners and hunters will be required to:

1. Have an approved property-based game management plan.
2. Have the number of deer for live capture approved during each year of the capture program.
3. Have an approved deer capture permit from the Parks and Wildlife Service.

4. Pay the designated royalty fee (to be decided at a later date).
5. Undertake live capture operations only during the period from 13 June - 31 August during the year approved.

Requirements on the deer to be captured:

1. Only female deer are to be kept. All males must be released immediately.
2. All female deer kept must be marked for future identification.
3. No deer may be slaughtered for a period of 12 months following capture. This restriction does not prevent captured deer from being sold, but not for the purposes of slaughter, during this period.

4.5.2 Policy for the Release of Farm Deer into the Current Deer Range

Policy:

The TDAC supports the release of farmed deer into the current deer range for the purposes of herd establishment and improvement for a three year trial program beginning in 1995 under a property-based game management plan if the following conditions are met:

Landowners and hunters will be required to:

1. Have an approved PBGMP.
2. Have their management plan approved during each year of the release program.
3. Have the support of the majority of surrounding landowners.
4. Have an approved deer release permit from the PWS.
5. Comply with appropriate DPIF regulations.

Requirements on the deer to be released:

1. All must be adequately treated to ensure they are free from any diseases or parasites which may pose a health risk to the existing wild herds. The treatment protocol includes a single treatment for liver flukes (*Fasciola hepatica*) with FASINEX (Triclabendazole) at 10mg/kg and a single treatment for lungworms (*Dictyocaulus viviparus*) and a wide range of both abomasal and external parasites with CYDECTIN (Moxidectin) at 10ml per 100kg (@ 5mg/ml) or 0.5 mg/kg. Following treatment, all animals must be held for a minimum of 10 days.
2. All antlered male deer (1.5 years old or older) must be released during the period from 13 June - 31 October during the year approved. Other deer may be released at any time.

3. The number of deer to be released will be decided between the landowner and his/her hunters. In cases of dispute, the TDAC will make the final decision regarding the number.
4. The frequency of release will be decided between the landowner and his/her hunters. In cases of dispute, the TDAC will make the final decision regarding the frequency.
5. Female deer of any age may be released.
6. Only male deer 2.5 years old or younger may be released.
7. The removal of antlers prior to release is advised but not mandatory.
8. The marking of animals (i.e. ear tags or marks) prior to release is advised but not mandatory.

4.5.3 Policy on the Importation of Mesopotamian Fallow Genetic Material

The issue of possible importation of Mesopotamian fallow deer genetic material (live deer and semen) proved particularly difficult to address because they are considered extinct in the wild and scant data are available on their biology and ecology. While it is still unclear, current taxonomy lists *D. d. mesopotamica* as a subspecies of *D. dama*. The primary advantage of this subspecies is the increased body weight which many deer farmers believe would increase the productivity of their farming operations.

Differences thought to exist between *D. mesopotamica* and *D. dama*:

1. *D. d. mesopotamica* are approximately 15-20% heavier than *D. dama* at maturity.
2. *D. d. mesopotamica* breed and fawn 4-8 weeks earlier than *D. dama*.
3. *D. d. mesopotamica* have numerous undesirable antler characteristics including, short brow tines, short main beams, little or no palm and a flattened (fan-shaped) portion of the main beam adjacent to trez tine.
4. *D. d. mesopotamica* are larger and more aggressive than *D. dama* and would likely outcompete them for breeding duties in the wild.
5. *D. d. mesopotamica* and *D. dama* readily hybridise.
6. *D. d. mesopotamica* females commonly produce twin fawns while *D. dama* rarely do.

Hunter Opposition:

1. If *D. d. mesopotamica* escaped into the wild, their larger body size and more aggressive behaviour could enable them to outcompete *D. dama* for breeding duties and eventually "pollute" the gene pool causing antler quality to decline.
2. Tasmania could lose its reputation for having one of the purest wild fallow deer herds in the world.
3. Tasmania could lose significant revenue from local, interstate and overseas hunters.

4. Tasmanian trophy heads could become ineligible for Douglas scoring and registration in the record books because they would not be pure *D. dama* taken under free range conditions.
5. Available data suggest that hybrid fawns would be born 1-2 months earlier than *D. dama* which would increase their risk to mortality from hypothermia.
6. The disease resistance of the hybrids is unknown.

Landowner, Parks and Wildlife Service and Forestry Tasmania Opposition:

1. The larger bodied, more aggressive Mesopotamian fallow deer would eat more and cause more damage to agricultural crops and young trees.
2. *D. d. mesopotamica* are capable of inhabiting more mountainous habitats including many of the World Heritage and traditional forestry areas not currently inhabited by deer.
3. European fallow almost never produce twin fawns while twinning is common in *D. d. mesopotamica*. Therefore, if they became established in the wild, the reproductive rate of the state's herd could substantially increase.

Deer Farmer Opposition (from a few individuals):

1. Tasmania would lose its reputation for having the finest pure captive fallow deer herd in the world, making marketing even more difficult.
2. Lowered antler production potential from hybrids (trophy production and velveting) may not justify gains in body weight.

Conclusions:

Due to the potential risks to the wild herd and to the agricultural and forest industries, the majority of TDAC member organisations opposed the introduction of all Mesopotamian fallow genetic material. The individual positions of each organisation are as follows:

Opposed

Tasmanian Parks and Wildlife Service
Forestry Tasmania
Hunting organisations

In Favour

Deer Farmers Council of Tasmania
Tasmanian Farmers and Graziers Association*

* *Would support only if the negative effects on the wild herd could be discounted.*

Policy

The TDAC will remain opposed to the introduction of all Mesopotamian fallow genetic material until such time a scientifically-valid study examining the potential risks and benefits has been completed. Only following the completion of such a study and a review of the results will the TDAC re-examine this policy.

Due to the potential benefits to the deer farming industry, the TDAC agreed to consider supporting a research project to examine the potential risks and benefits of the introduction of Mesopotamian fallow (live animals or genetic material). It was resolved that in order for the TDAC to support such a project, the following criteria must be adhered to:

1. The objectives of the project must be clearly defined.
2. Prior to the study, a comprehensive review of all published materials on Mesopotamian fallow deer should be completed.
3. The study should address the issues of body weight gains, earlier breeding and the potential negative effects on antler growth when Mesopotamian fallow are crossed with European fallow.
4. The study must be conducted for a minimum of 5-6 years to examine the effects over multiple generations.
5. The study must take place at no risk to the wild herd. The study should take place off of mainland Tasmania (possibly on King Island) or, at the minimum, under extreme security measures outside the current deer range (guidelines to be established later).
6. All study animals must be clearly marked and identifiable if they escaped into the wild.
7. Both the study design and results must be examined by a qualified panel of scientists and organisation representatives. The proposed panel would be chaired by DPIF and contain appropriate scientists, representatives from PWS, Deer Farmers Council, TFGA, TDAC and other organisations as deemed appropriate.
8. The data from the research project be collected and analysed by a suitably qualified person(s) or M.S./Ph.D. student.

4.5.4 Outcomes of the TDAC Policies

Since the above policies were developed through active consultation with major stakeholders, they were generally well received. It should be noted that while these were the policies of the TDAC, they were subject to approval, rejection or change by the relevant Government authorities (DPIF or PWS). However, all policies drafted by the TDAC during the project were accepted. The policies on live capture and release were initially drafted for a three year trial period from July 1995 to July 1998 to enable the TDAC to re-consider its position or to amend the conditions

under which these activities could take place. At the conclusion of the project, no deer had been captured from the wild and only two small releases had occurred. Both of the releases were within the existing deer range and involved six or fewer animals.

The policy on the importation of Mesopotamian fallow genetic material had not been progressed by the Deer Farmers Council at the conclusion of the project. However, during this period a few independent deer farmers had unsuccessfully lobbied the Department of Primary Industry and Fisheries (DPIF) for their importation. It is expected that these policies will be re-addressed by the TDAC and appropriate Government authorities (DPIF and PWS) at the conclusion of the trial period or at such time that a review is required.

4.6 EDUCATION PROGRAM

To address the lack of knowledge by stakeholders on basic deer biology and management practices, the TDAC implemented an education program consisting of four main approaches including: (1) informative presentations, (2) popular and scientific publications, (3) "hands on" training courses and (4) field supervision/training. Each approach proved effective at conveying information to target groups.

4.6.1 Informative Presentations

Informative presentations included both formal and informal approaches and were generally accompanied with colour slides, videos or other training aids such as data collection equipment or deer products (antlers, jawbones, skins, etc.). This was the most used approach during the first two years of the project, especially for landowners and hunters. Fewer training aids were used during the later stages of the project as landowners and hunters became more knowledgeable. Below is a summary of the presentations to stakeholder groups during the project.

Group	1993/94	1994/95	1995/96	1996/97	Total
Landowner only	2	3	5	7	17
Hunter only	14	16	13	5	48
Landowner & hunter	2	9	13	15	39
Public	8	28	14	0	50
Academic/scientific	2	2	2	4	10
Other	2	2	2	4	10
Total	33	65	53	40	191

Note: Of the 191 presentations given during the project, 170 (89%) were given in Tasmania and 21 (11%) in mainland States. Below is a breakdown of mainland presentations.

Organisations	State	No. Presentations
Research Into Deer Genetics & Environment	QLD	8
Australian Deer Association	VIC, NSW, ACT, QLD	7
Field and Game Association	VIC	1
Safari Club International	NSW	1
Brisbane Valley Landcare	QLD	1
Conservation Through Sustainable Use of Wildlife Conference	QLD	1
Conservation Outside Nature Reserves Conference	QLD	1
Victorian Game Management Unit	VIC	1
Total	-----	21

Of special significance were the two scientific conferences held in Brisbane, Queensland in 1994 and 1996. The first conference, *Conservation Through Sustainable Use of Wildlife*, was significant because it was the first Australian conference to recognise the value of recreational hunting in wildlife conservation. At the conference, there were six presentations on the value of recreational hunting including four on deer hunting. Recreational hunters were also instrumental in developing several resolutions regarding the use of introduced species. The key resolutions are listed below.

Key Resolutions from the *Sustainable Use of Wildlife Conference*:

- 1). Unless a land use conflict can be demonstrated, hunting and harvesting should be permitted on public lands and encouraged on private lands.
- 2). There is a need to recognise that responsible hunting can provide conservation benefits and for this to be acknowledged in governmental land use policy.
- 3). There is a need to better quantify the reduction in feral animal density required to meet conservation objectives.

- 4). That greater recognition be given to the value of public observation and monitoring of wildlife.

4.6.2 Publications

The second element of the education program was the dissemination of information through the publication of articles in both academic and popular forums. In total, 27 articles were published including 13 in popular magazines, 12 in TDAC publications, and two in the proceedings of academic conferences. Published articles covered a wide range of topics from deer biology and management to property-based game management and hunter behaviour. This strategy proved highly effective at conveying information and "selling" the project and its objectives.

Peer Reviewed Publications:

Cleland, M., R. Bell, and B. P. Murphy. (1998). An Innovative Model for Sustainable Wildlife Management in Off-Reserve Areas. Pp. 281-286 in Conservation Outside Nature Reserves ed. G. C. Grigg, P. T. Hale and D. Lunney. Centre for Conservation Biology, The Univ. of Queensland, QLD. Australia

Murphy, B. P. 1995. Management of Wild Fallow Deer in Tasmania: a Sustainable Approach. Pp. 307-311 in Conservation Through Sustainable Use of Wildlife, ed. G. C. Grigg, P. T. Hale and D. Lunney. Centre for Conservation Biology, The Univ. of Queensland, QLD. Australia.

General Publications:

Murphy, B. P. 1997. Shots Heard Around the World: Lessons Learned From Port Arthur. *Quality Whitetails*. 4(1):26-30.

Murphy, B. P. 1996. Its Official, the Tasmania Game Management Unit is Now a Reality. *Australian Deer*. 21(4):3-4.

Murphy, B. P. 1996. Tasmanian Deer Advisory Committee Inc. Report on Illegal Hunting Activities in Tasmania. Tasmanian Deer Advisory Committee Inc. 75 Pp.

TDAC Inc. 1996. Results of the 1996 Male Deer Season. Tasmanian Deer Advisory Committee Inc. 11 Pp.

Murphy, B. P. 1996. Update on the Status, Management and Future of Red Deer in Queensland. *Guns and Game* 12:22-26.

Murphy, B. P. 1996. What do Deer See? *VICDEER - Victorian Deer Farmers Association Bull.* 4(3):22-28.

- Murphy, B. P. 1996. It's Time For a New Hunting Language. *Australian Deer.* 21(4):24-26.
- Murphy, B. P. 1995. History, Ecology and Management of Fallow Deer in Tasmania. 1995 *Australian Shooters Journal Digest.* 272 Pp.
- TDAC Inc. 1995. Results of the 1995 Male Deer Season. 10 Pp.
- Murphy, B. P. 1995. Deer Management Strategies for Landowners and Hunters. Tasmanian Deer Advisory Committee. 6 Pp.
- Murphy, B. P. 1995. Property-based Game Management - Opportunities for Landowners and Hunters. Tasmanian Deer Advisory Committee. 18 Pp.
- TDAC Inc. 1995. TDAC Inc. Newsletter No. 3. Tasmanian Deer Advisory Committee Inc. 2(2) 8 Pp.
- TDAC Inc. 1995. TDAC Inc. Newsletter No. 2. Tasmanian Deer Advisory Committee Inc. 2(1) 8 Pp.
- Murphy, B. P. 1995. The Future of Hunting in Australia. *Australian Deer.* 20(3):5-10.
- TDAC Inc. 1995. Tasmanian Deer Advisory Committee Inc. Fallow Deer Biology and Management Short Course Manual. Tasmanian Deer Advisory Committee Inc. 120 Pp.
- Murphy, B. P. 1995. Determining the Age of Deer. *Guns and Game.* 2(6):42-49.
- Murphy, B. P. 1995. Quality Deer Management 'Down Under.' *Quality Whitetails.* 2(3):18-23.
- Murphy, B. P. 1995. What do Deer See? *Guns and Game.* 2(8):20-22.
- Murphy, B. P. 1995. Our Second Season - Update on the TDAC Project. *Australian Deer.* 20(5):12-21.
- TDAC Inc. 1994. Tasmanian Deer Advisory Committee Inc. Annual Report. Tasmanian Deer Advisory Committee Inc. 18 Pp.
- Murphy, B. P. 1994. Quality Deer Management Invades the Apple Isle. *Guns and Game.* 1(4):16-24.
- Murphy, B. P. 1994. Will Quality Deer Management Work in Tasmania? *Australian Deer.* 8(6)6-10.
- TDAC Inc. 1994. TDAC Inc. Newsletter No. 1 Tasmanian Deer Advisory Committee Inc. 1(1) 8 Pp.

TDAC Inc. 1994. Results of the 1994 Male Deer Season. Tasmanian Deer Advisory Committee Inc. 11 Pp.

TDAC Inc. 1993. Tasmanian Deer Advisory Committee Inc. Official Project Statement. Tasmanian Deer Advisory Committee Inc. 2Pp.

4.6.3 TDAC Training Courses

Another key strategy of the education program was the conduct of several "hands on" training courses. The Project Officer conducted nine training courses including four two-day courses, two one-day courses and three half-day courses in addition to many 1-3 hour training sessions on individual subjects such as deer aging and data collection. The two-day course was the most intensive and most effective. This course involved 16 hours of classroom instruction and a course test. Some of the key subjects covered included deer biology, deer management, deer aging, deer vision, data collection, reproductive analysis, antler growth, Douglas Scoring, PBGM, animal rights and hunter ethics. Two courses were held in Hobart and two in Launceston. In total, 66 participants including both hunters and landowners participated in the course. A positive outcome of these courses was that many participants, armed with their new information, became more involved in the management of deer and other wildlife on the properties on which they hunted. They have also become active promoters of QDM and PBGM.

4.6.4 Field Supervision/Training

To increase the number of individuals experienced in data collection and deer management techniques and to increase the awareness of the TDAC project, the Project Officer supervised and trained many research students, biologists/scientists, work study students, data collection volunteers and others in field data collection and management techniques. The majority of training occurred during the male deer season when the Project Officer was collecting deer harvest data.

Of note was research student Brian Boyle who completed an Honour's project on fallow deer entitled *Aspects of the Biology of Fallow Deer (Dama dama) in Eastern Tasmania* while working under the guidance of the Project Officer during 1994 and 1995 (Boyle 1995). This thesis was significant because it was the first published in Tasmania exclusive to fallow deer. In addition, several interstate and overseas volunteers were trained including representatives from the Australian Deer Research Foundation (ADRF), the Australian Deer Association (New South Wales), Environment Australia (formerly the Australian Nature Conservation Agency) and two visiting professors from Norway. Collectively, these training opportunities substantially increased the knowledge and awareness of the Tasmanian deer management program.

4.7 Media, Marketing and Public Relations Program

To complement the education program, the TDAC was also active in the areas of media, marketing and public relations.

4.7.1 Media Involvement

During the course of the project, the Project Officer conducted 47 media interviews on a wide range of subjects including the TDAC Project, changes to the hunting season, licence and regulations, PBGM, QDM and the formation of the Tasmanian Game Management Unit.

Media	1993/94	1994/95	1995/96	1996/97	Total
Television	1	3	1	5	10
Radio	5	11	2	1	19
Newspaper	4	9	3	2	18
Total	10	23	6	8	47

Note: Of the 47 interviews conducted during the project, 34 (72%) were conducted in Tasmania and 13 (28%) were conducted in mainland States. The majority (11) of mainland interviews were associated with a paid consultancy agreement with the Research Into Deer Genetics and Environment (RIDGE) group that took place in 1994.

Newspaper Interviews/Articles

Tasmania

<u>Title of Article</u>	<u>Date</u>	<u>Source</u>
<i>Game Management Plans to Continue</i>	27/6/97	<i>Tas Country</i>
<i>Damage by Game Animals Curbed by Management Unit</i>	9/5/97	<i>Tas Country</i>
<i>Cleary Reveals His Game Plan</i>	4/2/96	<i>The Mercury</i>
<i>Benefits for Wild Deer Hunters and Landowners</i>	17/2/95	<i>Tas Country</i>
<i>Confidence on New Deer Regulations</i>	31/1/95	<i>The Examiner</i>
<i>Wide Interest in Deer Plan</i>	23/7/94	<i>The Advocate</i>
<i>Hunters Get Their Say in New Wild Deer Plan</i>	20/7/94	<i>The Advocate</i>
<i>Shaping Future of Deer Hunting</i>	18/7/94	<i>The Mercury</i>
<i>Hunting Season Scrutiny</i>	1/7/94	<i>Tas Country</i>
<i>New Deer Control Strategies</i>	30/5/94	<i>The Examiner</i>
<i>Management of Deer Stock is Best for All</i>	20/2/94	<i>The Examiner</i>

<i>Wild Deer Plan to be Developed</i>	15/10/93	<i>Tas Country</i>
<i>US Expert to Form Deer Plan</i>	15/10/93	<i>The Mercury</i>

Mainland

<u>Title of Article</u>	<u>Date</u>	<u>Source</u>
<i>No Reprieve for Valley Deer Herds</i>	31/10/94	<i>Brisbane Valley - Kilcoy Sun</i>
<i>Deer Herds Under Threat</i>	27/10/94	<i>Brisbane Valley - Kilcoy Sun</i>
<i>Wildlife Expert Calls on State to Change Wild Deer Policy</i>	27/10/94	<i>The Courier Mail</i>
<i>Better Management Needed for Wild Deer</i>	26/10/94	<i>Sunshine Coast Citizen</i>
<i>Conservation Group Seeks Wild Deer Management Program</i>	20/10/94	<i>Kilcoy Sentinel</i>
<i>Brisbane Valley Landcare Annual Meeting</i>	20/10/94	<i>Kilcoy Sentinel</i>
<i>Deer Hunters Defend "Undeserved" Image</i>	Date and source unknown	

4.7.2 Marketing

In an effort to raise the awareness of the project, the TDAC developed a unique logo containing an outline of buck and a doe similar to that used by the U.S. Quality Deer Management Association (QDMA). Prior permission was obtained from the QDMA to use a modified version of its logo. The TDAC emblem was printed on a wide range of merchandise including decals, hats, windcheaters, shirts and stubby holders. This merchandise was sold by mail, at selected sporting goods stores and at hunter meetings, public meetings and public events. This initiative was effective at generating additional revenue and gaining wider recognition for the TDAC project and QDM. Within a couple of years, the emblem had become recognisable by the majority of hunters and landowners in Tasmania and many mainland hunters.

A further marketing and fundraising strategy was the conduct of five balloted hunts for a range of Australian deer species. A fallow deer hunt was balloted in 1994; a red deer and a fallow deer hunt were balloted in 1995; and chital hunts were balloted in 1996 and 1997. The first three balloted hunts generated substantial public interest and income while the chital hunt in 1996 just covered costs. The further chital ballot in 1997 was purposely conducted at a loss (free tickets given) in an effort to encourage attendance at the First Annual TDAC Statewide Trophy Competition and Data Collection Day (see Section 5.2).

4.7.3 Public Relations

In addition to active involvement in media and marketing, the TDAC participated in a range of public events to help raise the awareness of the project and deer hunting in general. Perhaps most successful of these events was Agfest which the TDAC participated in during each year of the project except 1996. Agfest attracts more than 50,000 people annually and, being an agricultural show, is an appropriate venue to introduce the public to deer hunting and management. Other public relations events included the FDCT Hunting and Outdoors Expo, the Latrobe Show and the TDAC Trophy Competition and Data Collection Day. Collectively, these events proved successful in broadening public awareness of the project and deer hunting in general.

4.8 Initiatives to Reduce Illegal Hunting Activities in Tasmania

The TDAC was concerned by the persistent and widespread poaching problem and believed it had the potential to undermine much of the progress achieved during the project. In response, the TDAC held several meetings with the Minister for National Parks and Wildlife, PWS Rangers, DPIF representatives, key landowners and hunting groups to discuss possible solutions. What resulted was a multi-faceted approach involving a number of complementary strategies. These initiatives are detailed below.

4.8.1 Investigation into Wildlife Offences in Tasmania (1983-1995)

In an effort to determine the long-term trends in wildlife-related offences in Tasmania, the TDAC conducted a comprehensive review of PWS conviction records from 1983-1995. The report detailed the wildlife species involved, number of people apprehended, number of people convicted, average fine imposed and total revenue received (see TDAC Inc. Report on Illegal Hunting Activities in Tasmania, 1996). The investigation revealed the following trends.

All Wildlife:

1. A decreasing trend in the number of persons charged, number of offences and number of convictions.
2. A stable or slightly decreasing conviction rate (offences/convictions) for offenders.
3. An increasing trend in the average penalty imposed per offence.
4. A stable trend in the total revenue received from wildlife offences.
5. A great disparity in the total fines received from each species.

Deer Only:

1. A rapidly decreasing trend in the number of persons charged and convicted.
2. A stable or decreasing trend in the average conviction rate.
3. An increasing trend in the average fine imposed.
4. A decreasing trend in the total revenue received from deer offences.

Of particular interest were the results relating to deer. The number of people charged and convicted on deer related offences declined to the lowest level on record for two consecutive years during 1993-94 and 1994-95. This finding could lead one to infer that deer poaching had declined. However, as indicated by a poaching survey conducted during the same period (see Section 4.8.2), this was clearly not the case. A more likely explanation was a decreasing emphasis on deer by PWS Rangers due to their increasing responsibilities, decreasing resources and shift from enforcement to education.

The TDAC recognises that relatively few offenders would be caught even with a greatly increased effort. This highlights the need for severe penalties for those who are caught. The increasing trend in the average fine imposed for deer offences was encouraging but still far below that needed to be an effective deterrent. As long as the fines imposed are well below the value of the resource, the deterrent will prove ineffective.

