



DARTMOOR TRAINING AREA

Environmental Appraisal

Volume 1 of 2 – Main Report



DE
DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

October 2007

Report for

Headquarters Defence Training Estates
Warminster

Main Contributors*MoD/Defence Estates:*

Dominic Ash
Martin Brown
Richard Brooks
John Loch
Lt Col Paul Norrington-Davies OBE
Lt Col (Retd) Tony Clark OBE
Maj Hamish Miln

Entec:

Kay Adams
John Bremner
Elspeth Church
Rachel Dimmick
Alistair Donohew
Jim Eardley
Alastair Forbes
Ian Hepplewhite
Nick Layton
Malcolm Pratt
Tristan Stephens

Issued by

Rachel Dimmick

Approved by

Nick Layton

Entec UK Limited

Gables House, Kenilworth Road, Leamington Spa,
Warwickshire CV32 6JX, England
Tel: +44 (0) 1926 439000
Fax: +44 (0) 1926 439010

L17774/rr139i1



Certificate No. EMS 69090



Certificate No. FS 13881

Dartmoor Training Area

Environmental Appraisal

Volume 1 of 2 – Main Report

October 2007

Disclaimer

This report contains information provided to Entec under the Licence for the use of Defence Estates Digital Data dated 18/07/06, 05/07/07, 25/07/07, 02/08/07 and 21/09/07 under which Defence Estates has provided information to Entec on an "as is" basis excluding all liability under clause 4.

In relation to such data, Entec provides that data to Defence Estates on an "as is" basis and excludes all liability in relation to that data and makes no representation or warranty, express or implied as to the accuracy or completeness of any statement or advice contained within this report to the fullest extent permissible by law.

Document Revisions

No.	Details	Date
i1	Draft Report for review	14/09/07
i2	Final Report	08/10/07

Non Technical Summary

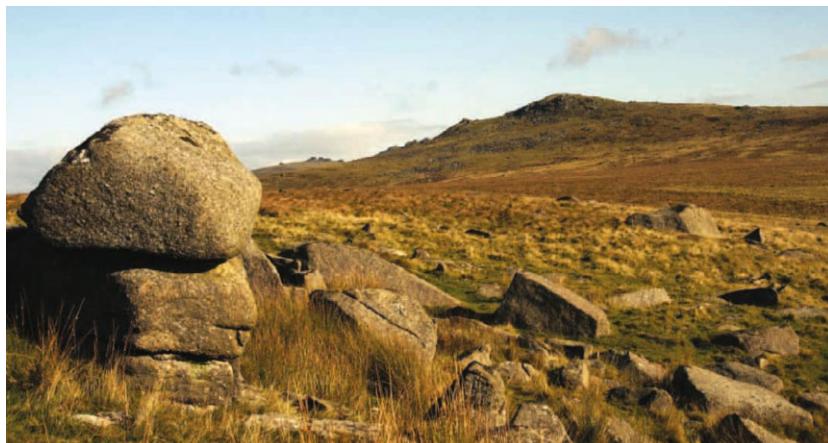
What is the purpose of the Environmental Appraisal?

The Ministry of Defence (MoD) uses land within Dartmoor National Park (DNP), known as the Dartmoor Training Area (DTA), for military training. Much of the land upon which the MoD trains is privately owned and training is undertaken under license from landowners including the Duchy of Cornwall. This license expires in 2012.

As part of the re-negotiation of the license, the Secretaries of State for Defence and for Environment, Food and Rural Affairs (DEFRA) require confirmation that:

- there is a clear military need for military training on Dartmoor; and
- the management of DTA for military activities will continue to be sensitive to environmental, farming and public access issues and is thus sustainable in the long term.

The Environmental Appraisal (EA) seeks to appraise the environmental effects of military training and identify measures required to manage any adverse effects so as to avoid or minimise them. The MoD has a comprehensive set of measures in place to control the effects of military training and these have been taken into account in the appraisal.



DTA consists of approximately 13,000 hectares (ha) of predominantly moorland in Devon, and is located approximately 20 km west of Exeter, 15 km north of Plymouth and approximately 320 km south west of London. It contains several nature conservation sites of national and international importance and includes a significant archaeological landscape with features dating back to Prehistory. Notable remains include the Dartmoor Reaves, a series of Bronze Age land boundaries and associated settlement remains. DTA amounts to approximately 14% of the total area of the National Park. Most of north-west Dartmoor is inaccessible except on foot and although some vehicular tracks exist, most of them provide access onto the moor rather than across it.

As DTA is important in terms of its natural and archaeological features, public access and recreation, the effects of military training need to be considered as part of the license re-negotiations.

What does military training involve?

The type of training which the MoD undertakes on DTA broadly falls within three categories known as live firing, dry training and adventurous training. Live firing involves training using live ammunition against either fixed or moving targets. Dry training activities are training activities undertaken without the use of live ammunition. Dry training may involve no ammunition at all or may involve the use of blank ammunition and pyrotechnics (light, noise and smoke) in order to practise tactics similar to those undertaken on operations and during live firing exercises. Adventurous training comprises training activities similar to those that would be undertaken by members of the public such as canoeing, caving and rock climbing.



DTA comprises five training areas, which include Okehampton, Willsworthy and Merrivale in the north and Cramber and Ringmoor in the south. Only Okehampton, Willsworthy and Merrivale are used for live firing but all five training areas are used for dry training. Live firing takes place within areas known as Range Danger Areas (RDAs) on Okehampton, Willsworthy and Merrivale. Willsworthy also includes fixed target ranges.

During live firing the RDAs are closed to members of the public for safety reasons. Live firing is permitted on average up to 120 days per year (Okehampton), 180 days per year (Merrivale) and 245 days per year (Willsworthy), public access is guaranteed for the remainder of the year. Public access is always possible on Oakhampton, Merrivale and Wilsworthy throughout August, at weekends and during Public Holidays, however access to Wilsworthy is restricted on the weekend containing the second Sunday in the month. Cancellations of live firing exercises, which result in RDAs becoming available for public access, are advertised in the local media and on the DTA website - <http://www.dartmoor-ranges.co.uk>.

Dry training can take place all year round and, as public safety is not an issue, the public can access the training area when dry training is taking place. Dry training exercises are carefully managed and do not take place within 100m of members of the public or within 200m of residential dwellings.

Helicopters may be used in support of training. Any exercise involving four or more helicopters is published in the Firing Notice on the DTA website six weeks in advance of the exercise.

Dry and adventurous training does take place outside the DTA, for example under license at areas such as Meldon Reservoir and Meldon Quarry or on private land under short term agreements. However such training tends to be small scale, involving low numbers of military personnel and frequently involves activities that are similar to those that would be carried out by members of the public, such as walking and canoeing. For this reason it is considered that the effects from such training are minimal and insignificant and therefore training outside DTA has not been considered in the EA.

Why do the military need to train on DTA?

The need for military training on DTA has been addressed through separate studies which have addressed both the continuing need to train on DTA and the need for military training on the Defence Training Estate in the south west of England. Whilst all three Armed Services train on DTA it is most frequently used by the Army and the Royal Marines.



The studies have considered alternatives to training on DTA including training on private land, conducting training overseas and the use of simulation or synthetic training. Both studies concluded that whilst these assets can assist in the delivery of training they cannot offer a viable alternative to training on DTA. The provision of new training areas was also considered when looking for a 13,700 ha site to replace MoD holdings in south-east England in 2007. In this study Defence Estates used overlays to depict designated areas, areas susceptible to flooding, existing MoD land, urban areas and centres of habitation in order to eliminate unsuitable areas from further examination. The study was unable to identify any suitable sites in mainland UK large enough (13,700 ha) to replace training areas in the south-east and therefore, by implication, DTA.

Across the UK, there are several existing large training areas, most have been developed to meet specific military needs and are therefore prioritised for the delivery of different types of training. A review of these training areas and ranges has demonstrated that they have numerous limitations imposed upon their use primarily as a consequence of legislation, planning agreements and undertakings and environmental management agreements with national and local stakeholders. In addition the MoD has identified a shortfall in light force training area capacity in UK; this, coupled with the return of 20,000 troops to the UK from permanent bases overseas will exert further pressure on an already scarce resource.

Finally, the training areas within the south west have been reviewed. This has shown that with the exception of Bodmin Moor, none of the potential training areas in the South West offers the terrain and climate required to provide the arduous and challenging training environment necessary to developing those skills that enable service personnel to cope with the demands and frictions of combat and survive on the modern battlefield. All are also far less extensive than DTA (Bodmin Moor, at 1,600 ha. is the largest but is only 12% of DTA in size) and therefore cannot provide the challenge, scope and variety of training currently carried out on DTA.

It has therefore been concluded that no realistic alternatives to the training available on DTA exist within the south west.

What is the process of appraisal?

The approach adopted for the EA is based on that used for the assessment of effects associated with developments for which Environmental Impact Assessment (EIA) is required for projects falling under the requirements of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (known as the EIA Regulations). The MoD has sought legal advice which stated that the MoD was not required to undertake an EIA. However, in order to ensure transparency and allow public comment, the MoD has conducted a non-statutory EA.

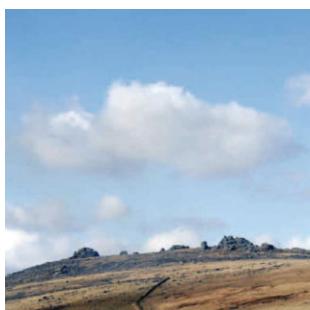
The Appraisal follows on from a Scoping Report which was produced in September 2006 and set out the scope of the Appraisal by identifying which effects were going to be appraised in detail. The Scoping Report was publicised on the DTA website; Statutory Bodies, stakeholder groups and the public were invited to comment on the proposed scope of the Appraisal. The scope of the Appraisal was refined as a result of the comments received and as a result of forming four Working Groups. Working Group meetings were held throughout the appraisal process in order to engage with relevant interested parties and organisations. The aim of these meetings was to discuss the scope of the appraisal, identify those issues that needed to be considered in the appraisal and to communicate the findings of the appraisal work. The Appraisal has assessed the significance of the effects which result from the military presence on Dartmoor. It has taken into account existing MoD management measures and proposed additional measures which seek to avoid, reduce or compensate for any adverse effects resulting from the military presence on Dartmoor. Such measures are known as mitigation measures.

The EA will be publicised and any comments will be addressed through an additional report, known as an addendum report, which will, if relevant, provide additional information to address the comments raised. The EA report and the addendum report will then be presented to the Dartmoor Steering Group in January 2008 for their consideration and comment prior to submission to the Secretaries of State for Defence and Environment.

What are the effects of military training?

Air quality

As part of the Scoping Report, information on air quality was reviewed and this showed that air quality at and around DTA was good and did not exceed the Air Quality Objectives set out in national legislation. It was considered that this indicated that military activities on DTA were not having an effect on levels of pollutants. Furthermore, there are several measures currently in place which help to manage and reduce air quality effects further.



Potential health effects relating to smoke associated with the use of pyrotechnics used during training were raised as an issue in the Public Access Working Group meetings. During live firing, the Range Danger Areas (RDAs) are closed to the public and therefore exposure to smoke is unlikely to occur and hence there are no significant effects. Dry training is not permitted within 100m of the public and 200m of residential properties. It is considered that exposure to smoke is temporary and given the minimum distances between dry training exercises and members of the public it is unlikely that significant effects will occur.

Cultural heritage

Cultural heritage refers to the historic environment, including archaeology, and includes a wide variety of sites and features, both visible and buried that are the product of past human activity in

the landscape. The range of sites and features can include buried archaeological deposits, standing buildings, industrial heritage and artefact scatters, as well as industrial and military remains. It also takes into account the historic landscape and how the character of the landscape has been influenced over time by human activity, with its boundaries, field patterns and woodlands.

Erosion from military vehicles and troop movements on foot, as well as from overgrazing is not significantly affecting the historic structure and archaeological monuments on DTA. Surveys of these features have shown that although erosion has occurred in the past, the management measures which DTE have put in place have resulted in a decrease in damage to the monuments. The surveys have shown that across DTA such monuments are in a good condition.



Effects from digging, ammunition and the creation of bivouac sites are not considered to be having a significant effect on buried features including archaeological remains. Currently there are no reports of this type of damage occurring and it is considered that management measures, including education of military troops about the features on DTA, are minimising the risk of this type of damage occurring.

Survey work has also shown that military training activities are not having a significant effect on the setting of historic and archaeological features. It is considered that there are no significant effects on the historic buildings and additional survey work is to be undertaken to provide further information on such features.

Effects on the historic landscape from military activities are considered to be not significant. Although the military occasionally leave marks on the landscape; such marks recover quickly and leave no permanent effect. However, the Appraisal has noted that undergrazing may be having a significant effect on the historic landscape but this has resulted from agricultural land uses rather than the presence of the military on DTA.

Landscape and Visual

Effects from military activities on historic and archaeological features, as discussed above, can have an effect on landscape character. However, the Appraisal has established that military activity is not having a significant effect on landscape character in this way. The management measures put in place by DTE prevent many such effects occurring. Results from survey work have demonstrated that the historic environment across DTA is in a 'good' condition.



It is considered that changes to, or the loss of vegetation patterns, as a result of military activities is not having a significant effect on landscape character. This is mostly due to the management measures that are in place to control how military training takes place. For example, measures limit digging activities, restrict the movement of vehicles and ensure that any holes created by live firing, or tracks created by vehicles are back filled. There are also measures in place to minimise the risk of fire. However, the Appraisal has noted that under and overgrazing as a result of stock being moved about has occurred in some areas.

The presence of military infrastructure, such as flag poles, and erosion from military activities such as digging, is not having a significant effect on landscape character. Although the presence of infrastructure such as flag poles may be considered to be out of place in a landscape, which is described as 'wild' and 'remote', management measures are in place to limit the effects of such features. For example, where possible, military features are located in suitable locations to minimise their effects on the landscape and finished in appropriate colours to help such features to blend into the landscape. Furthermore, many of the features are similar to other non-military features which are already present on Dartmoor. However, such features are essential to ensure

public safety and although additional measures have been identified to further reduce the effect, there remains a need for such features on DTA.

Military activities are not considered to be having a significant effect on tranquillity across DTA. An analysis undertaken by the Council for the Protection of Rural England has identified that DTA falls within an area that is considered to be one of the most tranquil areas in the UK and this conclusion takes into account the fact that there is military activity on DTA. This is considered to demonstrate that military activities are not having a significant effect on tranquillity.

The Appraisal has considered views from residential properties and areas of settlements as well as popular viewpoints, including car parks across DTA. Overall the effects from military infrastructure are not considered to be significant. This is because views of such features are limited because of intervening vegetation or topography, or because when live firing is not taking place such features are less visible or are considered to be part of the setting of the receptor being considered. The Appraisal has identified several options for further minimising the visual effects of such features which will be considered by DTE.

Land Use

DTA is used to graze livestock, which is moved for safety reasons, when live firing takes place. Local people are paid to move livestock prior to live firing and landowners also receive payments from the MoD for allowing training to take place. Therefore as, military training has an effect on the local economy these effects have been considered as part of the appraisal of socio-economic effects. The movement of stock clearance for live firing also has an effect on grazing patterns, which in turn has an effect on nature conservation. Therefore, this effect has been considered as part of the appraisal of nature conservation effects.



Additional measures to manage land use effects resulting from military training have been identified. These measures will include the review of payments to local people and the consideration of measures to minimise stock movement to meet objectives relating to nature conservation.

Nature Conservation

DTA includes a number of areas which are considered to be nationally or internationally important in terms of their nature conservation interest. DTA also includes several notable and protected species.



Military training activities are not considered to be having a significant effect on blanket bog habitats on DTA. Although military activities may have led to the erosion of blanket bogs in the past, current management measures ensure that erosion effects are minimised. Natural England are currently mapping the areas where erosion effects are thought to be the worst and this information will be provided to MoD so that the areas can be avoided when planning training.

The Appraisal has also considered other types of effects on habitats including effects from erosion, climate change, accidental fires, digging activities and High Explosive Mortars. None of these effects are considered to be having a significant effect on the habitats present on DTA, largely due to the management measures that are in place to control military training activities.

The Appraisal has considered whether silt is reaching streams and rivers on DTA and then having an effect on migratory spawning fish species (salmonid). Silt may come from eroding blanket bogs, from water running off tracks and from fords, where military traffic crosses streams. The

Appraisal has identified those rivers into which water drains from areas of erosion within DTA. Water quality and biological data has been analysed for these rivers. This data has shown that the levels of spawning have not reduced over time and therefore it is considered that silt in water draining from DTA, which may have been caused by military activities, is not having an effect on migratory spawning fish species.

The results of breeding birds surveys across DTA indicate that noise from military activities are not having an effect on breeding birds. The results of the survey did not show any patterns of distribution of birds which would indicate that noise effects were affecting birds. The results of the surveys will be used to inform training so that sensitive areas will continue to be avoided.

Noise

The Appraisal has considered noise effects from dry training and live field firing exercises on DTA, live fire target practice at Willsworthy Range and from helicopters. The Appraisal has predicted the levels of noise that are audible at the nearest residential properties and has also predicted the noise levels that a member of the public visiting DTA would hear if they were in close proximity to a dry training exercise (during live firing the RDAs are closed and therefore it is not possible for member of the public to be close to troops under training.). Noise levels have been predicted for when training is taking place within the centre of the Training Areas and, as a worst-case, when training is taking place close to the Training Area (for dry training) or RDA (for live firing) boundary.



The Appraisal has shown that noise effects are not considered to be significant. At many residential dwellings the results from modelling show that no audible increase in noise levels occurs. Where an audible increase does occur, noise levels are within those set out in standard guidance and disturbance effects will not occur. Management measures controlling military training ensure that there is a minimum distance between members of the public and residential properties but frequently the distance between training exercises and these receptors is much greater than the minimum. Additional mitigation measures identified to minimise effects on public access will also help to minimise noise effects even more.

Finally, the MoD have a self imposed noise limit on noise from live firing exercises which must not be exceeded at the boundary of the RDAs. The available data on noise levels from weapons indicates that noise from live firing is likely to be below the MoD's limit.

Public Access

Effects on members of the public because of access restrictions when live firing is taking place are considered to be significant. As part of the Appraisal consideration has been given to altering the firing calendar in order to change the times of year when public access is guaranteed. However, if all the suggested alterations were made to the firing calendar it would be impossible for the MoD to maintain a viable firing programme and therefore it has been concluded that the current calendar represents the best compromise. Minor local amendments to the firing calendar may be made in the future as a result of specific requests from organisations. Publication of the live firing programme six weeks in advance of firing helps to minimise the effects on public access.



The effects on the public because of limited access to areas of particular interest (Yes Tor, High Willhays, Tavy Cleave) are not considered to be significant. The MoD has examined the possibility of opening these areas to permanent access. However, the reduction in utility of the ranges that would result were access to be extended precludes this option from being

adopted, however as access to Yes Tor and High Willhays is already guaranteed on 245 days each year this is not considered to be significant. Increasing access to Tavy Cleave could have effects on breeding birds which are present in this area.

The effects of dry training on public access are not considered to be significant. As a result of the Appraisal, improved information will be provided about dry training and dry training near popular locations during peak visitor times will be discouraged. Therefore, there will be no significant effects on the public as those wishing to visit popular locations during peak tourist periods will not be disturbed by dry training as it will not be taking place at these areas. Those who have previously avoided visiting DTA due to a misconception about dry training should now be fully informed and be aware that access to DTA is possible during dry training periods.

Effects on members of the public planning visits to and walks around DTA could be occurring because of the amount of notice provided about live firing. Consideration has been given to extending Live Firing Notices from 6 weeks to 13 weeks, to allow the public increased time to plan visits to and walks around DTA. However, the Appraisal has shown that whilst the time available to the public would remain broadly the same there is potential for disruption as this extended timescale will reduce military flexibility. As a result alterations to published programmes would be more likely, causing difficulties for those wishing to plan visits to DTA. Furthermore, organisations have the ability to plan ahead on guaranteed access days, which are published annually, and include a number of days within each 3 month period. Therefore this effect is not considered to be significant.

Effects on members of the public may be occurring because of the clarity of information about access to DTA, which may prevent people from visiting DTA. A review of access information shown on OS maps has been undertaken, however, the mapped information will remain the same for safety reasons. There are contact details on the OS maps where visitors can find information on accessibility. The proposed mitigation is to improve the interpretation information about military training in the local area around DTA. It is considered that with this proposed mitigation in place, members of the public will have more information about how they can access DTA. It is considered that this may have beneficial effects as more people may become aware that it is possible to visit DTA and these effects are unlikely to be significant.

Startle effects on members of the public on DTA from aircraft in support of training by ground troops are not considered to be significant. Mitigation has been identified which will help to provide more information to the public about the use of aircraft in support of ground troops and improve the visibility of riders and as well as ensuring pilots are briefed regarding potential startle effects on horses and riders.

Socio-economics

The Appraisal has considered the effects that the military presence has on the local economy in relation to expenditure and employment. Much of the information which has informed the Appraisal has been taken from a previous study by Tourism Associates. Currently, survey work is taking place to analyse expenditure by soldiers in the local economy when they train at DTA. As the results of this survey will not be available until later on in the year it is not possible to identify whether all of the economic effects which have been considered are significant. However, although soldier spend may represent a sizeable contribution to the local economy in relation to all of Dartmoor the overall importance of military trade to the economy appears to be much smaller than other sources of spending, notably tourism.

Information from the Tourism Associates report would indicate that military supply chain spending (i.e. expenditure with third parties such as



those that supply goods or service to DTA) is not considered to be significant in relation to the local economy as not all spending will be within the Dartmoor economy.

The effects on the tourism economy as a result of military activities are not considered to be significant. Information in the Tourism Associates Report suggests that most visitors and tourists to Dartmoor are impartial about the presence of the military and survey results have shown that the majority of visitors would not increase their visits if the military were depart.

The agricultural economy is considered to be declining and the departure of the military could mean that there would be a loss of income for farmers and employment (as local people are employed to clear stock from the RDAs before live firing takes place). Therefore, it is considered that the presence of the military is having a positive significant effect for the local agricultural economy.

Effects on tourists and regular visitors to DTA resulting from the presence of the military are not considered to be significant. The results from visitors surveys completed as part of the Tourism Associates Report have shown that the majority of people interviewed answered that the military had no impact on their use or enjoyment of the moor and even if the military were to leave Dartmoor, very few (4%) indicated that they would make more visits to DTA.

Soils, Geology and Groundwater

A separate assessment has been undertaken to consider the quality of land at DTA. There are several receptors which may be sensitive to any contaminants which may present. These include people; both military personnel who come into contact with soils through training activities such as digging; and members of the public who walk, ride or farm on DTA. Groundwater running under DTA may also be sensitive and the geology underlying DTA comprises either granite or a variety of metamorphosed sedimentary rocks. Groundwater is also abstracted at many locations across DTA. There are several streams and rivers which flow from DTA into a number of larger rivers or reservoirs, some of which are used for drinking water so again, these may be sensitive to contamination. Finally the ecology of DTA, much of which is of international importance, may be sensitive to contamination as are grazing animals.



Although a comprehensive survey of DTA has not been carried out, camp areas are likely to contain small well defined areas of contaminants. The RDAs are more likely to contain lower concentrations of contaminants which are more widely distributed although there may be greater levels in areas of more intensive use such as the small arms ranges. There are likely to be historical sources of contaminants on DTA, not just from military uses but from non-military uses such as mining. There are several measures already in place which minimise the risk of contamination. The Land Quality Assessment has identified different options for the further management of potential contamination.

The assessment has shown that the risk to members of the public from contaminants, such as fuels and heating oils is considered to be low. This is mostly because such contaminants are more likely to be present within camp areas such as Okehampton Camp, which are not accessible to members of the public. The risks to surface water are considered to be low and for groundwater are considered to be low to moderate. The risks to grazing animals are low but are moderate in areas where there may be contaminants such as the small arms ranges. The risks to ecology are considered to be low.

The historic use of DTA for live firing has resulted in unexploded ordnance (UXO) being present under parts of the moor. Several measures to control the risks associated with UXO already exist, including clear warning signs for members of the public. Although clearance of UXO is undertaken

when appropriate, the possibility of clearing UXO from all of DTA is not considered feasible. Given the size of DTA it would take an estimated 40 years to search for and clear UXO and the removal of the UXO itself could cause irreparable damage to the internationally important habitats and cultural heritage features present on DTA.



Surface Water

Military training activities at both Okehampton and Willsworthy Camps and on DTA mean that there is a possible risk of contaminants reaching surface water in streams and rivers. This could have an effect on water quality. The existing management measures that are in place minimise the risks and therefore prevent significant effects occurring.

A review of available water quality data has been carried out to demonstrate that military training activities are not having an effect on water quality. This data has shown that water quality within Meldon and Burrator Reservoirs is of an excellent quality. Environment Agency data for rivers within and around DTA show that water quality is considered to be 'very good' or 'good'. Previous studies record the presence of fish and invertebrate species in streams within DTA which also indicate that water quality is good. A review of pollution incidents reveals that none of the recorded incidents in and around the training areas can be related to military activities.

Traffic and Transport

Traffic associated with military activities is not considered to be a significant component of traffic flows on the highway network in and around DTA. There are several management measures currently in place which limit the movement of vehicles, particularly across the moor.

A review of traffic flows along the access route to Okehampton Camp has been carried out as local people have indicated that congestion occurs along the route from the Camp to the Town Centre. A week long survey of traffic flows along the access routes was carried out. This information indicates that regular vehicle movements to the Camp, such as staff movements and deliveries account, for approximately 17% of daily flows along the access route from Okehampton town centre.



Vehicle movements associated with the movement of troops varies greatly. Typically, troops travel up to Okehampton Camp but then from the Camp travel out across the moor on training exercises. Traffic movements associated with transport of troops are unlikely to account for more than 10% of daily traffic flows along the access route from Okehampton town centre but on some days there may be no such movements.