4.8.2 Statewide Survey on Deer Poaching Activities

In 1995, the TDAC conducted a comprehensive statewide survey on deer poaching to determine the prevalence, severity and timing of the problem. This survey was made available to the various stakeholders at public meetings and by mail. More than 360 hunters, landowners and deer farmers completed the survey. Some of the more pertinent results are provided below.

Results of the 1995 TDAC Statewide Poaching Survey

1. Do you think that deer poaching in Tasmania during the past two years (1993-95) has (A) improved, (B) worsened, or (C) remained the same?

Response	Hunters	Landowners	Deer Farmers	Total
A. Improved	18 (18%)	5 (15%)	3 (30%)	26 (18%)
B. Worsened	24 (25%)	7 (21%)	1 (10%)	32 (23%)
C. Remained the same	56 (57%)	21 (64%)	6 (60%)	83 (59%)
Total	98	33	10	141

Summary: The results were very consistent among stakeholders with over 80% of each group reporting that deer poaching had either worsened or remained the same during the past two years. Excluding deer farmers, less than 20% of landowners and hunters reported that poaching had improved on their property during this same period. Despite the introduction of the *Guns Act 1991* and increasing penalties, these results suggested that poaching had not decreased.

2. What do you think is most needed to reduce deer poaching? (A) tougher penalties, (B) more Wildlife Rangers, (C) more people caught, or (D) education/social change.

Response	Hunters	Landowners	Deer Farmers	Total
A. Tougher penalties	62 (42%)	21 (53%)	6 (46%)	89 (45%)
B. More Wildlife Rangers	33 (23%)	6 (15%)	0	39 (20%)
C. More people caught	19 (13%)	7 (17%)	1 (8%)	27 (13%)
D. Education/social change	32 (22%)	6 (15%)	6 (46%)	44 (22%)
Total (responses)	146	40	13	199

Summary: All groups believed that tougher penalties were most needed to reduce the level of poaching in Tasmania. Landowners and hunters believed that the remaining approaches to reduce poaching were equally important. Deer farmers, however, believed that greater education and a change in social values were equally important to tougher penalties. Overall, the groups considered that increasing the number of people caught was least important which emphasises the need for stringent penalties for the few who are caught.

3. How severe a problem is deer poaching on your property? (A) major problem, (B) moderate problem, (C) minor problem, (D) no problem, or (E) not sure.

Response	Hunters	Landowners	Deer Farmers	Total
A. Major problem	32 (33%)	9 (26%)	2 (20%)	43 (31%)
B. Moderate problem	38 (40%)	14 (41%)	3 (30%)	55 (39%)
C. Minor problem	17 (18%)	9 (27%)	3 (30%)	29 (21%)
D. No problem	3 (03%)	0	2 (20%)	5 (03%)
E. Not sure	6 (06%)	2 (06%)	0	8 (06%)
Total	96	34	10	140

Summary: Approximately 70% of landowners and hunters reported that deer poaching was either a major or moderate problem on their properties. Deer farmers showed greater variation, probably because many do not have male deer in their farms or because they remove the antlers before they are fully formed which greatly reduces their attractiveness to poachers. Importantly, not a single landowner and only 3% of hunters reported that poaching was not a problem on their property. Clearly, deer poaching is a widespread and persistent problem in Tasmania.

4. When does most deer poaching on your property occur? (A) before the deer season, (B) during the deer season, (C) during the rut, (D) during the winter, or (E) not sure.

Response	Hunters	Landowners	Deer Farmers	Total
A. Before the deer season	45 (27%)	20 (33%)	1 (10%)	66 (28%)
B. During the deer season	22 (13%)	11 (18%)	2 (20%)	35 (15%)
C. During the rut	53 (31%)	19 (32%)	5 (50%)	77 (32%)
D. During the winter	40 (24%)	6 (10%)	1 (10%)	47 (20%)
E. Not sure	8 (05%)	4 (07%)	1 (10%)	13 (05%)
Total (responses)	168	60	10	238

Summary: Both landowners and hunters reported that most deer poaching occurs prior to the deer season or during the rut. Poaching was least common during the deer season and the winter when legal hunters and PWS Rangers are more likely to be present.

5. Does most poaching on your property occur during the (A) day, (B) night - after midnight, (C) night - before midnight, or (D) not sure?

Response	Hunters	Landowners	Deer Farmers	Total
A. Day	29 (24%)	12 (27%)	3 (27%)	44 (25%)
B. Night - before midnight	36 (30%)	17 (39%)	5 (46%)	58 (33%)
C. Night - after midnight	27 (23%)	9 (20%)	3 (27%)	39 (23%)
D. Not sure	27 (23%)	6 (14%)	0	33 (19%)
Total (responses)	119	44	11	174

Summary: All groups reported that the majority (53-73%) of poaching takes place at night, either before or after midnight. Interestingly, all groups reported a greater prevalence of poaching before midnight than after midnight. It is unclear whether this is related to the actual level of illegal activity or to the hours that landowners and hunter are more likely to be awake and hear the shots or see the spotlights. Irrespective, disturbance by poachers at night represents a serious problem for landowners and hunters because confronting armed violaters in the dark can be a frightening and potentially life-threatening situation.

6. During the past two years how many of the following incidents have you witnessed or found on your property? (Note: the average response for each community group below was calculated and then divided by two to provide an annual estimate. The results are therefore expressed as the average number of events witnessed per individual during a 12-month period).

Incident	Hunters	Landowners	Deer Farmers
A. No. of illegal spotlighters	0.8	2.0	0.4
B. No. of illegal trespassers	1.0	2.4	1.0
C. No. of locks, fences, gates damaged	0.5	1.6	0.5
D. No. of dead female deer found	0.4	1.4	0.6
E. No. of dead male deer found	0.9	1.9	0.5

Summary: These results were particularly disturbing since the majority of illegal activities go undetected. The average landowner in the deer range reported encountering 2 illegal spotlighters, 2.4 trespassers and finding 1.6 locks, gates, fences and other such structures damaged during an average 12-month period. Additionally, they found approximately 3.3 deer (male and female) dead on their properties under suspicious circumstances (headless bodies, shot and left, etc.). With Tasmanian devils removing much of the evidence, this figure should be considered extremely conservative. Hunters reported a lower incidence of witnessing illegal activities. This was not surprising since hunters are present on the property less frequently than landowners are therefore less likely to encounter illegal activities.

Survey Conclusions

The survey indicated that, despite the introduction of the *Guns Act 1991*, the incidence of deer poaching had remained stable or increased and took place on nearly every property in Tasmania containing deer. For example, all landowners, 98% of deer farmers and 97% of deer hunters reported that deer poaching was a persistent problem on their property. The survey further

showed that poachers cause considerable disturbance to landowners and hunters both during the day and night and are responsible for substantial damage to property structures (gates, locks, fences, etc.) and to the wildlife resource generally. Other more specific details of the survey regarding areas and times have been collated and provided to PWS Rangers in an effort to maximise the effectiveness of their limited time and resources.

4.8.3 Statewide Survey on Community Attitudes Towards Deer Offences

In an effort to determine stakeholder attitudes towards deer-related offences, the TDAC conducted a survey during a series of statewide public meetings in 1995 and also by mail. The survey allowed hunters, landowners and deer farmers the opportunity to assess a "score" to each of the potential deer-related offences under the Wildlife Regulations (1971). Each respondent was provided with a list of 29 potential deer-related offences and asked to assess a score from 1-10, with 1 being of little importance and 10 being extremely important. The responses by community group are summarised on the following pages.

Hunter Results

POTENTIAL DEER RELATED OFFENCE	HUNTERS	
	AVG	RANK
Taking an adult male deer during the closed season	9.4	1
Taking an adult male deer with the aid of a spotlight	8.9	2
Exceeding the bag limit on male deer	8.3	3
Altering a deer licence to deceive authorities	8.2	4
Buying or selling deer meat or deer products illegally	8.2	5
Taking an adult male deer during prohibited hours	8.2	6
Taking an antlerless deer during the closed season	7.8	7
Illegally exporting deer products without a permit	7.8	8
Taking an antlerless deer with the aid of a spotlight	7.8	9
Falsely representing to be a licence holder	7.7	10
Using a firearm with a silencer to take deer	7.7	11
Producing the licence of another person	7.6	12
Taking deer in a Wildlife Reserve	7.6	13
Applying for a second hunting licence in the same name	7.3	14
Lending a deer licence to another person	7.3	15
Taking an antlerless deer during prohibited hours	7.2	16
Exceeding the bag limit on antlerless deer	7.1	17
Possessing deer or deer parts illegally	6.9	18
Failing to affix a tag to an adult male deer	6.4	19
Using a dog to take deer	6.2	20
Using a low power firearm to take deer	6.2	21
Failing to affix a tag to an antlerless deer	6.1	22
Possessing hunting equipment in a Wildlife Reserve	6.0	23
Removing a deer tag	5.9	24
Using solid-jacketed military style ammunition to take deer	5.8	25
Taking deer from a vehicle	5.8	26
Damaging or defacing a deer tag	5.7	27
Removing the head or severing the body of deer without a permit	5.2	28
Taking a deer with bow and arrow	4.7	29

Landowner Results

POTENTIAL DEER RELATED OFFENCE	LANDOWNERS	
	AVG	RANK
Taking an adult male deer during the closed season	8.9	1
Buying or selling deer meat or deer products illegally	8.3	2
Taking an adult male deer with the aid of a spotlight	7.8	3
Altering a deer licence to deceive authorities	7.8	4
Taking a deer in a Wildlife Reserve	7.6	5
Taking an adult male deer during prohibited hours	7.4	6
Taking an antlerless deer during the closed season	7.2	7
Illegally exporting deer products without a permit	7.2	8
Producing the licence of another person	7.1	9
Possessing deer or deer parts illegally	7.1	10
Taking an antlerless deer with the aid of a spotlight	6.9	11
Falsely representing to be a licence holder	6.9	12
Using a firearm with a silencer to take deer	6.9	13
Exceeding the bag limit on male deer	6.8	14
Lending a deer licence to another person	6.7	15
Possessing hunting equipment in a Wildlife Reserve	6.7	16
Taking an antlerless deer during prohibited hours	6.5	17
Applying for a second hunting licence in the same name	6.5	18
Exceeding the bag limit on antlerless deer	6.2	19
Using solid-jacketed military style ammunition to take deer	6.2	20
Using a dog to take deer	6.0	21
Removing a deer tag	5.8	22
Taking deer from a vehicle	5.8	23
Failing to affix a tag to an adult male deer	5.7	24
Failing to affix a tag to an antlerless deer	5.3	25
Damaging or defacing a deer tag	5.3	26
Removing the head or severing the body of deer without permit	5.3	27
Using a low power firearm to take deer	5.2	28
Taking a deer with bow and arrow	4.3	29

Deer Farmer Results

POTENTIAL DEER RELATED OFFENCE	DEER FARMERS	
	AVG	RANK
Taking an adult male deer during the closed season	9.9	1
Taking an adult male deer with the aid of a spotlight	9.8	2
Taking an antlerless deer with the aid of a spotlight	9.8	3
Taking an antlerless deer during the closed season	9.1	4
Exceeding the bag limit on male deer	9	5
Taking an adult male deer during prohibited hours	8.9	6
Exceeding the bag limit on antlerless deer	8.8	7
Altering a deer licence to deceive authorities	8.8	8
Possessing deer or deer parts illegally	8.6	9
Taking an antlerless deer during prohibited hours	8.5	10
Buying or selling deer meat or deer products illegally	8.4	11
Falsely representing to be a licence holder	8.3	12
Taking a deer in a Wildlife Reserve	8.1	13
Producing the licence of another person	8.1	14
Using a firearm with a silencer to take deer	8	15
Illegally exporting deer products without a permit	8	16
Lending a deer licence to another person	7.9	17
Using a dog to take deer	7.7	18
Applying for a second hunting licence in the same name	7.6	19
Damaging or defacing a deer tag	7.1	20
Removing a deer tag	6.8	21
Failing to affix a tag to an adult male deer	6.1	22
Using a low power firearm to take deer	5.9	23
Failing to affix a tag to an antlerless deer	5.8	24
Taking deer from a vehicle	5.8	25
Possessing hunting equipment in a Wildlife Reserve	5.8	26
Using solid-jacketed military style ammunition to take deer	5.6	27
Removing the head or severing the body of deer without a permit	4.3	28
Taking a deer with bow and arrow	3.7	29

Survey Conclusions

The responses by all groups were remarkably consistent. Offences related to the illegal taking of deer, especially male deer, during the closed season or at night were considered the most important by all groups. This was not surprising in light of the increasing involvement in deer management programs in Tasmania that restrict the harvest of young males. This increases the number of male deer on the property and, as a result, increases the number vulnerable to poaching. The offence considered least important by all groups was taking a deer with a bow and arrow. This is likely attributed to the fact that bowhunting is legal in some mainland states and many other areas of the world.

4.8.4 Publication of Offenders Names and Fines

In 1995, the TDAC initiated a program to begin publishing the names, offences and fines of persons convicted of illegal hunting and *Guns Act 1991* offences in an effort to draw attention to these individuals in the community. These details were published in the TDAC Inc. Newsletters that were issued to all licensed deer hunters, landowners (with wild deer on their properties) and sporting goods dealers. The response to this initiative was extremely positive indicating the value of public acknowledgment. The publication of offenders names and fines also serves as a conduit for law enforcement agencies and the judicial system to send a clear message to the public that these activities are socially unacceptable and will be penalised accordingly. This initiative has been continued through the publication of *Game Tracks* magazine by the Game Management Unit within the Tasmanian PWS.

4.8.5 TDAC "DOB IN A POACHER" Program

In an effort to increase the quality of information received, and ultimately the number of people apprehended, in 1995 the TDAC introduced a program called *DOB IN A POACHER* whereby informants are eligible to receive a monetary reward (\$100) for providing information resulting in the conviction of a person or persons involved in an illegal activity relating to deer. This program was modelled after a highly successful program in the United States and is similar to the reward system used by the Tasmanian Police in their CRIMESTOPPERS program. This program increased the level of useful information received by PWS Officers and more importantly, resulted in convictions.

4.8.6 Cooperative Law Enforcement Activities

Meetings between the TDAC and PWS Rangers during the project resulted in the identification of a number of strategies to help maximise the Rangers limited time and resources. One of these strategies involved cooperative patrolling and surveillance schemes using hunters and landowners.

With only seven PWS Rangers in Tasmania, it is clear that this type of cooperation is essential, especially to properties with game management programs. Cooperative surveillance schemes were used successfully during the 1996 and 1997 deer rut and resulted in several deer-related convictions.

Other initiatives included the publishing the names and contact numbers of all PWS Officers and instructing landowners and hunters on the type of information needed when a suspicious incident is witnessed. In response, the TDAC created and distributed "suspicious incident" forms to landowners and hunters.

4.8.7 Conclusions of TDAC Initiatives to Reduce Illegal Hunting Activities

1. Fallow deer have been present in Tasmania for more than 150 years and are an important economic, recreational and social resource to many Tasmanians and an essential element in many PBGMPs.
2. The poaching of deer and other wildlife is a widespread and persistent problem in rural Tasmania.
3. In addition to the substantial impact on deer populations, many poachers also cause considerable damage to private property and unpleasant disturbances to the daily routines of landowners and hunters.
4. All stakeholders involved with deer management and control in Tasmania are genuinely concerned with the prevalence of illegal hunting activities and the illegal use of firearms.
5. A small percentage of offenders get caught which emphasises the need for severe penalties for those who are caught.
6. The fines imposed for illegal deer hunting activities during the past several years have proven inadequate as an effective deterrent.
7. The TDAC, in conjunction with the PWS, has undertaken numerous measures to reduce illegal hunting activities but needs assistance from the judicial system to achieve a greater level of success.
8. The much needed change in community attitudes towards the responsible use of firearms will require a substantial effort over an extended period of time.

The TDAC is hopeful that the law enforcement initiatives outlined in this report, in conjunction with the *Firearms Act 1996* will result in more people being apprehended and, over the longer term, to a measurable reduction in illegal hunting activities in Tasmania. However, initiatives to increase the number of people apprehended will prove largely ineffective if the fines subsequently imposed do not represent a real deterrent. The TDAC recognises that the individual circumstances of both the offender and the offence vary greatly and, consequently, the fines imposed also vary greatly. One recent initiative in wildlife offences, the confiscation of firearms, has proven to be a valuable deterrent and one that does not affect the offender's immediate financial status and his/her ability to provide basic amenities (food, clothing, etc.) to his/her family. Clearly, strategies such as those used to reduce the incidence of drink-driving and the illegal taking of crayfish and abalone have been highly successful and clearly demonstrate the value of severe penalties in changing public attitudes. The TDAC believes that a similar program is needed to reduce wildlife offences in Tasmania.

5. STATEWIDE DEER DATA COLLECTION PROGRAM

5.1 Objectives

A key objective of the TDAC project was to implement a comprehensive statewide deer data collection program that would provide reliable biological information on the wild herd from which to base future management decisions. The program had the following objectives:

1. To obtain reliable biological data on the wild fallow deer herd in Tasmania.
2. To establish a practical, cost-effective and ongoing research program.
3. To actively involve landowners and hunters in the program.
4. To identify segments within the total deer range which had unique characteristics or required specific management guidelines.
5. To utilise the information obtained from this program to prepare a practical, strategic management plan for the wild herd that most closely meets the needs of the Tasmanian community and maximises the biological, social and economic potential of the herd.

5.2 Methods

To achieve the above objectives, the TDAC implemented a statewide data collection program prior to the 1994 male deer season. The program officially ran from 26 February 1994 to 15 June 1997 but has been continued beyond the project by the Game Management Unit. A standardised data collection form containing instructions and illustrations was developed and distributed to deer hunters when they purchased a deer hunting license. Additional forms were made available through hunting clubs, at public meetings and at data collection stations established on several properties. Throughout the project, data were collected by hunters, data collection volunteers and the Project Officer. Additionally, University research student Brian Boyle assisted in data collection throughout the northeastern portion of the deer range in 1994 and 1995. Confidentiality of hunters' names and the properties on which their deer was harvested was paramount to the success of the project. In nearly every case, the Project Officer was the only person with access to specific property and/or hunter information. To ensure consistency of the data collected, the Project Officer conducted numerous training sessions throughout the study for hunters and research volunteers.

Information Collected on Both Male and Female Deer

Hunter's Name - The name of the person who harvested or found the deer.

Date - The date on which the deer was harvested or found.

Property or Area Harvested - The property or area where the deer was harvested or found.

Deer Sex - Male or female.

Age - The age of the deer harvested. For consistency purposes, the Project Officer determined the age of all deer reported in the study. Consequently, hunters were asked to provide one or both lower jawbones to the Project Officer. Hunters accomplished this in many ways including sending their jawbones through the mail, personally delivering them to the Project Officer or leaving them at property data collection stations, participating taxidermist shops or with designated data collection volunteers. Additionally, during the first two years of the project (1994-95), the Project Officer collected many jawbones from hunters at their residence.

Coat Colour - In Tasmania, fallow deer occur in four main colour varieties including black, white, red (common) and menil. A much less common colour form, brown or "dun", is also present. During 1994, all five colour varieties were listed on the data collection form. However, due to difficulties encountered by hunters in differentiating brown animals from lightly coloured black animals, the brown colour option was removed from the data collection form in 1995. All browns reported in 1994 were included as blacks in the data analysis.

Black - This colour variety is predominantly dark brown or black on the back, buttocks and tail with indistinct spots visible on the upper body of many individuals. The neck, lower flanks and underparts are generally light brown (mushroom) to grey in colour.

White - This colour variety is uniformly white or cream coloured throughout. The majority of white fallow deer are cream to light red in colour at birth and become completely white by 2.5 years of age. This colour should not be confused with albinos which are extremely rare in fallow deer. Unlike albinos, white fallow deer have normal eye pigmentation although their hooves and nose are less pigmented than those of other colour varieties.

Red - This colour variety, referred to in many other countries as "common", is predominantly light brown to red in colour with a black dorsal stripe extending from the base of the neck to the tip of the tail and also marks the buttocks on either side of the tail. The majority of red animals have distinct white spots visible on the upper body, although the spots are barely visible on some individuals. The underparts and rump on this variety are uniformly white.

Menil - This colour variety is similar to red but is lighter in colour, has more distinct white spots on the upper body and a light brown (as opposed to black) dorsal stripe down the back, tail and around the buttocks. The colour of the dorsal stripe is the easiest way to

differentiate reds from menils. As with reds, both the underparts and rump are uniformly white.

Live weight - Weight of the carcass fully intact.

Field dressed weight - Weight of the carcass with the stomach and internal organs removed but the skin, legs and head still attached.

Chest girth measurement - Circumference measurement taken at the deepest point of the chest just posterior to the front legs essentially in line with the heart.

Information Collected on Male Deer Only

In addition to the above information, the following antler measurements were collected on male deer. The definitions and techniques used for these antler measurements were the same as those used under the Douglas Score system, except that they were taken in millimetres (rather than inches) and were simplified for easier understanding.

Number of antler points - Number of antler points on each antler which can support a ring when the antler is held in any position.

Smallest beam circumference - The smallest circumference on the main beam of the antler between the brow and trez tine.

Antler spread - The maximum outside spread of the antlers including the points.

Antler span - The maximum inside spread of the antlers.

Antler length - The length of the antler from the bottom of the coronet to the upper extremity of the antler.

Palm width without points - The widest portion of intact palm growth (excluding the palm points) below the deepest top crutch.

Quality Score - The Quality Score is an approximation of the Douglas Score - the score most commonly used by Tasmanian hunters to compare overall antler quality. For simplicity and consistency purposes, many of the measurements required for a true Douglas Score were not included on the data collection form used in this study. As such, Quality Scores were calculated only from the measurements required on the data collection form. The Quality Score model was

created using data from 100 bucks officially scored under the Douglas System. Various mathematical “weights” were given to each measurement required on the data collection form until the model most closely predicted Douglas Score. The model used is as follows:

$$\text{Quality Score} = \{ \text{Average Antler length} + \text{Antler Span} + (\text{Average Palm width} \times 5) + (\text{Average Beam Circumference} \times 5) + (\text{Antler Points} \times 1.5) \} \times 0.825$$

Although less than half of the Douglas Score measurements are used in calculating the Quality Score, the final scores were generally within 10 points. Consequently, the Quality Score was a reliable estimate of the Douglas Score and a useful means of assessing overall antler quality and communicating with hunters.

Deer Season Dates:

Listed below are the dates of the deer season during the project.