Contents

1. Introduction	1
1.1 Background	1
1.2 Approach	2
1.3 Project Team and Consultation	3
1.4 Definitions of Live Fire Training and Dry Training	4
1.5 Report Structure	4
2. Description of DTA and Military Activities	7
2.1 Introduction	7
2.2 Land Uses within DTA	7
2.3 Military Training Activities	7
2.4 Management of Military Training on DTA	17
3. Need and Alternatives	21
3.1 Introduction	21
3.2 Outline of Training	21
3.3 Training Area Demand	22
3.4 Training Area Supply	22
4. Environmental Appraisal (EA): Approach	27
4.1 The EA Process	27
4.2 Application of the EA Process to this Project	31
5. Air Quality	37
5.1 Introduction	37
5.2 Context	37
5.3 Scope of the Assessment	38
5.4 Environmental Management Measures	39
6. Cultural Heritage	41
6.1 Introduction	41
6.2 Context	41
6.3 The Scope of the Assessment	45
6.4 Environmental Management Measures	47
6.5 Assessment of Potential Effects	51

6.6	Summary of Significance Evaluation	55
7.	Landscape and Visual Effects	57
7.1	Introduction	57
7.2	Context	57
7.3	Scope of the Assessment	58
7.4	Environmental Management Measures	61
7.5	Assessment of Potential Effects: Landscape effects	63
7.6	Assessment of Potential Effects: Visual Effects	77
7.7	Summary of Significance Evaluation	98
8.	Land Use	99
8.1	Introduction	99
8.2	Context	99
8.3	Scope of the Assessment	100
8.4	Environmental Management Measures	102
9.	Nature Conservation	105
9.1	Introduction	105
9.2	Context	105
9.3	Scope of the Assessment	109
9.4	Environmental Management Measures	113
9.5	Assessment of Potential Effects	115
9.6	Summary of Significance Evaluation	130
10.	Noise	131
10.1	Introduction	131
10.2	Context	131
10.3	Scope of the Assessment	135
10.4	Environmental Management Measures	136
10.5	Assessment of Potential Effects	137
10.6	Summary of Significance Evaluation	163
11.	Public Access and Recreation	165
11.1	Introduction	165
11.2	Context	165
11.3	Scope of the Assessment	167
11.4	Environmental Management Measures	170
11.5	Assessment of Potential Effects on Members of the Public Accessing DTA	172

11.6	Summary of Significance Evaluation	192
12. Socio Economic Effects		193
12.1	Introduction	193
12.2	Context	193
12.3	Scope of the Assessment	195
12.4	Environmental Management Measures	196
12.5	Assessment of Potential Effects	197
12.6	Summary of Significance Evaluation	213
13. Soils, Geology and Groundwater		215
13.1	Introduction	215
13.2	Context	215
13.3	Scope of the Assessment	216
13.4	Environmental Management Measures	217
13.5	Assessment of Potential Effects	218
13.6	Summary of Significance Evaluation	224
14. Surface Water		227
14.1	Introduction	227
14.2	Context	227
14.3	Legislative Context	227
14.4	Scope of the Assessment	228
14.5	Environmental Management Measures	230
14.6	Data Analysis	231
14.7	Analysis of Baseline Conditions	232
15. Traffic and Transport		239
15.1	Introduction	239
15.2	Context	239
15.3	Scope of the Assessment	239
15.4	Environmental Management Measures	241
15.5	Assessment of Potential Effects	242
15.6	Summary of Significance Evaluation	244
Glossary and Abbreviations		245

Table 2.1	Live Firing and Guaranteed Public Access	8
Table 2.2	Live Firing Training Stages	9
Table 2.3	Summary of Live Firing Facilities	10
Table 2.4	Helicopter Movements (January 2004 to September 2007)	13
Table 2.5	Military Vehicles	13
Table 2.6	DTA Environmental Management Measures	18
Table 3.1	Potential Training Area Alternatives within the South West	26
Table 4.1	Environmental Topics Addressed in EA	31
Table 5.1	Air Quality Planning Policies Relevant to DTA	38
Table 6.1	Planning Policy: Cultural Heritage	44
Table 6.2	Summary of Significant Effects: Cultural Heritage	56
Table 7.1	Key Characteristics of DTA as Defined in the Draft National Landscape Character Typology	66
Table 7.2	Key Characteristics of DTA as Defined in the Devon County Landscape Character Assessment	68
Table 7.3	Key Characteristics of DTA as Defined in the ESA Landscape Character Assessment	69
Table 7.4	Summary of Viewpoints Included in the Visual Assessment	78
Table 7.5	Summary of Roads/PROWs Included in the Visual Assessment	80
Table 7.6	Summary of Significant Effects: Landscape and Visual Effects	98
Table 8.1	Land use planning policies relevant to DTA	99
Table 8.2	Attendees at Land Use Working Group Meetings	100
Table 9.1	Planning Policy Context: Nature Conservation	107
Table 9.2	Summary of Significant Effects: Nature Conservation	130
Table 10.1	25 th Percentile Daytime Noise Levels	142
Table 10.2	25 th Percentile Night-time Noise Levels	143
Table 10.3	Perception of Changes in Noise Levels	144
Table 10.4	Summary of Noise Magnitude Criteria	145
Table 10.5	Significance Matrix	146
Table 10.6	Weapons and Ammunition used in a Representative Section Attack (Dry Firing)	147
Table 10.7	Summary of Noise Predictions for a Simulated Section Attack in Centre of Range	148
Table 10.8	Summary of Noise Predictions for a Simulated Section Attack at Closest Approach	150
Table 10.9	Summary of Noise Predictions for a Live Firing Exercise in Centre of Range	153
Table 10.10	Summary of Noise Predictions for a Live Firing Exercise at Closest Approach	155
Table 10.11	Summary of Noise Predictions for Live Target Firing on Willsworthy Range	158
Table 10.12	Summary of Noise Predictions for Single Lynx Helicopter Flight at Nearest Boundary to Receptors	161
Table 10.13	Summary of significant effects: Noise	164
Table 11.1	Public Access Policy Relevant to DTA	166
Table 11.2	Attendees at Public Access Working Group Meetings	167
Table 11.3	Consultation Outside of the Working Group Meetings	168
Table 11.4	Live Firing and Guaranteed Public Access	173
Table 11.5	Guaranteed Non-firing Dates for 2007	174
Table 11.6	Definition of Sensitivity	178
Table 11.7	Definition of Magnitude	179
Table 11.8	Definition of Significance	179
Table 11.9	Firing Calendar Proposals	182
Table 11.10	Summary of Significant Effects: Public Access	192
Table 12.1	Planning Policy Context: Socio-Economics	194
Table 12.2	Definition of Sensitivity	200
Table 12.3	Definition of Magnitude	201
Table 12.4	Definition of Significance	202
Table 12.5	Sector outputs and growth rates for Dartmoor	203

Table 12.6	Direct spending on contracts, tenders and procurement; Dartmoor, and Devon and Cornwall (2004 - 2005 financial year)	205
Table 12.7	Total estimated annual spend attributable to DTA; Dartmoor, and Devon and Cornwall (2004 – 2005 financial year)	206
Table 12.8	Financial Contributions (2004/05)	208
Table 12.9	Summary of significant effects: Socio-Economics	213
Table 13.1	Policy Context: Soils, Geology and Groundwater	215
Table 13.2	UXO Clearance	223
Table 13.3	Summary of Significant Effects	225
Table 14.1	Relevant Policies and their Implications	228
Table 14.2	Environment Agency Routine River Monitoring Data, 2003 -2005	235
Table 15.1	Planning Policy: Traffic and Transport	239
Table 15.2	Traffic Count Flows (24 hour period)	243
Table 15.3	Contribution of Okehampton Camp Traffic Flows to Overall Flows	243
Table 15.4	Summary of Significance Evaluation: Traffic and Transport	244
Figure 1.1	Location plan	After Page 6
Figure 1.2	Dartmoor Training Area	After Page 6
Figure 2.1	Land Ownership	After Page 20
Figure 2.2	Dry Adventurous Training Features	After Page 20
Figure 2.3	Use (in days) of Okehampton RDA for Live Firing (2002 to 2006)	15
Figure 2.4	Use (in days) of Willsworthy RDA for Live Firing between 2002 and 2006	15
Figure 2.5	Use (in days) of Merrivale RDA for Live Firing between 2002 and 2006	16
Figure 2.6	Use (in days) of Merrivale, Okehampton and Willsworthy RDAs for Dry Training between 2002 and 2006	16
Figure 2.7	Summary of Organisations	17
Figure 7.1	Landscape Designations and Character Information	After Page 98
Figure 7.2	Tranquillity Diagram	71
Figure 7.3	Observation Points and Flag Poles	After Page 98
Figure 7.4	Visual Receptor Locations	After Page 98
Figure 9.1	Nature Conservation: Designated sites	After Page 130
Figure 9.2	Nature Conservation: Rare Bird Nesting Areas	After Page 130
Figure 10.1	Noise Monitoring Locations	After Page 164

This page is intentionally left blank.



DARTMOOR TRAINING AREA

Environmental Appraisal

Introduction

1

1. Introduction

1.1 Background

- 1.1.1 In addition to using its freehold land, The Ministry of Defence (MoD) carries out training on the Dartmoor Training Area (DTA) using land held under license primarily from the Duchy of Cornwall. The license expires in 2012 and this Appraisal forms an essential pre-cursor to any decision on re-negotiation.
- 1.1.2 As part of the process and prior to re-negotiation of the license, confirmation is required by the Secretaries of State for Defence and Environment, Food and Rural Affairs (DEFRA) that:
- there is a clear military need for both live firing and dry tactical training; and
 - the management of DTA for military activities will continue to be sensitive to environmental, farming and public access issues and is thus sustainable in the long term.
- 1.1.3 This Environmental Appraisal (EA) follows on from the EA Scoping Report¹ (posted on DTA website at <http://www.dartmoor-ranges.co.uk>) which outlined the issues and proposed scope for the EA. The approach to the full EA process is outlined in **Section 1.2** and described in detail in **Chapter 4** of this report.
- 1.1.4 DTA consists of approximately 13,000 hectares (ha) of mostly open moorland and a further 35,000 ha of walkover rights. Of the 13,000 ha some 1,356 ha is MoD freehold, the remainder being held on licenses from other landowners.
- 1.1.5 To the north, the Okehampton, Willsworthy and Merrivale areas provide both live and dry training. To the south, the Cramber and Ringmoor areas provide dry training only. Beyond these areas, extensive tracts of unenclosed land are used for access by foot only. Two camps, the larger at Okehampton, the second at Willsworthy, support the training.
- 1.1.6 DTA falls within the Dartmoor National Park (DNP) boundary, occupying about 14% of the total national park area and about 25% of Dartmoor's open moorland. Much of DTA also carries environmental designations at both European and national level. **Figure 1.1** (following this chapter) shows the location of DTA and **Figure 1.2** indicates the DNP boundary, designated training areas (i.e. areas within the blue lines) and camps.
- 1.1.7 Military training has taken place on Dartmoor since the early 1800s. Artillery firing started in 1875 and Okehampton Camp was built in 1892. The area was used extensively for tactical exercises with live ammunition during the Second World War. An old, dilapidated huttet camp at Willsworthy was replaced by the existing building in 1995.
- 1.1.8 The Defence Lands Committee (Nugent Committee) undertook a complete review of all MoD land holdings in 1973; this was followed in 1975 by a non-statutory public inquiry, conducted by Lady Sharp GBE, into the continued use of Dartmoor for military training.
-

¹ Entec UK Ltd, September 2006, Dartmoor Training Area: Scoping Report for an Environmental Appraisal examining the effects of continuing military training on Dartmoor.

Recommendations made in the Sharp Report² resulted in an area to the south of DTA known as “Southern Ringmoor” being replaced by dry training facilities around Cramber Tor. The amount of time available for live firing was reduced when the Duchy License was renegotiated in 1991 and in 1998, live firing with artillery high explosive shells ceased. However, a report,³ commissioned by the MoD in 2005, concluded that, “*there is a continuing need to retain DTA in order to meet a significant proportion of the increased light force training demand*”.

- 1.1.9 DTA is prioritised for the training of light forces and the conduct of dismounted exercises. The main users are units based in the South West of England, principally the Royal Marines (RM).
- 1.1.10 DTA also hosts the Ten Tors and Jubilee Challenge event, which takes place in May of each year. The Ten Tors and Jubilee Challenge are not linked to military training on DTA, although MoD facilitates the event. Issues examined in relation to this event are discussed in **Appendix 1.1** and will form part of a separate report to the Dartmoor Steering Group (DSG)⁴ by Commander 43 (Wessex) Brigade, the event’s military organiser. These activities take place alongside agriculture (grazing of sheep, cattle and ponies) and recreation. Through the Dartmoor Commons Act 1985 and DNP Authority (DNPA) negotiation with land owners, extensive access by foot or horse is available to the public. Additional land around the northern areas of DTA and within Cramber Training Area has been designated for open access under the *Countryside and Rights of Way Act 2000 (CROW)*. Further explanation of both military and non military activity is provided in **Chapter 2**.

1.2 Approach

- 1.2.1 The approach adopted for this EA is based on that used for the assessment of effects associated with developments for which Environmental Impact Assessment (EIA) is required for projects falling under the requirements of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (hereinafter referred to as the *EIA Regulations*).
 - 1.2.2 The *EIA Regulations* are normally applied to certain types of development or activities that require planning, or other consents, because they could have environmental effects that are likely to be significant. In this case, there is no development or change that would trigger the EIA Regulations. Furthermore, MoD sought legal advice regarding the appraisal work. It is considered that the re-negotiation of the license does not amount to a renewal of the use of the land in accordance with Circular 12/96 and therefore an EIA is not required. Further information on the legal advice is outlined in **Chapter 4**. The assessment process that is used for an EIA development or activity however, is seen as a suitable model to apply to the EA of the potential effects of the continuation of military training at the steady state level of activity beyond 2012.
-

² Sharp (1977), The Continued Use of Dartmoor by the Ministry of Defence for Military Training Purposes. Cmnd 6837.

³ The Continuing Need for Military Training on Dartmoor, RPS June 2005.

⁴ The role of the DSG was set by Parliament in 1978. It requires the DSG to keep under review the progress made on the recommendations contained in the Sharp Report (Comd 6837) and the best possible reconciliation of the requirements of military training, conservation and public access. The DSG also considers matters referred to it by the Working Party and any reports prepared by the Working Party. The DSG reports annually to the Secretaries of State for Defence and the Environment. Membership of DSG is included on the DTA website (www.dartmoor-ranges.co.uk).

- 1.2.3 Whilst in this case there is no development or change requiring an EIA under the *EIA Regulations*, each EA topic has been considered in the context of fluctuations in the nature and intensity of activities, occurring over time. The underlying assumption for the EA is that post 2012, activity will continue to occur up to the thresholds against which the current license agreement was made.
- 1.2.4 While wishing to maintain the link to the EIA process it is recognised that in the absence of a 'development', the statutory framework of the *EIA Regulations* does not apply. In view of this, the term EA is used to replace EIA and Environmental Statement (ES) which is the product of the EIA process. Further information on the approach to the EA is outlined in **Chapter 4**.

1.3 Project Team and Consultation

Project Team

- 1.3.1 The EA project team has drawn on resources and expertise from the following organisations.
- Defence Training Estates (DTE) (Military Training Need and Definition).
 - HQ DTA (Training Facilities and Activities, Dartmoor Land Use).
 - Ten Tors Organisation (Ten Tors and Jubilee Challenge Facilities and Activities).
 - Defence Estates Environmental Support Team (Cultural Heritage, Nature Conservation, Public Access and Recreation).
 - Entec UK Ltd (Air Quality, Landscape and Visual Effects, Noise, Socio-economics; Soils, Geology and Groundwater; Surface Water, Traffic and Transport, EA Report Production).
 - RPS (various reports produced on behalf of DTE).

Consultation

- 1.3.2 The consultation process, which commenced prior to issue of the Scoping Report, will continue beyond the publication of the final EA report, with the opportunity for continuing dialogue via the DTA website and through the forum provided by the DSG. DTE has established a process through which stakeholder comments on the EA have been collated, reviewed and taken into account as required. The consultation process, which commenced prior to issue of the Scoping Report, will continue beyond EA report and addendum stages, with the opportunity for continuing dialogue via the DTA website and through the forum provided by the Dartmoor Steering Group (DSG). The DSG will debate the EA as part of its wider remit, which is to seek to reconcile the requirements of conservation and public access with the need for, and sustainability of military training on Dartmoor. The DSG reports annually to the Secretaries of State for Defence and for the Environment, Food and Rural Affairs. Further information on consultation is outlined in **Chapter 4**.
- 1.3.3 The project team wishes to express its gratitude to organisations and individuals who have provided responses during the Appraisal. A full list of consultees is included at **Appendix 1.2**.

1.4 Definitions of Live Fire Training and Dry Training

1.4.1 Discussions subsequent to the publication of the Scoping Report have demonstrated a general lack of understanding of live fire and dry training. Definitions of these 2 activities are outlined below.

Live Fire Training

1.4.1.1 Live Fire training involves the use of live ammunition against fixed and moving targets. It can be divided into 3 progressive stages.

- **Stages 1-3:** Firing on ranges with individual fixed firing points and fixed targets. Examples of these types of ranges are a gallery range or an Electric Target Range (ETR). These facilities are used for initial training and confirmation of skills before progressing to more advanced and demanding levels of marksmanship training.
- **Stage 4:** Firing on ranges with a variable number of fixed firing points employing a variety of realistic firing positions and fixed targets. An example of this is an Individual Battle Shooting Range (IBSR) which seeks to replicate the types of firing positions found on the battlefield. These facilities are used for intermediate training, for revision and for confirmation of skills before progressing to more demanding field firing.
- **Stage 5:** This stage is sometimes referred to as Live Fire Tactical Training (LFTT). Field firing ranges which allow free manoeuvre within a movement box in response to a given tactical situation using live ammunition. Neither firing points nor targets are fixed. This activity, combined with the application of marksmanship skills, marks the culmination of field marksmanship training. Limitations are imposed by the application of arcs of fire, targets can be placed anywhere within these left and right arcs.

1.4.1.2 In addition, there are ranges for specialist weapons such as hand held anti-tank weapons which have fixed firing points and targets many of which are moving targets. Specialist targetry and weapons templates dictate that these ranges cannot be used for other forms of shooting. These weapons can also be used on Field Firing areas as long as the safety template fits the area being used and suitable targetry is available.

Dry Training

1.4.1.3 Dry training, which is sometimes referred to as Blank Fire Tactical Training, refers to activities undertaken without the use of live ammunition. In many cases no ammunition is used at all, as is the case with adventure training, orienteering, first aid and a number of other activities but participants do require access to a training area. Where blank ammunition and pyrotechnics (light, noise and smoke) are used the activity is similar to that undertaken in LFTT but can be two sided as no live ammunition is used.

1.5 Report Structure

1.5.1 The EA report consists of:

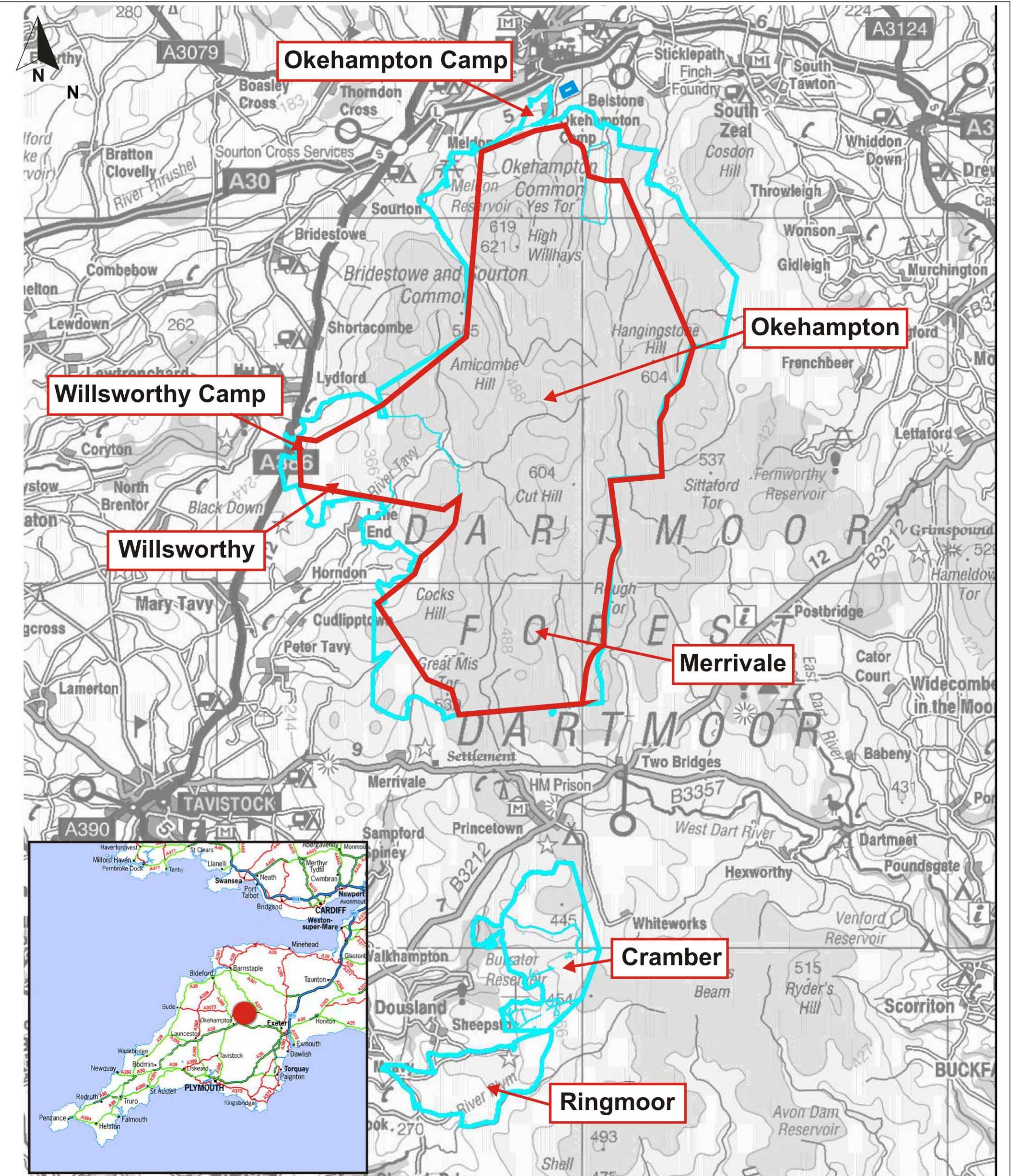
- A non technical summary describing the main aspects of the Appraisal and its findings;
- A main EA volume (this report); and
- Separate appendices providing supporting information (Volume 2).

1.5.2 The remainder of this Volume is as follows.

- **Chapter 2** describes the existing DTA environment including an explanation of land ownership, licensing and lease arrangements, and provides a description of military activities. The geographic extent of military activities and hence the EA study area is also described. The Chapter concludes with a summary of the existing environmental management undertaken by DTE at Dartmoor.
- **Chapter 3** explains the need for training on Dartmoor and the alternatives to the use of DTA, providing a summary of the detailed information provided by DTE
- **Chapter 4** details the approach to preparing the EA.
- **Chapters 5 to 15** cover each of the environmental topics identified for inclusion in the EA following the scoping stage and associated consultation.

1.5.3 A **Glossary** of abbreviations and definitions is included **after Chapter 15** in this Report. This includes explanations of the military terminology used in the main text and is intended to supplement the footnotes used throughout the EA Report.

This page is intentionally left blank.



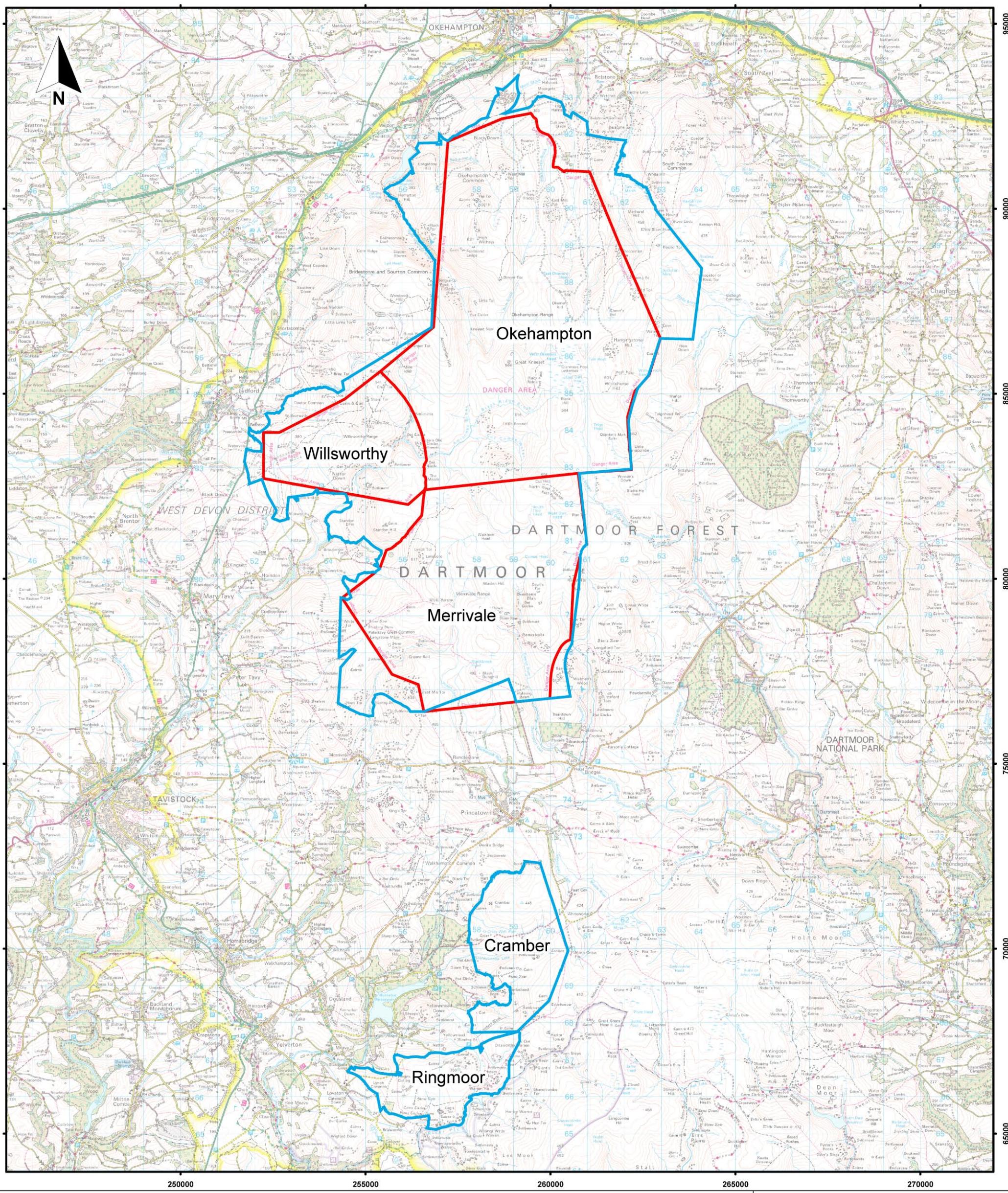
Key

- [Blue line] Dartmoor Training Area boundary
- [Red line] Range danger area boundary

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Defence Training Area
Environmental Appraisal

Figure 1.1
Location Plan



Key:

- Dartmoor Training Area
- Range Danger Areas

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 1.2
Dartmoor Training Area

0 5 Kilometers
Scale: 1:100,000 @ A3



DARTMOOR TRAINING AREA

Environmental Appraisal

Description of DTA and Military Activities

2

2. Description of DTA and Military Activities

2.1 Introduction

- 2.1.1 The following sections first provide an overview of Dartmoor Training Area (DTA) including the designations present and the type of land uses within DTA. The Chapter then goes on to describe the type of training activities undertaken by the military on and around DTA, their broad patterns, frequency and locations of such activities and the infrastructure in place which supports these activities. Finally an overview is given of the measures implemented by the MoD to manage the effects of military training.

2.2 Land Uses within DTA

- 2.2.1 DTA consists of approximately 13,000 ha of predominantly moorland in Devon, and is located approximately 20 km west of Exeter, 15 km north of Plymouth and approximately 320 km south west of London (refer **Figure 1.1**). The local highway network within and around DTA includes the A30 to the north, the A386 to the west and the A38 to the south. There are few residential properties within DTA or close to the training area.
- 2.2.2 DTA lies wholly within the Dartmoor National Park (DNP). Okehampton, Merrivale and Willsworthy form a contiguous entity in terms of training area in North Dartmoor, much of which is designated as the North Dartmoor Site of Special Scientific Interest (SSSI) and Dartmoor Special Area of Conservation (SAC). Cramber and Ringmoor, in South Dartmoor, lie outside of, but adjacent to, the South Dartmoor SSSI and Dartmoor SAC.
- 2.2.3 DTA includes a significant archaeological landscape with elements dating back to Prehistory. Notable among these remains are the Dartmoor Reaves, a series of Bronze Age land boundaries and associated settlement remains. The wider landscape does not enjoy statutory heritage protection as no such framework exists, but individual components within the wider landscape are included on the Schedule of Ancient Monuments.
- 2.2.4 Several watercourses lie within DTA including parts of the catchment areas of the East Okement River, River Taw, North Teign River, River Dart, River Meavy, River Tavy, River Lyd, River Walkham and West Okement River. Parts of the catchment areas for both the Meldon and Burrator Reservoirs lie within DTA.
- 2.2.5 DTA amounts to approximately 14% of the total area of DNP and about 25% of the open moorland. Most of north-west Dartmoor is inaccessible except on foot, although some vehicular tracks exist, most of which provide access onto the moor rather than across it. The uneven moorland plateau is surrounded by areas of enclosed land, most of which is more intensively grazed.

2.3 Military Training Activities

Location of Military Training

- 2.3.1 DTA consists of the Training Areas indicated on **Figure 1.2**.

Okehampton, Merrivale and Willsworthy Training Areas

- 2.3.2 Okehampton, Merrivale and Willsworthy Training Areas form a contiguous tract of land to the north of the B3357, extending almost to the A30 at Okehampton. Parts of the three Training Areas are used for live firing and are termed the 'Range Danger Areas' (RDA) and are enclosed by the Red Line in **Figure 1.2**. When the land is not being used for live firing it is available for all forms of dry training.
- 2.3.3 The number of days on which live firing can take place on the RDAs is outlined in **Table 2.1**, below.

Table 2.1 Live Firing and Guaranteed Public Access

Range Danger Area	Live Firing (days per year)	Guaranteed public access (days per year)
Okehampton	120	245
Merrivale	180	185
Willsworthy	245	120

Cramber and Ringmoor Training Areas

- 2.3.4 Cramber Training Area is located to the south of Princetown and east of Burrator Reservoir. Ringmoor Training Area forms an extension to Cramber to the south, centred on Ringmoor Down. Both areas are used for elements of dry training but not live firing.

Other Licensed Land

- 2.3.5 Further specific areas including Meldon Quarry, Meldon Reservoir, Foggintor Quarry, Dewerstone and Sheepstor are also used for dry tactical, individual and adventurous training as permitted by the licenses.

Land Ownership

- 2.3.6 Land occupied by MoD under freehold, lease or license includes the following:
- freehold (which corresponds to the Willsworthy Training Area);
 - land held under long (999 year) leasehold (Okehampton Camp);
 - land used under license at Cramber Training Area (although the area is referred to as 'leased'); and
 - land used under long term license.
- 2.3.7 The designated training areas i.e. that falling within the blue boundary line shown on **Figure 1.2** amount to some 13,000 ha. The majority of land within the leased and licensed areas is under the ownership of the Duchy of Cornwall, the Maristow Estate and South West Water. Land ownership is shown on **Figure 2.1** following this Chapter

'Unenclosed' Land

- 2.3.8 Training use of the further, extensive areas of unenclosed common land surrounding the Training Areas is confined to elements of dry training excluding the use of live or blank

ammunition, typically comprising groups of less than twelve on any one route on a particular day.

- 2.3.9 Unenclosed land makes up a further 35,000 ha of land over which the MoD has access only by personnel moving on foot, known as 'walkover rights'.

Training On Private Land (TOPL)

- 2.3.10 In addition to the use of the designated Training Areas, other training areas and surrounding unenclosed land, the MoD also undertakes training on other privately owned land. TOPL occurs under short term agreements with the land occupier to provide training opportunities, which are absent from the designated Training Areas, e.g. woodlands, helicopter landing sites, communication points, climbing, canoeing etc.

Type of Training Activities Undertaken on DTA

- 2.3.11 Training at DTA is normally confined to 'Light Force Training'⁵. DTA can support training up to battalion level (i.e. typically 400 to 1,000 personnel), and live fire tactical training up to company level (i.e. typically 100-120 personnel) at Okehampton (two companies concurrently), at Merrivale (one company) and platoon level (typically up to 30 personnel) at Willsworthy. Training is broadly defined as live firing, dry training and adventurous training. Dry training also takes place on Cramber and Ringmoor. Many of the activities associated with dry training and adventurous training are similar to activities undertaken by the public on Dartmoor, such as walking, orienteering and climbing.

Live Firing

- 2.3.12 Live Firing takes place using live ammunition against targets. Firing does not normally start before 0930hrs and normally finishes before 1630hrs. Night firing is not usually undertaken unless preceded by day firing and is normally completed by 2359hrs. There are five stages of live fire training which are outlined in **Table 2.2** below.

Table 2.2 Live Firing Training Stages

Stage	Type of training	Type of Range
1 to 3	Fixed firing points in lanes, marksmanship lessons and applications	Gallery Range, Electric Target Range (ETR) and Mechanised Moving Target Trainer (MMTT)
4	Fixed firing positions of varying types (trench/window//roof/wall) which involves individual movement	Individual Battle Shooting Range (IBSR)
5	Full tactical manoeuvre (individual and team) with no fixed firing points	Field Firing Area (FFA)

- 2.3.13 Okehampton RDA is the largest (4,966 ha) of the Dartmoor Ranges and provides scope for advanced battle shooting exercises up to company level (i.e. 100 to 120 personnel), including the use of support weapons and artillery. Willsworthy has the smallest RDA (1,015 ha) and provides facilities to train soldiers up to the Annual Personal Weapon Test

⁵ Defined as dismounted training by any serviceman or woman.

Standard (training Stages 1 to 3). Merrivale RDA (3,211 ha) provides a location for conducting Stages 4 and 5 battle shooting exercises. **Table 2.3**, below, provides a broad summary of the Live Firing training activities that currently take place on these three areas and it is assumed will take place post 2012.

Table 2.3 Summary of Live Firing Facilities

Range	Facilities Available	Notes
Okehampton	<p>Artillery Area with choice of gun positions which allows direct and indirect targets to be engaged.</p> <p>Five movement boxes for rifles, light support weapons, General Purpose Machine Guns, grenades etc.</p> <p>Anti Tank Range for man portable light anti armour weapons</p> <p>Mortar, sniper and General Purpose Machine Gun Ranges</p> <p>Grenade training</p>	<p>Limited to 30 days per year and to smoke and illuminating ammunition natures only (no high explosives (HE) or phosphorous may be fired).</p> <p>Only two movement boxes are normally used concurrently. A movement box can be established anywhere within the RDA boundary providing the ammunition danger area template can be contained within it.</p>
Willsworthy	<p>'A' Range (8 lane 800 yard gallery)</p> <p>'B' Range (12 lane ETR with targets at 100, 200 and 300m and ability to fire at ranges up to 600m)</p> <p>'C' Range (6 lane MMTT) with targets engaged from 150, 100 and 50m)</p>	<p>All infantry small arms weapons are permitted to fire by day and by night. Firing at the longer ranges has to be carefully co-ordinated with other range users due to their close proximity.</p> <p>As above</p>
Merrivale	<p>Bagga Tor (weapons movement box)</p> <p>Great Mis Tor</p> <p>Holming Beam</p> <p>Artillery Gun Position for firing into Okehampton Range</p> <p>Firing of 81mm Mortar</p>	<p>Individual battle shooting with rifle, Light Support Weapon, General Purpose Machine Gun. Individual and pairs field firing range caters for Close Quarter Battle including grenades and 51mm Mortar firing.</p> <p>This area is mainly used for the teaching of demolitions. Field Firing, General Purpose Machine Gun (Sustained Fire Role) and sniper firing points can also be provided.</p> <p>Field Firing for troop/platoon level (up to two platoons i.e. up to 60 soldiers at any one time). All basic weapons may be fired including General Purpose Machine Gun, sniper rifle and grenades.</p> <p>105 mm Light Gun</p>

Source: DTE SW SOs and DTE South West User Guide

Notes: Merrivale can be used complete or divided into three independent field firing areas (Bagga Tor, Great Mis Tor and Holming Beam)

Dry Training

- 2.3.14 The Training Areas are used for dry tactical training throughout the year (including dry training on Okehampton, Merrivale and Willsworthy RDAs when there is no live firing). There is no firm pattern to the frequency and location of training other than that dictated by the environmental management controls in place through the DTA Environmental Management System (EMS) and controls set out in DTE SW and DTA Standing Orders (SOs).

2.3.15 Dry tactical training includes movement on foot, digging in (i.e. digging of shallow holes or trenches to lay communication wires, and for concealment and protection), wiring (i.e. laying rolls of wire as an obstacle), construction and occupation of tented camps (such as field hospitals), bivouacking, and the use of blank ammunition and pyrotechnics. A number of locations are typically used for these activities, as described below and indicated on **Figure 2.2**.

- **Training Areas:** each of the training areas are used as described above. The general density of training use tends to be lower on Okehampton Willsworthy and Merrivale because of live firing, which displaces dry training to the south at Cramber and Ringmoor.
- **Bivouac Sites:** the 6 sites indicated on **Figure 2.2** (shown as D11 (East Okement Farm), D31 (Bagga Tor), D36 (Holming Beam), D56 (Gutter Tor) and D57 (Brisworthy Wood)) provide recognised locations for tented camps and bivouacs for up to two nights for groups of 30 or less personnel, although there is no restriction on bivouacking in other locations providing areas of heather are avoided and they are sited at least 20m from any sensitive archaeology.
- **Ringmoor and Cocks Hill Drop Zones (DZs):** used for parachuting personnel, stores and re-supply. Use of Ringmoor and Cock's Hill DZs is dependant on training objectives, and availability of troops and aircraft. During the last five years (2003 to 2007), bookings varied from zero to one day each year at Cock's Hill DZ, and up to eight days a year at Ringmoor DZ. Actual use of the DZs is less than the booked use, as additional days are booked for each parachute drop to allow for poor weather.
- **'Stone Tents':** situated at Bearwalls Farm (shown as D27 on **Figure 2.2**), Standon Farm and Ditsworthy Warren House (shown as D55 on **Figure 2.2**), consist of farm buildings that are used to provide basic shelter.

Aventurous Training

2.3.16 Adventurous, and Resource and Initiative Training is designed to build character, leadership and teamwork through challenging activities.

2.3.17 Adventurous training covers the following activities:

- rock climbing and abseiling (Meldon Quarry, Foggintor Quarry (shown as D45 on **Figure 2.2**), Dewerstone (shown as D70 on **Figure 2.2**), Sheepstor (D51 on **Figure 2.2**) and Haytor Rocks/Quarry);
- canoeing (Meldon Reservoir (shown as D15 on **Figure 2.2**), River Dart and River Tavy); and
- caving (two caves close to Buckfastleigh).

2.3.18 The potential effects of training on the unenclosed land outside of the DTA boundary, and adventurous training, including TOPL are scoped-out of the EA as it is considered that given the low numbers of personnel involved in these activities, and the similarities with activities undertaken by members of the public that the potential environment effects associated with such activities are minimal.

Aircraft: Flying Training

2.3.19 The environmental effects of fixed wing military aircraft flying training and transit are scoped-out of the EA as MoD Air, not DTA, are responsible for controlling low flying aircraft undertaking training over DTA, and movements of aircraft would occur whether or

not the military train on DTA. (DTE South West advise that aircraft movements would probably increase if the live firing Air Danger Area over North Dartmoor were to be removed).

Rotary Wing Aircraft in Support of Ground Troops

- 2.3.20 The aircraft currently used are: Merlin, Sea King, Puma, Apache, Gazelle, Lynx, Squirrel and Chinook. Within DTA routes and levels of activity are agreed with Commandant (Comdt) DTA. Pilots are required to conform with the orders set out in DTE SW SOs, specifically:
- other than in an emergency or with prior authority of the landowner, helicopters are allowed to land only within the designated Training Areas;
 - helicopters are normally required to transit above 250 feet Minimum Separation Distance (MSD)⁶. If authorised, helicopters may fly at any height over a training area;
 - horse riders are to be avoided where safe to do so; and
 - care must be taken to avoid undue disturbance of livestock; and
 - planning constraints require that helicopter landings should not occur in the field within the perimeter of Willsworthy Camp.
- 2.3.21 Within DTA, there is no set pattern to the movement of helicopters, or landing sites, though for safety reasons helicopter activity is greater around the perimeter of the RDA. There are however, designated Helicopter Landing Sites both at Okehampton and Willsworthy Camps. Ground exercises which employ four or more helicopters are notified in the Firing Notice published on the website some six weeks in advance. If fighter ground attack is to be part of an exercise consideration is given to activating the RDA or to put out sentries to warn the public of the activity.
- 2.3.22 A summary of helicopter movements between January 2004 and September 2007 is provided in **Table 2.4**. The data for these dates shows that the majority of helicopters land at Okehampton Camp Helicopter Landing Point (HLP), Brisworthy Wood (SX 555656) or the sports field adjacent to Okehampton Camp HLP, which is used if the HLP is occupied by vehicles. The majority of the helicopter movements are undertaken as part of tactical training or as 'touch and go' movements. Helicopter crews need to practice landing and take off procedures or to drop off passengers and stores, remaining on the ground for a short period. These types of movements are termed 'touch and go' movements. There are also occasional helicopter movements which are not associated with training.

⁶ MSD is the authorised minimum separation distance, in all directions, between an aircraft and the ground, water or any obstacle).

Table 2.4 Helicopter Movements (January 2004 to September 2007)

Year	Number of movements
2004	98 movements
2005	49 movements
2006	68 movements
2007	144 movements

Vehicle Movements

2.3.23 All types of military training are supported to some extent by military transport, which is restricted to tarmac roads and specified hard tracks unless off road movement is authorised by Comdt DTA because it is essential. Military vehicles and their use are summarised at **Table 2.5**, below.

Table 2.5 Military Vehicles

Type/ Description	Description	Use
All Terrain Vehicles (ATV)	Quad bikes, Kuboto, Supacat,	Movement of stores, personnel and casualty evacuation.
'Truck Utility' (Light/Medium/Heavy) (TUL/TUM/TUH)	Landrover 90, 110, and 130 wheel base, Toyota, Ford and Pinzgauer with up to 1 tonne carrying capacity. Can also tow a trailer. Many variants exist including ambulances, weapons mounted, gun tugs.	Movement of personnel, monitoring of training activity, field ambulance and other support.
'Truck Cargo' 4 tonne and 10 tonne	Bedford all wheel drive covered truck with 4 tonne carrying capacity, able to carry up to 23 personnel incl driver. Can also tow a trailer. Many variants exist including recovery, communications, DROPS (A military pallet system to allow delivery of pre-packed items).	Movement of personnel and stores/supplies
VIKING/BV206	6.9m long articulated, tracked vehicle designed for soft ground and snow. Variants include ambulance, weapon carriers, cargo and recovery.	Movement of personnel, stores/supplies
Minibus	12/15 seat	Movement of personnel

2.3.24 The potential effects from the movement of military traffic have been scoped-out of the EA as it is considered that the effects from such traffic are of insufficient magnitude to be having a significant effect on air quality or noise levels. However, as a result of consultation, the potential congestion effects along the access route to Okehampton Camp from Okehampton town centre have been considered in the Appraisal.

Supporting Infrastructure

2.3.25 Military personnel are accommodated as follows.

- Okehampton Camp: accommodation buildings which provide a total of 519 bedspaces, with a surge capacity to 776, with additional space for tented accommodation.
- Willsworthy Camp: accommodation building, which provides 94 bedspaces, with a surge capacity to 132.
- Staddon Farm (SX 545814): stone tent controlled by Comando Training Centre Royal Marines (CTCRM), which provides space for up to 50 personnel.
- Ditsworthy Warren House (SX 5866): stone tent providing space for 23 personnel plus additional space for tents.
- Bearwalls Farm: stone tent/ troop shelter provided for exercising troops.
- Holming Beam Shelter: stone tent / troop shelter provided for exercising troops.

2.3.26 Other administrative and support facilities are provided through use of buildings situated at Okehampton Camp.

Current Usage of the Training Area

2.3.27 There is no simple metric to describe the level of activity on military training areas as this will depend on the objectives, numbers and types of training that are carried out at any time. For the purpose of illustrating the general level of activity on DTA two metrics are commonly used, namely the number of days the training facilities are used and the number of man training days⁷. These metrics are helpful to set the likely significant environmental effects.

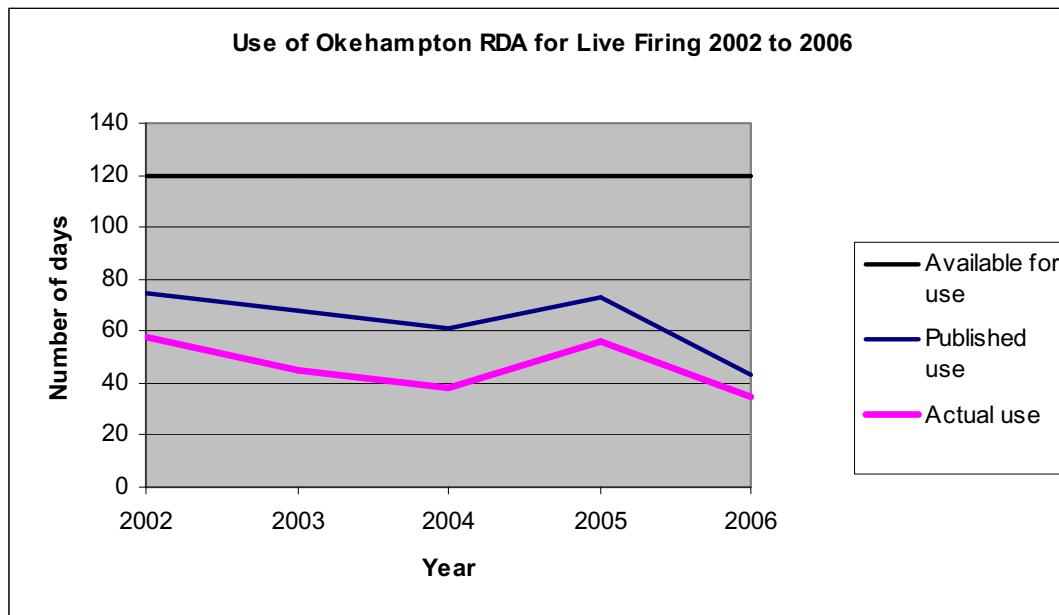
2.3.28 **Table 2.1** sets out the number of days per year that Okehampton, Merrivale and Willsworthy are available for live firing. All of DTA can be used for dry training throughout the year (i.e. up to 365 days per year).

2.3.29 **Figures 2.3 to 2.5** compare the published and actual use of Okehampton, Willsworthy and Merrivale RDAs for live firing between 2002 and 2006. The published use of the RDAs reflects the number of days that the RDAs have been booked for live firing training exercises. The actual use is the level of use that actually occurs after training has been cancelled. Cancellations usually occur because of bad visibility or because good weather has meant that not as many days are required as were booked. Cancellations may also occur because the training exercise cannot take place, for example, if equipment is not working.

⁷ The usage figures are derived from statistics agreed with DNPA through the DSG.

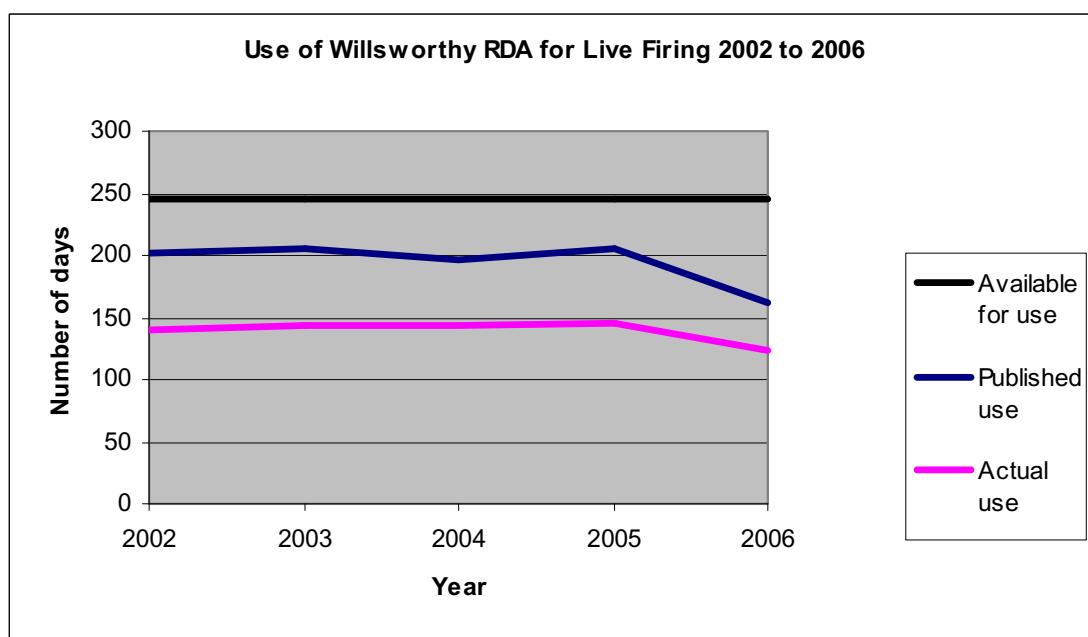
2.3.30 **Figure 2.3** below, shows that at Okehampton actual use of the RDA for live firing has fluctuated between 60 and 40 days per year, generally 20 days less than the published (or booked) use, although the difference between actual and booked use has decreased in recent years.

Figure 2.3 Use (in days) of Okehampton RDA for Live Firing (2002 to 2006)



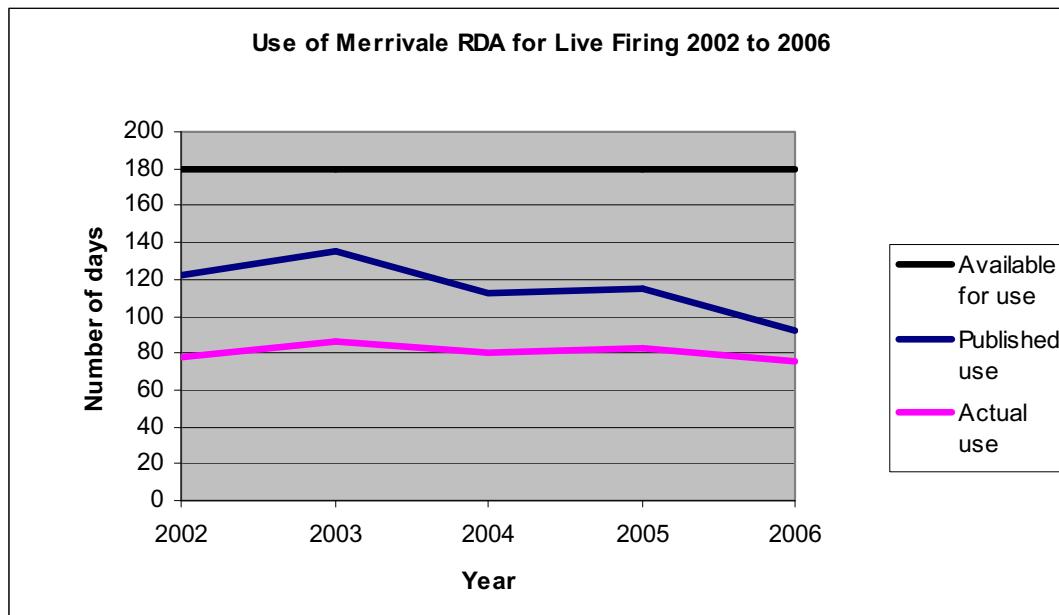
2.3.31 **Figure 2.4** below, shows that the actual and booked use of Willsworthy has remained constant at around 145 (actual) and 200 (booked) days per year although this has reduced since 2005.

Figure 2.4 Use (in days) of Willsworthy RDA for Live Firing between 2002 and 2006



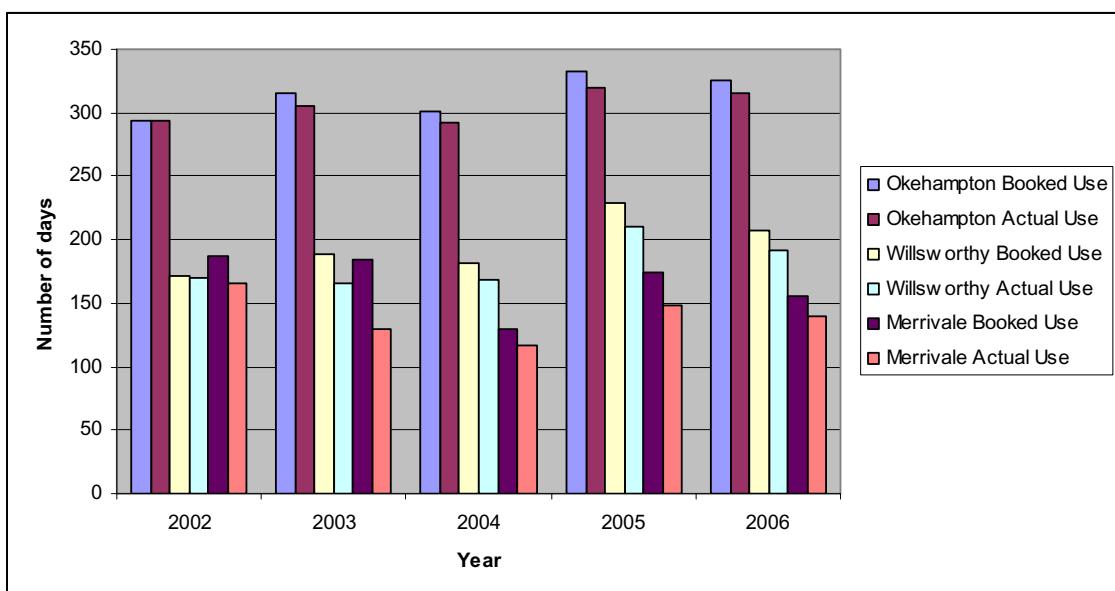
2.3.32 **Figure 2.5** below, shows that actual use of Merrivale has remained reasonably constant between 2002 and 2006 at around 80 days per year. The booked use of Merrivale has fluctuated between 135 and 90 days per year with a decline in the amount of booked use since 2003.