1994	Adult male deer	26 February - 27 March
	Female deer	7 May - 25 September
1995	Adult male deer	25 February - 26 March
	Antlerless deer	11 March - 26 March and 6 May - 11 June
1996	Adult male deer	2 March - 31 March
	Antlerless deer	16 March - 31 March and 11 May - 16 June
1997	Adult male deer	1 March - 30 March
	Antlerless deer	15 March - 30 March and 10 May - 15 June

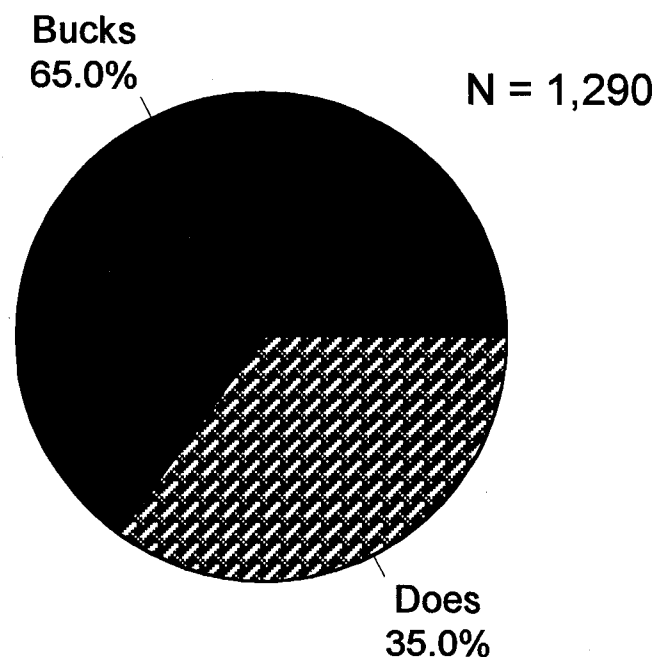
During the project several changes were made to the hunting season and regulations, particularly in regard to antlerless deer (see Sections 4.4.1-4.4.3). In 1995, following a public vote held in 1994, the term “female deer” was changed to “antlerless deer” and the total length of the season was reduced from five months to six weeks and split into two periods. A further change was made in 1996 when both the adult male and antlerless deer seasons were moved one week later. This change benefited both the hunters and the herd. The later male season enabled hunters to hunt one week closer to the rut in April when older bucks become more active. The later antlerless season in March gave late-born fawns an extra week of growth before their dam (mother) could

potentially be harvested. The later May antlerless season allowed the herd to complete the majority of rutting activity before being disrupted by hunters.

5.3 Statewide Deer Results

The following results include all deer reported during the statewide deer data collection program from 1994-1997. However, at the end of the 1993 doe season, prior to the introduction of the data collection program, 10 does were harvested by hunters in conjunction with the Project Officer to obtain some baseline information. Consequently, the results presented for "all deer" and "does" include information from 1993-1997 while the results presented for "bucks" include information from 1994-1997. Although slight increases were observed in body weights and certain antler measurements during the more favourable growing seasons of 1996 and 1997, the results did not differ significantly from those in 1994 and 1995. As a result, the data were pooled for the entire study period.

5.3.1 Breakdown of the Statewide Deer Harvest by Sex



Above: The breakdown of the statewide deer harvest from 1993-1997 by sex.

A total of 1,290 deer, including 838 bucks and 452 does, were reported by 696 hunters from 1993-1997. The average participating hunter during the project reported 1.8 deer, including 1.2 bucks and 0.6 does.

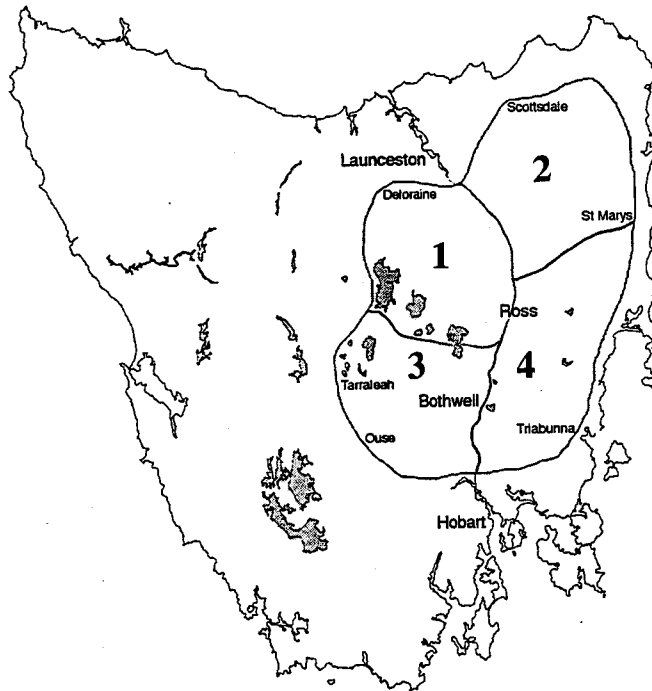
5.3.2 Statewide Deer Harvest by Year

Year	Bucks	Does	Total
1993	0	10	10
1994	234	87	321
1995	210	210	420
1996	180	87	267
1997	214	58	272
Total	838	452	1290

Above: The breakdown of the statewide deer harvest by year.

The total number of deer (bucks and does) reported during each year of the study was reasonably consistent except in 1993 and 1995. Only 10 does were reported in 1993 because this occurred prior to the implementation of the statewide data collection program in 1994. The number of does reported in 1995 was substantially greater than any other year due to the extensive doe culling operations that took place in response to the severe droughts in 1994 and 1995. The slightly lower number of doe samples in 1997 was due to the conclusion of the TDAC project and the need to complete this report. Additional doe samples were received after the 1997 season, but due to time constraints, could not be included in this report.

5.3.3 Deer Management Regions



Above: The Deer Management Regions (DMRs) used in the study.

In order to detect regional differences in deer herd characteristics, the deer range was divided into four Deer Management Regions (DMRs). For ease of definition, DMR boundaries were defined by major roads rather than specific herd characteristics. However, the deer herds within these areas originated from fairly distinct stocking sources and are largely confined by geographical features (mountains, major roads, etc.). Therefore, little mixing occurs between herds and they can generally be considered separate populations. DMR 1 (Northwest) is the area west of the Midlands Highway and north of the road from Tunbridge west to the Lake Highway, north to the southern tip of Great Lake and south to Bronte Park. DMR 2 (Northeast) is the area east of the Midlands Highway and north of the Avoca Highway to St Marys. DMR 3 (Southwest) is the area west of the Midlands Highway and south of DMR 1. DMR 4 (Southeast) is the area east of the Midlands Highway and south of DMR 2. With the exception of DMR 2 where deer numbers are lower, it is estimated that there are roughly equivalent numbers of deer in each region. However, within DMRs deer populations vary greatly with relatively few properties accounting for the majority of deer within the region.

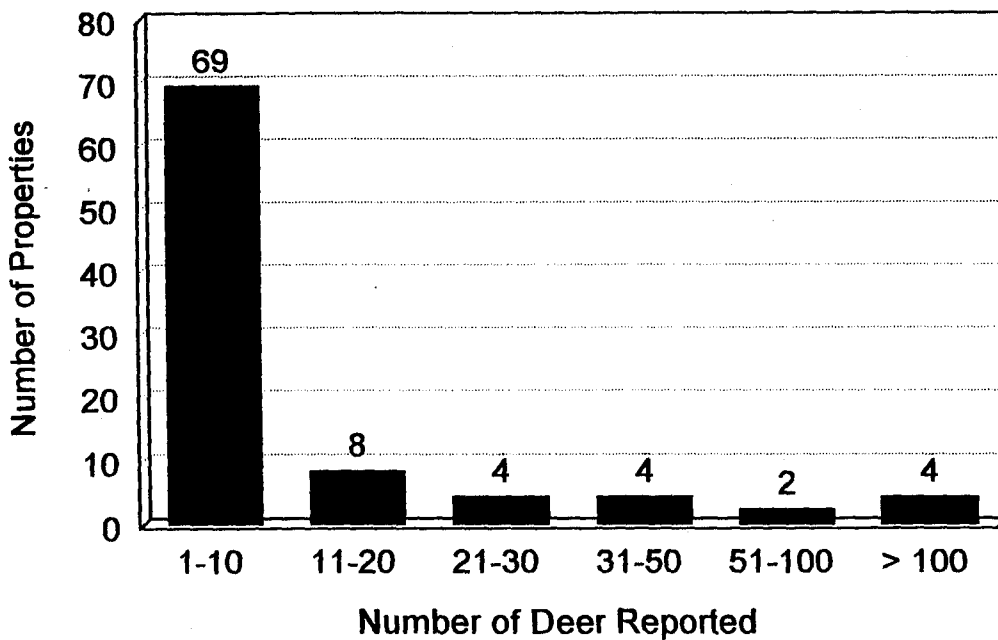
5.3.4 Statewide Deer Harvest by Region

Region	Bucks	Does	Total
1	201	238	439 (34%)
2	109	36	145 (11%)
3	180	59	239 (19%)
4	342	106	448 (35%)
Unknown	6	13	19 (01%)
Total	838	452	1290

Above: The breakdown of the statewide deer harvest by region.

The total number of deer reported from each DMR varied considerably from 145 in DMR 2 to 448 in DMR 4. Although the total number of deer reported for DMR 1 and DMR 4 was similar, there was a considerable difference in number of each sex reported. DMR 4 reported substantially more bucks than any other region. This was due primarily to a greater level of participation in the data collection program by properties in this region rather than a greater number of bucks harvested. Additionally, during the first two years of the study (1994-95), the majority of properties in this region did not actively protect 2.5 year old bucks which increased the number taken. DMR 1 was the only region to report more females than males, whereas the other DMRs reported approximately three times as many males as females. DMR 2 reported the fewest number of both male and female deer due in part to a lower total deer population but also to a relatively low participation rate by properties in the region. The number of deer reported for each DMR generally reflected the population in that area except for DMR 3 which was under represented due to a general lack of participation by many properties in the region, particularly those with large deer herds.

5.3.5 Property Distribution of the Statewide Deer Harvest



Above: The property (or area) distribution of the statewide deer harvest.

During the study, deer were reported from 91 different areas including 79 private properties and 12 areas of State Forest or Crown land. However, the number of deer reported was not equally distributed among properties (or areas). The majority of properties (69) (76%) reported 10 or fewer deer while 6 (6%) reported more than 50. In fact, the 6 properties that reported more than 50 deer accounted for 62% of all deer reported during the study. This was not surprising because these properties had among the highest numbers of deer and deer hunters in the State. Therefore, it is believed that the data collected during the study accurately reflected the statewide herd.

5.4 Male Deer Results

5.4.1 Buck Harvest By Region

Region	Number of Samples	Percent (%)
1	201	24
2	109	13
3	180	22
4	342	41
Total	832	100

Above: A breakdown of buck harvest by region of the State.

A total of 838 bucks were reported by hunters during the project. Of these, 832 (99%) reports included sufficient information regarding the harvest location to allocate it to a DMR. While the number of samples varied considerably between regions, it was nearly equal when divided east (54%) and west (46%) of the Midlands Highway.

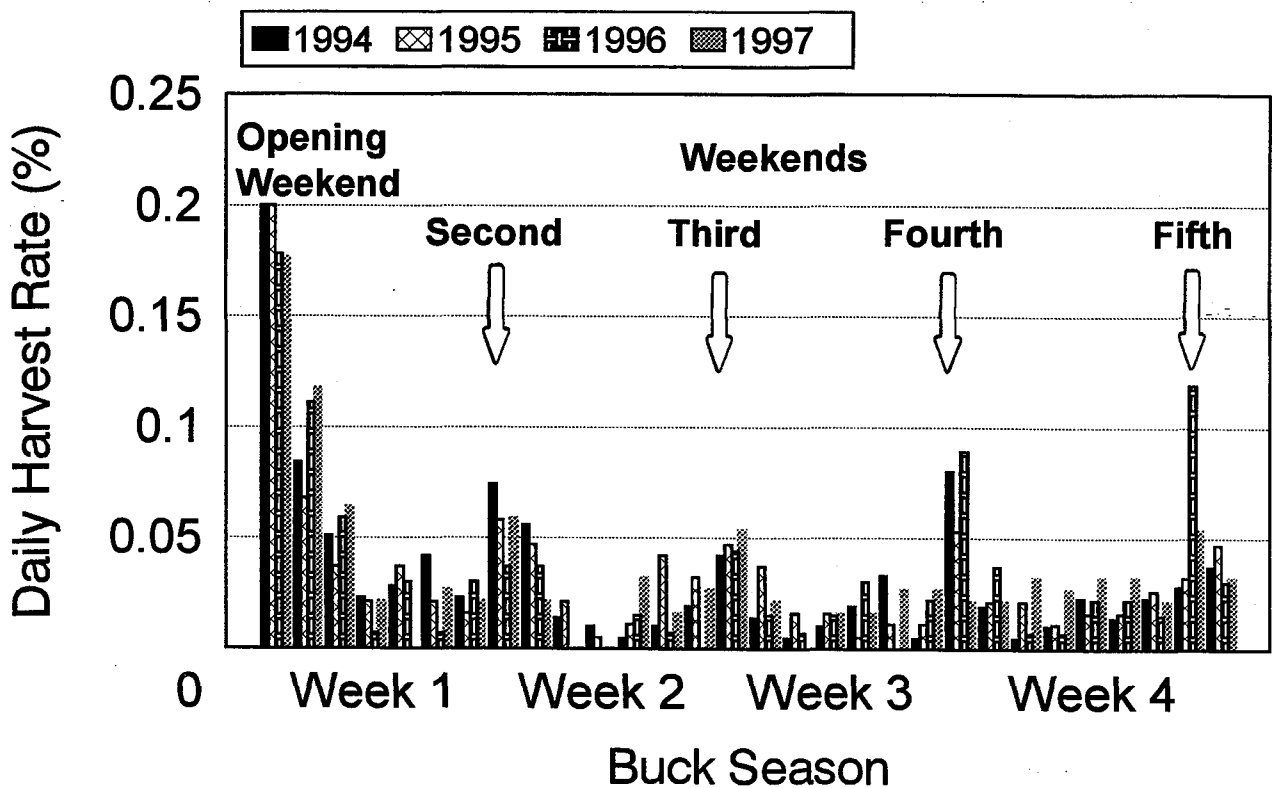
5.4.2 Buck Harvest by Year

Year	Number	Percent
1994	234	28
1995	210	25
1996	180	21
1997	214	26
Total	838	100

Above: An analysis of bucks harvested during each year of the project.

Of 838 bucks reported during the project, 764 (91%) included a lower jawbone allowing the age to be estimated. The sample size was remarkably consistent during each year of the project except 1996 when statewide numbers were considered by many landowners and hunters to be lower due to the severe droughts and increased female culling which occurred during 1994 and 1995.

5.4.3 Buck Harvest Dates



Above: The distribution of buck harvest dates.

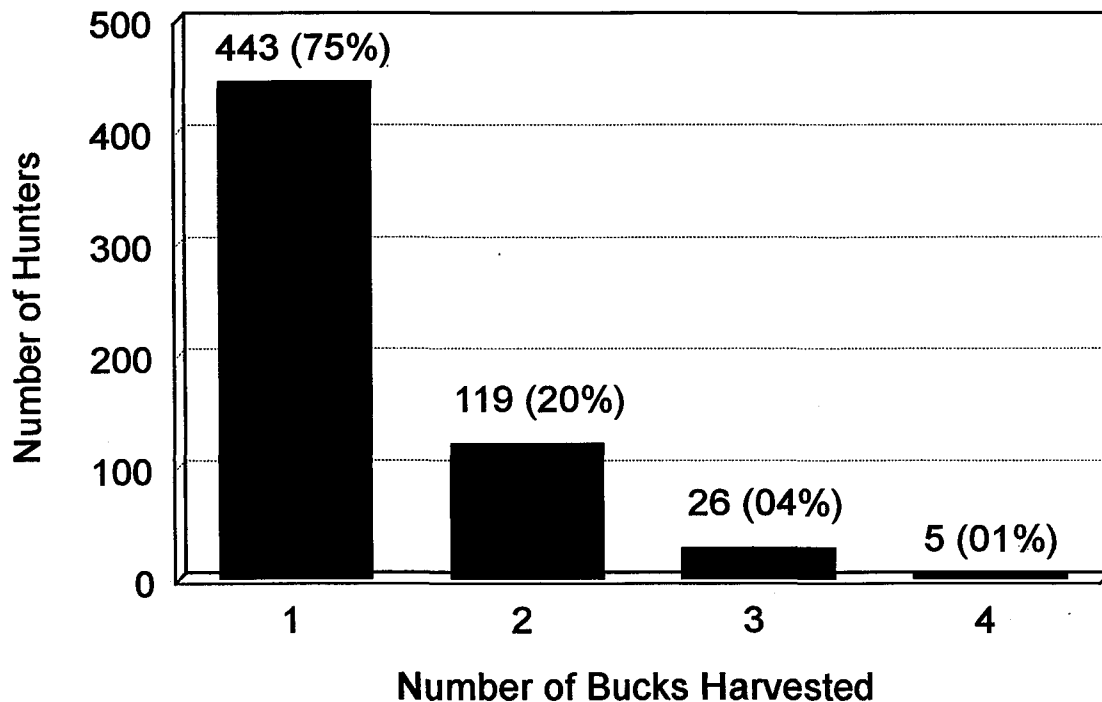
The pattern of buck harvest was generally consistent throughout the study reflecting hunter activity, particularly on weekends when 63% of all bucks were harvested. Not surprising, the majority of bucks (28.4%) were taken on opening weekend, followed by 9.7% the second weekend, 6.9% the third weekend, 8.6% the fourth weekend and 9.5% the fifth weekend. During all years of the study, the fewest number of deer were harvested during the middle of the second and third weeks of the season.

An interesting trend was the change in hunter activity in 1996 with the introduction of a one week later opening date for the male deer season. During 1996, hunters harvested a substantially greater percentage of bucks on the fourth and particularly, the fifth weekends than during either of the two previous seasons. This is likely attributed to the later season which allowed hunters the opportunity to hunt closer to the rut when bucks become more active. It may also be attributed to the fact that, with an increasing number of properties practising Quality Deer Management, more bucks were present on these properties late in the season than were prior to management.

Another interesting result was the change in hunter behaviour again in 1997. Apparently, the success enjoyed by hunters during the last two weekends of the 1996 season caused many hunters

to reduce their hunting effort during the middle of the season and shift their efforts to the last week, particularly the weekdays. As a result, 23% of all bucks taken in 1997 were taken during the last week compared to only 14% in 1994, 17% in 1995 and 21% in 1996. Clearly, hunters altered their hunting behaviour with increasing involvement in deer management programs.

5.4.4 Buck Harvest Per Hunter (Hunter Success)

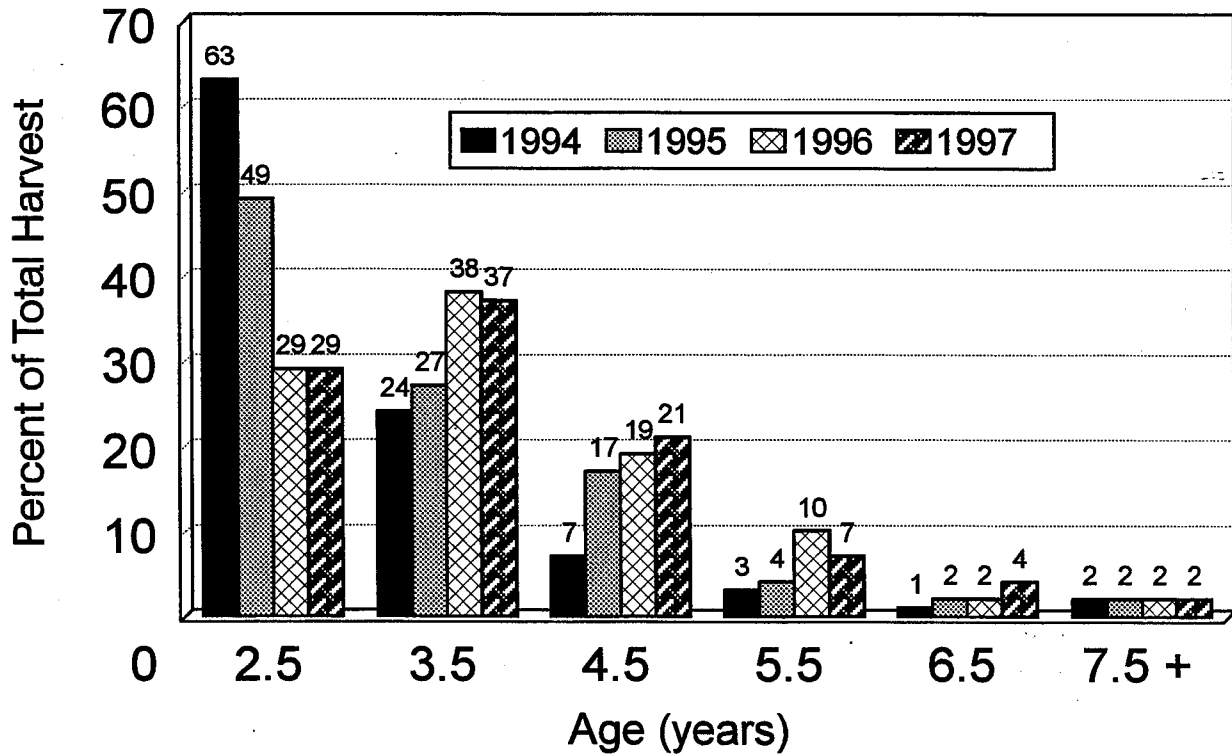


Above: Breakdown of the number of bucks harvested per hunter.

Of 838 bucks reported by hunters during the study, 796 (95%) reports included sufficient information to determine the hunter's name. The remaining 42 (5%) reports did not include the hunter's name or the buck was measured by the Project Officer at locations such as property meat safes or taxidermist shops where the hunter's name was unknown. The 796 bucks were taken by 593 different hunters which suggests both a reasonably low success rate of .34 bucks per hunter per year and an equitable distribution of the total harvest. Both of these findings are supported by the fact that 75% of hunters reported only one buck during the four years of the project, 20% reported two bucks, 4% reported three bucks and only 1% reported taking a buck during each of the four years. While the annual success rate of .34 in this study is nearly identical to that obtained in previous years by the Tasmanian Parks and Wildlife Service through license returns, it is likely biased high since the majority of deer reported in this study came from properties with moderate to high numbers of deer. As a result, the success rate of hunters on these properties would be expected to be higher than the "average" hunter. Consequently, it is believed that the

true success rate is closer to .25 -.30 bucks per hunter per year or approximately 750 bucks taken legally statewide each year.

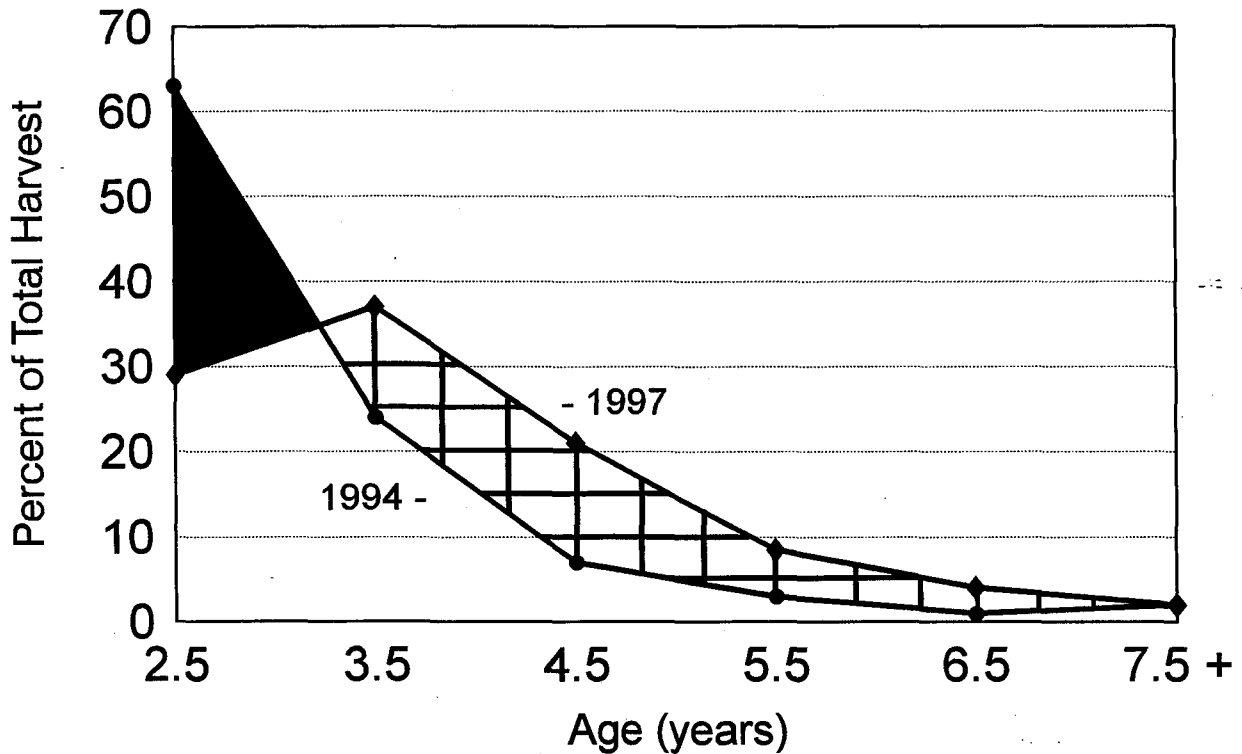
5.4.5 Statewide Buck Harvest By Age Class



Above: A breakdown of bucks harvested from 1994-97 by age class.

The number above each bar graph is the percentage of the total harvest represented by that age group. The results clearly show an increasing buck age structure as more hunters became involved in deer management programs. Most encouraging was the reduction in the percentage of 2.5 year old bucks in the harvest from 63% in 1994 to only 29% in both 1996 and 1997. Another positive result was the increase in the percentage of "quality" bucks (3.5-5.5 years old) in the harvest. In 1994, only 37% of bucks harvested were 3.5 years old or older whereas 71% were 3.5 years old or older in 1997. In addition, the percentage of bucks 4.5 years old or older more than doubled from 13% in 1994 to 34% in 1997. Considering that bucks typically need to be at least 4.5 years old to produce antlers scoring 200 or more Douglas points, this shift in age structure substantially increased the number of "quality" bucks taken by hunters. Clearly, many Tasmanian hunters are protecting young bucks and managing their deer herds for older, better quality bucks. Little gain was made in bucks 6.5+ years old. This is likely the result of two factors including the short duration of the project which prevented many bucks from reaching this age class and perhaps also to the fact that many hunters were satisfied with younger "quality" bucks and were unwilling to pass them in search of mature "trophy" bucks.

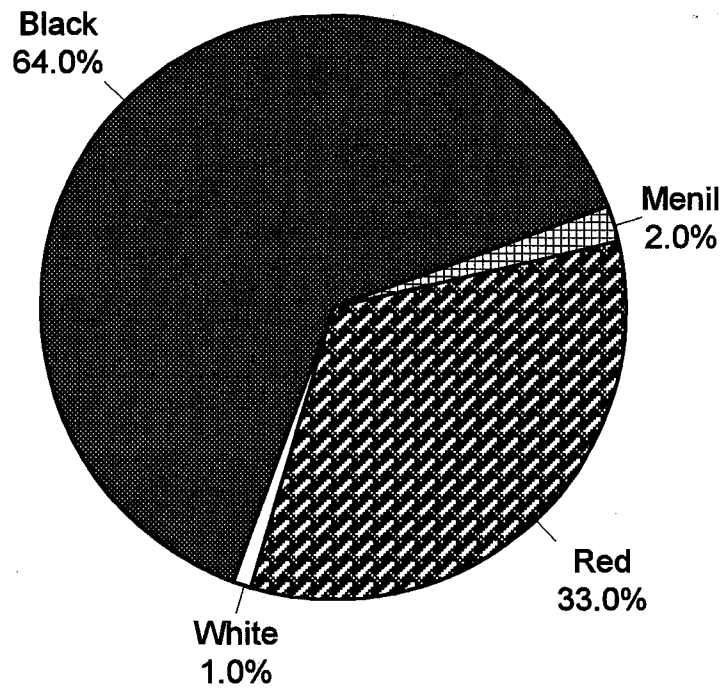
5.4.6 Statewide Buck Age Structure Gains



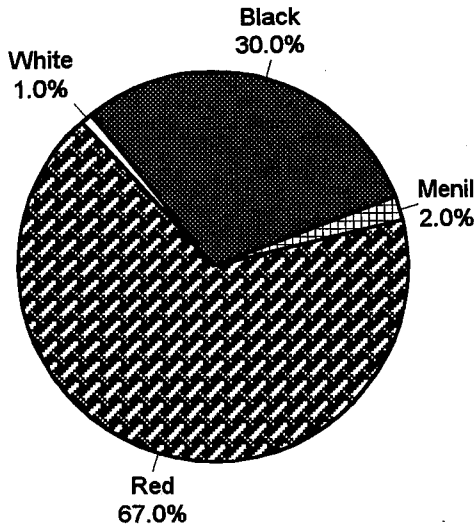
Above: The gains made in statewide buck age structure from 1994-1997.

The hatched area above represents the gains made statewide in buck age structure during the project. The bottom line represents the age structure in 1994 and the top line represents the age structure in 1997. The shaded (black) area represents the decrease in the percentage of first year bucks (2.5 years old) in the harvest. As with the previous graph, it is obvious that significant gains were made in bucks 3.5-5.5 years old with smaller gains made in bucks 6.5+ years old. This is supported by the fact that the mean age of all bucks harvested during the project increased from 3.1 years in 1994 to 3.7 years in 1997. This equates to a net increase of nearly 20% or 0.5 years per buck. Therefore, at the conclusion of the project, the "average" buck harvested in Tasmania was slightly older than a second head.

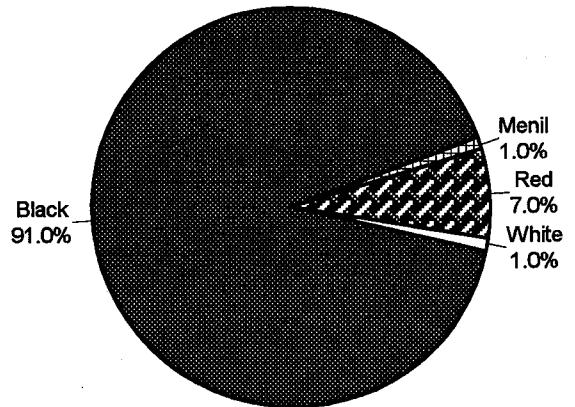
5.4.7 Statewide Buck Colour Varieties



West of Midlands Highway



East of Midlands Highway



Above: The percentages of buck colour varieties statewide (top) and east (lower right) and west (lower left) of the Midlands Highway.

The percentages of black and red buck colour varieties remained relatively consistent throughout the project with black animals averaging 59-67% of the annual harvest and red animals averaging 28-40%. The variation in annual percentages of these colours was related largely to the proportion of deer reported from the east or west side of the Midlands Highway during a given year. For example, during years when more deer were reported from the east side of the Midlands

Highway there was a higher percentage of black animals in the harvest. In years when more deer were reported from the western side of the highway, there was a higher percentage of red animals. The difference in colour varieties corresponds to their original release sites in Tasmania and supports the assumption that little mixing of herds occurs on either side of the Midlands Highway.

The percentage of white and menil bucks in the harvest declined markedly throughout the study. In 1994, 6 white bucks were reported, whereas only 1 white buck was reported in 1995 and none were reported in either 1996 or 1997. Similarly, 6 menil bucks were reported in 1994 but only 2 were reported in each of the 3 subsequent years. It is unclear why these colour varieties became less common. Possible causes include increased poaching of the rare colour varieties (white and menil) as more legal hunters refrained from harvesting young bucks of any colour and an under-reporting of rare colour varieties by protective hunters. Additionally, in the early stages of the project, many hunters had difficulty separating menils from lightly-coloured reds. It is therefore possible that some red bucks were incorrectly classified as menils during the first year of the project.

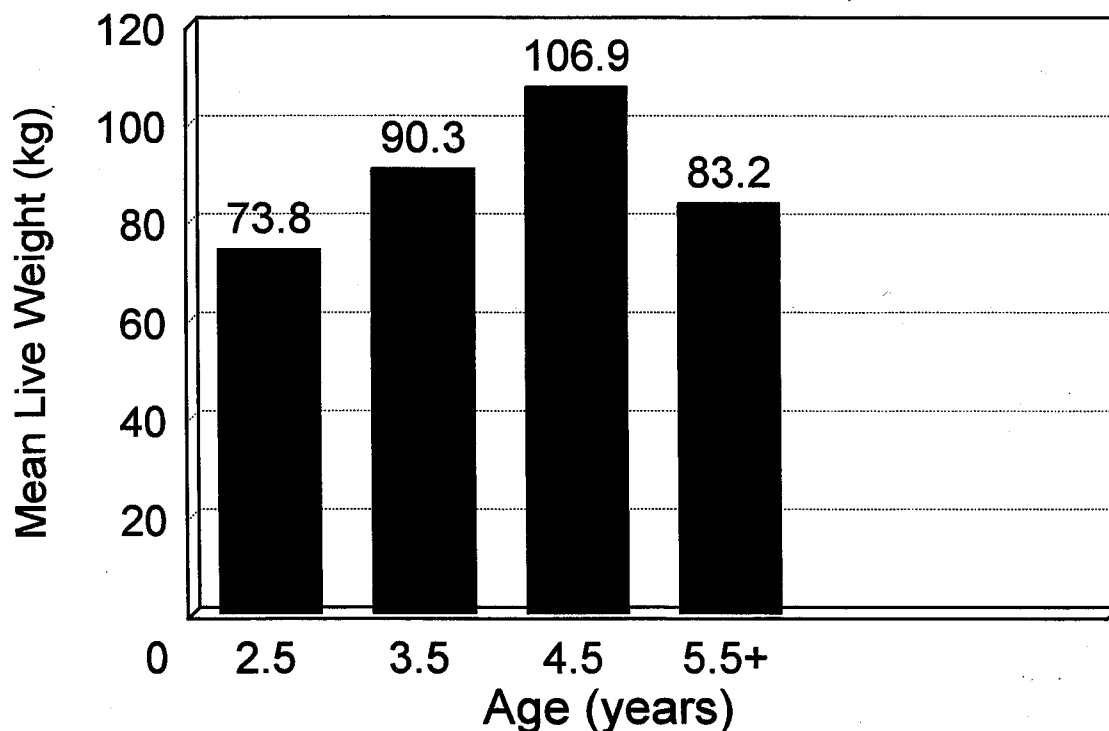
5.4.8 Buck Colour Varieties by Region

Region	Black	Red	White	Menil	Total
1	70 (38%)	109 (59%)	2 (01%)	3 (02%)	184
2	103 (97%)	1 (01%)	2 (02%)	0	106
3	37 (22%)	126 (75%)	0	5 (03%)	168
4	296 (89%)	31 (09%)	3 (01%)	4 (01%)	334
Total	506 (64%)	267 (34%)	7 (01%)	12 (01%)	792

Above: The breakdown of buck colour varieties by region of the State.

A total of 792 hunters reported the colour of their buck. Based on these results, it is evident that the percentage of black bucks decreases and red bucks increases from the northeastern portion of the deer range to the southwestern portion. For example, in DMR 2 (Northeast) 97% of bucks reported were black and only 1% were red; whereas, in DMR 3 (Southwest) 75% were red and only 22% were black. DMR 1 (Northwest) had the most even distribution of all colours with 38% black, 59% red, 1% white and 2% menil. DMR 2 had the highest percentage of white bucks with 2% while DMR 3 had the highest percentage of menil bucks with 3%.

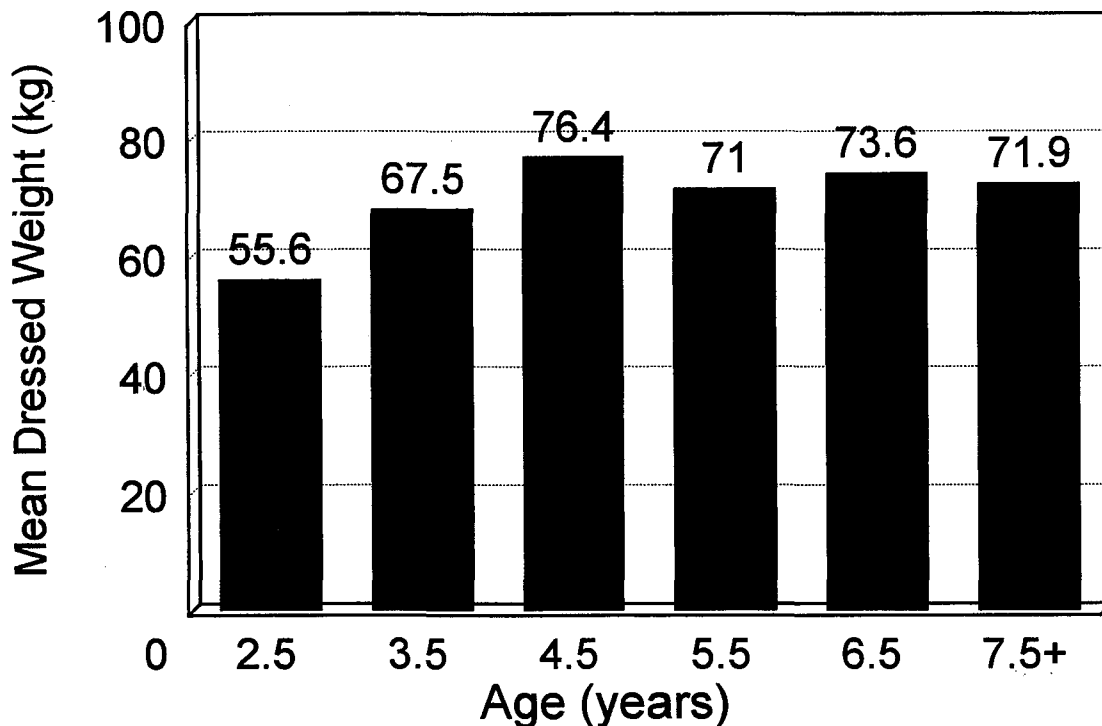
5.4.9 Buck Mean Live Weight



Above: The mean live weight for bucks from 1994-1997.

Due to an insufficient sample size, the weights for all bucks 5.5 years old or older were combined. On average, buck mean live weight increased 16.5 kg (37 lbs) from 2.5-3.5 years of age and 16.6 kg (37 lbs) from 3.5-4.5 years of age. This is because bucks grow rapidly until they reach physical maturity (not antler maturity) which generally occurs at 4.5-5.5 years of age. The apparent drop in weight in bucks 5.5 years or older is likely due to the low number of animals in the sample and the fact that many were taken on State Forest or other areas containing thick cover but reduced feed quality. The heaviest buck officially weighed was 121 kg (270 lbs) and was 4.5 years old although several weighed in excess of 90 kg (201 lbs). The lightest buck weighed only 55 kg (123 lbs) and was 2.5 years old.

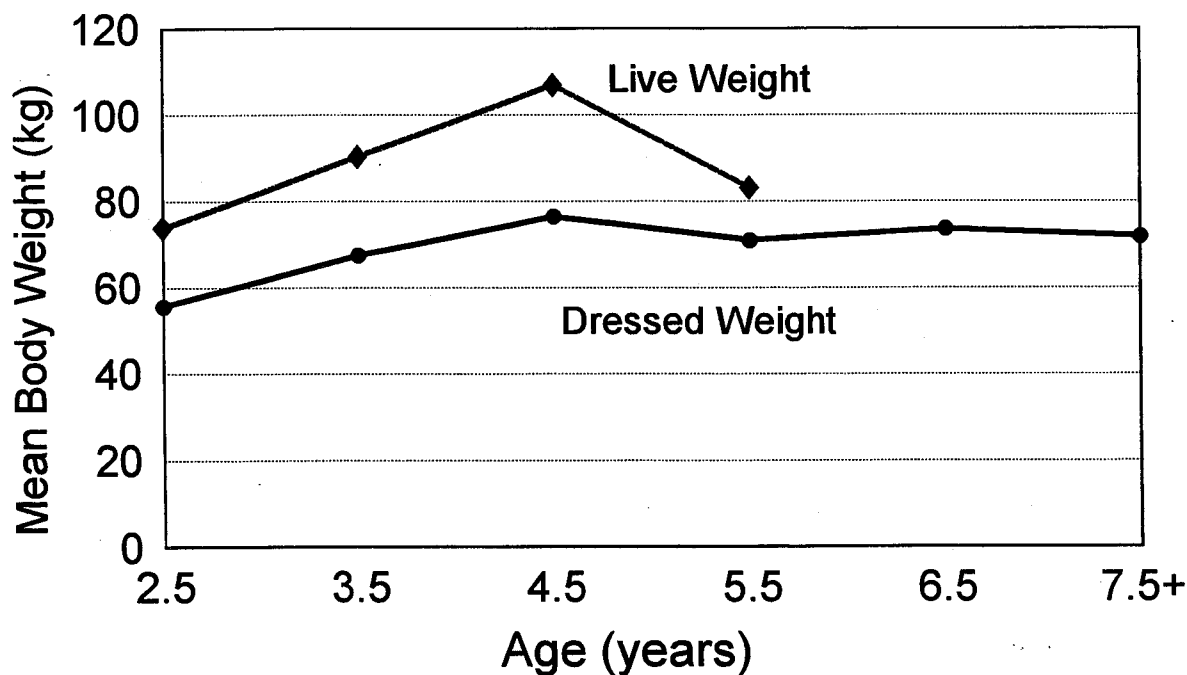
5.4.10 Buck Mean Dressed Weight



Above: The mean field-dressed weight (gutted only) for bucks by age class.

As with live weight, the mean field-dressed weight of bucks increased markedly from 2.5-4.5 years of age followed by a general levelling thereafter. Bucks reported in 1996 and 1997 averaged 2-3 kg heavier than those in 1994 and 1995 when drought conditions prevailed. The apparent drop in weight after 4.5 years of age is thought to be attributed to the low sample size and areas in which these bucks were taken. Many older bucks were also carrying previous wounds which may have affected body condition. The heaviest field-dressed buck reported during the project weighed 95 kg (210 lbs) and was only 3.5 years old. Several bucks, particularly those 4.5 years or older, weighed in excess of 85 kg (190 lbs). The lightest buck recorded was a 2.5 year old that weighed only 34 kg (76 lbs).

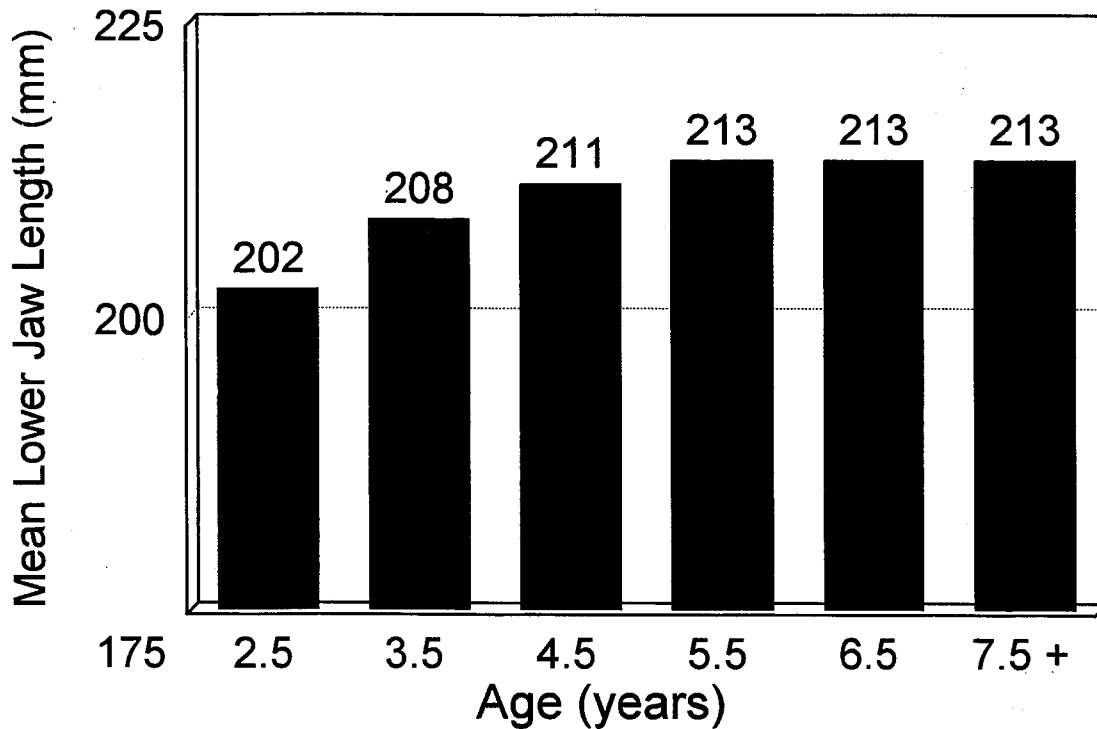
5.4.11 Relationship Between Buck Mean Live and Dressed Weight



Above: The relationship between mean live and dressed weights for bucks by age class.

For 2.5 and 3.5 year old bucks, the mean dressed weight represented 75% of the live weight. In contrast, in 4.5 year olds, the dressed weight represented only 71% of the live weight. This difference is likely related to rumen (stomach) size which increases with age. Consequently, as a buck matures, a greater percentage of its live weight is comprised of rumen contents. A larger rumen also enables older bucks to utilise poorer quality feed. This is thought to be a survival strategy which enables older bucks to obtain their nutritional requirements from lower quality "bush" feeds so that does and fawns have access to the better quality feeds. There were insufficient samples to determine the relationship between live and dressed weight for bucks 5.5 years old or older.

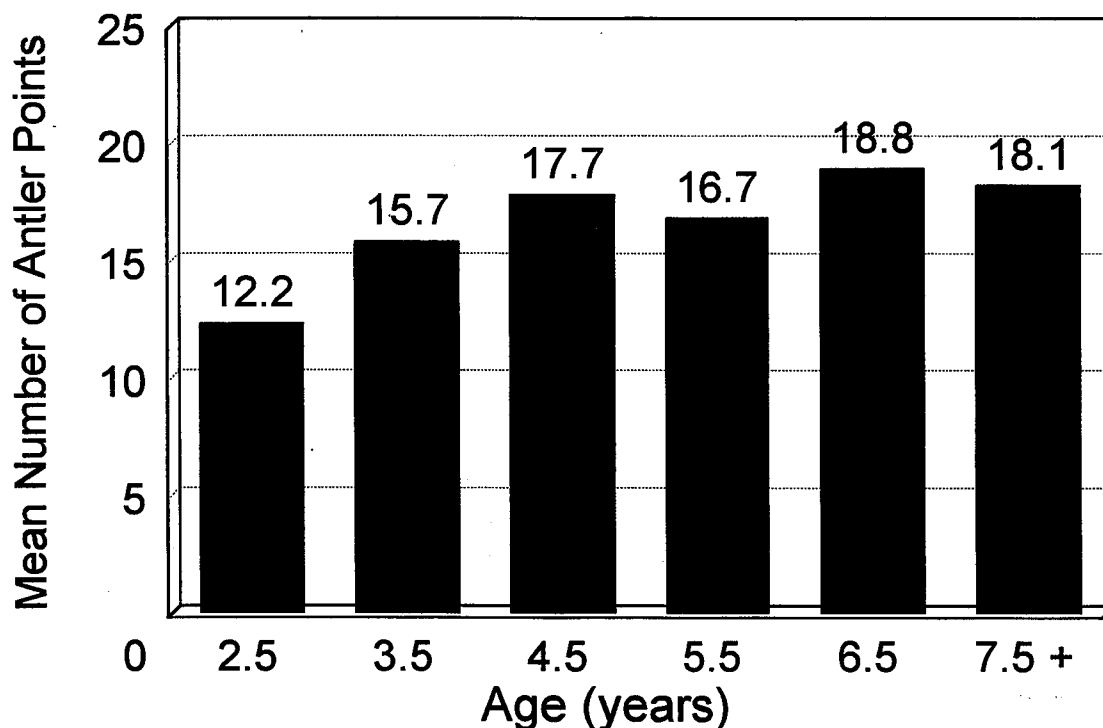
5.4.12 Buck Mean Lower Jaw Length



Above: The mean lower jaw length for bucks by age class.