Figure 2.5 Use (in days) of Merrivale RDA for Live Firing between 2002 and 2006



2.3.33 **Figure 2.6** below, shows that of the three RDAs, Okehampton is used the most for Dry Training. This is likely to be because Okehampton RDA has the lowest level of use for Live Firing. Merrivale has the lowest level of use for Dry Training. Generally, there is only a small amount of difference between booked and actual use.

Figure 2.6 Use (in days) of Merrivale, Okehampton and Willsworthy RDAs for Dry Training between 2002 and 2006

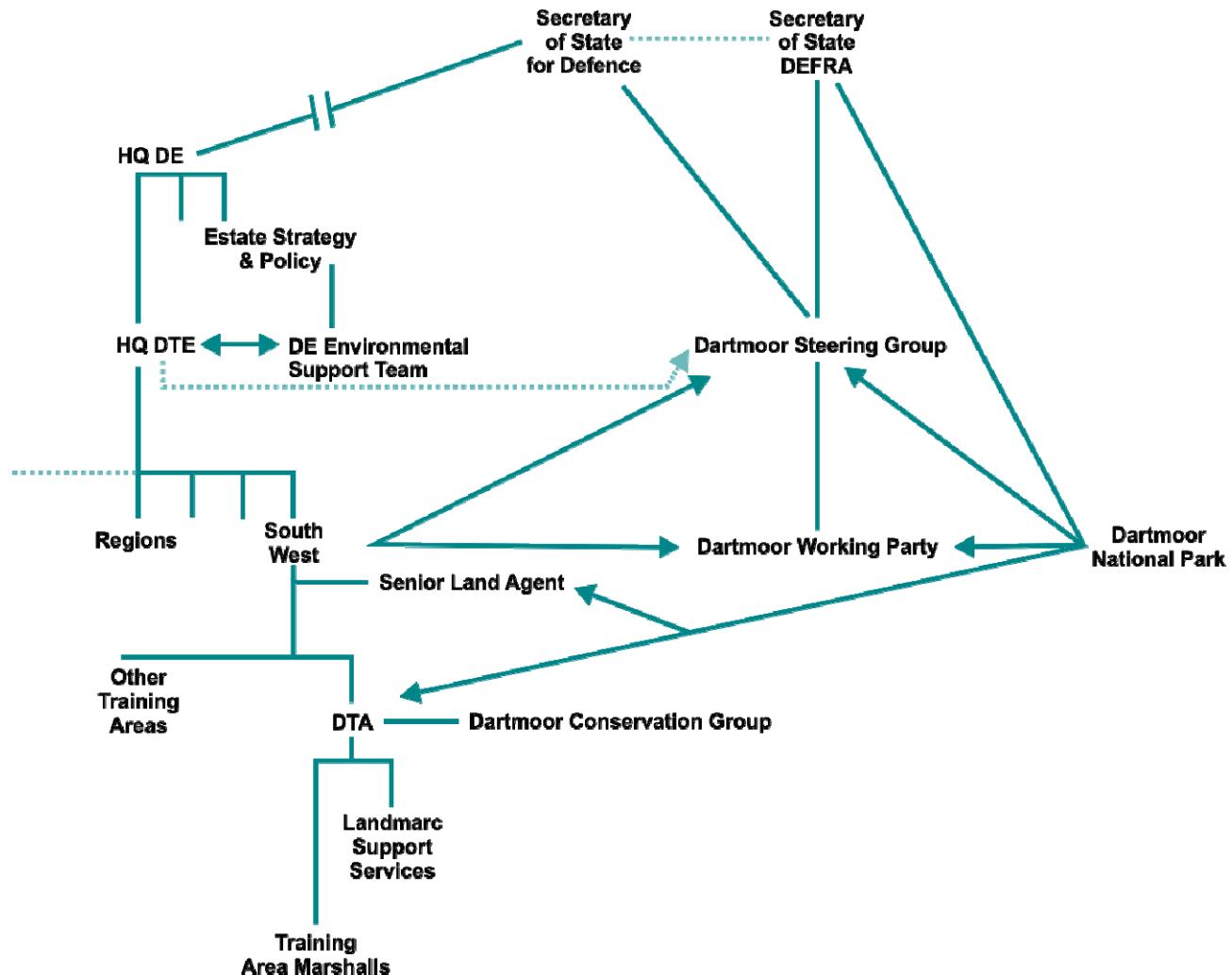


2.4 Management of Military Training on DTA

- 2.4.1 The Environmental Management System (EMS)⁸ for DTA represents the current position in ongoing management, to mitigate against negative environmental effects. Mitigation has been developed by a combination of dialogue with stakeholders and monitoring.

2.4.2 **Figure 2.7** below summarises the organisations participating in the delivery of management initiatives on DTA.

Figure 2.7 Summary of Organisations



⁸ Environmental Management System Manual, Dartmoor Training Area, Version 2.2 Jul 07.

2.4.3 An overview of the measures in place is reproduced at **Table 2.6**, below.

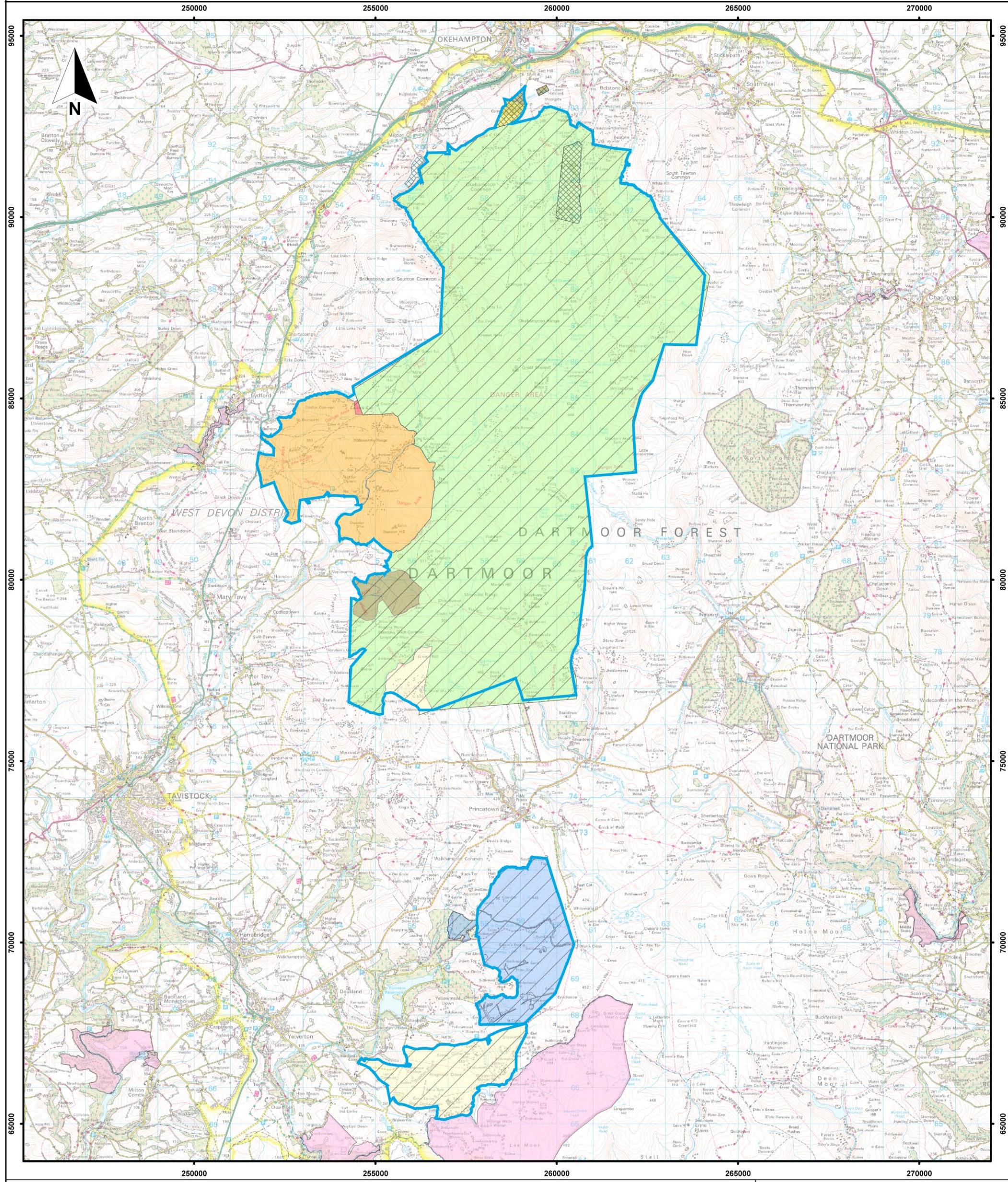
Table 2.6 DTA Environmental Management Measures

Environmental Issue	Management Measure
Air quality	Regular service and maintenance of generators, combined with infrequent use and limited deployment , use of LPG fuel in cookers, cookers switched off during the night, management system to ensure efficient use of heating systems in buildings.
Air quality, noise	Regular servicing and maintenance of aircraft and vehicles.
Air quality, traffic and transport, noise	Measures to minimise vehicle use including monitoring of mileage and measure to co-ordinate vehicle use and sharing.
Nature conservation	Restrictions on type of ammunition to prevent holes being excavated in the ground, debris cleared and major holes backfilled, access limited to certain bird species nesting areas during breeding seasons, flora and fauna monitored, fire warning system used to highlight risk periods and notify users of additional controls which are needed during higher risk periods, clearance of stock from live firing areas when live firing is programmed - where possible live firing exercises are planned to enable stock to be moved to areas requiring grazing, management plan on Willsworthy Training Area (part of North Dartmoor SSSI).
Cultural heritage	Educational information provided to users, historic environment monitored, use of historic sites and tors as targets forbidden, and maintenance of buildings of historic significance at Okehampton Camp.
Geology, nature conservation, archaeology	Careful and appropriate selection of digging sites - requirement to backfill trenches and re-turf, areas of heather and blanket bog avoided.
Geology, nature conservation, archaeology	Restrictions on military vehicle transit routes, vehicle movements off permitted tracks is limited to those having operational training need, rutting repaired, tracks and roads inspected and repaired, consultation with DNPA about routes for groups of more than 30 people outside training area, erosion of footpaths monitored.
Landscape and visual	Litter and debris cleared by military personnel after training and periodically by staff, visual intrusion of supporting infrastructure (shelters, flag poles) minimised through use of appropriately coloured paint (green or grey) or construction using appropriate materials (granite), Landscape Management Plan implemented for Okehampton Camp, parking and access constraints implemented to limit and prevent vehicular access by both public and military, visual intrusion of Okehampton anti-tank training area minimised by incorporating into railway bank, portalos sited in appropriate location to avoid visual intrusion where possible, new field portaloo design being developed.
Noise, recreation, nature conservation	Careful control of military aircraft activity which takes into account when activities will occur, number of aircraft, flying heights, which are normally limited - low flying requires prior authorisation. Helicopter pilots briefed to avoid habitation, riders and livestock.
Noise, recreation	Range danger areas closed during live firing, blank firing and use of pyrotechnics prohibited within 100m and 200m of civilians respectively.
Economy and employment	Military personnel and attendees to training and events such as Ten Tors instructed to avoid livestock. Ten Tors managers' weekend held annually – managers required to attend every 5 years. MoD pays for rights to train and provides compensation for stock injured or killed. Incident reports and complaints record maintained by MoD. Approximately 80 staff employed on DTA, preference given to local purchasing where cost effective. Local farmers employed for stock clearance.
Tourism and recreation	Leaflets and information boards used to encourage access outside live firing programme, information about guaranteed public access and firing programme made available on website, information boards, information centres on local radio and in military and civilian publications, cancellations of firing publicised in a similar way.
Waste, recreation	All general waste disposed of in accordance with regulations with some recycling in place. Military debris and civilian litter collected off moor, waste from ammunition (containers and cartridge cases) put into military salvage system.
Water	Water management measures - some timed automatic taps, on site sewage treatment works, maintained and inspected in accordance with industry standards.
Water, nature conservation, land quality	Spillage minimisation - prevention plan in place, bunding and interceptor tanks used in appropriate locations such as refuelling points, spill response kits, oil and grease traps, trained personnel.

- 2.4.4 As part of the continuing process of environmental monitoring, an independent audit of the EMS was completed in March 2005⁹. The scope of this EA, as defined through the scoping and consultation process completed to date, includes consideration of the findings of that report and where appropriate further potential mitigation is put forward under each subject area chapter. Mitigation measures, which are set out in the DTA's EMS, Integrated Land Management Plan and DTE SW SOs, are also set out under each topic chapter where relevant.

⁹ RPS, (2005) External Audit of Dartmoor Training Area's Environmental Management System.

This page is intentionally left blank.



Key:

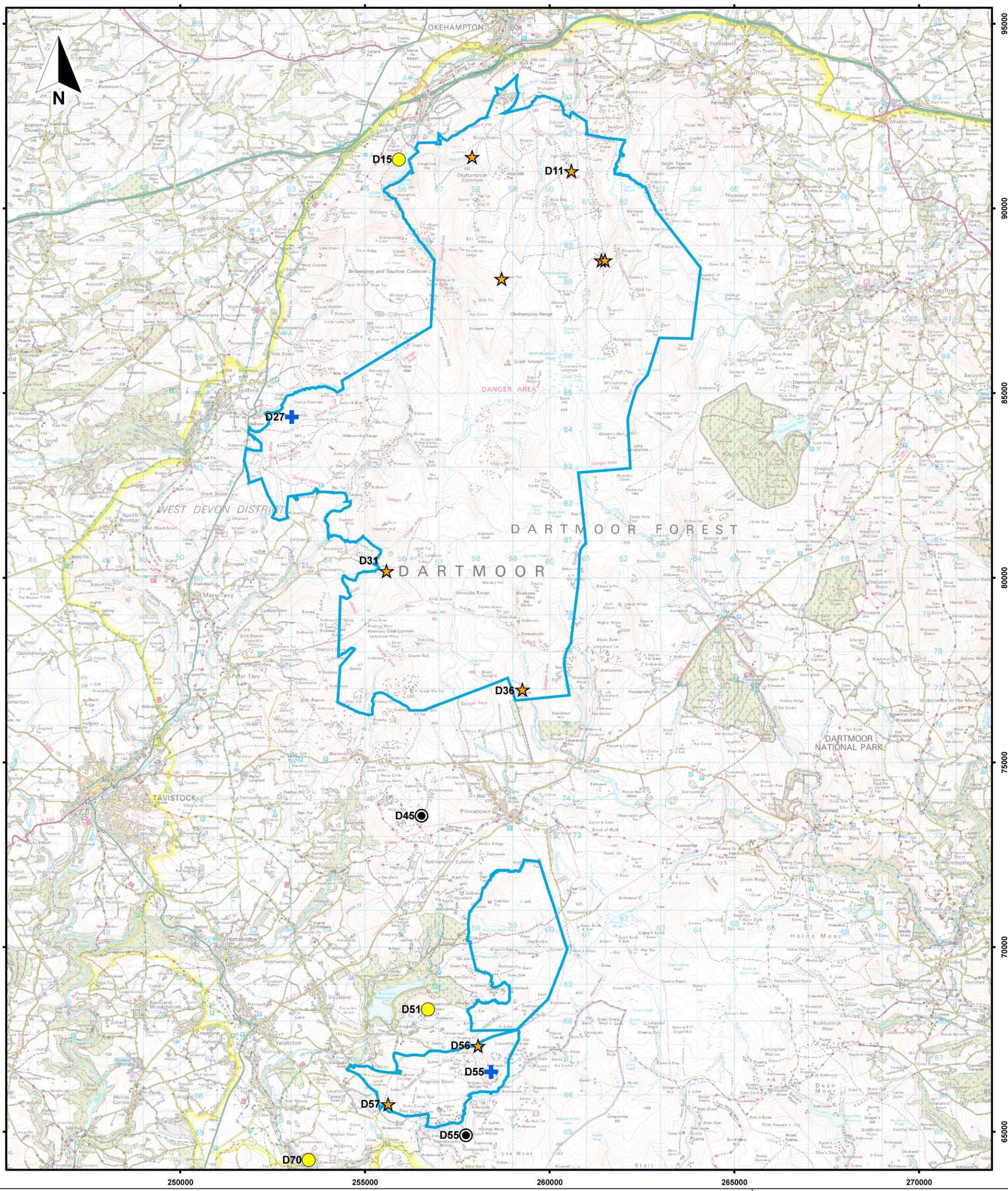
- | | | | | | |
|---|---------------------------|---|------------------|---|-----------------------|
|  | Dartmoor Training Area |  | Public Trust |  | Defence Estate Rights |
|  | Defence Estates Freehold |  | South West Water | | |
|  | Defence Estates Leasehold |  | Leawood Estate | | |
|  | Individual Owners |  | Maristow Estate | | |
|  | Duchy of Cornwall |  | National Trust | | |

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 2.1
Land Ownership





Key:

- [Blue Box] Dartmoor Training Area
- [Yellow Star] Bivouac Locations
- [Black Circle] Dry Training Location
- [Yellow Circle] Adventurous Training
- [Blue Cross] Stone Tents

DE DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 2.2
Dry and Adventurous Training Features

Scale: 1:100,000 @ A3

Prepared for the Ministry of Defence, Defence Estates, contract DE4/4513

September 2007
17774-L35b adamk

Entec



DARTMOOR TRAINING AREA

Environmental Appraisal

Need and Alternatives

3

3. Need and Alternatives

3.1 Introduction

- 3.1.1 The need to continue training on DTA and the analysis of potential alternatives to its use has been addressed through previous independent study.¹⁰ This Chapter draws upon information in that report and on further information provided by DTE¹¹ to summarise the most recent position.
- 3.1.2 While all three Armed Services make use of DTA, the Army and the Royal Marines are its primary customers, representing by far the greatest demand on its facilities. Therefore an overview of how the Army and Royal Marines are trained is provided first, followed by similar commentary related to other military users. The demand (now and in future) placed upon DTA is then summarised. The Chapter concludes with an appraisal of the potential alternatives to the use of DTA.

3.2 Outline of Training

Army and Royal Marines

- 3.2.1 Armed Forces are required to undertake a wide variety of tasks to underpin national security and the Government's foreign policy objectives. In addition to the broad geographic sweep of these tasks and the complicated combinations and permutations of units and soldiers needed to achieve them, they are also often dangerous and unpredictable.
- 3.2.2 Land Forces training¹² is conducted within a clear and structured framework, which ensures that soldiers at all levels are properly prepared for the potential operations that they may be required to undertake. Training Objectives are linked directly to a unit's readiness state so that training is efficient and cost effective and only concentrates on delivering those skills that are necessary to the fulfilment of the aim. The MoD has an inescapable moral and legal duty to ensure that all soldiers are properly trained to fulfil any task that they may be called upon to undertake. This obligation is fulfilled in part by training on MoD ranges and training areas.
- 3.2.3 Military training is structured and progressive and takes place at different stages in a soldier's career. Individual training¹³ takes place in three distinct phases. Initial training is delivered in two phases; Phase 1 recruit training is common to all arms and services and is conducted at Army Training Regiments, Phase 2 training is type specific specialist training and takes place at a variety of individual training establishments throughout the

¹⁰ The Continuing Need for Military Training on Dartmoor (RPS, June 2005).

¹¹ The Need for Military Training on Defence Training Estate South West (DTE SW) HQ DTE August 2007.

¹² A more detailed explanation of military training can be found in Chapter 2 of the Need for Military Training on DTE SW HQ DTE August 2007.

¹³ Individual training is the training of individual soldiers in order to equip them with the skills necessary to survive on the battlefield.

UK. Soldiers are posted to the field army on completion of Phase 2 training. Phase 3 training is undertaken throughout a soldier's career in order to refresh skills, acquire new skills and develop potential, most Phase 3 training is linked to promotion.

- 3.2.4 Collective training¹⁴ takes place at all levels from section (8 to 10 personnel) up to company (100 to 120 personnel) and battlegroup (600+ personnel); formation training involves the training of one or more battlegroups. DTA is used extensively for individual and collective training.
- 3.2.5 Pre-deployment training is undertaken by soldiers before they deploy on operations, it builds on the individual and collective training undertaken by all service personnel and is specifically designed to meet the unique demands and requirements of operational theatres. It can only be delivered to trained soldiers. DTA is used to deliver pre deployment training

3.3 Training Area Demand

- 3.3.1 DTE SW provides training areas and ranges for units from all over UK as well as those based locally. The major units and service establishments located within DTE SW's catchment area, all of which require access to local training facilities, include:
 - Regular and Reserve Royal Navy and Royal Marine Units;
 - Regular and Territorial Army Units;
 - Individual Training Organisations including; Britannia Royal Naval College, Dartmouth, HMS Raleigh, Torpoint and the Commando Training Centre, Royal Marines, Lympstone;
 - RNAS Culdrose and RNAS Yeovilton;
 - Joint Services Survival School;
 - Bristol and Exeter Universities' Officer Training Corps (OTC);
 - RN, RM, Army and RAF Cadets; and
 - Ministry of Defence Police (MDP)¹⁵.

3.4 Training Area Supply

- 3.4.1 Available training resource can be divided into the following categories:
 - DTE land owned, leased or licensed to the MoD;
 - Training on Private Land (TOPL);
 - Overseas training facilities;

¹⁴ Collective training is training which forms trained individuals into cohesive formations and units and broadens individual experience.

¹⁵ A more detailed explanation of demand in the SW can be found at Chapter 5 of The Need for Military Training in DTE SW HQ DTE August 2007.

- Simulation or synthetic training resources; and
- New training land.

DTE Land

- 3.4.2 The suitability and availability of DTE land is constrained by a variety of key environmental, seasonal and other factors¹⁶ which impact on training activity and the delivery of military capability. These factors were identified in the Defence Estates Training Rationalisation Study¹⁷ and are summarised in Chapter 3 of The Need for Military Training on DTE SW.
- 3.4.3 In addition, the suitability and availability of training land to meet specific training requirements is also determined by location, physical features, size and shape, available facilities, training priority, disruption and other limitations arising from legal commitments, environmental management practices and constraints, public access and present use.
- 3.4.4 All of these factors will interact to determine the suitability and availability of the DTE to meet the identified training demand. Balancing the need to train in a sustainable manner against the increasing demands placed upon a finite resource is a complex matter

TOPL

- 3.4.5 The MoD makes extensive use of privately owned land to supplement its own estate. TOPL takes place across the whole of the UK through a variety of different agreements, which are characteristically short term in nature. It is used for everything from the provision of sniper ranges to Adventurous Training (AT) and on occasions the use of tracked vehicles, parachute landings and river crossings. The availability of TOPL for live firing and use by tracked vehicles is however considered exceptional and by far the greatest use of TOPL is for Tactical Exercises without Troops (TEWTs)¹⁸ and for exercising 'walkover' rights.
- 3.4.6 Significant numbers of TOPL exercises take place within National Parks and it has been concluded¹⁹ that whilst the main pressure for the removal of training from National Parks is focused on live firing and associated Range Danger Areas (RDA), (as their use precludes access by the public), the MoD does not anticipate being able to re-provide these facilities by the use of TOPL, except possibly in some remote areas of Scotland. TOPL is also further limited by uncertainty of tenure, constraints due to landowner activities, the presence of environmental restrictions similar to those applicable to MoD owned land²⁰, planning restrictions and increased cost should further demand be placed on land used for TOPL. TOPL must therefore be viewed as a limited resource.

¹⁶ Factors include; environment, legislation, size and shape, physical features, facilities, and contractual obligations.

¹⁷ Defence Estates Training Rationalisation Study, 2004.

¹⁸ TEWTs are used to practice commanders at all levels in the application of military theory to the solution of tactical problems on the ground.

¹⁹ Defence Estates Training Rationalisation Study (DETRS) 2004.

²⁰ The Need for Military Training on DTE SW HQ DTE August 2007: Paragraphs 3.2.5 to 3.2.7.

Overseas Training Facilities

- 3.4.7 Oversees training exercises are, in general, limited to the delivery of collective training at company and battlegroup level, they are not used for the delivery of Phase 1 and 2 training and have limited utility in the delivery of Phase 3 training. The Defence Estate Strategy states that “*Overseas training facilities are essential, particularly for joint force training, but cannot replace UK-based training and are significantly more expensive*”²¹.

Simulation or Synthetic Training Resources

- 3.4.8 Simulator-based training²² can make a contribution to the achievement of training objectives and the delivery of military capability and is used by the MoD to complement other forms of training.
- 3.4.9 The use of simulators is driven by a number of factors including the pressure on finite resources, improvements in realism, the need to enhance the quality and timelines of training and the introduction of the digital battlefield. Whilst some training using simulators can take place in barracks and specialist training facilities Tactical Engagement Simulation (TES)²³ requires the use of training areas. However, there is no substitute for live fire or dry tactical training and consequently the MoD do not foresee that simulation will have a significant impact on the requirement for training estate in the future.
- 3.4.10 In conclusion, whilst simulation can complement training it “*falls well short of the realisms provided by field training*”²⁴ and cannot provide a substitute for live fire or dry tactical training or produce the realistic and challenging conditions which reflect the frictions of war.

New Training Land

- 3.4.11 Additional training resources are theoretically available through the purchase of new training land. However, notwithstanding financial considerations, the need to satisfy the military suitability criteria (location, physical features, size and shape, facilities) and the need to overcome associated environmental, social and economic factors associated with the acquisition of a substantial new training area within the UK, MoD policy clearly states that the rural estate should be no larger than is necessary and that the MoD does “*not envisage any future major acquisition of training land*”²⁵
- 3.4.12 A recent desk top study undertaken by Defence Estates, using a Geographic Information System to overlay designated areas, areas susceptible to flooding, existing MoD land, urban areas and centres of habitation was unable to identify any suitable sites in mainland UK large enough to replicate the training facilities delivered by DTA²⁶.

²¹ MoD In Trust and On Trust - The Strategy for the Defence Estate, 2000, Page 11.

²² The Need for Military Training on DTE SW HQ DTE August 2007: Paragraphs 3.4.2. to 3.4.4.

²³ TES is live simulation where real people operate in a real environment but with simulated effects.

²⁴ MoD In Trust and On Trust - The Strategy for the Defence Estates, 2000, Page 12.

²⁵ MoD In Trust and On Trust - The Strategy for the Defence Estates, 2000, Page 31.

²⁶ The Need for Military Training on DTE SW HQ DTE August 2007, Paragraph 3.54

Additional Factors and Constraints Placed on the Supply of Training Facilities

3.4.13 Specific to the issues surrounding the strategic need for training facilities, it has also been concluded that:

- at a National level, Land Forces (including Royal Marines) will be of a broadly similar size (approximately 100,000 personnel) and shape until 2050 unless there is a significant change in Foreign Policy;²⁷
- the training requirement is likely to be more demanding on the training estate as the range, capabilities and reach of weapons and equipment increase;²⁸
- implementation of the '*Future Army Structure*' will impact on the number of personnel based in the UK, which will increase by 20,000 as the Army withdraws from Germany by 2030;²⁹

3.4.14 Further constraints on training apply at three of the UK's eight major training areas (Dartmoor (Devon), Castlemartin (Pembrokeshire) and Otterburn (Northumberland)), which are located in National Parks. These are subject to numerous limitations on live firing and dry training. A further five sites (at Kirkcudbright (Dumfries and Galloway), Sennybridge (Powys), Stanford (Norfolk), Salisbury Plain (Wiltshire) and Lydd and Hythe (Kent)) contain large areas of designated land which limits their use³⁰. All training areas and ranges have limitations of one sort or another imposed upon their use as a consequence of legislation, planning agreements and undertakings, and environmental management agreements with national and local stakeholders.

3.4.15 Against these constraints it has been assessed that all sites are currently running at or near full capacity. The recent RPS study³¹ into the availability of light force training on Dartmoor concluded that:

"there is an increasing demand for light force training in the UK to meet MoD mandated training requirements. This will lead to a net shortfall of 138 'sub unit weeks'³² for dry tactical training and 238 sub unit weeks for live fire tactical training. In view of this shortfall it is not plausible for the MoD to release any of its existing main training areas".

²⁷ Delivering Security in a Changing World - Defence White Paper 2003.

²⁸ Defence Policy: Future Trends to 2050 - High Level Assumptions Paper HQ DTE May 2006.

²⁹ Army Board Meeting of 22 November 2001.

³⁰ The Need for Military Training on DTE SW HQ DTE August 2007, Paragraphs 3.13 - 3.41.

³¹ The Continuing Need for Military Training on Dartmoor, RPS Jun 2005.

³² A Sub unit training week = number of units (Battalions) x number of companies in a Battalion (4) x number of weeks of training.

Potential Alternatives within the South West

3.4.16 A detailed breakdown of training facilities in DTE SW can be found at Chapter 4 of The Need for Military Training In DTE SW. Ranges, Training Facilities and Designated Training Areas within the south west are summarised at **Table 3.1** below.

Table 3.1 Potential Training Area Alternatives within the South West

Name	Facilities Available
Fremington Camp and Braunton Burrows	c. 200ha. of dunes, grassland and scrub, offering low level dismounted infantry and adventurous training.
Penhale	7 miles North of Newquay; c. 383 ha. coastal site, of dunes, grassland and scrub, offering low level dismounted infantry training up to company level and also adventurous training. Includes helicopter landing site and parachute drop zone.
Bodmin Moor	Extending to 1,600 ha., offering low level dismounted infantry training up to battalion level. Includes a parachute drop zone and hard standing at Davidson Airfield for specialist air delivery training and hard standing for logistic exercises and field hospitals.
Pilner Rifle Range, Severn Estuary.	Situated on the estuary to the north of Bristol and offering an eight lane range plus basic skill at arm training.
Yoxter Training Camp and Ranges, Cheddar, Somerset	354 ha. of rolling landscape offering limited low level dismounted infantry training up to platoon level, plus an eight lane range.
Langport Range and Training Area, Somerset	240 ha. of rolling farmland offering low level dismounted infantry training up to platoon level, helicopter training, driver training, plus an eight lane range.
Straight Point Ranges, Lympstone	Gallery and electronic target range.
Antony and Tregantle Training Areas, Plymouth	315 ha. of pasture between Whitsand Bay and The River Lynher Estuary, providing military and adventurous training. Five . gallery ranges at Tregantle. Anthony Training Area provides low level dismounted infantry training up to platoon level.
Scraesdon Fort	Fort used for training for Operations in Urban Areas
Staddon Heights, Plymouth	43 ha. of beaches, cliffs and coastal defence structures, used for amphibious assault training.
Wyke Regis Training Area, Weymouth	81 ha. offering specialist training in mobility and counter mobility. Includes an eight lane electronic target range.

3.4.17 With the exception of Bodmin Moor, none of the potential training areas indicated in **Table 3.1** offers the terrain and climate required to provide arduous training in a natural environment similar to that provided by DTA. All are also far less extensive than DTA (Bodmin Moor, at 1,600 ha. being the largest is only some twelve percent of the DTA in size).

3.4.18 It has therefore been concluded that no realistic alternatives to the training available on DTA exist within the South West.



DARTMOOR TRAINING AREA

Environmental Appraisal

Environmental Appraisal: Approach

4

4. Environmental Appraisal (EA): Approach

4.1 The EA Process

Overview

- 4.1.1 As outlined in **Section 1.2** of this Report, the approach adopted for this EA is based on that used for the assessment of effects associated with developments for which Environmental Impact Assessment (EIA) is required for projects falling under the requirements of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (hereinafter referred to as the *EIA Regulations*). The assessment process that is used for an EIA development or activity is considered to be a suitable model to apply to the EA of the likely significant effects of the continuation of military training at the steady state level of activity beyond 2012.
- 4.1.2 Prior to undertaking this process MoD sought legal advice. The licenses between the Secretary of State for Defence and landlords are private contractual arrangement that require re-negotiation before expiry. The next license to expire is with the Duchy of Cornwall in 2012 and MoD is seeking to re-negotiate a further period. This does not amount to a renewal of the use of the land in accordance with Department of Environment Circular 12/96, which relates to the *Environment Act 1995, Part III, National Parks*. For Circular 12/96 to be relevant the renewal should amount to a resumption of the use of a National Park after an interruption or pause, which is not the case in respect of military training on Dartmoor.
- 4.1.3 MoD is not bound to carry out an EIA, either in accordance with Circular 12/96, or on a statutory basis in accordance with the *EIA Regulations*. However, MoD has conducted an EA that mirrors the output of an EIA. Where possible it proposes measures for mitigation of any adverse effect of the military presence on Dartmoor and assesses the significance of effects. The EA Report will be subject to public consultation. In the absence of a 'development', the statutory framework of the *EIA Regulations* does not apply. In view of this, the term EA is used to replace EIA. The Environmental Statement (ES) is the product of the EIA process, in this case the EA Report is considered to be the equivalent of an ES.
- 4.1.4 The key characteristics of the EIA process leading to completion of an ES are that it is:
- systematic, comprising a sequence of tasks defined both by regulation (in the case of EIA) and by good practice, leading to the use of the information that is gathered to inform decision-making;
 - analytical, requiring the application of specialist skills from the environmental sciences;
 - impartial, its aim being to inform the decision-maker rather than to promote the project;
 - consultative, with provision being made for obtaining feedback from interested parties including local authorities and statutory bodies;
 - interactive, allowing opportunities for concerns regarding environmental effects to be addressed, and, in this case, improve the management of military training on DTA, where appropriate.

- 4.1.5 The preparation of the EA Report is one of the key stages in the process, as it brings together the environmental information that has been used to inform the assessments of likely significant effects and the evaluation of the significance of these effects. The EA Report also needs to include information about the decisions that have been taken to improve the management of military activities.
- 4.1.6 Following the production of the EA Report, it will be considered as part of the decision making process regarding the license re-negotiations.
- 4.1.7 The key steps in the EA process are summarised in **Box 4.1**. These are based on the EIA Regulations, government guidance and good practice. They require inputs from not only the EA team but also the MoD and third parties such as statutory consultees.

Box 4.1 Key Steps in the EA Process

- Defining the military training activities, including consideration of the need for training and alternatives for meeting this need;
- Deciding on the likely significant effects that need to be assessed and how the necessary assessments will be carried out (i.e. scoping);
- Consulting over the scope of the EA and refining the scope in response to the comments received
- Assembling further information about the baseline environmental conditions that relate to the likely significant effects;
- Identifying measures to avoid or reduce adverse effects, or to increase the environmental benefits,
- Ongoing consultation with statutory consultees and other interested parties, as appropriate;
- Assessing the magnitude and other characteristics of the environmental effects being assessed;
- Evaluating the significance of the predicted effects;
- Collating the findings in an EA Report and summarising the findings in a non-technical summary;
- Decision-making, which may involve *inter alia* ongoing negotiation and requests for further information;
- Informing stakeholders of the decision on the re-negotiation;
- Ongoing environmental monitoring, management, assessment and other work, as required.

- 4.1.8 Before describing how the EA process has been applied (see **Section 4.2**), outlined below are aspects of Entec's generic approach to scoping EIAs and EAs and the terminology used in these processes.

Terminology Used in this Report

Impact and Effect

- 4.1.9 Within the EIA/EA process, most use the terms 'impact' and 'effect' interchangeably, whilst others use the terms with different meanings. Some use 'impact' to mean the cause of an 'effect' whilst others use the converse meaning. This variety of definitions has led to a great deal of confusion over the terms 'impact' and 'effect', both among the environmental specialists that undertake EIA/EAs and those who read the resulting reports.
- 4.1.10 The convention used in this Report is to use the word 'effect' when describing the environmental consequences of military training. Such effects come about at the end of a series of events, or pathway, that involve:
- physical **activities** that would or do take place (e.g. vehicle movements);

- environmental **changes** that occur as a result of these activities (e.g. an increase in noise levels) - in some cases one change causes another change, which in turn results in an environmental effect; and
- the environmental **effects** that are predicted to result from these changes - these are the consequences of the environmental changes for specific environmental resources or receptors (eg consequences for valued fauna or loss of vegetation, consequences for people of an increase in noise levels etc.).

4.1.11 This EA is concerned with evaluating the significance of the effects of military activities, rather than the impacts or changes that cause them. However, this requires these activities to be understood and the resultant changes quantified, which often necessitates predictive assessment work.

Mitigation

4.1.12 In this Report, mitigation is defined as covering the following.

- **Avoidance:** Measures taken to avoid adverse effects.
- **Reduction:** Measures taken to reduce adverse effects.
- **Compensation:** Measures taken to offset/compensate for significant adverse effects. These measures usually take the form of attempting to replace what will be lost.

Enhancement

4.1.13 The genuine enhancement of environmental interests, unrelated to any avoidance, reduction or compensation, is not considered to be mitigation. However, it may still be relevant to the EA.

Scoping

4.1.14 Scoping involves identifying:

- the people and environmental resources (collectively known as 'receptors') that could be significantly affected by the proposals; and
- the work required to take forward the assessment of these likely significant effects.

4.1.15 The context for scoping is provided in the EIA regulations and in DETR Circular 02/99 *Environmental Impact Assessment*. Schedule 4 of the Regulations states that the ES should include "*a description of the likely significant effects of the development on the environment...*". The Circular states that "*In many cases, only a few of the effects will be significant and will need to be discussed in the ES in any depth. Other impacts may be of little or no significance for the particular development in question and will need only very brief treatment to indicate that their possible relevance has been considered.*"

4.1.16 Scoping needs to be started at the outset of the EIA/EA process in order to allow the EIA/EA to focus on important issues. Making early decisions about which effects are likely to be significant might be considered to be premature, given that the best way to make such decisions is to assess each effect in detail and then to decide whether or not it is significant. In practice, though, it is unrealistic to do this, given the great number of effects that could result from a proposed development or activity; assessing all of these in detail would be impractical.

4.1.17 It is essential to recognise that early decisions about likely significant effects may be wrong and that the scope of the EIA/EA needs to be kept under constant review and be

revised as appropriate in response to the understanding of baseline environmental conditions and the project or activity being assessed. Such changes should continue to be made, as required, up to the time that the EA is produced.

- 4.1.18 Entec's approach to scoping is to set out the early conclusions about the scope of the EIA/EA in a Scoping Report. There is no statutory requirement to produce such a report but to do so is widely recognised as good practice on the basis that it engages interested parties and enables them to contribute to the scope of the EIA/EA from an early stage, which in turn can reduce delays later on.
- 4.1.19 In the Scoping Report, effects are identified for further assessment ('scoped-in') when:
 - they are likely to be significant; or
 - they could be significant - with further information and/or consultation being required to determine whether they are likely to be significant.
- 4.1.20 For each of these effects, the Scoping Report identifies the work required to take forward the EIA/EA. Ideally there is sufficient information available for the Scoping Report to define the details required to assess the identified effects. Often, though, all that can be done is to identify the survey work needed to determine whether receptors that could be significantly affected are present and/or to understand the changes that could affect the receptors. Only when this has been done can the assessment requirements relating to the receptor be defined. As new evidence becomes available, effects that were scoped-in might be scoped-out and vice versa.

Typical Project Evolution

- 4.1.21 Even before the start of the EIA/EA process, many proposals are informed by environmental considerations. Further opportunities to avoid or reduce potential adverse effects, or to deliver environmental enhancements, may be identified whilst preparing the Scoping Report. Some of these opportunities will be acceptable to the client/project design team and will become part of the scheme proposals. The interactive process of scheme development continues through to a 'design freeze', at which stage detailed work to assess the effects of the finalised scheme can be completed. For this project, such an approach is not applicable and the appraisal has considered environmental effects by assuming military training activity up to the currently agreed threshold levels.
- 4.1.22 Entec's normal approach to EIA/EA is to assess the effects of the scheme proposals, incorporating the mitigation and enhancement measures that the client has agreed should form part of the proposals, irrespective of how or when (whether before or during the EIA/EA stage) they were adopted. In undertaking the assessment of the proposals, it is, however, essential to consider the likely effectiveness of the mitigation/enhancement measures. Only those measures that might reasonably be expected to be effective can influence the assessment.
- 4.1.23 This approach often enables some effects to be 'scoped-out' of the EIA/EA on the basis that incorporated measures that might reasonably be expected to be effective will avoid significant adverse effects. These measures are described in the scheme description chapter of the ES, whilst the specific benefits relating to the individual environmental topics that are assessed as part of the EIA/EA are described in the relevant topic-specific ES/EA Report chapters.
- 4.1.24 In this case, environmental considerations are already being taken into account in the management of military training on DTA. Additional mitigation has also been identified through the consultation process and assessment of effects.

- 4.1.25 The additional mitigation identified has been agreed with DTE and where appropriate will be implemented through the DTA Environmental Management System (EMS).

4.2 Application of the EA Process to this Project

Topics to be Addressed in the EA

- 4.2.1 Schedule 4 of the EIA Regulations specifies that the EIA should address “*...direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects...*”. Schedule 4 also specifies that the ES should describe those “*aspects of the environment likely to be significantly affected by the development, including, in particular population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.*” In this report, these topics are dealt with under the headings set out in **Table 4.1**.

Table 4.1 Environmental Topics Addressed in EA

Topics in the EIA Regulations (SI No. 293)	Topics in this report
Population	Socio-economics; Air Quality, Noise and vibration and land use
Fauna	Flora and fauna
Flora	Flora and fauna
Soil	Land quality
Water	Hydrogeology and hydrology
Air	Air Quality
Climatic factors	Air Quality; Hydrogeology and hydrology
Material assets, including the architectural and archaeological heritage	Cultural heritage; Traffic and Transport
Landscape	Landscape and visual
The inter-relationship between the above factors	No specific topic but addressed by analysis of the environmental changes associated with the development and the consequent effects being central to the approach used to scoping and assessment

The Stages of the Development

- 4.2.2 Normally the potential environmental effects of the development have to be considered during both the construction and operational phases of a proposed development. In this project, there are no facilities to be constructed hence there are no effects to be considered. Similarly any changes in training are not associated with any land use changes or modification of current activities. Any such changes will relate to some intensification in training but only within the current levels permitted on DTA.

Scoping

- 4.2.3 The Scoping Report was finalised and publicised in September 2006. As the report was not written in support of a planning application, it was not submitted to the local planning authority as would be done in the case of an EIA under the EIA Regulations. Instead, the report was publicised on the DTA website (<http://www.dartmoor-ranges.co.uk>), issued to consultees and public exhibitions were held with the aim of receiving responses and feedback on the proposed scope of the appraisal.
- 4.2.4 Several statutory and non-statutory consultees were invited to respond with comments on the proposed scope of the EA, as would be done by the planning officer if a request for a Scoping Opinion has been submitted to the local planning authority (LPA) under the EIA Regulations. A list of the statutory and non-statutory consultees consulted as part of the scoping process is included in **Appendix 1.2**. The planning officer at the LPA would normally consult with statutory consultees and other consultees as required, and use the consultation responses to produce a Scoping Opinion.
- 4.2.5 Two public exhibitions were held, at Tavistock on Monday 30th October 2006 and Okehampton on Tuesday 31st October 2006, and members of the public were invited to attend to find out more about the appraisal process and to be given the opportunity to comment on the proposed scope of the assessment. These events were publicised beforehand through local media including newspapers, radio and television. Comments received from members of the public were recorded.
- 4.2.6 As the EA is not being undertaken under the EIA Regulations, a Scoping Opinion has not been produced as part of the scoping process. Instead, the comments received from statutory and non-statutory consultees have been collated as part of the consultation summary (contained in **Appendix 4.1**). This has been considered in conjunction with the scope of the assessment set out in the Scoping Report. The scope of the appraisal has been progressively refined on the basis of consultation responses, from the environmental information resulting from survey or assessment work and from issues raised as part of Working Group (WG) meetings (see following section for further information on the WG).
- 4.2.7 The final scope of the appraisal is outlined in each of the topic chapters. Reference is made to any changes in the scope since the publication of the Scoping Report.

Working Groups

- 4.2.8 WG have been set up to examine the four key topics considered in the EA; they cover public access, nature conservation, cultural heritage and land use. The WG comprise, a chairman; the topic specialist completing the appraisal for each particular topic and members from statutory and non-statutory organisations (see **Sections 6.3, 8.3, 9.3 and 11.3** and **Appendix 1.2** for details of working group meetings and attendees).
- 4.2.9 WG meetings were held throughout the appraisal process in order to engage with relevant organisations. The aim of these meetings was to discuss the scope of the appraisal, identify issues which needed to be considered in the appraisal and to communicate the findings of the appraisal work. The terms of reference for the working groups are included in **Appendix 4.2** and also on the DTA website (<http://www.dartmoor-ranges.co.uk>).

Approach to the Assessment of Environmental Topics

- 4.2.10 All of the topic assessments set out in **Table 4.1** have been undertaken on the basis of a common understanding of the nature of military activities.
- 4.2.11 Each environmental topic chapter generally follows a common format, as outlined below.

- **Context:** This provides a ‘pen-picture’ of each environmental topic relevant to the military training, including the policy context and legislative context. The detailed baseline relating to receptors and resources that could be significantly affected by the proposed development is set out in a later section.
- **Scoping of the assessment:** This summarises the proposed scope of the assessment as set out in the Scoping Report and details any change in scope that may have been identified through consultation regarding the Scoping Report and in Working Group meetings.
- **Environmental Management Measures:** This summarises all of the existing management measures which are currently in place in as part of the DTA EMS, Integrated Land Management Plan (ILMP) and Defence Training Estate South West Standing Orders (DTE SW SOs). This section also outlines subsequent measures which have been identified in order to minimise further the environmental effects of military activities or improve management practices.
- **Assessment of potential effects:** Where there are two or more receptors or groupings of receptor that could be significantly affected by military activities, separate sections are included under this heading. Other receptors are not addressed (as they have been scoped-out). The section is divided into four subsections.
- **Data gathering and survey work:** This describes how data were collected for use in the assessment.
- **Current conditions:** This includes information about the current baseline situation and the importance/sensitivity of the receptors.
- **Significance evaluation methodologies:** This sets out the assessment methodology used to assess effects on receptors and the criteria or standards that have been used to determine the significance of effects.
- **Assessment of effects and evaluation of significance:** The results of the detailed assessment are described, reflecting any mitigation measures that have or will be incorporated into the management of military activities. For some receptors, there is a need to consider the effects of different activities and their associated environmental changes (e.g. the effects of habitat disturbance and operational noise on a bird species). Each change is characterised, for example with reference to its duration, extent, magnitude and reversibility, and confidence in its prediction. Based on this analysis, a conclusion is drawn about how each change is expected to affect the receptor in question. Information about the effects of all the environmental changes is then drawn together and a conclusion reached about the overall effect, the significance of which is then evaluated using evaluation criteria. A conclusion is then reached as to whether the effect is ‘significant’ or ‘not significant’. Broadly, an effect that is considered significant is of such weight that it could require consideration by the Dartmoor Steering Group (DSG) in their report to Ministers³³.
- **Summary of significance evaluation:** This section summarises (usually in tabular form) information about predicted effects and their significance.

³³ This approach is based on that set out in European Commission (2001). Guidance on EIA Scoping. Office for Official Publications of the European Communities, Luxembourg (see Checklist of criteria for evaluating the significance of impacts).

Links Between the EA and Existing Management Measures

- 4.2.12 As outlined in **Section 4.1**, even before the EA process began, the management of military training on DTA was informed by environmental considerations. The existing EMS, ILMP and DTE SW SOs incorporate measures to ensure that environmental effects are avoided or mitigated. Therefore, the effects of military training have been assessed taking into account the fact that these measures are already in place, and certain effects were scoped-out in the Scoping Report on the basis that there is sufficient mitigation. In addition, the process of undertaking the assessment has identified additional measures that should be incorporated into the EMS, ILMP and/or SOs in order to further minimise or avoid environmental effects. Such measures have been agreed with DTE and DTE SW and the assessment is based on the environmental conditions that exist with these measures in place.

Assumptions

- 4.2.13 In addition to the assumptions reflected in the description of training activities (**Chapter 2** refers), the EA has been based on the key assumption that any future license agreement will be based on current thresholds in training activity.

Cumulative Effects

- 4.2.14 Effects from military activities occurring cumulatively in conjunction with effects from proposed future developments in the wider area have been scoped-out of the assessment. Typically, cumulative effects from one or more developments in conjunction with the development or activity being assessed are considered in relation to identified receptors. For example, if a residential property has views of a proposed development site and also has views of another proposed development site, then the cumulative effects of views of both of these development sites on that receptor is considered as part of the assessment.
- 4.2.15 A search has been undertaken of the West Devon Borough Council (WDBC), Teignbridge District Council (TDC), South Hams District Council (SHDC) and DNPA websites to review planning applications submitted to these authorities since 1st January 2005. The search considered planning applications within parishes around DTA. Only applications for which planning permission had been granted were considered. The search revealed that in several parishes no planning applications had been submitted during the timescale considered. In several parishes several planning applications had been submitted but these were considered to be minor in scale (i.e. applications for construction of low numbers of properties or extensions to existing properties). Further information is outlined in **Appendix 4.3**. A search was also undertaken of minerals and waste planning applications from the Devonshire County Council (DCC) website.
- 4.2.16 Overall, it is considered that no applications have been granted planning permission within or around DTA that are of sufficient scale to result in significant cumulative effects in combinations with any effects which may result from military activities on DTA.

Consultation on the EA Report

- 4.2.17 Once the EA Report is complete, it will be made available for statutory body, non governmental organisation and public comment via the DTA website. Public exhibitions will also be held at Tavistock on 23rd October 2007, Bovey Tracey on 24th October 2007 and Okehampton on 25th October 2007. The comments from consultation will be included in an addendum report which will seek to address comments, and, if relevant, additional information will be provided in order to address such comments. The consultation process, which commenced prior to issue of the Scoping Report, will continue beyond EA

report and addendum stages, with the opportunity for continuing dialogue via the DTA website and through the forum provided by the Dartmoor Steering Group (DSG). The DSG will debate the EA as part of its wider remit, which is to seek to reconcile the requirements of conservation and public access with the need for, and sustainability of military training on Dartmoor. The DSG reports annually to the Secretaries of State for Defence and for the Environment, Food and Rural Affairs.

This page is intentionally left blank.



DARTMOOR TRAINING AREA

Environmental Appraisal

Air Quality

5

5. Air Quality

5.1 Introduction

- 5.1.1 Potential effects from military training on air quality arise from pollutants from vehicles used to move troops around and to access Okehampton and Willsworthy Camps and also from smoke grenades used as part of Dry Training. This Chapter was completed by Rachel Dimmick BSc MSc AIEMA.

5.2 Context

Legislative Context

- 5.2.1 The 2007 AQS³⁴, provides a framework for improving air quality at a national and local level. This updates previous 2000³⁵ Strategy and its 2003³⁶ addendum. Central to these Strategies are health-based standards for key air pollutants; these standards are based on medical and scientific reports on how and at what concentration each pollutant affects human health. The AQOs based on these standards were made statutory through the Air Quality Regulations 2000³⁷, as amended in 2002³⁸ and the Air Quality Standards Regulations (AQSR) 2007³⁹.
- 5.2.2 Part IV of the Environment Act 1995 requires local authorities to review periodically air quality within their areas. This process of Local Air Quality Management (LAQM) is an integral part of delivering the Government's AQOs detailed in the AQS and its associated regulations. The Review and Assessment of local air quality aims to identify areas where national policies to reduce vehicle and industrial emissions are unlikely to result in air quality meeting the Government's AQOs at locations of relevant public exposure. This review and assessment process involves measurement of air quality and predicting how it may change in the next few years. If a local authority identifies an area where one or more of the objectives are not likely to be achieved, it must declare an Air Quality Management Area (AQMA) covering the locality. On declaration of an AMA the local authority must prepare a Local Air Quality Action Plan in consultation with key stakeholders to improve the air quality within the areas. There are no AQMAs within the vicinity of Dartmoor Training Area (DTA).

Policy Context

- 5.2.3 This Section provides a review of relevant policies relating to air quality within the local area in and around DTA, which are outlined in **Table 5.1**.

³⁴ HMSO (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Department for Environment, Food and Rural Affairs in Partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland. July.

³⁵ DETR (2000); The Air Quality Strategy for England, Wales and Northern Ireland; CM4548 and Addendum (2003).

³⁶ DETR (2003); The Air Quality Strategy for England, Wales and Northern Ireland; Addendum .

³⁷ HMSO (2000) The Air Quality (England) Regulations SI 928.

³⁸ HMSO (2002) The Air Quality (England) (Amendment) Regulations SI 3034.

³⁹ The Air Quality Standards Regulations 2007, Statutory Instrument 2007 No. 64.