Like body weight, lower jaw length is a good general indicator of growth, especially in young animals. Mean lower jaw length increased with age from 2.5-5.5 years of age. Within age classes, jaw length varied in relation to habitat quality and generally reflected body weight and antler quality. The longest jaw length recorded was 225 mm (8.6 in.) from a 5.5 year old buck while the shortest was only 173 mm (6.8 in.) from a 2.5 year old buck. The 2.5 year old buck was particularly interesting because it was the smallest buck recorded for the entire study with only 6 antler points and an antler length of only 211 mm (8.3 in.). The next shortest jaw length recorded was 189 mm (7.4 in.), also from a 2.5 year old buck.

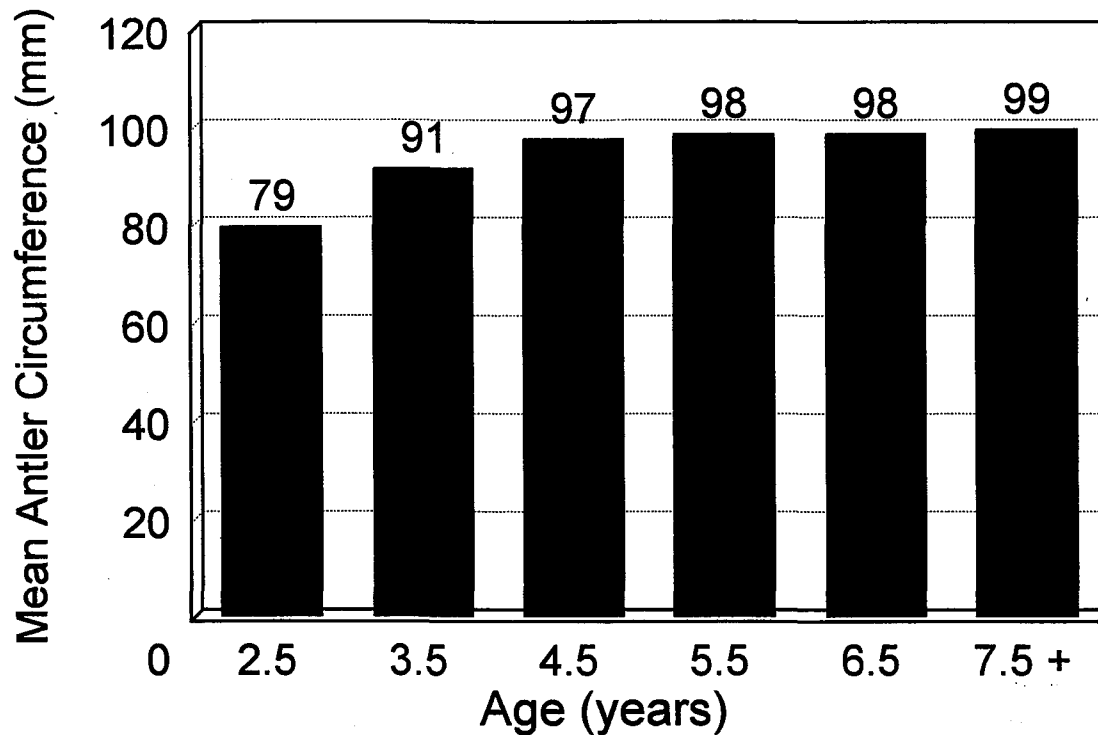
5.4.13 Mean Number of Antler Points



Above: The mean number of antler points for bucks by age class.

The mean number of antler points increased with age through 4.5, but likely increases at least until 6.5. However, there was considerable variation within age groups, particularly for bucks 4.5 years old or older. This suggests that number of antler points is not a reliable predictor of age for bucks older than 2.5. Consequently, hunters wishing to protect bucks 3.5 years of age or older would be advised to use additional antler characteristics such as antler length, palm width or Douglas Score. Of 61 bucks recorded during the study with 20 or more antler points, 47 (77%) were at least 4.5 years of age. Five bucks shared the spot for most antler points with 25 including three 4.5 year olds, one 6.5 year old and one 7.5 year old. A 2.5 year old buck had the fewest number of antler points with just three.

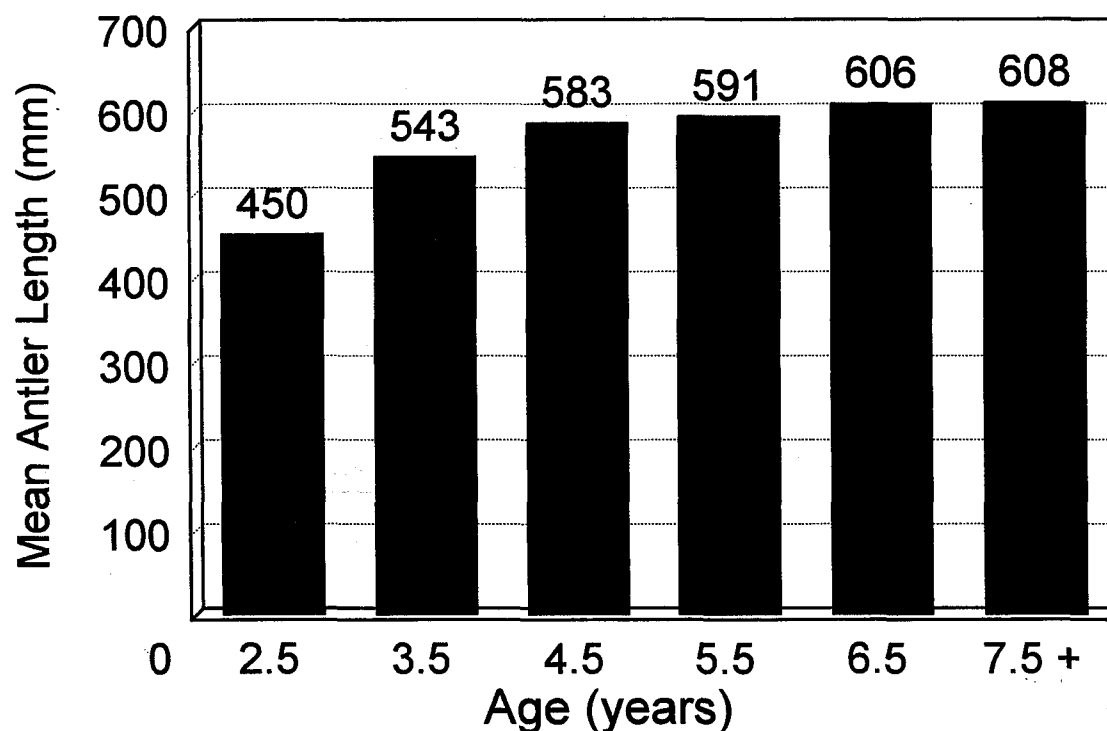
5.4.14 Mean Antler Circumference



Above: The mean antler circumference by age class.

Mean antler circumference increased markedly from 79 mm (3.0 in.) at 2.5 years of age to 97 mm (3.8 in.) at 4.5 years of age and remained relatively constant thereafter. Many hunters use antler circumference or "weight" as a general indicator of age. These results suggest that antler circumference could only be used to separate 2.5 year old bucks from those 3.5+ years old. A 5.5 year old buck had the greatest antler circumference at 140 mm (5.5 in.) while a 2.5 year old buck had the smallest antler circumference at 53 mm (2.1 in.).

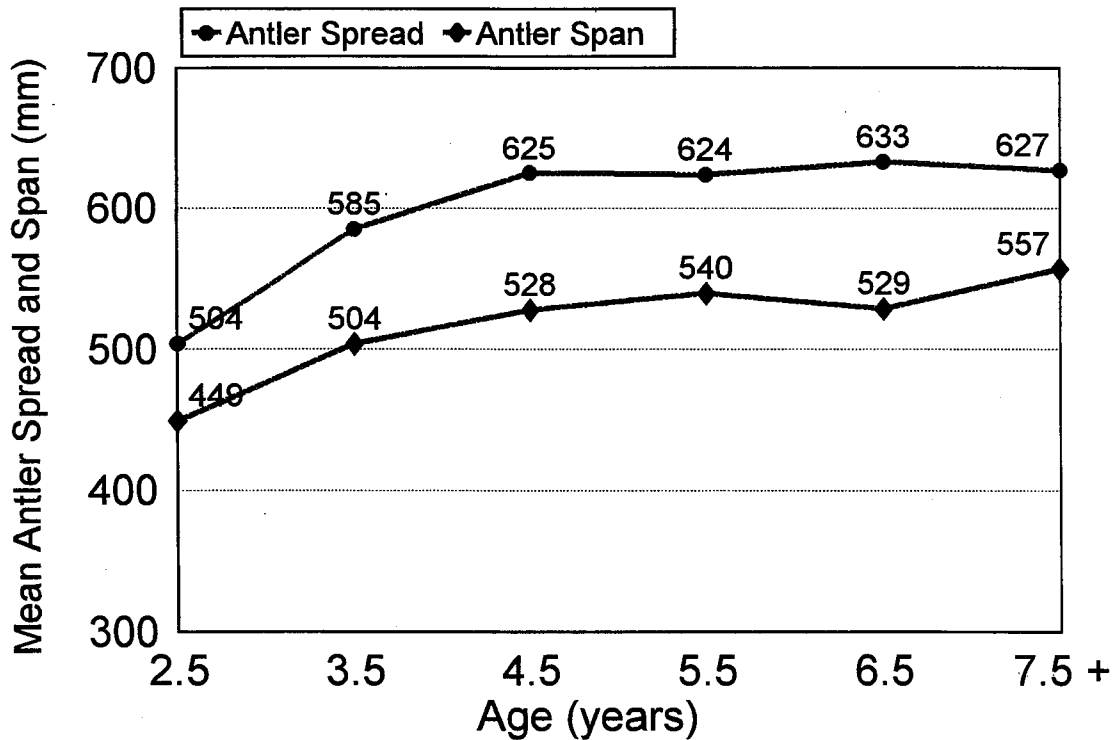
5.4.15 Mean Antler Length



Above: The mean antler length for bucks by age class.

Antler length was one of few antler attributes measured in this study which appeared to increase throughout life, albeit only marginally after 5.5 years of age. As such, it appeared to be one of the best general predictors of age, particularly in younger animals and could be used in conjunction with other characteristics to estimate the age of deer in the field. Two 4.5 year old bucks shared the spot for the longest antlers at just over 69 cm (27.2 in.), although several bucks had antlers over 62 cm (24.4 in.). The shortest antlers recorded were only 21 cm (8.3 in.) long from a 2.5 year old buck.

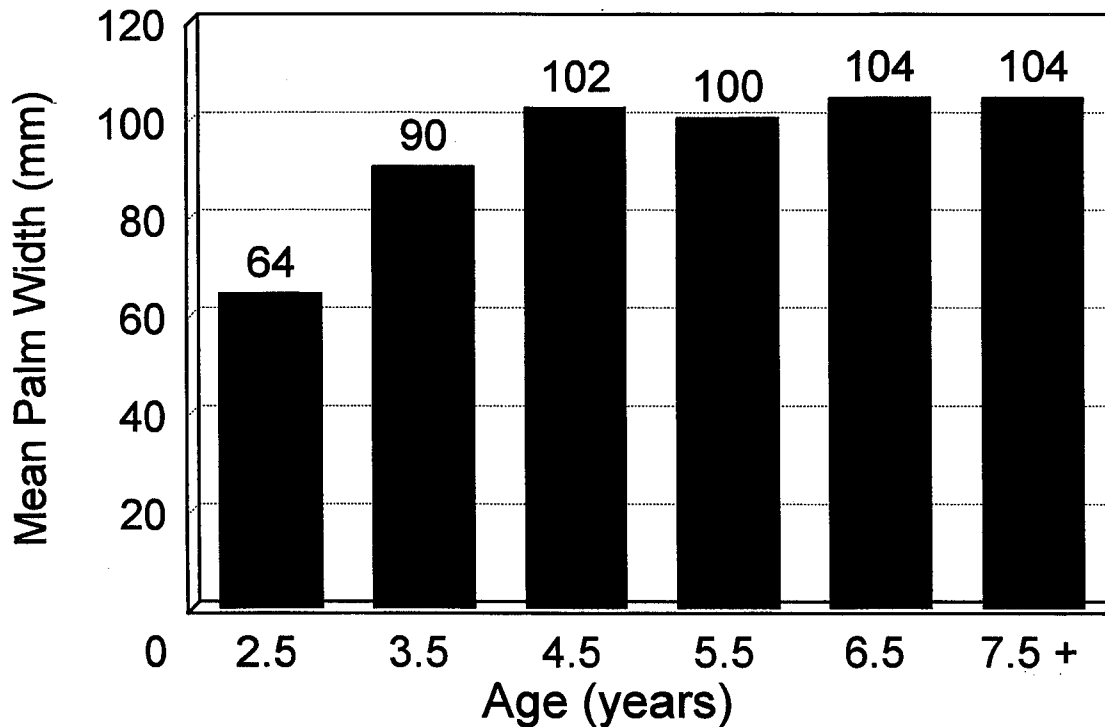
5.4.16 Relationship Between Mean Antler Spread and Span



Above: The relationship between mean antler spread and span by age class.

There was a strong correlation between antler spread and span. While both measurements varied greatly within and between age groups, they generally increased with age at least until 6.5. The difference between antler spread and span increased with age as bucks grew longer antlers, longer palm points, wider palms and their antlers began to turn in at the top. For example, the mean difference between antler spread and span in 2.5 year olds was only 55 mm (2.2 in.) whereas it averaged 89 mm (3.5 in.) in bucks 4.5 years old or older. The widest antler spread measurement was 81 cm (31.9 in.) from a 7.5 year old while the narrowest was 26 cm (10.2 in.) from a 2.5 year old.

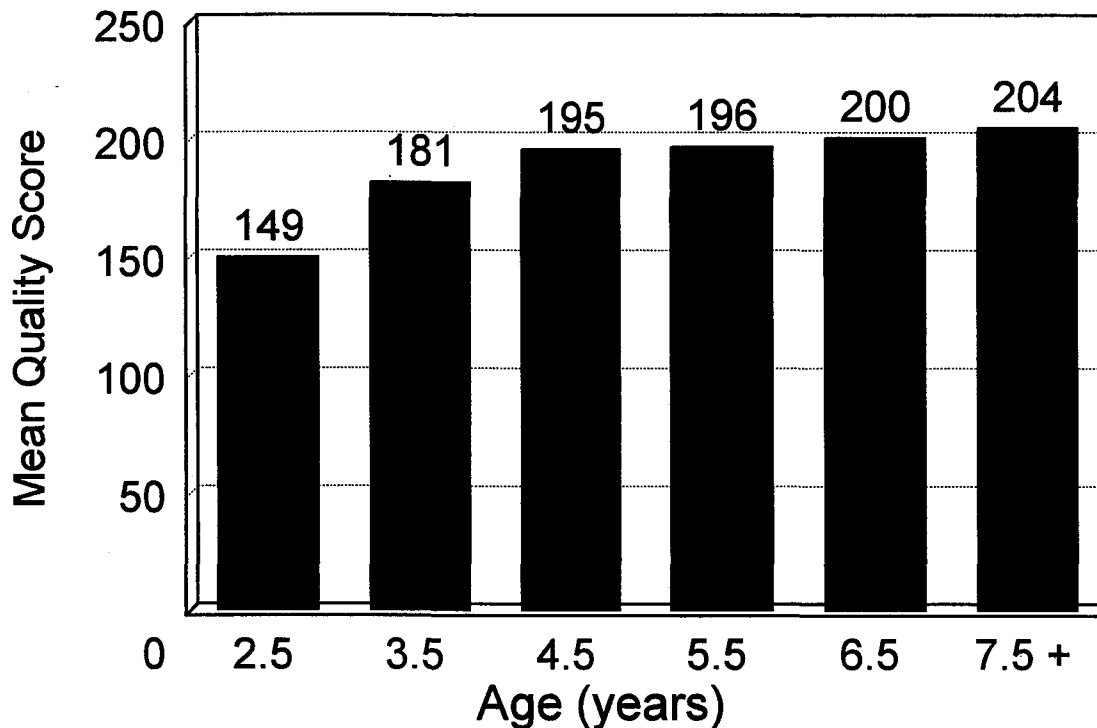
5.4.17 Mean Palm Width Without Points



Above: The mean palm width without points for bucks by age class.

Mean palm width without points increased with age until 6.5 when it appeared to level. As with most other measurements, palm width varied greatly both within and between age groups. Due to the substantial difference in mean palm width between 2.5 and 3.5 year old bucks, this antler attribute appeared useful as a general guideline that could be used by hunters to protect 2.5 year old bucks. A 4.5 year old buck had the widest palm measurement at 18.3 cm (7.2 in) and also had the highest Quality Score recorded during the study at 242. A 2.5 year old buck had the narrowest palm width measurement at just 2.0 cm (0.8 in).

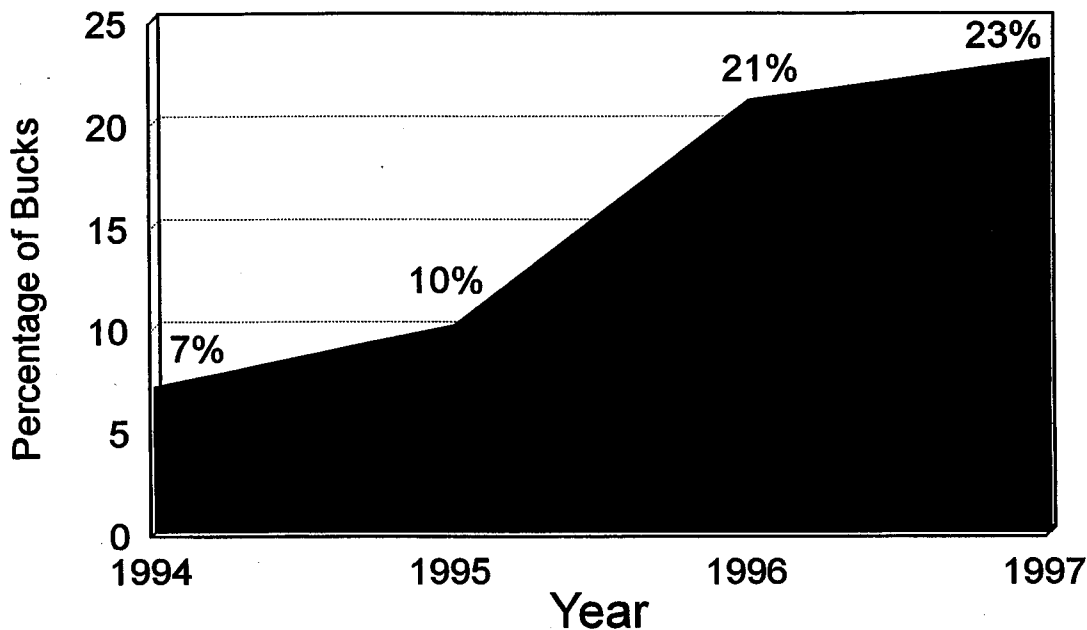
5.4.18 Mean Quality Scores



Above: The mean Quality Scores for bucks by age class.

The Quality Score is an approximation of the Douglas Score based on the measurements required on the data collection form used during the project. Since the Quality Score includes a wide range of antler measurements, it was considered the best indicator of overall antler quality used in this study. As with many of the individual antler measurements, mean Quality Scores increased with age. This is not surprising considering that most bucks do not reach antler maturity until at least 6.5 years of age. Mean Quality Scores appeared to be only slightly influenced by annual weather conditions as mean scores within age groups were only 2-3 points lower during the drought years of 1994 and 1995. A 4.5 year old buck had the highest Quality Score in the study at 242 while a 2.5 year old buck had the lowest Quality Score at just 80.

5.4.19 Percentage of Bucks in Harvest With a Quality Score of 200 or Greater

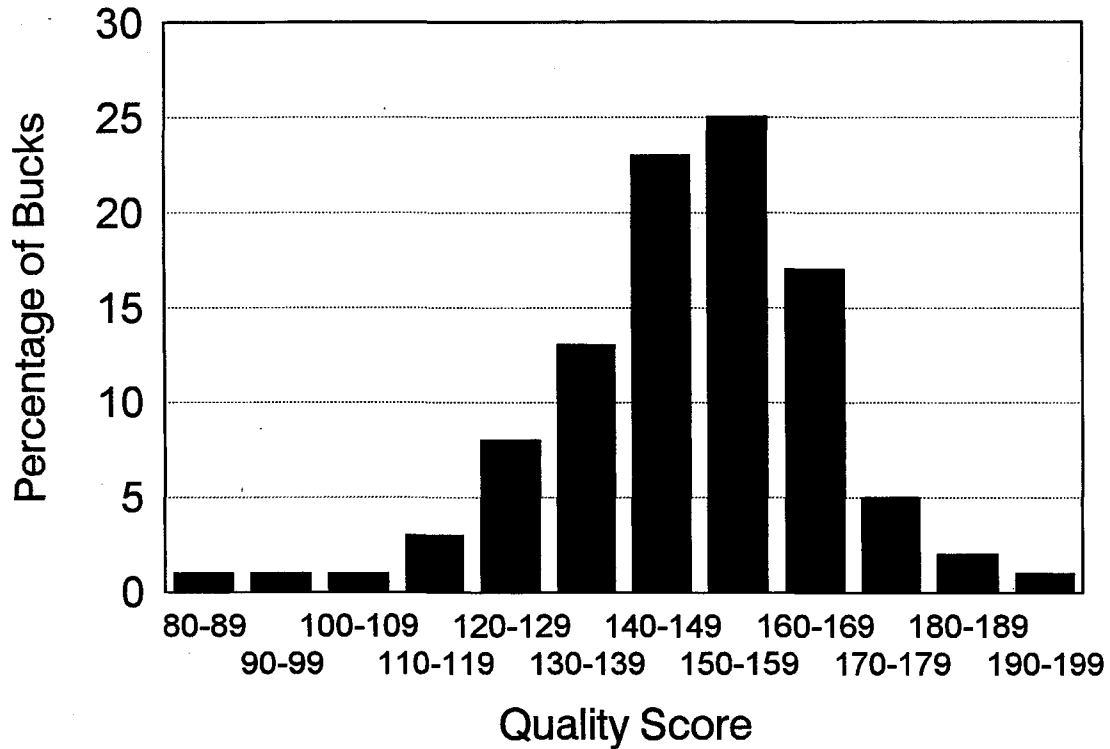


Above: The percentage of bucks in the statewide harvest with a Quality Score (Douglas Score estimate) of 200 or more during the study.

In Tasmania, bucks with a Douglas Score of 200 or more points are considered "trophies" by most hunters. Since the difference between the Douglas Score and Quality Score was generally less than 10 points, the Quality Score provided a reasonable estimate of the Douglas Score. The percentage of bucks with a Quality Score of 200 or greater more than tripled from just 7% in 1994 to 23% in 1997. This does not mean that 23% of all bucks in Tasmania in 1997 scored more than 200, but rather that 23% of bucks harvested by hunters scored at least 200.