Table 5.1 Air Quality Planning Policies Relevant to DTA

Policy Reference¹	Implications
SWRSS RE9	The effects of development on air quality must be taken into account and local authorities should ensure, through LDDs, that new development will not exacerbate air quality problems in existing and potential AQMAs (Air Quality Management Areas).
DSP Policy CO15	Development that would give rise to a significant deterioration in air quality should not be located where that deterioration would adversely affect other land uses and amenity in the vicinity.

Note 1 – The full names of the plans and guidance cited are given in Appendix 4.4, which details all policies and guidance that are relevant

5.3 Scope of the Assessment

Consultations

5.3.1 There has been no specific consultation with any statutory or non-statutory consultees regarding air quality. However, air quality was one of the issues discussed as part of the Land Use Working Group meetings (see **Chapter 8**).

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

5.3.2 No air quality effects were scoped-in to the appraisal as part of the Scoping Report.

Effects Subsequently Scoped-in to the Appraisal

5.3.3 No air quality effects have been scoped-in to the Appraisal since the completion of the Scoping Report.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

5.3.4 The following effects were scoped-out of the EA in the Scoping Report.

- **Direct effects associated with military activities:** The amount of dust associated with digging activities, the use of vehicles on tracks and odour effects associated with pyrotechnics are considered minor and not continuous effects. It is unlikely that there are any residential or other sensitive receptors, which would be affected by such activities. Since the completion of the Scoping Report, potential health effects relating to smoke associated with the use of pyrotechnics used during training have been raised in the Public Access Working Group meetings. During live firing, the Range Danger Areas (RDAs) are closed to the public and therefore exposure to smoke from these sources is unlikely and hence no significant effects should arise. Dry training is not permitted within 100m of the public and 200m of residential properties. It is considered that exposure to smoke is of a temporary nature and given the minimum distances it is unlikely that significant effects will occur.
- **Indirect effects associated with emissions from traffic supporting military activities on DTA:** Baseline information demonstrates that air quality objectives within and around DTA are not exceeded. This would be expected given the low traffic densities in the surrounding area. Moreover, given the small contribution to road traffic from military vehicles associated with training activities using local roads no

significant air quality effects would be expected. Furthermore, management measures are in place to minimise vehicle movements, (i.e. through lift sharing schemes) and ensuring vehicles are well maintained. Therefore, this effect is scoped-out of the EA.

- **Indirect effects associated with supporting facilities (generators, cookers and boilers):** It is unlikely that the use of support facilities such as generators, cookers and boilers would produce significant emissions, which would threaten the achievements of the air quality objectives within DTA. Furthermore, management measures are currently in place to ensure that emissions are minimised as much as possible. These measures ensure that equipment is well maintained, used only when required and energy efficient fuel is used where appropriate. This effect is scoped-out of the EA.
- **Indirect effects associated with the use of aircraft in support of ground troops:** The quantity of aircraft training with ground troops is relatively small. Management measures are undertaken to ensure that aircraft are serviced and maintained efficiently. It is considered that the emissions from aircraft used in support of ground troops would not have a significant effect on air quality due to the small numbers involved and their operational heights (see **Section 2.3**). This effect is scoped-out of the EA.
- **Indirect effects associated with fuel burning (climate change):** The emissions of greenhouse gases from military activities (including the use of aircraft) will remain a very small fraction of regional emissions. Hence, this effect is scoped-out of the EA.

Effects Subsequently Scoped-out of the Appraisal

- 5.3.5 No subsequent effects have been identified and scoped-out of the Appraisal.

5.4 Environmental Management Measures

- 5.4.1 Responsibility for the implementation of mitigation measures lies with the MoD through DTE to Commandant DTA assisted by Senior Land Agent DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders.
- 5.4.2 Environmental measures currently in place include the following.
- Regular service and maintenance of generators, combined with infrequent use and limited deployment, use of LPG fuel in cookers, cookers switched off during the night, management system to ensure efficient use of heating systems in buildings.
 - Regular servicing and maintenance of aircraft and vehicles.
 - Measures to minimise vehicle use including monitoring of mileage and measure to co-ordinate vehicle use and sharing.
 - Cramber/Ringmoor: Limited vehicle use across the moor.
- 5.4.3 No additional management measures have been identified in relation to air quality.

This page is intentionally left blank.



DARTMOOR TRAINING AREA

Environmental Appraisal

Cultural Heritage

6

6. Cultural Heritage

6.1 Introduction

6.1.1 The landscape of Dartmoor is rich in Archaeological remains. Military training has the potential to have a detrimental effect on individual monuments and the wider historic environment. For this reason the effects of military training have been subject to an assessment carried out by Martin Brown FSA MIFA BA, Environmental Adviser (Archaeology) to Defence Estates.

6.2 Context

Technical Context

- 6.2.1 The cultural heritage or historic environment includes a wide variety of sites and features, both visible and buried that are the product of past human activity in the landscape. The range of sites and features can include buried archaeological deposits, standing buildings, industrial heritage and artefact scatters, as well as industrial and military remains. In addition, the character of the landscape formed over centuries of human activity, with its boundaries, field patterns and woodlands may be seen as the frame within which the individual sites sit, with the components combining to create the historic environment.
- 6.2.2 The presence of cultural heritage features, whether protected by legislation or not, may be a material consideration within the planning process or other mechanisms for decision making concerning a range of activities, including military training. In cases such as this one, where the cultural heritage may be identified as a significant issue, a range of responses may be employed, including a variety of data-gathering exercises, including the desk-based assessment, which brings together existing information in order to consider the effect of the proposed operation on the historic environment. Such a survey will identify the nature of features likely to be involved. This requires the following considerations:
- monuments may be affected directly by activities but there may also be indirect effects, such as effects on the settings of monuments; and
 - the desk-based assessment (DBA) only includes currently available information concerning the cultural heritage but it is important to recognise that there is potential for further, as yet unknown features to survive within the study area.
- 6.2.3 However, other methods may be employed, including condition assessment for identified monuments. Like the DBA this sort of survey will only look at previously identified sites, primarily Scheduled Monuments (SM). Identified sites will be visited and their survival and general condition assessed and reported on. This is a repeatable survey that may be revisited, with the original survey becoming a benchmark against which later results may be compared to measure standards of monument condition and rates of decline/improvement across an area.
- 6.2.4 In addition, geophysical survey or targeted excavation may be used in particular circumstances. These techniques may be employed to answer specific questions about a

site, such as its extent or the nature of damage sustained from burrowing animals, or to confirm the presence of archaeological remains,

Legislative Context

Scheduled Ancient Monuments

- 6.2.5 The 1979 Ancient Monuments and Archaeological Areas Act is central to archaeological resource management, as amended by the National Heritage Act 1983, which consolidated all previous Ancient Monuments legislation that had originated with the Ancient Monuments Protection Act 1882. The 1979 Act enables the Secretary of State for Culture Media and Sport (DCMS) to maintain a schedule of nationally important historic sites.
- 6.2.6 The consent of English Heritage (EH) is required to carry out works to SMs. Specific consent has to be given for any works resulting in the alteration, demolition or destruction of or any damage to a SM.
- 6.2.7 It is a criminal offence to carry out works to a SM without appropriate consent. Should any such works also require planning permission it is advised that EH be contacted to advise on Scheduled Monument Consent prior to submission of any planning application.
- 6.2.8 In respect of SMs, Defence Estates (DE) works in partnership with EH to document archaeological sites. The entire area of DTA has been subject to an archaeological baseline survey and a rolling programme of re-survey has recently begun to document changes in monument condition and to target any necessary management works.

Listed Buildings

- 6.2.9 Buildings deemed to be 'listed' are included on statutory lists of buildings of 'special architectural or historic interest' compiled by the Secretary of State for Culture, Media and Sport under the Planning (Listed Buildings and Conservation Areas) Act 1990. The Secretary of State usually acts on advice from EH.
- 6.2.10 Listing ensures that the architectural and historic interest of a building is carefully considered before any alterations (internal or external) are agreed. However, listing is not intended to fossilise a building. The sustainable future of a building afforded by putting it to good use is desirable and informs much guidance given by EH.
- 6.2.11 Although there are currently no listed buildings within DTA there are a number of historic buildings that are probably of listable quality. DTA has undertaken to take due regard for these buildings and has already commissioned an historic building survey of Okehampton Camp from specialist contractors Wessex Archaeology.

Designation Review

- 6.2.12 In 2004 EH began a review of both Scheduling and Listing as mechanisms for the protection of the historic environment under the umbrella of the Designation Review. This process is being carried out in response to Department of Culture, Media and Sport (DCMS) consultation paper: Protecting the Historic Environment - Making the System Work Better (2003).
- 6.2.13 Both EH and DCMS agree that present levels of protection should continue. However, there is a recognition that the system, which has evolved over a century, needs to be modernised and streamlined to take account of different components of the historic environment including statutorily protected sites, as well as other designations including conservation areas and registered sites, such as gardens or battlefields. English Heritage believes the review should "*deliver both a unified designation system and a unified*

regulatory regime for the integrated management of the historic environment.” (English Heritage 2003, 1.4)

- 6.2.14 The EH proposals go on to say that “English Heritage believes that an integrated consent regime incorporating statutory management agreements is key to the implementation of the proposed new single list. Indeed, it would become an imperative once the first item combining more than one component – say a listed building on a scheduled site in a registered park or garden - was placed on the new list”. (Op. Cit., 8.1)
- 6.2.15 This would ensure a streamlined system replacing the current situation where multiple applications for consents may be required for a single operation affecting a single building or monument with multiple designations.
- 6.2.16 The EH Response recommends a new system that includes management agreements for a raft of works necessary to the sustainable use and maintenance of historic structures and monuments. In effect these agreements will allow effective integrated management of complex sites with multiple designations, allowing a raft of consents for agreed management and limited change over a given period of time. This could include pest control, scrub management or internal reconfigurations of modular office space in an historic building.

Planning Context

- 6.2.17 In addition to the legislation affecting the monuments and listed building protected by statute there are two Planning Policy Guidance notes (PPGs) that offer guidance on how archaeological remains, listed buildings and the wider historic environment should be dealt with in a local government planning context. This guidance is given by central Government in the following documents:
 - Planning Policy Guidance Note 15: Planning and the Historic Environment (Department of the Environment) 1994 (PPG15)
 - Planning Policy Guidance Note 16: Archaeology and Planning (Department of the Environment) 1990 (PPG16)
- 6.2.18 Under the terms of these documents the effect of development on the historic environment should be a material consideration in any planning decisions and likely effects must be considered and mitigated. The physical effect of a development on underlying or neighbouring archaeology is considered in PPG16 while the wider effects on historic landscape and buildings are covered by PPG15. These commitments are further reinforced in relevant local planning policies.
- 6.2.19 The Office of Communities and Local Government has announced its intention to review both PPGs discussed here within the programme of streamlining the planning process but no date has been set for review, reporting or change.

Planning Policy Guidance Note 15: Planning and the Historic Environment

- 6.2.20 PPG15 was written in order to assist local authorities in the preparation of policies for the conservation of the landscape and buildings within it.
- 6.2.21 The guidelines identify categories and principles to which Planning Officers should adhere, including the need for adequate development control on development proposals which would affect historic sites and structures, including listed buildings, conservation areas, parks and gardens, battlefields or the wider historic landscape.

Planning Policy Guidance Note 16: Archaeology and Planning

- 6.2.22 PPG16 was written in order to aid local authorities in considering the value of the archaeological resource and to establish a procedure for the adequate investigation and conservation or preservation of those remains. It asserts that archaeology is a material consideration in the planning process. Where archaeology is likely to be an issue early consultation with archaeological specialists is recommended. Although the presumption of preservation in situ is described as the ideal situation, mechanisms for investigation and recording of archaeological remains are set out.
- 6.2.23 Until recently MoD enjoyed Crown Exemption to the planning legislation, including these PPGs but is now bound by them.

Table 6.1 Planning Policy: Cultural Heritage

Policy Reference	Policy Content
DNPALP Policy BL8	The conversion and/or change of use of buildings, outside Local Centres and Selected Rural Settlements will be permitted where the natural beauty, cultural heritage or rural character of the area is conserved.
DNPALP Policy MD1	Planning permission will not be granted for major development which would be damaging to the scenic beauty, the natural systems and landforms, the wildlife and cultural heritage or the quiet enjoyment of the National Park, unless after the most rigorous examination it can be demonstrated that there is an overriding national need which cannot reasonably be met in any other way.
DNPALP Policy MD2	Objections will be raised to proposals for the use of additional areas of land for military training, or for new military buildings or structures, or for new, renewed or intensified uses of land and buildings, where such proposals would be damaging to the wildlife, natural beauty, cultural heritage or the quiet enjoyment of the National Park.
DNPMP Policy AH1	Archaeological and historical features will be protected against damage or loss
DNPMP Policy AH2	Conservation and positive management of archaeological sites and historic features will be encouraged.
DNPMP Policy AH3	Artefacts of archaeological or historical importance will be protected against loss, damage or deterioration and be properly conserved, preferably in situ or where necessary in storage.
DNPMP Policy AH4	Protection of landscapes of archaeological/historical interest, in their entirety, will be sought.
DNPMP Policy AH5	The recording and advancement of knowledge of the archaeological and historical resources of Dartmoor will be promoted.
DNPMPD Policy AH.G1	All Premier Archaeological Landscapes (PALs) identified in the Moorland Vision will be brought into active management with their condition improving.
DNPMPD Policy AH.G2	There will be a 5% reduction in the number of Scheduled Monuments at high or medium risk
DNPMPD Policy AH.G3	There will be a developing, accessible and easy to use Historic Environment Record (HER) providing comprehensive coverage of the historic environment.
DNPMPD Policy AH.G4	Positive action will be taken in at least 150 cases to safeguard or improve the condition of archaeological features or artefacts
DNPMPD Policy HB.G1	A broad Cultural Heritage Strategy will guide all aspects of cultural heritage conservation and enhancement within Dartmoor National Park
SWRSS Policy ENV3	Development should conserve and enhance the natural beauty, wildlife and cultural heritage of the National Park or Area of Outstanding Natural Beauty.
DLP Policy CO2	In Dartmoor National Park, the conservation and enhancement of the natural beauty, wildlife and cultural heritage will be given priority over other considerations in the determination of development proposals.
MoD Internal Policy: JSP 362	The Defence Lands Handbook (Chapter 6) provides guidance to Defence Estates on both policy and responsibilities toward the historic environment and cultural heritage. JSP 362 is supported by In Trust and On Trust: The Strategy for the Defence Estate. Chapter 6: 6.2:15 lays a clear responsibility on Heads of Establishment to be aware of issues that could potentially have an effect on the cultural heritage and to seek appropriate advice in respect of its care. In addition they should ensure that

Policy Reference	Policy Content
MoD Internal Policy	<p>appropriate management systems, including Environmental Management System (EMS) and, as appropriate, an Integrated Land/Rural Management Plan (ILMP/IRMP). The ILMP for DTA has recently been completed. 6.2:17 also acknowledges the necessity for MoD to work with statutory bodies, such as EH and with other key stakeholders, such as DNP, where sites of importance without legislative protection but that might require sensitive management have been identified and at 6.9:85 commits MoD to engagement with such key stakeholders in respect of wider cultural heritage issues</p> <p>In Trust & On Trust. The Strategy for the Defence Estate (June 2000) sets out the following overarching policy statement: "<i>Whilst meeting defence requirements MoD will continue to maintain, protect and where possible enhance the cultural heritage value of the estate. Thus, whilst historic buildings may not always be ideal for modern defence usage, MoD will continue to devise creative ways of using them that are both sympathetic and practical</i>"</p>

6.3 The Scope of the Assessment

Technical Consultations

- 6.3.1 Following the publication of the Scoping Report formal responses were received from the following members of the archaeological community:
- EH;
 - DNPA Archaeologist and
 - Tom Greeves, Archaeologist, on behalf of the Dartmoor Society.
- 6.3.2 The issues raised by each of these respondents were discussed at Cultural Heritage Working Group (CHWG) meetings. While the consultation confirmed the scope of the assessment in its overall approach to the cultural heritage it also emphasised the need for any assessment of the cultural heritage of DNP to include the landscape as a cultural artefact. This should, in turn, promote considerations of the industrial and military effects on the landscape in the past, including systems of tin leats and the sites of former Army camps from the Victorian and World War 1 and 2 eras, as well as associated training sites. Also discussed was the Condition Monitoring programme for archaeological sites, it was felt that the results of the imminent resurvey of Willsworthy should be included in the final assessment, if possible, in order to provide comparisons in condition and to offer insights into DE stewardship of DTA.
- 6.3.3 The Willsworthy survey will revisit material from one of a number of EH surveys that have extensively studied DTA. The initial EH baseline surveys and other academic studies mean that DTA has been extensively researched and while there will always be undiscovered remains, current knowledge affords a detailed picture of the archaeological site types to be found across DTA. As the list of archaeological sites documented in the EH volumes are considered to be a comprehensive record of the resource, lists of sites are not reproduced here. Instead the Appraisal will provide an overview of the history and significance of DTA and the potential effects on the cultural heritage of the continuation of military training. Copies of these reports are available for public consultation in a variety of locations including Okehampton and Tavistock libraries, the DNPA Historic Environment Record (HER), the National Monuments Record (NMR) at Swindon and via the Dartmoor Society.

Effects Requiring Further Consideration

6.3.4 Effects on cultural heritage may be direct, such as the loss of assets as a result of erosion or troop activity, or indirect, such as encroachment on the setting of monuments. The significance of any effect depends on the scale of the event, the importance of the feature and the potential effects of any event on the feature. The importance of the feature is the key factor here - not all sites and monuments are of equal importance. Identification of importance may be based on legislative protection, local designation or professional judgement.

Potential Receptors

6.3.5 Potential cultural heritage receptors include:

- standing archaeological remains, including stone rows;
- any sub-surface features of potential archaeological interest;
- built heritage, including observation posts, farmsteads and range buildings, and
- areas of culturally significant landscape (most, if not all of the open moor)

6.3.6 Activities that could affect these receptors include:

- military activities such as vehicle movements, troops walking, bivouacking, digging, stock clearance and live firing;
- agricultural activity such as stock grazing and rubbing, and traffic movement
- public access, whether on foot, bicycle, horses or in off road vehicles;
- flora and fauna such as rabbits burrowing, scrub encroachment or roots
- water, rain and frost.

6.3.7 The Appraisal will only consider those activities which relate to military activities.

Effects Scoped-in in the Scoping Report

6.3.8 The following effects were scoped-in in the Scoping Report

- Effects, including the direct loss of, or damage, to historic structures or upstanding archaeological monuments within DTA, or effects on their setting resulting from the activities identified.
- Effects, including the direct loss of, or damage, to known buried or archaeological features, including earthworks, or effects on their settings from the possible use of stones from cairns or abandoned buildings as material for bivouacs.
- Effects on previously unknown archaeological features resulting from their loss, whether total or partial as a result of the above activities.
- Direct effects on the setting of archaeological sites
- Effects on the historic built estate within DTA from military activities.

Effects Subsequently Scoped-in to the Appraisal

6.3.9 Following consultation it has become apparent that consideration of the cultural heritage of DTA needs to adopt a more landscape-based approach. However, no further survey work is required to support this at this stage as sufficient information is held in the Devon

Historic Landscape Characterisation and the DNP Premier Archaeological Landscapes (PALs) designation. As a result, the following effects will be considered.

- Direct disturbance to areas of culturally significant landscape resulting from the military activities above.
- Direct disturbance of areas of historic landscape, notably land designated as PALs.
- The effects of agricultural practice and grazing patterns.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

6.3.10 No effects were scoped-out in the Scoping Report but it was identified that both the EH and the Wessex Archaeology surveys clearly demonstrated that the current training regime on DTA poses little threat to the historic environment and that there is little evidence of current damage from military activities. However, to demonstrate that this is the case, information from the recent and previous surveys on the condition of monuments and the likely causes of damage have been considered in the EA.

Effects Subsequently Scoped-out of the Appraisal

6.3.11 No other effects have been scoped-out of the appraisal.

Information Gaps

- 6.3.12 An area as large and culturally significant and with many upstanding archaeological remains as Dartmoor has attracted a great deal of attention from early antiquarians to the present day. Extensive research was carried out for the baseline surveys that underpin the Scoping Report and for the historical overview presented in that document. While it was unrealistic to review all the studies completed about the archaeology of Dartmoor over the last 200 years, key sources were consulted, principal among these were the NMR, which includes EH data and DNPA HER. If further archaeological remains are identified, they will be incorporated into existing records.
- 6.3.13 DE is committed to repeat baseline surveys on the archaeological sites on DTA every five years. This revisiting of the baseline data will address gaps in the data concerning changes to both the condition of individual monuments and trends in overall monument condition.
- 6.3.14 There is currently no comprehensive survey of the military archaeology on Willsworthy where it is densest but there are plans to remedy this situation.

6.4 Environmental Management Measures

Measures Incorporated to Mitigate Potential Significant Effects

- 6.4.1 A variety of measures have been designed to mitigate the effects of military activities on cultural heritage features on DTA.
- 6.4.2 The DTA ILMP, developed with the Statutory Bodies, recognises as a strategic aim the protection of archaeology. Specific objectives have been agreed and an action plan set out. The ILMP sits within the wider EMS that establishes the environmental management of DTA, including issues of pollution and fire, as well as cultural and natural heritage. In addition, DTE SW SOs set out procedures in respect of archaeological sites. The importance and fragility of the archaeological heritage are underlined and reference is

made to the DTA maps, which show some upstanding SMs. The map is, particularly in the light of the EH survey, believed to be deficient but it is due for review in 2008/09. In addition, it is made clear to troops that these and other archaeological sites must not be disturbed or damaged. The proscriptions of the SOs can now also be supported and better enforced by the Training Area Marshals, who will support Comdt DTA in ensuring proper use of the DTA.

Site Mapping

- 6.4.3 DTA maps are produced by MoD and are available to authorised users. The maps have upstanding SMs marked on them with a blue cross; this convention is standard across the DTE. This mapping is important because, unlike some other training areas, there is no physical signage or palisading of monuments to draw the attention of users to sites that should be avoided. The map legend includes the symbol and refers troops to DTE SW SOs for clarification and further instruction. However not all significant sites or blocks of landscape may be marked. As has been noted above the maps are due for review.

Education

- 6.4.4 In order for troops to avoid damage to archaeological sites that are not physically marked on the ground they need to know what to look for. The cultural heritage of DTA is presented to troops in a variety of ways, including information posters visible in a number of locations around Okehampton and Willsworthy Camps, HQ DTA's information/briefing room and numerous copies of the DNPA Guide to the Archaeology of the Open Moor which are made available to allocated users. In addition, archaeology is listed as a resource available to training troops in the Outside Activities section of the DTE South-West User Guide. All exercising troops receive a brief which includes cultural heritage

Data Collection

- 6.4.5 In addition to the large scale EH baseline assessments described above there are a number of mechanisms designed to collect data about the cultural heritage:
- 6.4.6 SMs are subject to both external and internal scrutiny. Every 5 years DE has undertaken to either carry out or commission monument condition assessment designed to report on the condition of each monument. These surveys are carried out by heritage professionals. In addition MoD's Service Provider will monitor monument condition as part of their management regime for the estate. The results of such surveys, particularly the DE led condition assessments, are used to target resources and conservation efforts. The English Heritage Field Monument Warden also periodically visits all Scheduled sites in order to check on their condition and to advise on management.
- 6.4.7 In addition to scrutiny of SMs, both DE and MoD's Service Provider may have oversight of non-scheduled archaeological sites, in order to ensure their preservation. This is the case on DTA where Scheduled sites comprise only a small part of the resource.
- 6.4.8 An archaeological survey of Okehampton Camp was undertaken in 2003. This identifies buildings and earthworks within the Camp, ascribing interpretation and date to each one. This document is intended to assist Comdt DTA when issues arise relating to refurbishment or demolition and should ensure that the historical value of each structure is taken into account.
- 6.4.9 There is no formal mechanism for the assessment of wider historic landscapes. Such a methodology may be developed in partnership with the DNPA and other landowners in respect of PAL). The PAL designation is intended, in part, to be a management tool for the designated upland areas within the National Park (see above).

Monument Condition Reporting

- 6.4.10 DE is charged with annually reporting to the Secretary of State on the condition of SMs on the MoD Estate. This monitoring helps ensure adherence to the 1979 Ancient Monuments and Archaeological Areas Act. Monitoring also provides condition data that is one of the MoD's Key Performance Indicators for Sustainable Development and is reported in the MoD Biennial Heritage Conservation Report⁴⁰. Condition reporting has been a requirement since 2000 when it first appeared in the Estate Strategy⁴¹. The survey results can also be used to guide management work, such as scrub cutting to ensure the continued preservation of archaeological deposits.
- 6.4.11 In order to provide effective data on monument condition, extensive surveys of DTE's larger training areas have been undertaken. At DTA, DE worked in partnership with EH, which had begun a mapping programme across Dartmoor, to ensure effective recording of archaeological sites, including both SMs and other sites without statutory protection. This survey included physical description of the site with an assessment of the condition of each site. The areas comprising DTA were surveyed between 2001 (Willsworthy) and 2005 (Ringmoor). There is a commitment on behalf of DE to ensure that surveyed sites are subject to resurvey on a five yearly rolling programme. On DTA the survey work is being funded through the Rural Elements of the Estate Strategy (REES) budget which funds environmental works on the DTE. The re-survey of Willsworthy was undertaken during summer 2007. This revisiting of the baseline data will address gaps in the data concerning changes to both the condition of individual monuments and trends in overall monument condition. The results of the English Heritage surveys have been summarised in the Scoping Report and they indicate that in recent years little damage to archaeological sites can be directly attributed to the military activities undertaken on Dartmoor.

Signage

- 6.4.12 On some DTE sites archaeological sites are marked with signs, fences or palisades. Although this is a successful method of marking sensitive and fragile sites this approach has not been adopted on DTA for a number of reasons. The signs and palisades would add clutter to the landscape and both they and fencing would be incompatible with the open moorland of Dartmoor. This approach has been discussed and agreed with DNPA. In addition, while palisades are particularly useful in preventing vehicle incursions across sites this is not considered to be a potential source of monument damage on DTA.

Land Management

- 6.4.13 There are potential agricultural threats to the cultural heritage. However on land used under license from an external landlord the military user is responsible only for damage incurred during training. On MOD Freehold land the situation is more complex and it is the responsibility of MOD/DE and their tenants to take account of responsibilities toward the heritage resource.
- 6.4.14 On a local level stocking rates can be a problem for sites. Over-grazing, where stock levels are too high has long been identified as an issue, particularly where poaching occurs around feed rings or water troughs. Similarly animal behaviour can become an issue, particularly where monuments, such as standing stones, are utilised for rubbing.

⁴⁰ This document sets out historic environment data for the Defence Estate, including monument condition and listed building condition.

⁴¹ "The Defence Estate Strategy 2006: In Trust and On Trust" is a document providing a single focus for the strategic development of Defence Estates. It replaces the 2000 strategy.

Over stocking will also almost certainly lead to erosion of earthworks as animals cross them, creating tracks or shelter in hollows, creating poaching leading to scarring. Stock levels and the condition of archaeological sites and their immediate settings should be monitored to ensure problems do not arise. Where problems are identified these can be dealt with between DE staff and the tenant. Any necessary remedial work should be undertaken as soon as possible after damage is notified to prevent a worsening situation developing.

- 6.4.15 Undergrazing is also an issue that must be addressed. Without adequate grazing the open moor will see natural succession to scrub and eventually to woodland. In addition to damage to sites from roots, scrub and young trees will provide cover for rabbits and, in time, badgers, whose burrows can seriously compromise the archaeological integrity of a site. Before the succession of woody species the ingress of bracken with its highly disruptive root systems can also be anticipated. Finally the landscape effect of such profound landscape change cannot be underestimated as it would alter a view relatively unchanged in over a thousand years. It would also alter the landscape setting of monuments and has the potential to obscure sites, particularly the extensive industrial sites, such as metal extraction complexes.
- 6.4.16 There is no easy remedy to the issue of under-grazing as it may be driven by external forces, including the economics of upland agriculture, epidemic and even by climate change. Wherever possible sustainable land management practices should continue to be employed and appropriate stocking levels agreed.

Access

- 6.4.17 Informal public access cannot be so easily managed and it is perhaps inevitable that some damage from vehicles, horses or walkers will always occur. DTA staff assist DNPA archaeologists and Rangers with monitoring historical sites, assessing risk and preventing damage.

Summary of mitigation

- 6.4.18 In summary, the following measures are currently implemented as part of the management of military training:
- maintaining monuments in good condition;
 - alerting and educating troops to the presence of archaeological sites and their fragility;
 - ensuring training takes account of the cultural heritage by implementing no dig areas, out of bounds areas and prevention of inappropriate use of sites;
 - Effective Monument Condition survey programme on 5 yearly resurvey programme;
 - targeted management of archaeological sites;
 - ensuring appropriate grazing levels;
 - prevention of erosion of sites by troops on foot or in vehicles;
 - prevention of damage to archaeological sites from firing;
 - ensuring appropriate mapping of archaeological sites;
 - prevention of use of archaeological sites as bivouacs; and
 - prevention of monument damage by general public.

6.4.19 The following additional measures have also been identified:

- promotion of appropriate management of PALs in partnership with statutory bodies and stakeholders;
- identification and protection of elements of military heritage on Willsworthy;
- responding to changes in heritage protection; and
- production of cultural heritage sensitivity map to assist with management of MoD's responsibilities and briefing allocated user.

6.5 Assessment of Potential Effects

Data Collection and Survey Work

6.5.1 The principal data source for the EA is the EH baseline survey of DTA, which has involved the collation of surveys undertaken across DTA over a number of years, including the Monument Condition Surveys intended to set baselines for the quinquennial programme of resurvey and reporting on archaeological monuments on the defence estate. The first quinquennial monument condition survey review of Willsworthy is taking place during 2007. These surveys present data from the National Monuments Record and the Dartmoor National Park Historic Environment Record. Supplementary information was obtained from local independent archaeologists.

6.5.2 Since 2001 EH has been undertaking surveys across DTA as part of a wider survey of the whole of Dartmoor. These Archaeological Baseline Condition Surveys include data on a range of sites, both Scheduled and sites not under legislative protection, gathered from the DNP Sites and Monuments Record and, where appropriate, EH records, including Field Monument Warden reports. Each site was then visited and its dimensions and condition recorded and its location mapped. Although the brief of the project was not to specifically seek out new sites a number of these were encountered during fieldwork and were duly recorded. These surveys comprise monument condition baseline surveys and were undertaken in order to gather information in support of the Biennial Stewardship Report, which is prepared by DE in order to document the condition of the estate. Okehampton (2004), Ringmoor (2005), Merrivale (2004) and Willsworthy (2001) were surveyed by EH with a partial survey of Cramber in 2002. A full EH survey of Cramber Tor was completed in 2006. These surveys will be repeated on a five year programme and the first, which is of Willsworthy Training Area, was undertaken in August 2007. Both original data and subsequent surveys are recorded on a Monument Condition recording form, the form of which has been agreed between DE and the national heritage bodies of the UK. Repeated use of the form provides comparable data across the defence estate over time and space.

6.5.3 The baseline surveys described here include all known features. New features identified during further surveys and condition assessment exercises will be added to the database of archaeological sites and will be included in further surveys.

Current Conditions

6.5.4 The conclusion drawn from the surveys of is that the heritage in the care of DE on DTA is well managed. As was stated in the Scoping Report it is the opinion of EH staff involved in the original surveys that the general condition of archaeological sites and monuments within DTA was good.

- 6.5.5 While the EH reports do not directly seek to attribute damage there are examples of erosion presented and some comments made in each report about the likely source of that damage. It is evident from the surveys that in the past military activities were not undertaken on a sustainable basis and that damage to monuments, whilst not a regular occurrence did occur. In recent years, management measures have been implemented (see below) and the net result has been a marked diminution in incidences of attributable military damage to monuments. These initiatives have included raising awareness of the historic environment with users and management of vehicle use. These measures have brought about an improvement in the situation on the ground and, as a result in the condition of monuments on DTA. For example, the EH view of the Willsworthy area was that "...the MoD now presides over a mostly stable archaeological landscape". Furthermore, this survey noted that, monument damage, where recorded, was, for the most part, considered the fault of visitors and stock, rather than the military. In this area, some boundary stones have been used for rubbing by stock and were becoming undermined as a result. Where there is damage, it is vital that further study and interpretation of the data is continually carried out so that damage can be properly attributed and further steps taken to prevent it.

Okehampton

- 6.5.6 The Okehampton survey reported that no instances of military damage had been recorded and that visitor damage appeared to pose a more serious threat to the archaeological resource. In the Okehampton area the Wessex Archaeology survey suggests that there is little cause for concern in terms of damage to archaeological remains from military activities.

Willsworthy

- 6.5.7 In respect of military remains EH believes Willsworthy to have a nationally important assemblage of military archaeology going back over a century and more. A survey of the military remains in this area is planned in order to document and ascribe value to this significant archaeological component to the landscape in the Willsworthy area. It is probable that, as on other DTE sites, that some of these military remains will be candidates for protection through Scheduling legislation.
- 6.5.8 Although the formal results of the Willsworthy re-survey have not yet been received informal comment from the contractor is that the condition of monuments has improved since 2001.

Merrivale

- 6.5.9 Merrivale presents the most concern of the areas surveyed. EH has made a targeted recommendation concerning the exclusion of troops and vehicles from specific monuments. This has been made a priority and is being addressed as part of training management. However, in general Merrivale is said to possess 'a largely stable heritage resource'. Although some erosion has been identified in this area it is felt to relate principally to stocking levels and is, as such, not the direct responsibility of DE/DTA. Both DTA and the landowner have been alerted to their responsibilities and DNPA have seen copies of the reports. These reports will form the basis for further remedial and management works.

Cramber

- 6.5.10 The Cramber report also identifies a stable environment with monuments mostly in either fair or good condition. Such damage as was recorded is primarily the result of stock but again some erosion is the result of visitors.

Ringmoor

- 6.5.11 Ringmoor has the densest concentration of archaeological remains on DTA. The Ringmoor report describes the majority of monuments as stable and in comparable condition to similar sites elsewhere across Dartmoor and beyond DTA. No recent military digging has been reported. A small number of monuments were noted as causes of concern but their situation appears relatively easily remedied and in at least one case is again the result of visitor erosion.

Significance Evaluation Methodology

Overview

- 6.5.12 The evaluation of significant effects on a particular cultural heritage asset depends on a combination of the importance or value of the feature in question and the likely scale of change attendant upon the particular event.

Sensitivity or Value

- 6.5.13 Although the Scheduled or Listed status of an archaeological site or historic building may be seen as an indicator of national importance it should be noted that due to on-going programmes of designation and restrictions on designation imposed by the heritage protection legislation not all nationally important sites are protected by heritage protection legislation. In addition there is, as yet, no adequate legislation to protect large areas of landscape deemed to have cultural heritage sensitivity. However DNPA and other stakeholders, including EH, have established the PALs designation (See above in **Paragraph 6.3.9**) to denote significant areas of historic landscape.

Sites of National Importance

- 6.5.14 SM are of national importance and should be preserved in situ within an appropriate setting. Other sites deemed to be of national importance are those which fulfil the criteria for Scheduling, as set out in the EH criteria for protection under the appropriate legislation, which are based on survival, rarity, documented information and value within a class of monuments and within a group of sites in a specific area:⁴²

Sites of Regional or Local Importance

- 6.5.15 Sites either not warranting protection through scheduling or not suitable for legislative protection may still have a local or regional significance.
- 6.5.16 Some areas of DNP, including areas within DTA have recently been designated as PALs (see above in **Paragraph 6.3.9**). Although this designation carries no legislative force it underlines the particular importance and sensitivity of certain parts of the landscape. This designation is helpful because Scheduled status is neither an appropriate nor effective method for the preservation of blocks of landscape and a local notification can serve to highlight their importance. The existence of PALs reinforces comments made by all stakeholders that the significance of Dartmoor as a cultural heritage asset must be considered at landscape level, rather than at the level of individual monuments. The PALs designation seeks to highlight the significance of parts of the moor. Currently no formal mechanism for designation as a PAL exists, reflecting the more intuitive and collaborative approach to designation so it cannot be presented here.

⁴² <http://www.english-heritage.org.uk/server/show/conWebDoc.2436>

- 6.5.17 There is no formal protection for landscape on cultural heritage/historic environment grounds so local designations like this have a value, albeit limited, in protecting the heritage. Were historic features or deposits to be affected by development they would be protected under the remit of PPG16 but outside this framework there is no formal protection beyond Scheduled status. Other designations, such as PAL are merely advisory.

Non-Statutory Registers

- 6.5.18 EH maintains non-statutory registers of both historic Parks and Gardens and of Battlefields but no part of DTA is included on either register. As has been noted above DNP has recently designated a non-statutory list of PALs that includes some of the land within DTA.

Other Sites

- 6.5.19 The assessment of importance of those sites not carrying a designation is a matter of professional judgement. Such assessments may draw on a number of factors, including: condition, period, rarity, historical and archaeological documentation and association with other sites either by monument class or period. Non-designated sites may be considered as largely being of regional or local importance but as noted above not everything of national importance has been subject to designation; military remains are particularly well-represented in this respect as their importance has only lately been recognised.

Assessment of Effects and Evaluation of Significance

- 6.5.20 The magnitude of effect on a particular cultural heritage asset is crucial to the evaluation process of the significance of any effect. Magnitude is here defined as the extent to which any effect changes or damages the key characteristics of the asset. For example the loss of part of a Stone Row would significantly compromise its integrity and intrinsic value, as well as its contribution to the wider landscape character. By contrast the unavoidable loss of a section of medieval field boundary need not have such a significant effect, provided that there was adequate recording as well as sufficient portions of the feature remained to ensure it retained its intrinsic value and contribution to the wider character of the landscape.
- 6.5.21 The setting of a monument may also be significantly affected by activities or developments not otherwise harmful to an individual site or monument. This is of particular importance in an area such as DTA where, as has already been noted, the importance of individual sites is more than enhanced by the landscape of which they are a part.

Effects on Historic Structures or Upstanding Archaeological Monuments

- 6.5.22 It is considered that effects on historic structures or upstanding archaeological monuments, in (including the setting of such features) from erosion resulting from vehicle and troops (on foot) movements as well as from overgrazing are not significant. This opinion is based on the EH surveys which are discussed above and which show that where there is damage and erosion it is limited in scale and that, more importantly, the wider areas are well managed.

Effects on Known Buried or Archaeological Features

- 6.5.23 Effects, including the direct loss of, or damage, to known buried or archaeological features, including earthworks, or effects on their settings from military activities such as disturbance from military digging, the creation of bivouac sites and the effects of ammunition are not significant. Currently there are no reports of damage to monuments

through digging. Bivouac sites have been an issue in the past but the education programme seems to have reduced the incidence of improper use of archaeological sites. No reports of damage through the use of archaeological sites as targets have been received in recent years.

Effects on Previously Unknown Archaeological Features

- 6.5.24 Effects on previously unknown archaeological features resulting from their loss, whether total or partial as a result of disturbance from military digging, the creation of bivouac sites and the effects of ammunition are also considered not significant. The EH surveys did identify some new sites and other archaeologists working on DTA/DNP have also reported previously unknown archaeological remains. So far none has been reported as suffering damage. Elsewhere on the DTE troops do occasionally report findings made during exercises but there have been no such reports from DTA.

Effects on the Setting of Archaeological Sites

- 6.5.25 Military training is not having a significant effect on the setting of archaeological sites. The EH reports do not comment adversely on the setting on monuments, nor has the DNPA Archaeologist raised this as an issue. Military training is not having a significant effect on the historic built estate within DTA. In part this is because to date not enough attention has been paid to the historic buildings but this situation is being remedied. Where building surveys have been undertaken, such as in the Okehampton Camp, the results are being used to ascribe value to buildings and to guide their management.

Effects on the Historic Landscape

- 6.5.26 It is considered that there are significant effects on the historic landscape as a result of undergrazing but this is a process being driven by external forces affecting UK agriculture. However military training activities are not having a significant effect on historic landscape. Despite occasional incidents where vehicle tracks leave temporary marks in the landscape, these recover quickly and leave no lasting trace. Indeed, this process is part of a millennia long process of activity on and access to the moor by a variety of users, including the military.

6.6 Summary of Significance Evaluation

- 6.6.1 As described in the preceding section military training is considered to be having few significant effects
- 6.6.2 Although there are a number of potentially significant effects that could affect receptors, the current evaluation, principally underpinned by the monument condition surveys, is that at current levels military training is having little discernible effect on the cultural heritage of DTA. In some cases, erosion that may be the result of military vehicles or foot passage cannot be proved and may equally be the result of public access or agricultural activities. Agriculture does, in many ways, give the greatest cause for concern in that there is erosion attributable to animals on some sites. However, the recent Willsworthy survey seems to suggest that this situation has improved. Conversely, the potential for under-grazing to have a significant effect on the cultural heritage is recognised.

Table 6.2 Summary of Significant Effects: Cultural Heritage

Receptor and summary of predicted effects	Type of effect¹	Significance²
Historic structures and upstanding archaeological monuments: Effects from erosion resulting from vehicles, troop movements on foot and overgrazing.	-ve	NS The EH surveys show that where there is damage and erosion it is limited in scale and that, more importantly, the wider areas are well managed
Known buried or archaeological features: Direct and indirect effects from military digging, the creation of bivouac sites and the effects of ammunition.	-ve	NS There are no recent reports of damage from these activities.
Previously unknown archaeological features: Direct effects (loss or damage) from digging, creation of bivouac sites and ammunition.	-ve	NS There have been no reports of damaged to recently discovered sites and remains.
Archaeological sites: Indirect effects on setting from military training	-ve	NS EH Reports have not identified any adverse effects on the setting of such features.
Historic Landscape Character: Effects from the presence of military activities	-ve	NS It is considered that military training does not leave a lasting trace on the historic landscape.
Key/footnotes:		
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S Significant or NS Not-significant



DARTMOOR TRAINING AREA

Environmental Appraisal

Landscape and Visual Effects

7

7. Landscape and Visual Effects

7.1 Introduction

- 7.1.1 This Chapter reports on the appraisal of potential Landscape and Visual Effects arising from the use of Dartmoor Training Area (DTA). The distinctive character of the Dartmoor landscape and the value attached to this is reflected in its National Park designation. Potential effects on landscape character, due either to direct physical impacts, or through visual intrusion due to military activities is therefore clearly a key consideration. This has been reflected in consultee responses received during the Environmental Appraisal (EA).
- 7.1.2 The appraisal of Landscape and Visual Effects has been completed by Entec UK Ltd, using a team consisting of Landscape Architects and Landscape Character Assessment specialists as follows.
- Tristan Stephens, BA Dip LA MLI: Visual Effects and analysis of computer generated Zones of Visual Influence.
 - Kay Adams, BSc: Landscape Effects.
 - Nick Layton, BA Dip LA MLI, MRTPI: Mitigation proposals.

7.2 Context

Legislative Context

- 7.2.1 The National Parks and Access to the Countryside Act (1949) (and subsequent amendments) represents the underlying legislative context within which the scope and approach to the appraisal of Landscape and Visual Effects has been considered. The objectives of the Act are reflected in the specific policies set out in the Dartmoor National Park Management Plan (DNPMP 2001) as noted later in this Chapter.

Policy Context

- 7.2.2 **Appendix 4.4** to this report lists the planning policies relevant to the DTA EA. Brief comment is made below on those of particular relevance to the appraisal of Landscape and Visual Effects:

National Planning Policies

- 7.2.3 Planning Policy Statement (PPS) 1, paragraph 5 states that “*Planning should facilitate and promote sustainable and inclusive patterns of urban and rural development by (inter alia) - protecting and enhancing the natural and historic environment, the quality and character of the countryside, and existing communities.*”
- 7.2.4 PPS 7 Paragraph 22 reflects the importance to be attached to conserving the natural beauty of nationally designated landscape such as that on Dartmoor. This is also reflected in Department of Environment Circular 12/96: Environment Act 1995, Part III (National Parks), which also recognises the long standing tradition of defence training use in such areas.

Regional Planning Policies

- 7.2.5 The importance of the Dartmoor in landscape terms is reflected in the Draft South West Regional Spatial Strategy (June 2006), which seeks to maintain the distinctiveness of the south west's landscape character areas (under Policies ENV1 and ENV2), also preserving and enhancing areas of national landscape importance including the Dartmoor National Park (DNP).

Local Planning Policies

- 7.2.6 DNMPMP 2001 sets out, under Policy MA2 and MT.G1 the need for military infrastructure to be sympathetic to its landscape context. The DNMPMP Draft 2006 also states the need for the management of training areas to ensure positive environmental benefits. (During consultation specific discussion with DNPA has taken place in relation to the positioning of military structures and the appraisal findings will inform ongoing dialogue.)
- 7.2.7 The Dartmoor National Park Authority Local Plan (DNPALP) also sets out a series of policies designed to conserve and enhance the landscape related to the granting of planning permission (Policy BL2), protection of landscape features including geology and natural landform (Policy WG3) enhancing biodiversity and protecting habitats (Policies HW.M1; CO9; CO10).
- 7.2.8 Consideration of the above policies, combined with responses from consultees at the scoping stage of the EA gives rise to the need to address, in detail, a number of Landscape and Visual issues in the EA.
- 7.2.9 At the highest level the above legislative and planning context can be summarised as relating to the sensitivity of the Dartmoor landscape and its ability to accommodate current and future military training along with other land uses.
- 7.2.10 Whilst military training clearly takes place within a highly sensitive environment, the EA has not identified negative landscape and visual effects that are considered to be of sufficient significance to warrant the attention of the decision makers in relation to the Duchy License re-negotiation.
- 7.2.11 However, given the MoD commitment to sustainable training, it is appropriate that mitigation opportunities to reduce potentially adverse effects are examined, even though these effects are not judged to be significant.

7.3 Scope of the Assessment

Consultations

- 7.3.1 DNPA has been a key consultee in relation to the appraisal of Landscape and Visual Effects. This process has included a site visit on 2 July 2007 to Okehampton Training Area, at which the potential mitigation measures applicable to warning signal flag poles (FPs) and clearer's shelters and stables, also known as Observation Posts (OPs) were discussed. This discussion has assisted in the consideration of mitigation options and the potential application of these options to FPs and OPs throughout the Range Danger Areas (RDA).
- 7.3.2 Although recent statistics fall below the currently agreed threshold in terms of live firing, the appraisal of Landscape and Visual Effects has been based on the assumed threshold for live firing per year (i.e. Okehampton, 120 days, Merrivale, 180 days, Willsworthy, 245 days). The appraisal assumes that dry training can take place across all of the DTA throughout the year (i.e. up to 365 days per year when live firing is not taking place).

Effects Requiring Further Consideration

Effects scoped-in in the Scoping Report

7.3.3 The Scoping Report⁴³ set out the anticipated scope of the appraisal of landscape and visual effects at that stage of the EA.

Potential Landscape Effects

7.3.4 The potential landscape effects noted in the Scoping Report are summarised below:

- Effects on prevailing landscape character due to changes to features of cultural heritage importance i.e. archaeological artefacts and buildings: Please refer to **Chapter 6** (cultural heritage), which investigates the potential for physical changes to features of cultural heritage importance. The appraisal of landscape effects considers the consequences of any physical changes i.e. the indirect effect that these may have on landscape character.
- Effects upon prevailing landscape character due to loss of, or modification, to vegetation patterns: The appraisal of landscape effects considers the direct effect of changes to vegetation patterns and also the indirect effect on landscape character due to management activities to meet nature conservation or other objectives.
- Effects on prevailing landscape character due to damage and/or erosion caused by military activities: The potential for physical damage such as increases in bare ground due to damage from vehicle movements and to a lesser extent, soldiers on foot, which might undermine prevailing character.
- Loss of tranquillity and consequent effects on landscape character due to visual and noise intrusion arising from military activities, including helicopters, in support of ground troops, vehicles, personnel movements, dry training, blank firing and pyrotechnics, and live firing: Please also refer to **Chapter 10**, which considers noise from live and dry firing training.

Potential Visual Effects

7.3.5 The potential visual effects noted in the Scoping Report are summarised below:

- Potential effects on recreational and residential receptors and users of transport routes, due to activities associated with training activity on foot.
- Potential effects on receptors as a result of visual intrusion due to infrastructure such as FPs, warning signals, signage, OPs and lighting: Although it should be noted that, in order to complete their primary function of ensuring public safety FPs and signage must be clearly visible to those members of the public approaching a Range Danger Area (RDA).
- Potential effects on residential and recreational receptors and views from adjacent transport routes, causing visual intrusion due to activities associated with military training (vehicle movements and other similar support activity).

⁴³ Dartmoor Training Area: Scoping Report for an Environmental Appraisal Examining the Effects of Continuing Military Training on Dartmoor, Entec Sep 2006.

Effects subsequently scoped-in to the Appraisal

- 7.3.6 In addition to the above, consultation on the Scoping Report and discussions at the Working Group Meetings identified the need to consider landscape quality and remoteness, and the historic landscape.
- 7.3.7 The consultee comments on the Scoping Report also drew attention to the need to consider the full extent of potential visibility and cumulative effects. The full extent of visibility has been considered during field work and by reference to computer generated visibility mapping to assist in setting the study area for reporting. Cumulative effects are covered at **Section 4.2** of this Report.

Effects Not Requiring Further Consideration

Effects scoped-out in the Scoping Report

- 7.3.8 Effects scoped out at the Scoping Report stage are summarised below:

Landscape Effects

- Effects on landscape character due to changes in settlement patterns: this type of effect is not applicable to the EA as the main built element within DTA is Okehampton Camp and any construction or demolition would be considered through the planning control process. Furthermore, no significant redevelopment of this facility is anticipated in the near future.
- Effect on the prevailing landscape character due to changes in watercourses and other water bodies: no redevelopment of existing military facilities that could have a potentially significant effect on hydrology is anticipated in the near future.

Visual Effects

- Effects on residential and recreational receptors and users of transport routes due to visual intrusion arising from permanent training support facilities at Okehampton Camp: this type of effect is not applicable to the EA as any construction or demolition would be considered through the planning control process.

Effects subsequently scoped-out of the Appraisal

- 7.3.9 No effects have been scoped out of the Appraisal as a result of consultee responses to the Scoping Report or discussion at Working Group Meetings.

Study Area

- 7.3.10 As the appraisal of landscape and visual effects has proceeded beyond the scoping stage, its scope has been further modified in terms of the geographic extent of the study area within which detailed work has been undertaken. The principal factor in setting the area shown, concerns the physical distance between the visual 'receptor' and source of any visual effect (i.e. flags, training activity etc.) and hence the diminution of effect due to the scale of the surrounding landscape and the influence of weather conditions on the clarity of views. The area shown does not take into account the screening effect of topography and in some locations, vegetation in the form of tree cover. A radius of four kilometres (km) has been taken as the limit for potentially significant views to training activities and/or related structures, effectively giving a 'worst case' offset from the training area boundaries of four kilometres.
- 7.3.11 As a result of the visual appraisal of FP and OPs, a number of features have been prioritised as offering particular scope for investigating further visual mitigation over and

above that already in place. These are highlighted in **Section 7.4** and the current, approximate, extent of visibility for FPs is illustrated in **Appendix 7.1, (Figures 1 to 14)**. This was established using computer generated visibility mapping, provided by Defence Estates (DE). It should be noted that there is no figure for Longstone Hill as, although there is a FP at this location, this location was not included in the Intervisibility Study.

- 7.3.12 The computer generated analysis of FPs offers the opportunity to further analyse options for their positions to maximise safety but also seek to avoid unnecessary visual effect. The DE baseline computer mapping offers similar opportunities to do so for OPs.
- 7.3.13 Site field work, including consideration of the additional potential screening effect of vegetation, has been used to supplement this information in making comment later in this chapter.

7.4 Environmental Management Measures

- 7.4.1 **Chapter Two** provides an overview of the Environmental Management Measures already in place to mitigate or compensate for the landscape and visual effects of training activity.
- 7.4.2 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant (Comdt) DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs).
- 7.4.3 The management measures currently in place are summarised below.
 - Removal of Litter and Debris as a result of training.
 - Visual intrusion arising from the positioning of FPs and OPs, RDA signage and radio masts: - 'Intervisibility' analysis followed by improvements, to be completed by 2012.
 - Visual intrusion due to the design and external finishes of structures: Opportunities to improve the design and external finishes of structures are considered at appropriate points in the maintenance cycle. This has led to the adoption of recessive colours and textures and various treatments to observation points such as turf roofs
 - Landscape effects due to erosion caused by military vehicles: DTE SW SOs state that vehicles are to be confined to hard surfaced tracks
 - Landscape effects due to disturbance of topography and vegetation: DTE SW SOs sets out rules for avoiding certain areas of vegetation, and areas of archaeological significance, and also place constraints on digging including the requirement to fully reinstate any disturbance.
 - Visual intrusion due to training activity: Includes the use of existing features to assimilate training (e.g. the Okehampton Camp anti tank training area) and the appropriate siting of portaloos and the development of a new field design taking account of visual effect.
 - Okehampton Camp Landscape Plan: Includes measures to merge the Camp into the surrounding landscape and further reduction of lighting levels to prevent light pollution
- 7.4.4 In addition to the benefits of the mitigation set out above, the visual effects of much of the training activity are minimised due to the operational requirements for which the training is designed. The need for military activity, as far as possible, to be undetected results in

activities occurring below ridgelines, adopting means of camouflage, and applying fieldcraft.