5.4.20 Distribution of Quality Scores by Age Class

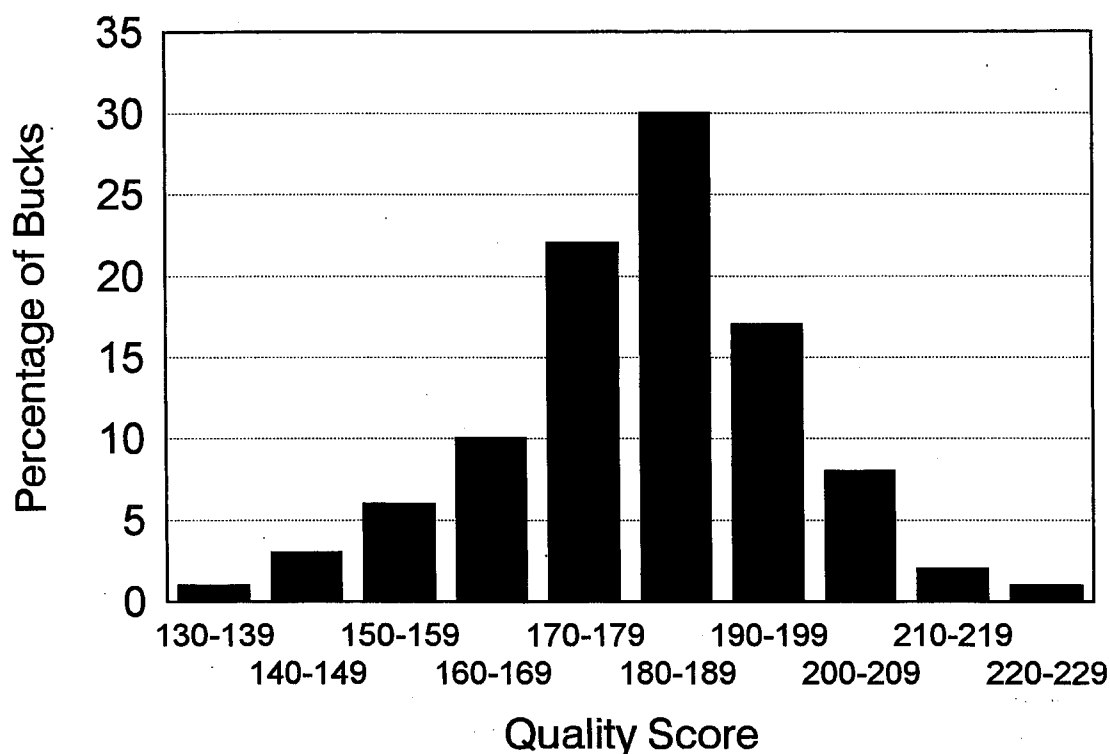
Distribution of Quality Scores for 2.5 Year Old Bucks



Above: Distribution of Quality Scores for 2.5 year old bucks.

The distribution of Quality Scores for 2.5 year old bucks reveals a normal distribution with 66% having Quality Scores between 140 and 169. There was a higher percentage of bucks with scores below this range (26%) than above it (8%). However, nearly all bucks scoring under 120 came from poor quality habitats and/or overpopulated deer herds and likely suffered from poor nutrition. The highest Quality Score for this age group was 191 while the lowest was 80.

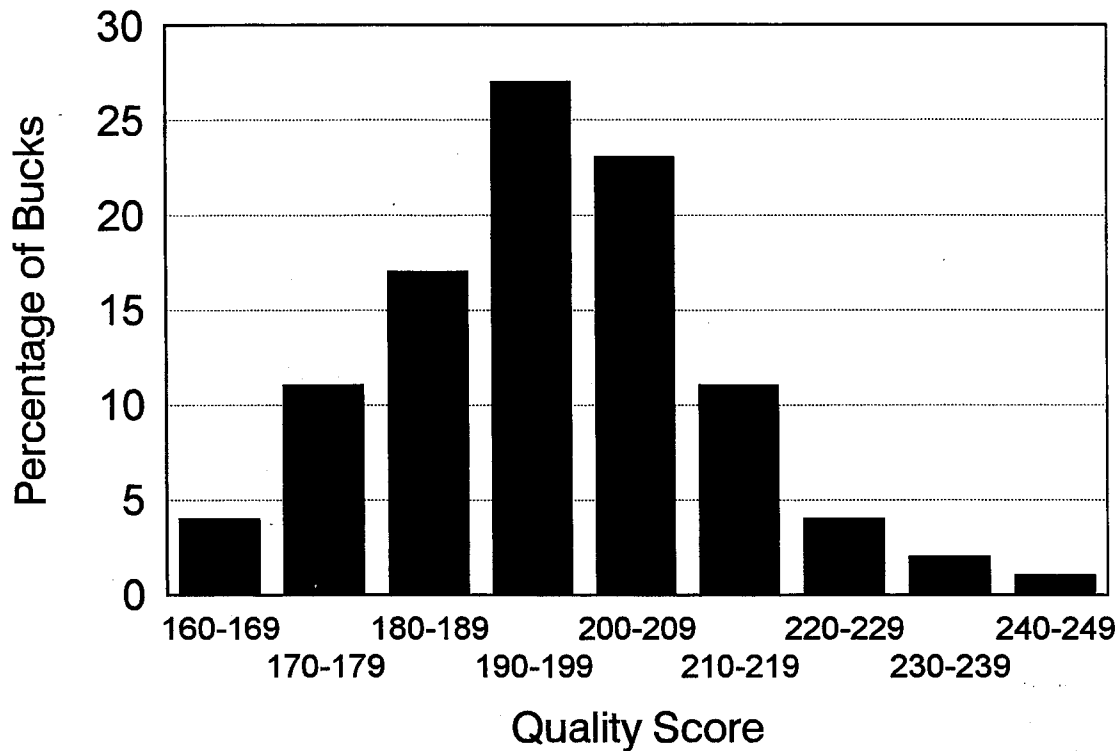
Distribution of Quality Scores for 3.5 Year Old Bucks



Above: Distribution of Quality Scores for 3.5 year old bucks.

As with 2.5 year old bucks, the distribution for 3.5 year old bucks was normal with 70% having Quality Scores between 170-199. In fact, this age group exhibited the most normal distribution of any age group. There was a slightly higher percentage of bucks with Quality Scores below this range (19%) than above it (11%). The highest Quality Score for this age group was 223 while the lowest was 138.

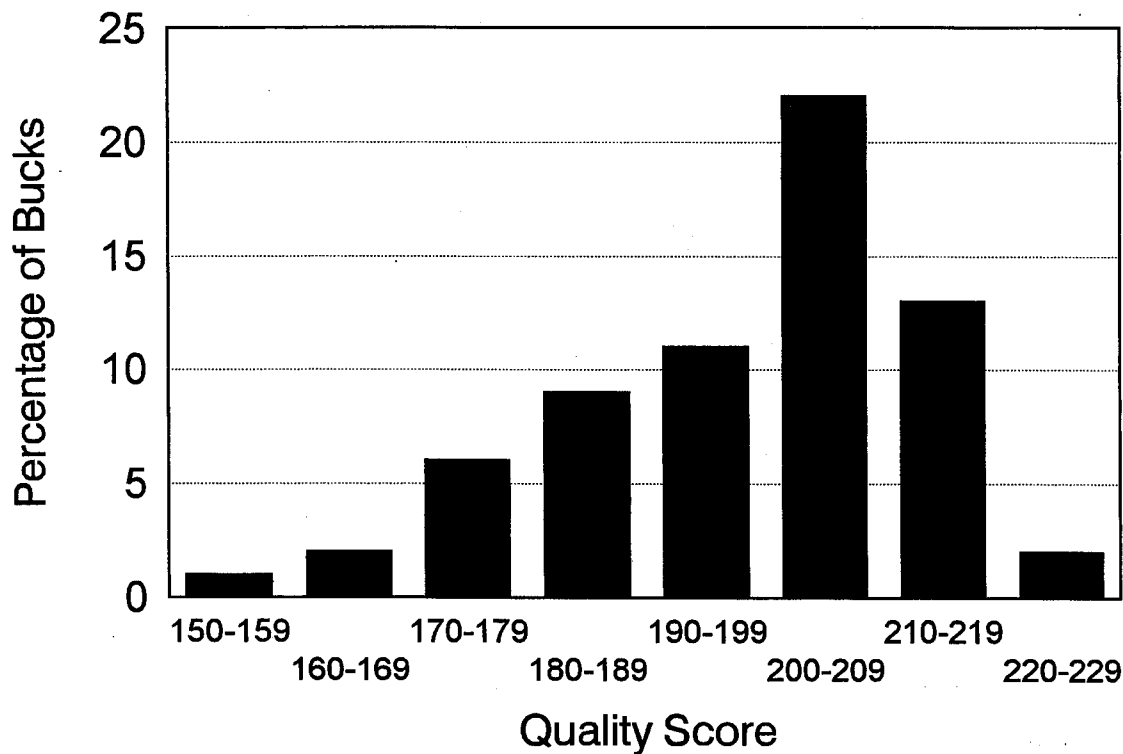
Distribution of Quality Scores for 4.5 Year Old Bucks



Above: Distribution of Quality Scores for 4.5 year old bucks.

The Quality Score distribution for 4.5 year old bucks was fairly normal with 67% scoring between 180-209. However, this distribution was skewed to the left with a wide range in extreme values to the right of the distribution. Two possible explanations for this distribution pattern are errors in age estimation and bucks reaching maturity ahead of their cohorts (others of the same age). It is possible that some 5.5 year old bucks taken from properties with high quality food sources exhibited tooth wear patterns indicative of 4.5 year olds and were aged accordingly. Another possible explanation was that some 4.5 year old bucks reached maturity earlier than their cohorts (most bucks attain physical maturity at 5.5 years of age) and grew exceptional antlers for their age. The highest Quality Score for this age group was 242 which was also the highest recorded for the study. The lowest Quality Score for this age group was 165.

Distribution of Quality Scores for 5.5+ Year Old Bucks



Above: Distribution of Quality Scores for 5.5+ year old bucks.

Due to the low sample size, the Quality Scores for all bucks 5.5 years of age or older were combined. The majority (70%) of bucks in this age group had Quality Scores between 190-219, although the distribution was highly skewed to the right with 27% scoring below this range and only 3% above it. This finding was somewhat concerning because bucks should be in their prime at this age and score well in excess of 200. There are many possible explanations. First, many of the older bucks were taken on State Forest or other areas of thick bush where escape cover was high but feed quality was low. Second, many bucks were carrying previous body injuries (fighting and bullet wounds) which may have affected antler quality. Third, young bucks with poor antler formation have an increased chance of survival on properties that protect bucks with small antlers. This enables a greater percentage of bucks with poor antler formation to reach the older age classes. Fourth, bucks 5.5 years of age or older likely represent less than 10% of the total buck population and most would be the dominant animal in their area. Therefore, the energy spent by these bucks rutting and breeding would be particularly taxing and may affect their subsequent year's antler growth. Finally, it is possible that many of the older, better quality bucks are taken illegally during the closed season. This last issue is one that can, and in many cases, is being addressed by property hunting groups through increased patrolling and surveillance activities during the closed season.

TOP 50 BUCKS (1994-97)

REG. NO.	HARVEST DATE	AGE	COAT COLOUR	LIVE WT (kg)	DRESSED WEIGHT (kg)	CHEST GIRTH	ANTLER POINTS - LEFT	ANTLER POINTS - RIGHT	TOTAL NUMBER POINTS	SM. BEAM CIRCUM. LEFT	SM. BEAM CIRCUM. RIGHT	ANTLER SPREAD	ANTLER SPAN	ANTLER LENGTH - LEFT	ANTLER LENGTH - RIGHT	PALM WIDTH W/O POINTS - LEFT	PALM WIDTH W/O POINTS - RIGHT	QUALITY SCORE	COMMENTS
3	2-Mar-97	4.5	Red			118.0	12	13	25	9.8	9.8	67.0	53.7	62.9	61.0	19.4	17.1	242	Douglas Score 234 4/8
1	10-Mar-96	4.5	Red		94.0	118.0	12	11	23	10.0	10.0	75.0	67.0	71.0	67.0	14.0	10.0	231	
1	2-Mar-96	4.5	Red				12	10	22	10.8	10.9	74.3	58.4	67.3	71.0	13.3	12.1	230	Douglas Score 236 2/8
4	13-Mar-94	4.5	Black	94.0	75.0	105.0	13	12	25	10.0	10.0	71.0	53.0	66.0	69.0	13.8	13.8	229	Douglas score 230 1/8
1	25-Mar-94	7.5	Red				12	13	25	10.0	10.0	63.5	53.5	63.5	62.5	12.0	17.0	228	
2	27-Feb-94	4.5	Black		88.5	107.0	9	8	17	12.0	12.0	64.0	55.0	66.0	68.0	13.0	14.0	227	
1	1997	3.5	Red				13	9	22	11.4	10.2	67.6	53.7	61.9	60.0	13.7	13.7	223	Douglas Score 218 1/2
1	1-Mar-97	4.5	Red		90.0	112.0	9	12	21	10.0	10.0	73.3	57.8	68.9	67.3	11.7	13.3	223	Douglas Score 227 1/4
4	2-Mar-96	4.5	Black		77.0	107.0	10	10	20	9.0	9.0	74.5	67.5	61.0	61.5	10.8	15.5	222	Douglas Score approx 220
2	28-Mar-97	6.5	Black				11	11	22	10.2	10.0	68.0	56.0	67.0	69.0	12.5	11.9	222	Douglas Score 230 5/8
2	25-Feb-95	4.5	Black		82.0	111.5	9	7	16	11.3	11.5	63.0	54.2	62.5	61.5	14.8	12.3	219	
4	1997	7.5	Black				12	12	24	9.5	9.5	81.0	66.0	64.0	65.0	11.5	9.0	219	
3	1-Mar-97	4.5	Red	121.0		126.0	12	9	21	10.5	10.5	64.5	60.5	66.0	66.0	10.5	11.0	218	Lovely buck, huge body
4	19-Mar-94	7.5	Black		75.0	109.0	10	9	19	11.0	10.5	63.0	65.0	61.0	61.0	13.0	9.5	218	
3	30-Mar-96	5.5	Black				9	14	23	10.0	9.8	62.0	53.0	54.0	58.5	14.5	13.2	217	
1	27-Mar-96	4.5	Red				14	11	25	10.1	10.5	61.0	50.5	58.5	62.2	13.0	12.3	217	
4	11-Mar-95	4.5	Black	116.0	72.0	104.0	10	11	21	11.0	10.0	72.0	66.0	53.0	53.0	13.0	11.0	217	Cleft left antler
3	5-Mar-94		Meril				10	11	21	11.4	10.4	73.0	53.0	61.0	61.5	12.0	13.0	217	
1	16-Mar-96	4.5	Black		89.0	117.0	7	9	16	9.0	9.5	65.0	56.0	61.0	60.0	15.0	15.5	217	
4	26-Feb-94	4.5	Black				10	9	19	10.5	10.3	62.5	59.5	63.0	64.2	11.2	12.1	216	
3	29-Mar-97	4.5	Black				9	11	20	10.0	10.0	64.0	51.5	66.0	67.0	15.0	10.5	216	Douglas Score 210, old wound
1	26-Mar-97	4.5	Red		88.0	102.0	11	10	21	11.0	10.5	74.5	66.0	58.0	60.5	10.0	10.5	216	
1	2-Mar-96	5.5	Black		86.5	116.0	10	9	19	11.1	11.1	73.3	63.5	63.5	62.4	11.1	8.9	215	Douglas Score 226 5/8
1	18-Mar-95	7.5	Red		81.0		10	12	22	10.0	10.0	62.0	59.0	63.0	63.0	11.0	11.0	215	Douglas Score 219 7/8
1	1-Mar-97	4.5	Black		73.0	104.0	13	9	22	11.0	10.5	63.0	54.0	66.0	66.0	12.5	9.0	215	Douglas Score 211 5/8
3	1997	4.5					11	11	22	9.8	9.8	65.1	49.5	64.5	62.5	13.7	12.4	215	Douglas Score 223 7/8
4	2-Mar-97	3.5	Black		60.0	113.0	9	10	19	9.5	9.5	62.0	56.0	59.0	58.5	13.5	14.0	214	
3	13-Mar-96	3.5	Red	107.0		124.0	9	10	19	11.0	12.0	60.0	56.0	64.0	65.0	11.0	10.0	214	Nice buck
1	1-Mar-97	3.5	Black	80.0	65.0	110.0	13	9	22	11.0	11.0	57.0	46.0	61.0	64.0	12.0	13.0	214	Douglas Score 214, velvet
4	1-Mar-97	5.5	Black				5	5	10	9.5	10.0	59.0	58.0	59.5	64.0	15.5	15.0	213	
2	11-Mar-94	6.5	Red				12	11	23	10.5	9.5	67.0	55.0	63.5	58.0	13.0	10.0	213	
1	27-Mar-97	5.5	Red		70.0	100.0	9	8	17	14.0	14.0	67.5	57.5	57.0	63.0	10.0	8.0	213	Douglas Score 198 3/4
4	2-Mar-94	3.5	Black	92.0		108.0	10	11	21	10.0	10.5	64.0	52.5	56.0	55.5	13.0	13.5	212	
4	5-Mar-95	4.5	Black		81.0	108.0	9	9	18	10.2	10.1	59.8	48.5	62.5	59.2	15.0	12.7	211	
1	9-Mar-96	6.5	Red			104.0	15	9	24	10.9	9.9	66.1	54.0	64.2	62.5	9.2	10.8	211	DS 225 4/8, basal snags
1	27-Mar-94	5.5	White				12	11	23	10.0	10.0	66.0	53.0	61.0	60.0	12.0	11.0	211	
4	25-Mar-95	4.5	Black		76.0	120.0	11	12	23	8.9	8.9	55.9	50.8	58.4	58.4	12.0	15.2	211	
1	1996	5.5					9	9	18	10.2	10.2	70.2	58.4	61.0	61.0	11.7	11.7	211	Douglas Score 221 3/8
4	2-Mar-97	3.5	Black				7	8	15	9.5	9.5	54.0	53.0	61.5	59.0	14.0	15.0	211	
1	1997	5.5	Red				13	8	21	10.5	10.5	62.2	47.6	67.3	64.8	13.0	10.2	211	Douglas Score 215
2	21-Mar-97	5.5	Black		90.0	120.0	10	9	19	10.0	10.5	65.0	56.0	55.0	55.0	13.0	12.5	210	
1	15-Mar-97	4.5	Black		76.0	94.0	10	10	20	10.0	10.0	62.0	56.0	56.0	56.0	11.0	14.0	210	
1	4-Mar-97	4.5	Black		81.0	111.0	10	9	19	10.0	10.0	63.5	54.5	61.0	60.0	12.0	12.0	209	
3	2-Mar-96	5.5	Red	105.0		111.0	11	7	18	10.0	9.5	65.5	55.0	69.0	67.0	12.0	10.0	209	Douglas score 208 3/4
3	21-Mar-97	4.5	Black		77.0	105.0	11	10	21	9.8	9.4	66.0	54.6	61.3	59.4	13.3	10.2	209	Douglas Score 209 2/8
1	10-Mar-96	4.5	Red		84.0	109.0	11	12	23	10.5	13.0	62.0	46.0	62.0	67.0	11.2	10.0	208	
1	30-Mar-96	5.5	Black			97.0	9	9	18	9.5	10.2	66.3	52.5	59.5	58.2	12.2	13.5	208	Long brows and guards
3	8-Mar-97	3.5	Red	87.0		114.0	9	11	20	9.5	9.5	62.0	58.0	56.0	56.5	12.0	12.0	208	Good buck
2	26-Mar-96	5.5	Black			120.0	9	9	18	10.0	9.5	66.0	49.7	60.0	62.5	12.8	13.0	207	Great to pass small stags
1	21-Mar-95	6.5	Black		82.0	114.0	10	10	20	11.0	11.0	64.0	47.0	64.0	61.0	12.0	10.5	207	

5.4.21 Top 50 Bucks (by Quality Score)

Previous page: List of the top 50 bucks reported during the study ranked by Quality Score.

Of the top 50 bucks measured during the study, 9 (18%) were taken in 1994, 6 (12%) in 1995, 14 (28%) in 1996 and 21 (42%) in 1997. These figures clearly indicate an increasing trend in the number of quality bucks taken by hunters as more became involved in management programs. This was supported by the fact that 36 (70%) of the top 50 bucks were taken on properties practising Quality Deer Management. The age structure of the top 50 was as follows: 7 (14%) 3.5 year olds, 23 (47%) 4.5 year olds, 11 (23%) 5.5 year olds, 4 (8%) 6.5 year olds and 4 (8%) 7.5+ year olds. Considering that bucks 4.5 years of age or older comprised only 27% of the harvest during the study, they accounted for 86% of the bucks in the top 50. When analysed by region of the State, DMR 1 had the greatest number in the top 50 with 23 followed by DMR 4 with 12, DMR 3 with 11 and DMR 2 with 6.

5.5 Female Deer Results

5.5.1 Doe Harvest by Region

Region	Number of Samples	Percent (%)
1	238	53
2	36	8
3	59	13
4	106	23
Unknown	13	3
Total	452	100

Above: The breakdown of the statewide doe harvest by region from 1993-1997.

During the project, hunters reported 452 does of which 439 (97%) provided sufficient information on harvest location to allocate it to a specific DMR. The reported doe harvest from each region varied significantly and was less evenly distributed than the buck harvest due to the limited number of properties which harvested does during the project. For example, DMR 1 accounted for 54% of the total statewide sample and 71% of this came from a single property. Similarly, 66% of does harvested in DMR 2 came from a single property. The doe harvest in DMR 3 and DMR 4 was more evenly distributed among properties.

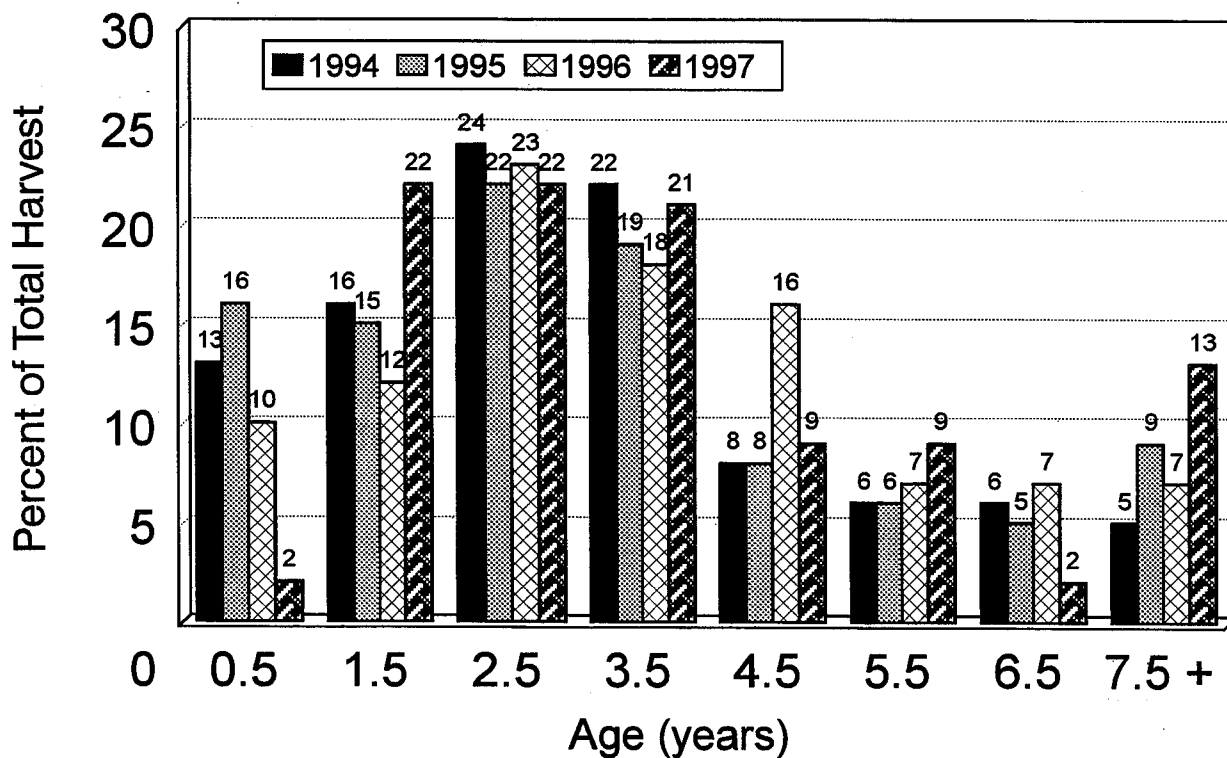
5.5.2 Doe Harvest by Year

Year	Number	Percent
1993	10	2
1994	87	19
1995	210	47
1996	87	19
1997	58	13
Total	452	100

Above: The breakdown of the statewide doe harvest by year from 1993-1997.

The number of does reported during each year of the project varied considerably from just 10 in 1993 to 210 in 1995. Only 10 does were reported in 1993 because this was prior to the implementation of the statewide data collection program. The number of doe samples was higher in 1995 due to the extensive doe culling operations that resulted from the droughts of 1994 and 1995. The slightly lower number of doe samples in 1997 was due to the conclusion of the TDAC project.

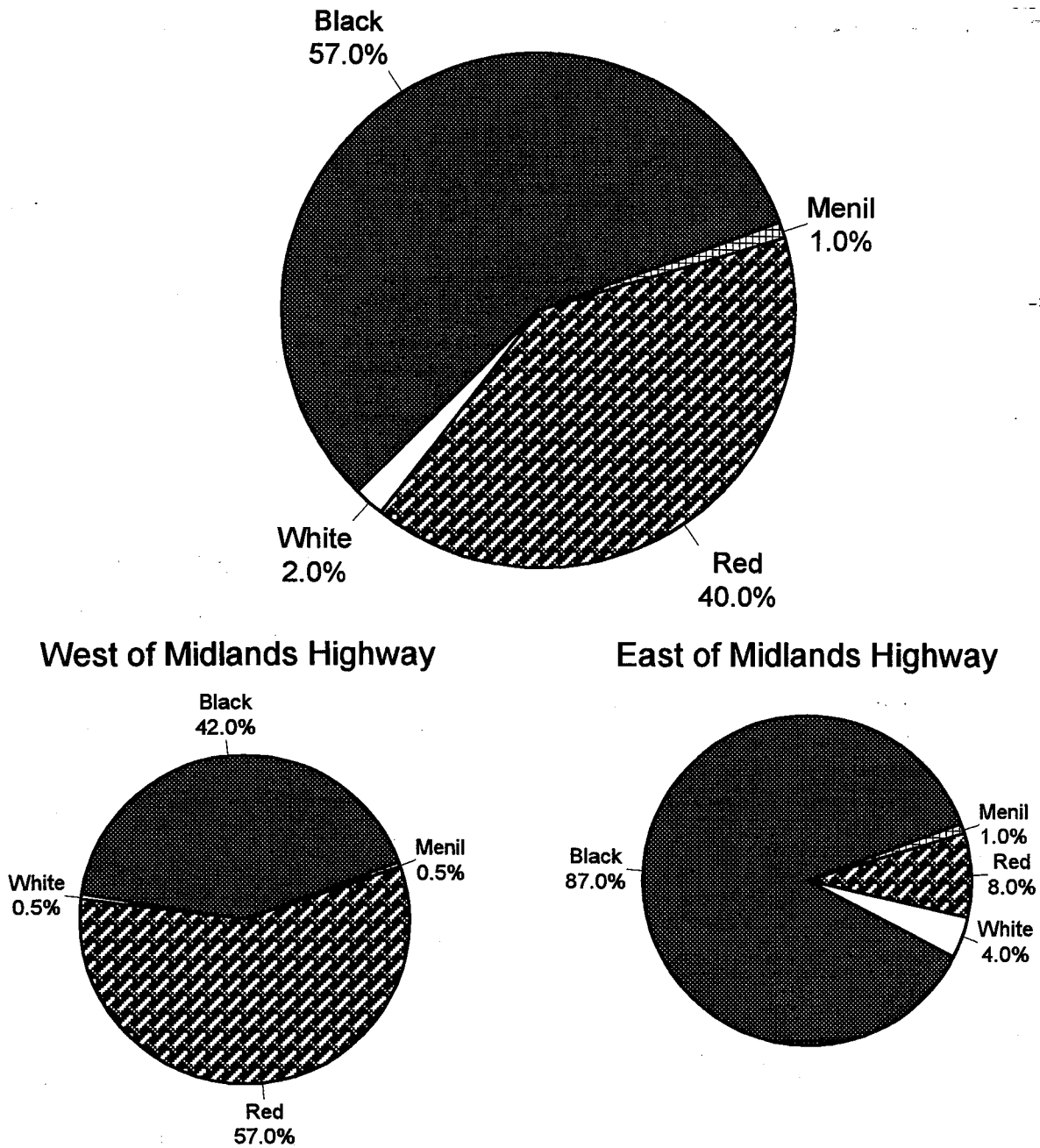
5.5.3 Statewide Doe Harvest by Age Class



Above: The breakdown of the statewide doe harvest by age class.

Due to the relatively low number of does reported during the study and to the patchy distribution of the samples, there was greater variation between years in the doe age structure than in the buck age structure. These results suggest that many hunters refrained from harvesting fawns (0.5 years old) and yearlings (1.5 year olds) in preference for adult does (2.5 years old or older). As a result, 2.5 year old does represented the greatest percentage of the harvest during all years of the study. This is likely due to the fact that 2.5 year old does are generally the most numerous adult-sized animals in the herd. The next most common age class harvested was 3.5 year olds followed in prevalence by 4.5, 5.5 and 6.5 year olds, respectively. The relatively high percentage of 7.5+ year old does suggests that many are surviving into the older age classes. The reason for the sharp decline in the percentages of 3.5 to 4.5 year olds in the harvest is unclear. In theory, the age structure should decrease in a step-wise fashion until 5.5 or 6.5 years of age. Two possible explanations for this include an increased ability of 4.5 year old does to avoid hunters and/or errors in age determination. These results suggest that once a doe reaches 4.5 years of age, it has a good probability of surviving into the older age classes.

5.5.4 Statewide Doe Colour Varieties



Above: The breakdown of statewide doe colour varieties.

The majority of does reported statewide during the study were black (57%) followed by reds (40%), whites (2%), and menils (1%). The percentages of the various colour varieties were reasonably consistent with those observed for bucks except that a greater percentage of does were red and fewer were black. For example, 40% of does reported during the study were red and 57% were black whereas 33% of bucks were red and 64% were black. The variation in the percentages of these colours was likely related to the fact that the majority of does came from DMR 1 (west of the Midlands Highway) where reds predominate.

When divided east and west of the Midlands Highway, the distribution of colours was also similar to that observed for bucks with black animals predominating on the east side of the highway and red animals predominating on the west side. An interesting result was that although there was a higher percentage of red does than red bucks reported statewide, there was a lower percentage west of the Midlands Highway where reds are more common. For example, 57% of does west of the Midlands highway were red while 67% of bucks were red. This difference is difficult to explain unless hunters selected black does in preference to red ones. This situation has been observed by the Project Officer on a few properties that were attempting to increase the prevalence of the red colour variety by harvesting proportionally more black animals.

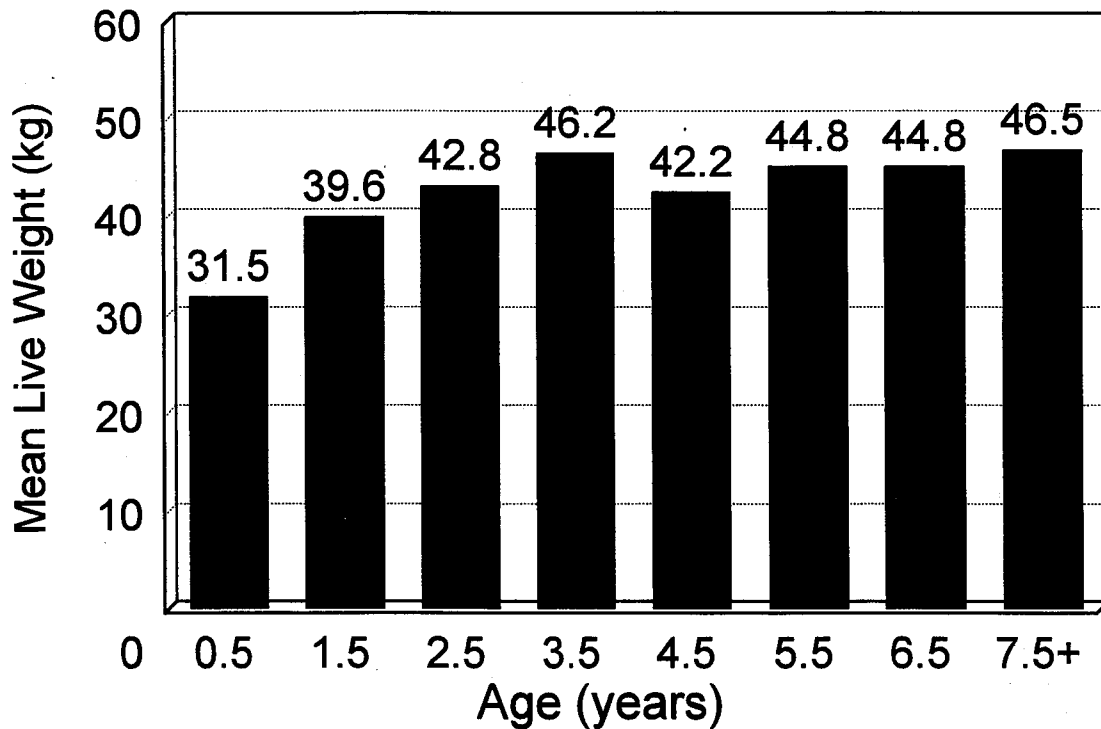
5.5.5 Doe Colour Varieties by Region

Region	Black	Red	White	Menil	Total
1	92 (47%)	101 (52%)	1 (01%)	0	194
2	28 (80%)	1 (03%)	5 (14%)	1 (03%)	35
3	15 (25%)	43 (73%)	0	1 (02%)	59
4	82 (89%)	9 (10%)	0	1 (01%)	92
Total	217 (57%)	154 (41%)	6 (02%)	6 (02%)	380

Above: The breakdown of doe colour varieties by region.

A total of 380 hunters reported the colour of their doe and the property (or area) on which it was taken. As with bucks, DMR 1 had the most even distribution of all colours with 47% black, 52% red and 1% white. It is unknown why no menil does were reported for this region because the Project Officer observed several during his travels. DMR 3 had the greatest percentage of reds (73%) and the lowest percentage of blacks (25%). DMR 2 and DMR 4 had a similar colour distributions except that DMR 2 had a lower percentage of reds (1%) but a higher percentage of whites (14%). The higher number of white animals in DMR 2 is likely attributed to genetics. The recessive allele which produces the white variety is more common in black herds than in red herds. Additionally, one property in DMR 2 purposely harvested several white does in an effort to reduce the number of poachers attracted to the white deer on the property and the other deer which the white animals made easier to locate.

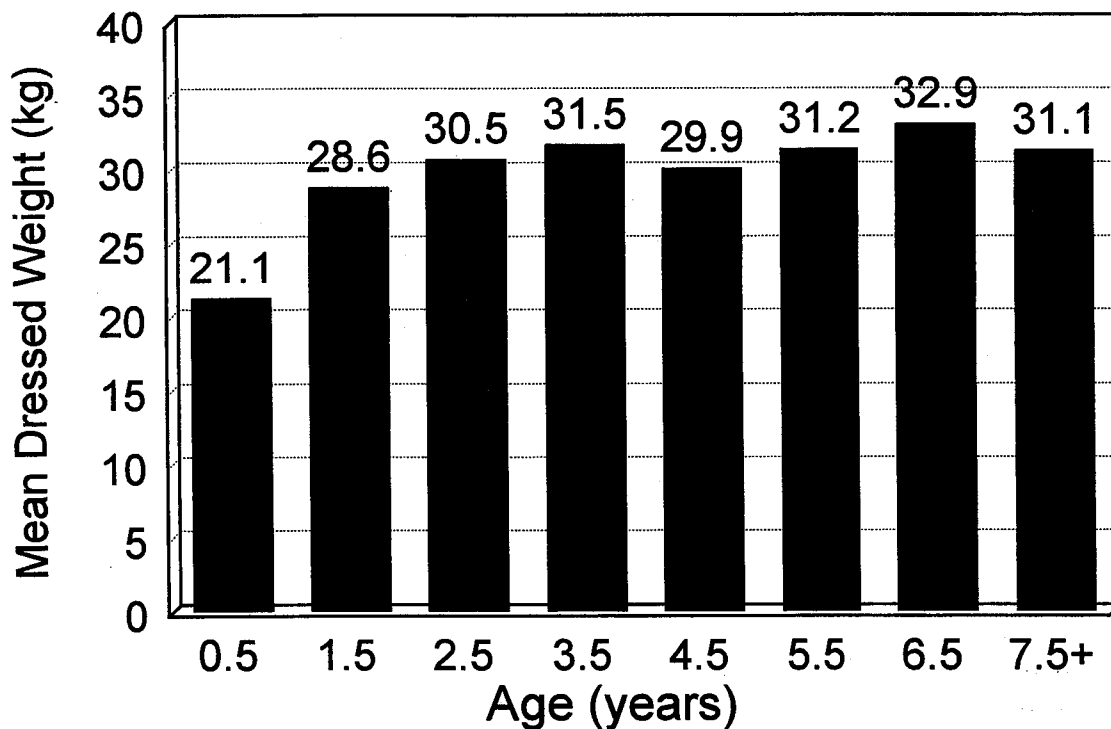
5.5.6 Doe Mean Live Weight



Above: The mean live weight for does by age class.

Doe mean live weight increased consistently with age until 3.5 and then levelled or declined slightly. It is unclear why live weight appeared to decline after 3.5 years of age. During the study, does were taken throughout much of the year (under license or crop protection permit) which greatly influenced their live weight. This was particularly true in the case of fawns (0.5 years old) and yearlings (1.5 years old) which rapidly increase in weight during the year. In the future, as more data become available, it would be appropriate to partition weights according to season and physiological requirements. Three does including a 3.5, 5.5 and 6.5 year old shared the spot for the heaviest live weight at 55 kg (122.7 lbs). The lightest live weight recorded was a fawn (0.5 years old) at 25 kg (55.8 lbs) although one 4.5 year old doe weighed only 26 kg (58 lbs).

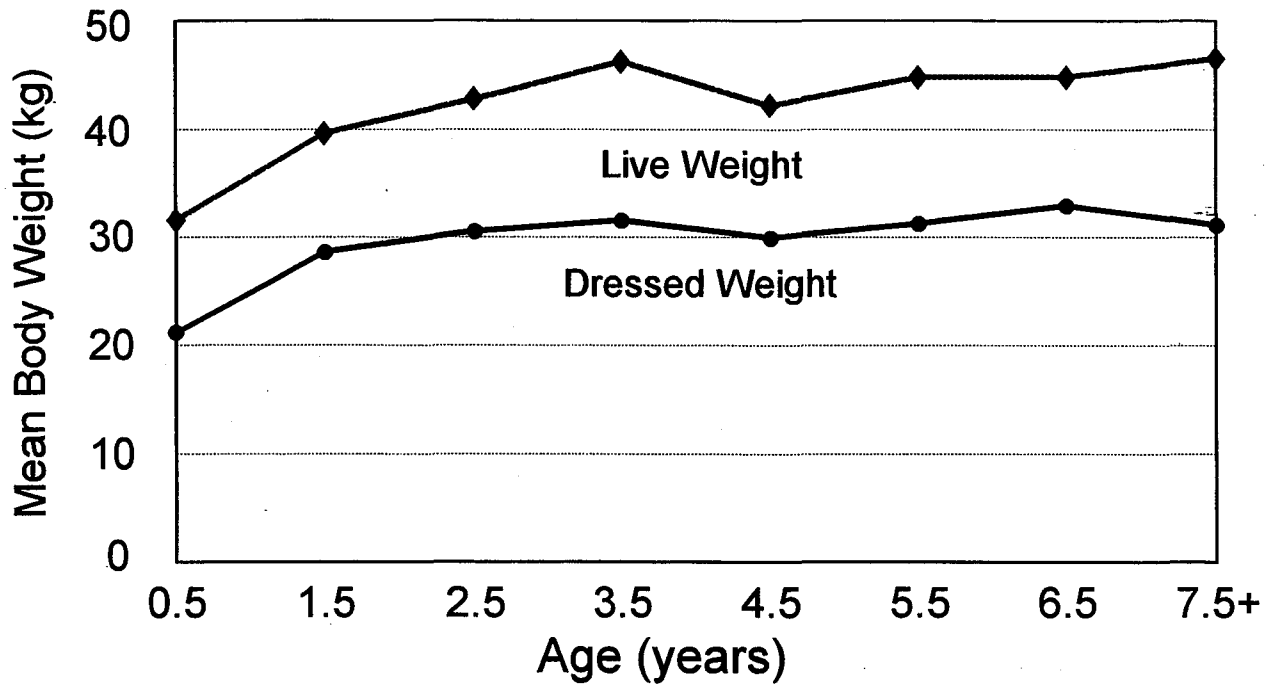
5.5.7 Doe Mean Dressed Weight



Above: The mean field-dressed weight (gutted only) for does by age class.

As with live weight, there was a substantial increase in weight from 0.5-3.5 years of age followed by a general levelling thereafter. These results suggest that does attain adult body size at 3.5 years of age whereas bucks do not reach adult body size until at least 4.5 years of age. This would suggest that, as in many other mammals, females mature earlier than males. The heaviest field dressed doe weighed 48 kg (107.1 lbs) and was 3.5 years old. The lightest doe recorded was 0.5 years old and weighed only 15 kg (33.5 lbs).

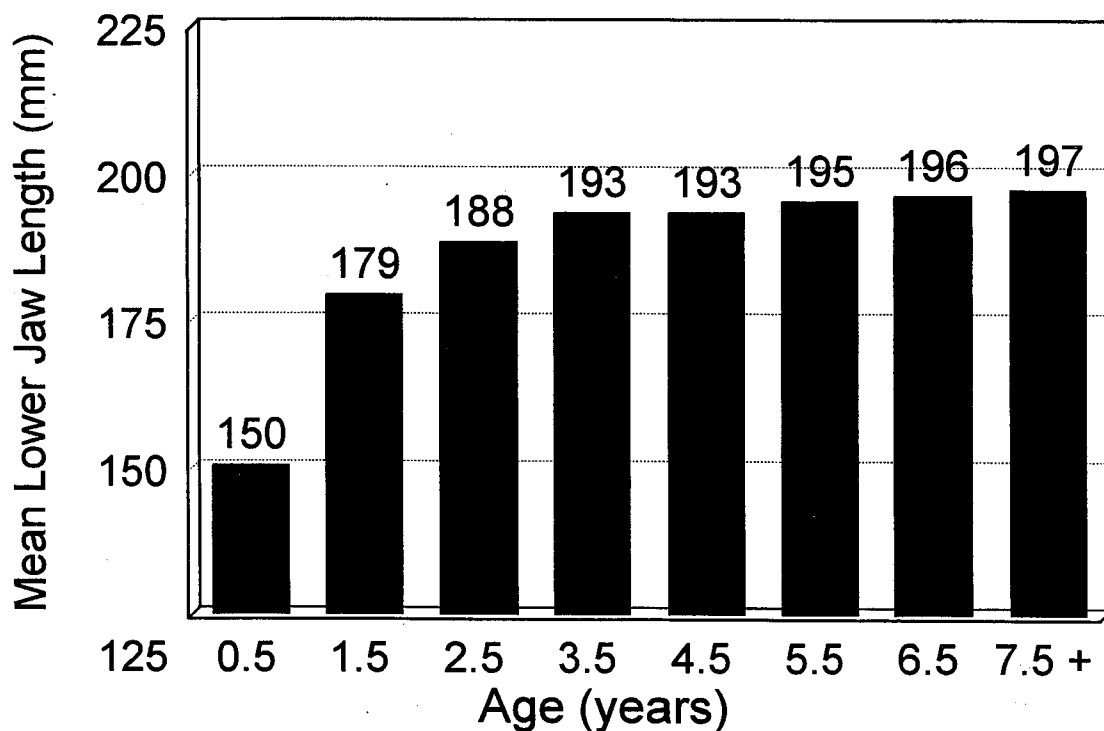
5.5.8 Relationship Between Live and Dressed Weight



Above: The relationship between live and dressed weight for does by age class.

As with bucks, there was an increasing difference between live and dressed weight for does at maturity. For example, the difference between live and dressed weight was 10 kgs for 0.5 year olds, 11 kg for 1.5 year olds, 12 kgs for 2.5 year olds and 14 kg for does 3.5+ years old. This finding suggests that rumen capacity in adult does is relatively larger than in fawns and yearlings and/or that young animals convert a greater percentage of their feed intake into muscle than do adults. The percentage difference between live and dressed weight in does was slightly lower than in bucks suggesting that does have a smaller rumen relative to their total body size than do bucks. However, this finding could have been confounded by the fact that does in this study were harvested throughout much of the year whereas bucks were harvested during a consistent period (February-March) which coincided with maximum feed availability and physical condition .

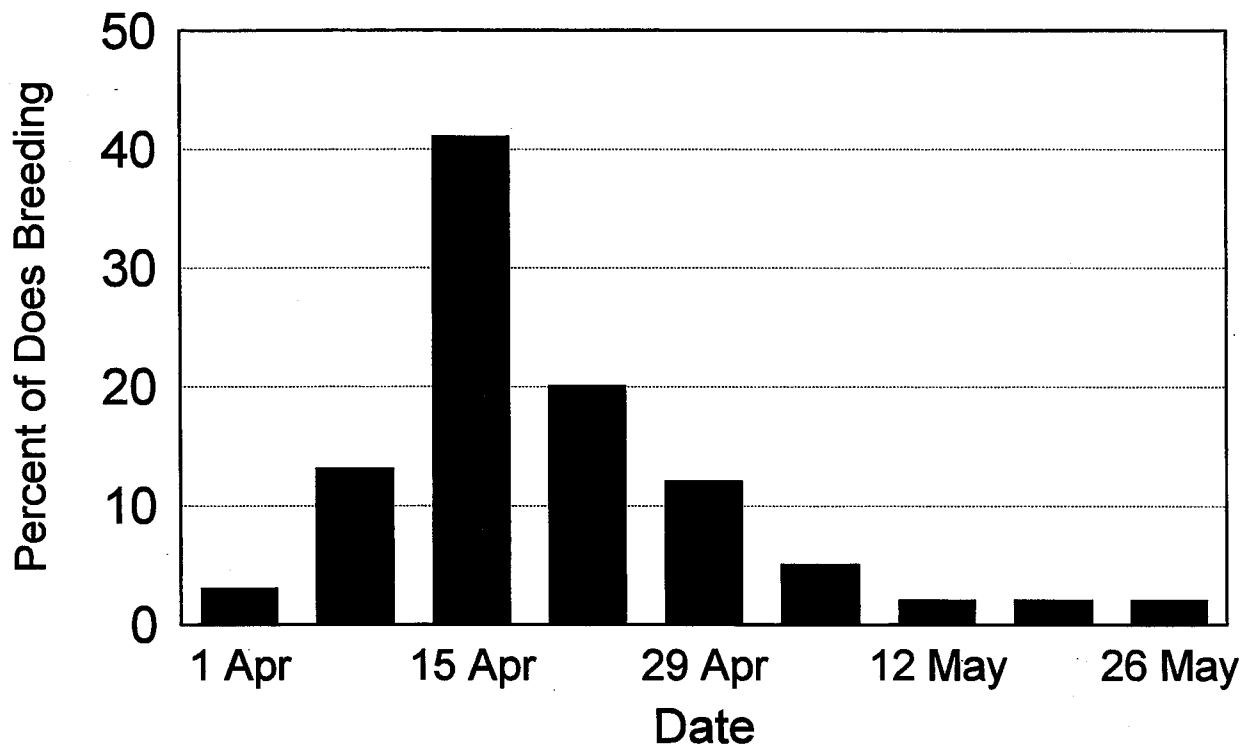
5.5.9 Doe Mean Lower Jaw Length



Above: The mean lower jaw length for does by age class.

Mean lower jaw length increased with age until 3.5 and then slightly thereafter. It was interesting that lower jaw length increased with age throughout life in does while it levelled in bucks at 5.5 years of age. More data are needed to examine this relationship. As with bucks, mean lower jaw length varied within age classes in relation to habitat quality and generally reflected the animal's body weight and overall condition. The longest jaw length recorded was 204 mm from a 6.5 year old doe although 20 does had jaw lengths between 200-203 mm. This finding would suggest that 205 mm could be used as a reasonable maximum for does in Tasmania and that lower jaws found in the field exceeding this length would likely be from bucks.

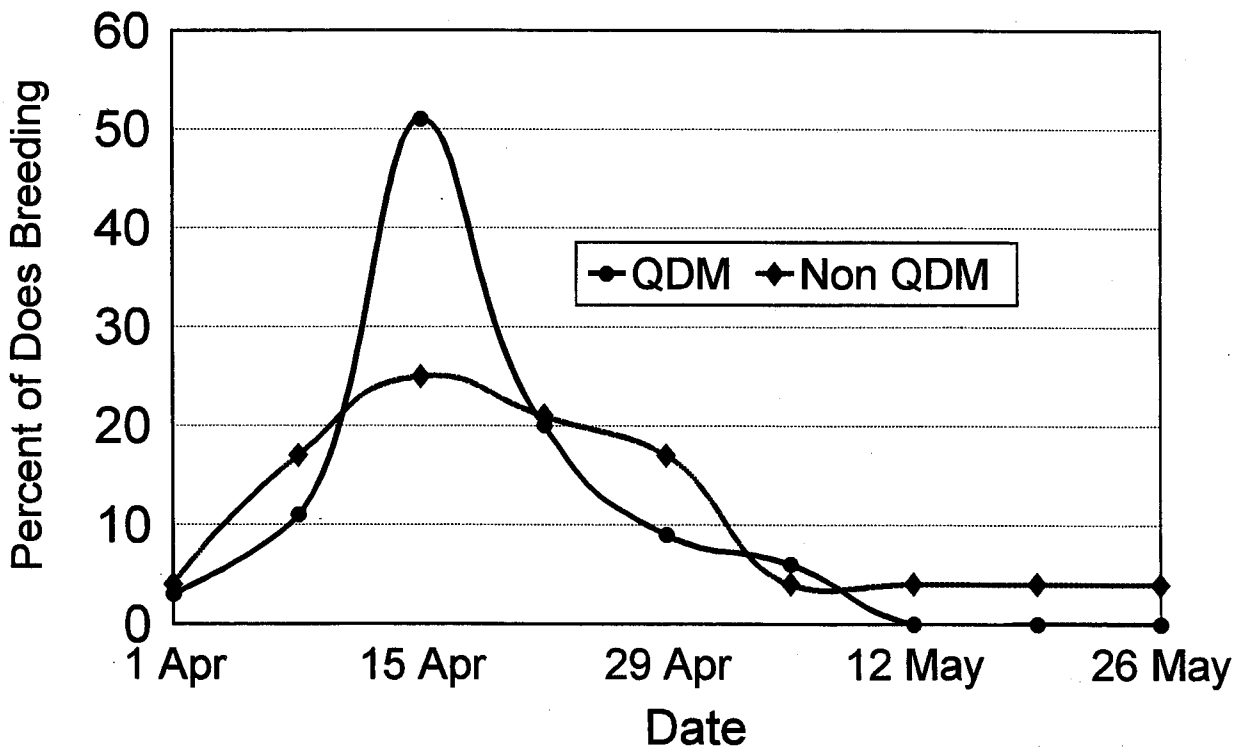
5.5.10 Statewide Doe Conception Dates



Above: The breakdown of conception dates from does taken statewide from 1993-1997.

The following results were obtained from 59 foetuses collected by hunters from pregnant does taken during the study. By weighing the foetuses, both the conception (breeding) and parturition (fawning) date was estimated. This information was among the most useful collected during the study because it provided insight on the breeding efficiency and overall condition of the herd. Throughout the state, 85% of does conceived between 8-29 April and 62% conceived between 15-22 April. In fact, nearly 30% of all does conceived during a 3 day period from 15-17 April. These results suggest a relatively healthy situation overall, although the fact that 15% of all females conceived in May was of some concern. These late breeding does likely missed their first oestrous or breeding cycle in April due to an insufficient number of bucks or too many does and had to cycle a second time 18-21 days later. Consequently, these fawns would have been born 21 days later than others born that year. Late born fawns have a lower survival rate, lower weaning weight and a reduced chance of becoming a quality adult animal. Two does in the study conceived after 24 May suggesting they were bred on their third oestrous cycle. The earliest recorded conception date was 2 April and the latest was 27 May.

5.5.11 Doe Conception Dates (QDM Properties vs Non-QDM Properties)

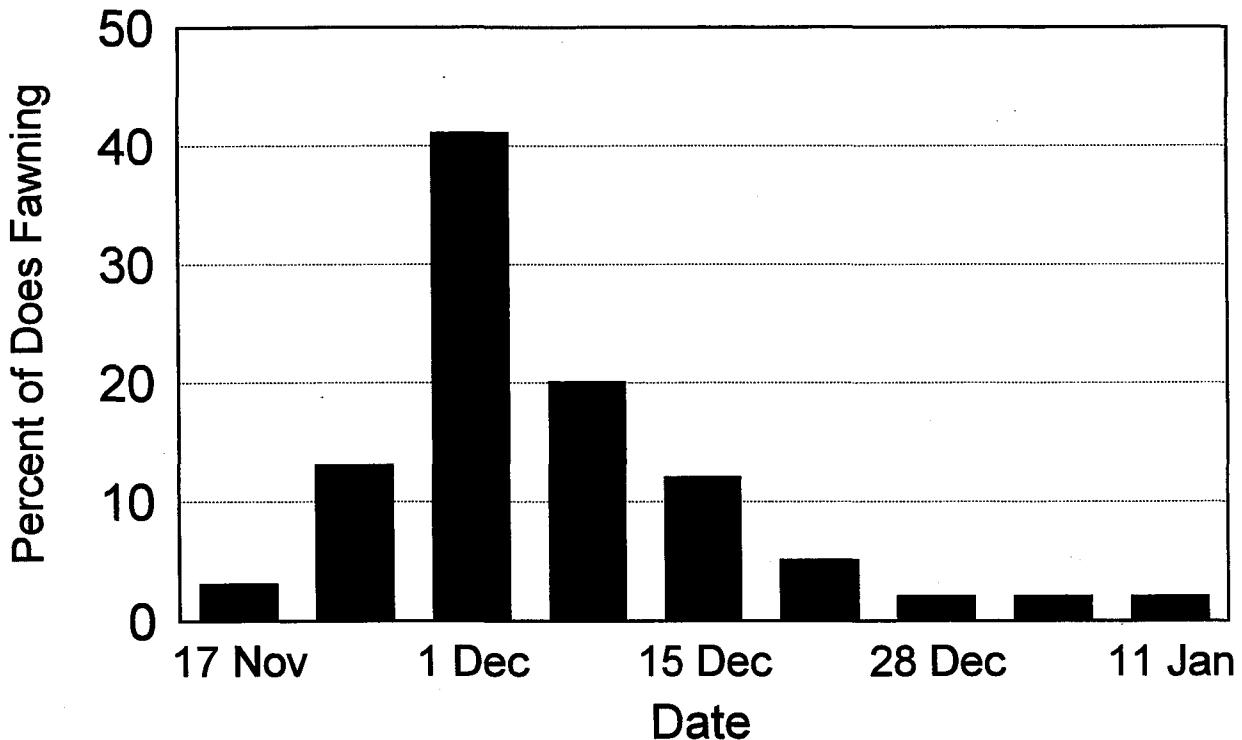


Above: A comparison of doe conception dates for properties operating under Quality Deer Management guidelines (QDM) and properties not operating under QDM guidelines.

Doe conception dates were analysed by region, habitat type and whether or not the property was operating under QDM guidelines. There were no detectable differences in mean conception dates according to region or habitat type while there was a marked difference in conception dates according to deer management strategy (QDM or non-QDM). For the purpose of this analysis, properties operating under QDM guidelines were defined as those which harvested reasonable numbers of does and protected at least 2.5 year old bucks. The conception period on QDM properties was both shorter and more intense than on non-QDM properties. For example, on non-QDM properties the total conception period was 51 days whereas it was only 34 days (32% shorter) on QDM properties. Furthermore, the mean conception date on QDM properties was 6 days earlier than non-QDM properties. On QDM properties, 83% of all does conceived during a two week period from 8-22 April whereas only 54% of does on non-QDM properties conceived during this same period. Additionally, no doe conceived after 7 May on QDM properties while 16% of does on non-QDM properties conceived between 7-27 May. The combination of adequate doe harvests and protection of young bucks appeared to substantially improve breeding efficiency. These findings were supported by the observations of many hunters who reported a

brief but intense rutting period and a uniform group of fawns following the implementation of a QDM program. A short breeding period also reduces the length of time that bucks are most vulnerable to poaching and enables legal hunters to concentrate their protection efforts when it is most needed.

5.5.12 Statewide Doe Parturition Dates



Above: The breakdown of doe parturition (fawning) dates of does taken statewide from 1993-1997.

Doe parturition dates were determined by adding the gestation length for fallow deer (230 days) to the conception date. In this study, 62% of all does harvested would have given birth between 1-15 December with nearly 30% giving birth during the first 3 days of December. The earliest recorded parturition date was 18 November and the latest was 12 January. However, reports from hunters would suggest that fawns are occasionally born in late January or even early February. For this to occur, a doe would have to miss 3-4 oestrous cycles without conceiving. This would suggest an unhealthy deer herd with an unbalanced adult sex ratio and young male age structure. It is believed that sightings of late born fawns will decline with increasing participation in QDM. Based on these results, the antlerless deer season in mid March would not jeopardise the survival of orphaned fawns. Most deer farmers in Tasmania suggest that orphaned fawns must be at least 60-90 days old to survive on their own with little or no ill effect. The latest born fawn in this study (12 January) would have been approximately 67 days old at the beginning of the March antlerless season while the vast majority of fawns would have been more than 90 days old.

5.5.13 Foetal Sex Ratio

Doe Age	Male	Female	Total
1.5	6 (75%)	2 (25%)	8
2.5 +	25 (50%)	25 (50%)	50
Total	31 (53%)	27 (47%)	58

Above: The breakdown of the foetal sex by doe age (yearling or adult).

The overall foetal sex ratio was 53% male and 47% female which is typical for many species of deer and other mammals. When analysed by doe age, yearlings (1.5 year olds) had a higher percentage of male offspring than adult does (2.5 years or older) which had equal numbers of each sex. This could be related to the low sample size, although this trend has been observed in other deer species. While the reason for this phenomenon remains unclear, there are many theories ranging from population regulation to differences in energy demands on the doe relative to the sex of the offspring. Regardless, this could have an impact on properties actively harvesting adult does. These herds would likely have a lower mean doe age structure and a greater percentage of yearlings. Therefore, it is possible that these properties would have a disproportionate fawn sex ratio in favour of males. This conclusion is supported by the fact that the foetal sex ratio on QDM properties was 58% male to 42% female while it was 42% male to 58% female on non-QDM properties. Furthermore, the mean doe age on QDM properties was 3.6 years whereas it was 3.9 years on non-QDM properties.

6. FINANCIAL REPORT

The financial outcomes of the project were very pleasing. Careful financial management, in conjunction with strategic fundraising initiatives, enabled the extension of the project well beyond the initially planned two years. Summarised below are a Summary of Receipts and Payments from 1 July 1992 to 30 June 1997 and a Statement of Financial Position at 30 June 1997. Government grants were fully acquitted at the conclusion of the project, and it was resolved by the TDAC that funds remaining after the sale of the motor vehicle would be invested with the capital investment secured. In addition to providing for future operating costs, the TDAC prioritised a range of initiatives for potential future funding. These initiatives are documented in the meeting minutes of the TDAC.

6.1 Summary of Receipts and Payments for the Period 1 July 1992-30 June 1997

INCOME	Dollars (\$)	Dollars (\$)
Government Grants		254,594
Interest on Investments		32,791
Other Income		<u>39,440</u>
		326,825
EXPENSES		
Establishment and Operating Expenses 1992-93	75,881	
Operating Expenses 1994-97	204,874	
Capital Expenditure (Return O/S on motor vehicle)	<u>32,833</u>	313,588
CASH BALANCE AS AT 30 JUNE 1997		13,237

6.2 Statement of Financial Position as at 30 June 1997

	Dollars (\$)	Dollars (\$)
ACCUMULATED FUNDS		35,038
Represented By:		
CURRENT ASSETS		
Cash	13,238	
Stock	1,121	
Receivables	<u>407</u>	14,766
NON CURRENT ASSETS		
Equipment	31,756	
Less Provision for Depreciation	<u>10,391</u>	21,365
TOTAL ASSETS		36,131
LESS CURRENT LIABILITIES		
Creditors		1,093
NET ASSETS		35,038

7. KEY OUTCOMES OF THE TDAC PROJECT

Listed below are a few of the key outcomes from the TDAC project presented in accordance with the original aims and objectives (refer to Section 3.3).

Aim

Aim: To develop a practical, strategic plan for Tasmania's wild fallow deer that most closely meets the needs of the Tasmanian community and maximises the biological, social and economic potential of the herd.

Outcome: The TDAC introduced the concepts of Property-based Game Management (PBGGM) and Quality Deer Management (QDM), both of which were widely adopted by landowners and hunters in Tasmania. Collectively, these programs successfully resolved many of the difficult and often contentious game management issues previously confronting landowners, hunters and the Government and substantially improved the quality of the wild fallow deer herd.

1. Success of QDM

At the conclusion of the project, QDM had been adopted by over half of all deer hunters and landowners within the deer range. This approach resulted in substantial improvements in the sex ratio and age structure of the statewide deer herd including a more than 50% reduction in the harvest of first head bucks (2.5 years old) and a 329% increase in bucks with Quality Scores (Douglas Score estimate) in excess of 200 points. The success of QDM in Tasmania led to its application to other deer species throughout Australia and in New Zealand.

2. Success of PBGM

At the conclusion of the project, more than 45 landowners, 1,200 hunters and 165,000 ha of private land were operating under written PBGM plans. The success of these plans received national and international recognition and led to the re-structure of the Tasmanian Parks and Wildlife Service (PWS) to include a Property-based Game Management Unit. The formation of this unit was officially announced by the Hon. John Cleary, MHA, Minister for National Parks and Wildlife, on 3 February 1996 and it officially opened on 1 July 1996. To facilitate the development of this unit, the TDAC Project Officer Brian Murphy was sub-contracted by the PWS on a part-time basis for 12 months to serve as Program Consultant. This consultancy expired with the conclusion the TDAC project on 30 June 1997.

Objectives

1. Objective: *To employ or engage, as required, suitably qualified persons to implement the aim of the project.*

Outcome: The TDAC employed a qualified wildlife (game) biologist from the U.S. with specific experience in deer biology and management to serve as Project Officer.

2. Objective: *To conduct and facilitate any such research into wild or domestic fallow deer as may be necessary to develop, manage or maintain a Tasmanian wild deer management program.*

Outcome: The TDAC established and implemented the largest and most comprehensive deer research program undertaken to date in Australia with more than 1,300 animals being reported (measured, weighed and aged) by nearly 700 hunters in just four years.

3. Objective: *To actively promote the role of ethical hunting as a principal tool in a Tasmanian wild deer management program.*

Outcome: The TDAC promoted the role of ethical hunting in deer management through the conduct of nearly 200 presentations and training seminars for hunters, landowners, deer farmers, biologists, scientists and the public.

4. Objective: *To improve communication and understanding between hunters, landowners, government agencies, deer farmers, and the community on issues concerning deer management in Tasmania through educational seminars, written literature, informal meetings, interviews (television, radio and newspaper and any other means deemed appropriate by the Committee.*

Outcome: The TDAC substantially improved the level of communication and understanding between key stakeholders through the participation in nearly 300 meetings, the conduct of approximately 50 television, radio and newspaper interviews and through the publication of more than 20 articles in scientific publications, journals and sporting magazines.

5. Objective: *To advise the Department administering the National Parks and Wildlife Act 1970, the Secretary of the Department and/or the Minister on issues concerning the fallow deer resource of Tasmania.*

Outcome: The TDAC regularly provided advice to Government on issues involving wild fallow deer including recommendations for changes to the hunting season, hunting license and regulations. All recommendations were accepted by Government and widely supported by all stakeholders resulting in a more flexible and efficient management program.

8. FUTURE DEER RESEARCH NEEDS

Throughout the project, the Project Officer identified a number of areas where further research was required or where certain currently used management techniques needed further validation. The following is a list of areas where additional information is needed, but which were beyond the scope of this project. They are not listed in any specific order.

Research Needs

1. Developing a practical and reliable model to estimate the size of the statewide deer herd. To date, no reliable estimate of the statewide deer herd has been available. Previous population estimates have been derived from a combination of sources including hunter license returns, hunter surveys, estimations of the legal and illegal take and local knowledge from landowners, hunters and other key individuals. While these estimates have proven adequate in the past, as more landowners and hunters become involved in management programs and as the community questions the role of deer in Australia it will become increasingly important to have a reliable method to estimate the statewide fallow deer population.
2. Estimating the size of local deer populations based on hunter sighting information. As a result of the TDAC project, a number of property hunting groups now collect deer sighting information to provide general trends in local deer numbers. This information also provides useful information on the sex ratio and age structure of the herd. Sighting information is particularly important in QDM programs where many bucks are observed but not harvested. If a method could be developed using the sighting information to predict actual herd size, it would enable more specific management guidelines to be established.
3. Estimating the levels of hunting and non-hunting mortality by sex, age and region of the State. There is no reliable information regarding the sources and levels of mortality (hunting and non-hunting) for fallow deer in Tasmania relative to sex, age and region of the State. This information would be particularly useful for male deer which are subject to higher levels of natural (i.e., post rut mortality) and man-induced mortality (i.e., hunting and poaching).
4. Estimating fawn survival and recruitment (inclusion into pre-hunting season population). While much useful reproductive information such as conception and parturition dates was obtained during this study, there is currently no estimate of annual fawn survival and recruitment in Tasmania. Without this information, it is difficult to predict population growth and harvest levels.
5. Determining regional and statewide genetic variation within the herd. While genetic variation in fallow deer has been investigated in other areas of the world, no such information exists for fallow deer in Tasmania. This information, in conjunction with the morphological data collected in this project could be useful in detecting local or regional populations where genetic differences exist in relation to antler quality, body weights,

reproductive success or other such factors. This could be particularly useful in the northeastern portion of the deer range where adult male deer appear to have poorer quality antlers (fewer antler points and narrower palms) than animals of the same age in similar habitats elsewhere in the State. Obviously, such differences could be related to other factors such as nutrition.

6. Determining deer home range size and dispersal patterns relative to sex, age and season. Little information is available on these subjects in Tasmania. A radio telemetry study conducted by the Department of Primary Industry and Fisheries (DPIF) in 1994-95 provided some insight into fallow deer home range size in Tasmania but did not examine the effects of age or season (Statham and Statham 1996). This information would be particularly useful to properties operating under QDM guidelines which strive to increase the male age structure and balance the adult sex ratio.
7. Determining the dispersal mechanisms and/or habitat factors responsible for "buck" properties and "doe" properties. During the TDAC study, a number of properties were identified which held significantly more of one sex than surrounding properties while other properties held both sexes in approximately equal numbers. For example, several properties harvested more male deer during each year of the study than they had total female deer on the property. In nearly every case these "buck" properties were adjacent to "doe" properties (areas with 20 or more female deer per adult male). This pattern suggests a particularly high rate of male dispersal from these "doe" herds to adjacent properties with lower total deer numbers. However, it remains unclear if other factors such as habitat type or feed quality are involved.
8. Determining the causes and rate of deer herd spread in Tasmania. Based on the report by Wapstra (1973) and the conclusions of this report, it is evident that the deer herd has increased its range in Tasmania during the last 20 years. However, it is unclear why the rate of spread has been greater to the South and West than in any other direction. Future research should examine both habitat and human factors.
9. Determining the food habits of fallow deer in relation to sex, age, season and habitat type. No detailed analysis of the diet selection of fallow deer in Tasmania has been conducted. As such, little is known of their food habits or impact on the Tasmanian environment. This information would be useful in developing specific management techniques to improve habitat quality for deer and identify sensitive areas where deer should be excluded.

Technique Validation

1. Validating the tooth wear and replacement aging technique used during the project. The technique used to age deer in this study was similar to that used by Chapman and Chapman (1975) although modified slightly by the Project Officer based on jawbones from known-age deer in Tasmania (Murphy 1995). However, the known-age samples were obtained from deer farms and therefore could differ from those obtained from wild deer. Additionally, slight regional differences in wear were observed by the Project Officer. Therefore, it would be useful to validate this technique using known-age animals from wild populations in various regions of the State.
2. Validating the foetal aging technique used during the project. The foetal age estimation technique used in this study was derived by fitting a regression analysis to known-age foetuses obtained by Chapman and Chapman (1975) from fallow deer in England. While the regression fit the data particularly well ($R=.99$), it is possible that foetuses from does in Tasmania do not weigh the same as those from does in England at similar stages of gestation.

9. FUTURE MANAGEMENT RECOMMENDATIONS

The TDAC Project has placed wild deer management in Tasmania on a sound biological path. The Project also has revealed several areas for additional research and the productive linkages that can be forged between hunters, landowners, government agencies, deer farmers and the community.

Therefore the TDAC recommends that:

1. The newly formed Game Management Unit (GMU) within the Parks and Wildlife Service (PWS) be strengthened and sufficiently resourced to:
 - a. engage a minimum of three suitably qualified staff to continue the development, implementation and ongoing review of PBGM and QDM, and incorporate these initiatives into other off-reserve conservation programs,
 - b. become the primary Unit responsible for wild deer management in Tasmania,
 - c. facilitate ongoing research into wild fallow deer,
 - d. continue the statewide deer data collection program including scientific analysis, recording and reporting of results.

- e. provide consistent and reliable communication to key stakeholder groups to foster an increased awareness and understanding of sustainable game management practices,
 - f. facilitate a strategic and ongoing program to minimise illegal hunting activities, and
 - g. prepare, in consultation with major stakeholder groups, operational and strategic plans for the ongoing management of game species in Tasmania.
2. PBGM and QDM continue to be the principal game management strategies for developing and maintaining a sustainable future for wild fallow deer and other species in off-reserve areas in Tasmania.
 3. The human dimensions of game management, while most difficult to achieve, be generally regarded as the most important. The items identified in Section 4.1.3 proved critical to the success of the project and should be used in the development of a Charter for the GMU.
 4. PWS (GMU) employees continue to be represented on the TDAC.
 5. The TDAC remain the primary body advising the Government on deer hunting, deer management and community aspects of fallow deer. Further:
 - a. the TDAC should retain strong and ongoing linkages to the GMU with regard to the research and management needs of wild fallow deer in Tasmania, and
 - b. the TDAC policies on live capture, release and importation of Mesopotamian fallow continue for an additional 5 years (through July 2003).
 6. Improvements to the PWS of game licencing regime be investigated and appropriate consultation regarding options be conducted with stakeholder groups prior to implementation.

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