- 7.4.5 This has been an important consideration in the Appraisal as compared to other types of activity or development, because of the use of camouflage, the distance at which an activity is likely to become imperceptible in views is correspondingly closer.
- 7.4.6 Further mitigation and compensation measures proposed as a result of the appraisal of landscape and visual effects are outlined below, noting for each measure where other options were considered. In most cases these represent the continuation of the measures that DTE has committed to undertaking, as summarised above. However, FPs and OPs are sited in such a manner to guarantee public safety when RDAs are closed to access. More detailed commentary on mitigation options is provided within the text at **Sections 7.5 and 7.9**. In some case these are additional to the measures already in place. In others (for example OPs) the proposals represent the development of the mitigation process already committed to, as previously noted. The numbers shown in brackets refer to the viewpoints used in the appraisal and reported on at **Section 7.9**.
- 7.4.7 Additional mitigation and compensation measures include the following.
 - Better shielding of lights through directional lights or similar techniques.
 - Reduce the visual effect of FPs.
 - Consider mobile OPs where track access is available.
 - (2) Meldon Reservoir area: Consider improvements to Blackdown OP with option to cut back into hillside, replace with stone built/turf roofed building.
 - (3) Car Park east of Okehampton: Review positions of St Michael's and Watchet Hill FPs- subject to detailed analysis.
 - (8) Car Park near Halstock Hill: Reduce effect of FPs by repainting in recessive colour.
 - (11) Watchet House: Review position of Watchet Hill FP; avoid skyline - Option also to repaint using recessive colour.
 - (12) Cullever Steps: Review positions of Watchet Hill and Halstead Hill FPs - Option also to repaint using recessive colour
 - (13) East Okement Farm: Consider foreground planting.
 - (16) Fernworthy Forest: Review positions of flag poles at Hangingstone and Quintins Man; avoid skyline. Longer term consider improvements to observation post - Subject to detailed analysis.
 - (17) Postbridge: Review position of Rough Tor FP; avoid skyline - Subject to detailed analysis.
 - (19, 22-26) Holming Beam, Car Parks on B3357: Review positions of Great Mis Tor, White Tor FPs and others. Consider improvements to OP - Subject to detailed analysis.
 - (35-37) Lane End: Review positions of FPs. Consider localised screen planting at Lane End House.
 - (38) Prescombe Farm: Localised screen planting to remove views towards stop butts.

- (42, 43) High Willhays, Yes Tor: Review positions of Watchet Hill and Halstead Hill FPs. Consider improvements to Fordland Edge OP - Option also to repaint FPs using recessive colour.

7.5 Assessment of Potential Effects: Landscape effects

Data Gathering and Survey Work

Desk Study

7.5.1 Much of the assessment of potential effects was undertaken using published information and information provided by DE. Data regarding tranquillity was provided by the Campaign for the Protection of Rural England (CPRE) and Natural England(NE). Information utilised included the following:

- The Character of England Landscape, Wildlife, Natural and Cultural Features (Countryside Agency et al., 2005⁴⁴);
- Countryside Character Volume 8 South West (Countryside Agency, 1998)⁴⁵;
- National Landscape Character Typology and associated definitions (<http://www.magic.gov.uk>⁴⁶)
- National Park boundaries (<http://www.magic.gov.uk>);
- Dartmoor National Park description (http://www.countryside.gov.uk/lar/landscape/dl/national_parks/dartmoor.asp);
- The Devon Landscape (Devon County Council, 2002)⁴⁷.
- Dartmoor Environmentally Sensitive Area Landscape Assessment (ADAS, 1994)⁴⁸;
- Ordnance Survey 1:50,000 and 1:25,000 scale mapping;
- External Audit of Dartmoor Training Area's Environmental Management System - Final Report (RPS Health, Safety and Environment, August 2005)⁴⁹;
- The Evolution of the Dartmoor Landscape: Exploring Burrator (Dartmoor National Park Authority. Devon County Council and Peter Keene 2001)⁵⁰

⁴⁴ Countryside Agency et al (2005) *The Character of England Landscape, Wildlife, Natural and Cultural Features*. Countryside Agency, Cheltenham.

⁴⁵ Countryside Agency, (1999) *Countryside Character Volume 8: South West – the character of England's natural and man-made landscape*. Countryside Agency, Cheltenham. Available at http://www.countryside.gov.uk/LAR/Landscape/CC/south_west/dartmoor.asp.

⁴⁶ Prepared for the Countryside Agency by Steven Warnock, in conjunction with the Living Landscape Project and Entec Ltd.

⁴⁷ Devon County Council (2002) *The Devon Landscape: An appraisal of Devon's landscape at the beginning of the 21st Century*. Devon Books, Tiverton.

⁴⁸ ADAS (1994) *Dartmoor Environmentally Sensitive Area Landscape Assessment*. ADAS (unknown).

⁴⁹ RPS Health, Safety and Environment (2005) *External Audit of Dartmoor Training Area's Environmental Management System Final Report*. Available at http://www.dartmoor-ranges.co.uk/Downloads/EMS/EMS_Audit_Final_Report_2005.pdf.

- Dartmoor Training Area; Review of existing landscape data sources (RPS, 2006)
- Okehampton Camp Landscape Plan (DE EST 2004).
- Mapping Tranquillity 'Defining and assessing a valuable resource'. (The Centre for Environmental and Spatial Analysis and Participatory Evaluation and Appraisal in Newcastle upon Tyne (PEANuT) at Northumbria University and The Landscape Research Group University of Newcastle, 2005)⁵¹.
- Understanding Tranquillity (Countryside Agency, 2005)⁵²;
- National, South West and Devon tranquillity maps (CPRE, 2007) <http://www.cpre.org.uk/campaigns/landscape/tranquillity>

Survey Work

- 7.5.2 Site Surveys included an initial visit (2 August 2007) at which Dartmoor National Park Authority (DNPA) planners, DTE staff and the consultants walked a part of Okehampton Training Area to view OPs and other structures. The site visit also included Okehampton Camp, where ongoing landscape management has resulted in the removal of non indigenous tree species and a programme of new planting. This has been designed to further assimilate the Camp with its surroundings.
- 7.5.3 Subsequent site visits were carried out on 7/8 August 2007. The aims of the visits were firstly to verify the desk study findings and to assess how Landscape Character Area (LCA) descriptions in published material corresponded to DTA. Secondly, to gather further information on potential visual receptors to supplement computer generated intervisibility work.

Current Conditions

Landscape Character

- 7.5.4 DTA principally comprises of open, upland moorland located within the distinct landscape of DNP. Okehampton, Willsworthy and Merrivale Training Areas are located in the northern moorland plateau whilst Cramber and Ringmoor are located on the southern moorland plateau (the two being separated by the West Dart River Valley).
- 7.5.5 Dartmoor as a whole is the most southerly upland landscape in England, rising over 615m (2,000 feet) above sea level within DTA and contrasting strongly with the adjacent lowland landscapes of South Devon. A number of river valleys fed by the area's high annual rainfall dissect the irregular moorland plateau, which forms the majority of DTA.
- 7.5.6 The high moor is an open, 'wild' landscape with settlement and field enclosure confined to the peripheral upland valleys. Although there are access roads and tracks on the northern part of DTA and around the north and west boundary of Ringmoor, access to DTA is

⁵⁰ Dartmoor National Park Authority. Devon County Council and Peter Keene (2001) *The Evolution of the Dartmoor Landscape: Exploring Burrator*. Available at <http://www.dartmoor-npa.gov.uk/au-generalinformation>.

⁵¹ The Centre for Environmental and Spatial Analysis and Participatory Evaluation and Appraisal in Newcastle upon Tyne (PEANuT) at Northumbria University and The Landscape Research Group University of Newcastle (2005) *Mapping Tranquillity 'Defining and assessing a valuable resource'*. Campaign to Protect Rural England, London. Available at <http://www.cpre.org.uk/news/view/47>.

⁵² Countryside Agency, (2005) *Understanding Tranquillity*. Countryside Agency, Cheltenham.

limited. Public roads mainly finish at the upper end of valleys where enclosed agricultural land gives way to the open, grazed moor.

- 7.5.7 The pattern of moorland vegetation includes bogs, mires, heather, bracken and grasslands. Bare rock is frequently exposed, with the characteristic granite tors often visible over a wide area. On the exposed moorland, tree cover is limited to isolated trees distorted by strong winds, the lack of tree cover contributing to the sense of openness along with the extensive views. By contrast, within the sheltered upland valleys on the moorland edge, ancient woodlands are characteristic and in combination with the enclosing effect of the surrounding topography, views become generally more limited.
- 7.5.8 The upland valleys are also characterised by a mix of rough grassland and pasture. Where fields are present within the upland valleys, they are delineated by banked hedges and granite stonewalls, reflecting the underlying geology. Evidence of the underlying geology is a recurring feature, providing a unity to the wider landscape. Granite visible in rocky outcrops and tors on the open moorland is also used in buildings and walls in the surrounding upland valleys. Furthermore, the landscape is rich in archaeological features and history.
- 7.5.9 In the Character of England: Landscape, Wildlife, Natural and Cultural Features⁵³, DTA falls within the Dartmoor Joint Character Area (see **Figure 7.1** at the end of this Chapter). The Culm Joint Character Area lies to the north and west of DTA and South Devon Joint Character Area to the west. The description of Dartmoor is set out in *Countryside Character Volume 8 South West*⁵⁴ also published by the Countryside Agency. The key characteristics of Dartmoor are noted in **Box 7.1**.

Box 7.1 Key characteristics of DTA as defined in the Joint Character Area description

- Strong contrasts between open, windswept moors with wide views and sheltered landscapes of valleys and fringes.
- Central high moorland with a wild landscape of tors, clitters, bogs, grassland, heather and bracken.
- Around the moorland core is a gentler landscape of small, irregular pasture fields with dry stonewalls and banks, cut by large, terraced, wooded valleys, which shelter farmsteads and hamlets. The valleys have steep-sided, fast-flowing streams and a network of sunken lanes.
- Main villages and towns lie beyond the outer edge of moor but are linked to it by ancient roads and lanes.
- Granite and slate in cottages, farmhouses, villages, walls and abandoned mine buildings, unifies the landscape.
- Mining industry has made a strong impact on the landscape, with dramatically sited spoil heaps and ruins.
- Very high historic interest from the Bronze Age onwards: particular features include highly visible features such as hut circles, standing stones, reaves, field systems, hillforts.

Source: Countryside Agency, (1999). *Countryside Character Volume 8: South West the Character of England's natural and man-made landscape*. Countryside Agency, Cheltenham.

⁵³ Countryside Agency et al., (2005) *The Character of England Landscape, Wildlife, Natural and Cultural Features*. Countryside Agency, Cheltenham.

⁵⁴ Countryside Agency, (1999) *Countryside Character Volume 8: South West the Character of England's natural and man-made landscape*. Countryside Agency, Cheltenham.

7.5.10 In the Draft National Landscape Character Typology⁵⁵ published by the Countryside Agency, DTA falls predominately within the 'HDO' landscape character type with the northern and western extent of DTA abutting and sometimes extending into 'UDA' (see **Figure 7.1**). These descriptions refer to the physiography, land cover and cultural pattern within each landscape character type. Further information is outlined in **Table 7.1**.

Table 7.1 Key Characteristics of DTA as Defined in the Draft National Landscape Character Typology

Attribute	'HDO' landscape character type	'UDA' landscape character type
Physiography: This comprises the underlying structure and physical form of land surface and is derived from the interpretation of the relationship between geological and contour data.	H: High Hills High land, mainly over 1000 ft, including high hills and ridges and mountains associated with Palaeozoic (Permian, Carboniferous, Devonian, Ordovician, Silurian and Cambrian) and earlier Pre-Cambrian rocks of sedimentary origin.	U: Low Hills Upstanding areas, mainly below 1,000 ft, including sloping low hills associated with Palaeozoic (Permian, Carboniferous, Devonian, Ordovician, Silurian and Cambrian) and Mesozoic rocks (mainly sandstones and limestones) of sedimentary origin.
Land cover: The nature of the ground in which terrestrial plants (natural and cultivated) grow. This description is derived from the interpretation of geological, soils and agricultural census data.	D: Heath and Moorland Land associated with nutrient-poor mineral and/or peaty soils supporting dwarf shrub heath, acidic grassland and bog habitats, or relic heathy/moorland vegetation (bracken/gorse etc). This ground type is normally associated with sandstone, or sandy drift in the lowlands, but it is widespread on mixed sedimentary and igneous rocks in upland/hard rock areas. Often marginal in agricultural terms.	
Cultural pattern: The structural component of the cultural landscape which is expressed through the historic pattern of settlement and land use.	O: Unsettled / open land Extensive areas of uncultivated, mainly unenclosed land (including moorland, heath and coastal grazing marsh) characterised by the virtual absence of human habitation.	A: Wooded – ancient woods Settled agricultural landscapes (dispersed or nucleated settlement) characterised by an assorted pattern of ancient woodlands which pre-date the surrounding enclosure pattern – in places associated with densely scattered hedgerow trees.

Source: National Landscape Character Typology and associated definitions (<http://www.magic.gov.uk>)

7.5.11 As detailed in **Section 1.1**, DTA falls entirely within DNP. The aim of the designation (as defined by the Environment Act 1995) is to:

"conserve and enhance the natural beauty, wildlife and cultural heritage of the National Park; and to promote opportunities for the understanding and enjoyment of the special qualities of the Parks by the public".

7.5.12 The DNP is described⁵⁶ as

"...the largest and wildest open space in southern England ...

...It consists of two, high, boggy plateaux divided by the River Dart. Surrounding them is rocky land, where dramatic stone outcrops, called tors, form the spectacular backdrop to the famous Dartmoor ponies. The softer river valleys, with their ancient clapper bridges, provide a welcome contrast to the stark magnificence of the moors.

...

⁵⁵ <http://www.magic.gov.uk>

⁵⁶ http://www.countryside.gov.uk/lar/landscape/dl/national_parks/dartmoor.asp

... Dartmoor is famous for its prehistoric remains, with many standing stones. Bronze and Iron Age hut circles and hillforts are visible in several places. Tin mining remains can be seen about the Moor; the last mine closed in 1939".

7.5.13 ‘Special qualities’ are defined on the DNP Authority (DNPA) website (<http://www.dartmoor-npa.gov.uk/index/visiting/vi-dartmoorspecialquals.htm>) as follows:

- the combination of spectacular natural features and farmed landscapes;
- diversity of landscape;
- a wealth of wildlife;
- its rivers and streams, and the quality of air and water;
- the broadleaf woodlands;
- a rich legacy of the past;
- traditional land management practices and activities, and local customs;
- the character of settlements;
- opportunities for quiet enjoyment;
- the open nature of the moors and the freedom to enjoy them; and
- a wide range of opportunities for outdoor activities.

7.5.14 At a county level, a LCA was completed for Devon in 2002⁵⁷. In this work the site falls within the local landscape character zone of Dartmoor and West Devon with the majority of the site lying within the ‘Dartmoor - High Moor’ zone with small parts of DTA falling within the ‘Dartmoor - Enclosed’ zone. The key characteristics of each are provided **Table 7.2**.

⁵⁷ Devon County Council (2002) The Devon Landscape: An appraisal of Devon’s landscape at the beginning of the 21st Century. Devon Books, Tiverton.

Table 7.2 Key Characteristics of DTA as Defined in the Devon County Landscape Character Assessment

Dartmoor - High Moor	Dartmoor – Enclosed
<ul style="list-style-type: none"> • Extensive high moorland of blanket bog, heath and grass moor. • Natural granite features providing characteristics landmarks. • Archaeological features, remnants of quarrying and other extractive workings. • Visual skyline element of many Devon landscapes. • Broad, sweeping skylines punctuated by tors; panoramic views and wild 'internal' vistas. • Exposure to the elements • Recreational use. • Ponies, cattle, sheep, walkers, cyclists, horse riders, kite-flyers, paragliders, parked cars. 	<ul style="list-style-type: none"> • Strong undulating landscape underlain by granite geology. • Cut by distinctive wooded valleys. • Strong field pattern, characterised both by hedges and stone walls. • Enclosed, wooded appearance deriving from the valley woodlands, bushy hedgerows and hedgerow trees. • Close visual relationship with adjacent high moor. • Granite buildings, especially farmhouses. • China clay works.

Source: Devon County Council (2002). *The Devon Landscape: An appraisal of Devon's landscape at the beginning of the 21st Century*. Devon Books, Tiverton.

- 7.5.15 District landscape assessments have been undertaken for South Hams⁵⁸ and Teignbridge⁵⁹. However, neither assesses the landscape within the National Park and therefore DTA.
- 7.5.16 In addition to its National Park status, DTA is designated as an Environmentally Sensitive Area (ESA), due to its high landscape, wildlife and historic value (see **Figure 7.1**). The ESA Landscape Assessment confirms the existing conditions set out above by identifying two landscape types within DTA (see **Table 7.3**). The majority of DTA within the ESA is characterised as 'Open Moor and Heath' with 'Hill and Valley Farmlands' occurring on the edge of the moorland plateau.

⁵⁸ South Hams District Council, (2001) *South Hams Landscape Character Assessment and Guidelines Draft for Consultation*. South Hams District Council, Totnes. http://www.southhams.gov.uk/lndscp_chrtr_ass.pdf.

⁵⁹ Teignbridge District Council, (2001) *Teignbridge District Landscape Assessment (Excluding Dartmoor National Park)*. Teignbridge District Council, Newton Abbot. <http://www.teignbridge.gov.uk/index.cfm?articleid=2801>.

Table 7.3 Key Characteristics of DTA as Defined in the ESA Landscape Character Assessment

Open Moor and Heath	Hill and Valley Farmland
<p>An, open, expansive and remote landscape of a broadly mottled and rugged character with a sense of antiquity and continuity</p> <ul style="list-style-type: none"> • An open, expansive and remote character created by the lack of tall vegetation and infrequent enclosures over moorland plateaux or outlying heaths, and isolation from human settlement or activity. • A broadly mottled character created by the mosaic of semi-natural moorland vegetation; by interlocking tracts of moor and heath of contrasting textures and seasonal colours, together with occasional drifts of managed scrub woodlands on low fringe commons. • A rugged character and a sense of antiquity and continuity created by the coarse, rocky, boulder strewn outcrops and prominent granite tor features on scattered summits, and the presence of historic sites and patterns within the existing moorland context. 	<p>A sheltered, traditional landscape within a semi-natural and historic framework.</p> <ul style="list-style-type: none"> • A sheltered character created by the informal network of woodland, inter-connecting tree belts, copses and bushy hedgerows which is less enclosed towards the elevated hillsides. • A traditional character created by the strong patterns of sweeps of clean grassy fields on lower hillsides and valleys, merging with less improved pastures and scattered meadows on broad elevated hillsides. • A semi-natural framework created by ribbons of valley mires, woodlands and pockets of remnant heathland linking with patches of scrub and bracken and less improved pastures • An historic framework created by the established pattern of hedgerows, hedgebanks and stone walls, the network of routes and ancient sites, and the traditional stone buildings and other artefacts.

Source: Ministry of Agriculture, Fisheries and Food (1994). *Dartmoor Environmentally Sensitive Area Landscape Assessment*. Adas, Unknown.

- 7.5.17 A number of existing management measures on DTA seek to maintain the area's distinct landscape character and limit the effects of military activity. These measures are summarised at **Section 7.4**.
- 7.5.18 A landscape management plan has been produced for Okehampton Camp⁶⁰ and accepted by DNPA as a planning condition. The key recommendations relevant to landscape are that visual intrusion of the Camp should be reduced by removing structures from the skyline, centralising functions (in particular catering and messing), reducing lighting levels, maintaining the grazing regime, and demolishing redundant structures. The Plan recognised that the historic structures of the original camp, constructed in 1893, should continue to be protected.

Tranquillity

- 7.5.19 Tranquillity is seen as a significant asset of landscape, indeed it is identified as a key criterion in contributing to landscape value as set out in Landscape Character Assessment Guidance for England and Scotland (Countryside Agency et al 2002) and the accompanying Topic Paper 6 Techniques and Criteria for Judging Capacity and Sensitivity (Countryside Agency et al 2004).
- 7.5.20 There have been attempts to map tranquillity in 1995 and more recently in 2007. The 1995 tranquillity mapping exercise was published by CPRE and the former Countryside Commission. In these maps, 'tranquil areas' were defined as: "*places which are sufficiently far away from the visual or noise intrusion of development or traffic to be considered unspoilt by urban influences*". The mapping focussed exclusively on the presence of elements that detract from tranquillity with tranquil areas being determined by

⁶⁰ DE EST, (2004) Okehampton Camp Landscape Management Plan.

calculating the distances from various features perceived to be disruptive e.g. power stations and motorways.

- 7.5.21 The more recent tranquillity mapping exercise⁶¹ advanced the 1995 work. This latest work involved significant consultation to define what is meant by the term tranquillity and identified both the elements that contribute to (positive) and detract from (negative) tranquillity. Rather than seeking to separate 'tranquil areas' from 'non tranquil areas' this mapping exercise looks at relative tranquillity. The definition used for relatively tranquil areas is set out below in **Box 7.2**

Box 7.2 Relatively Tranquil Areas

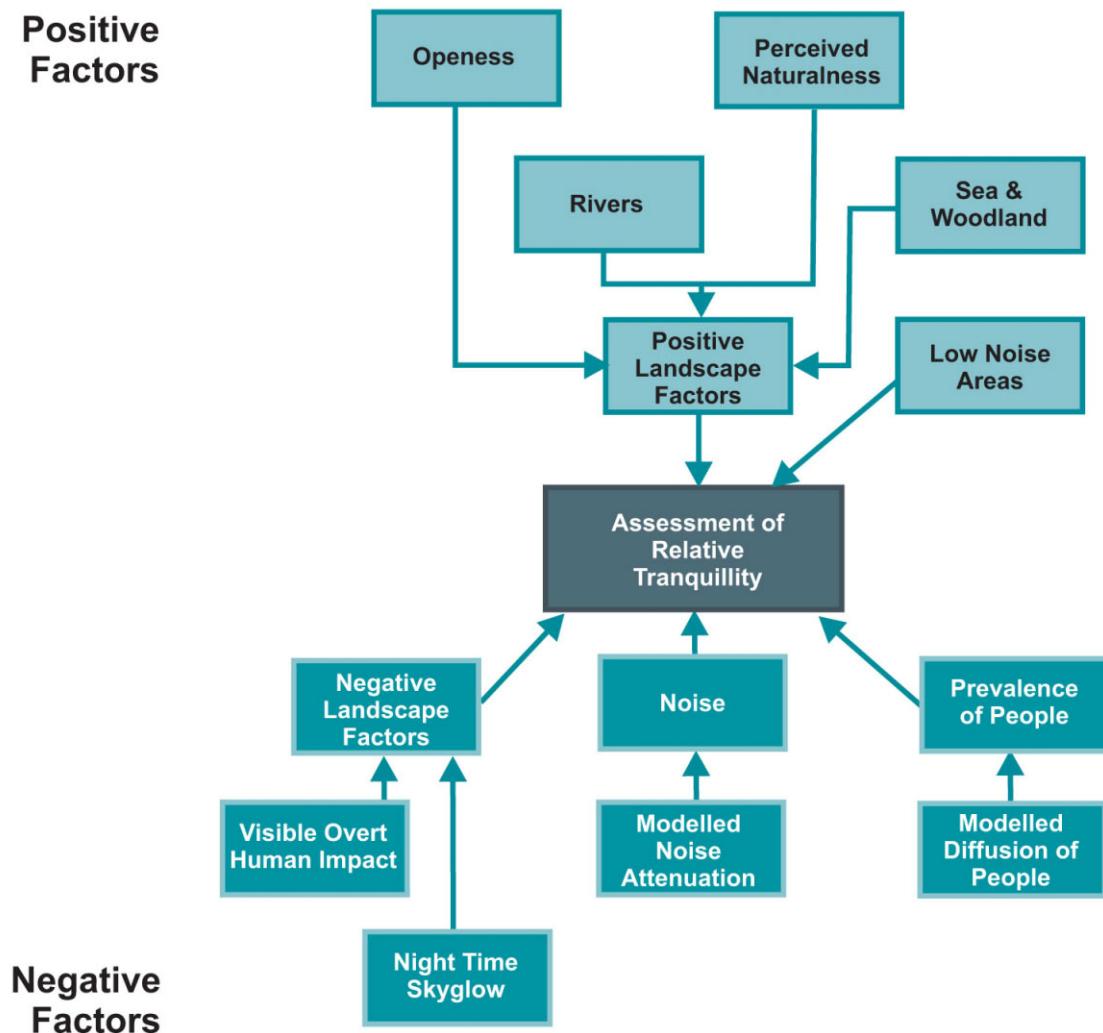
Relatively tranquil areas are those where the physical and experiential characteristics of the landscape are more likely to provide countryside users with the space and conditions to relax, achieve mental balance and a sense of distance from stress. Relatively tranquil areas are characterised by a low density of people, minimal levels of artificial noise and a landscape that is perceived as relatively natural, with few overt signs of human influence.

Source: The Centre for Environmental and Spatial Analysis and Participatory Evaluation and Appraisal in Newcastle upon Tyne (PEANuT) at Northumbria University and The Landscape Research Group University of Newcastle (2005). *Mapping Tranquillity 'Defining and assessing a valuable resource'*. CPRE publications, London

- 7.5.22 The factors, both positive and negative, influencing tranquillity are shown diagrammatically in **Figure 7.2**, below.

⁶¹ The Centre for Environmental and Spatial Analysis and Participatory Evaluation and Appraisal in Newcastle upon Tyne (PEANuT) at Northumbria University and The Landscape Research Group University of Newcastle (2005) *Mapping Tranquillity 'Defining and assessing a valuable resource'*. CPRE publications, London

Figure 7.2 Tranquillity Diagram



Reproduced from: MacFarlane, R., Haggett, C., Fuller, D., Dunsford, H. and Carlisle, B. (2004). *Tranquillity Mapping: developing a robust methodology for planning support*, Report to the Campaign to Protect Rural England, Countryside Agency, North East Assembly, Northumberland Strategic Partnership, Northumberland National Park Authority and Durham County Council, Centre for Environmental & Spatial Analysis, Northumbria University.

- 7.5.23 On the national and regional tranquillity maps (refer **Appendix 7.2**), Dartmoor (and as a consequence DTA) is clearly identifiable as a 'most tranquil' area. At a county level Devon's mean tranquillity score ranks fifth most tranquil out of 87 county council/unitary authorities. The county map in particular emphasises the extent of tranquillity available within DTA with extensive swaths of green (representing most tranquil areas) covering the area.
- 7.5.24 As a consequence, Dartmoor's tranquillity is considered within the Draft NPMP to be of strategic importance for the South West Region.

7.5.25 As assessed in National Park Management Plan 2007-2012 - Draft (NPMP 2007-2012 Draft) "Dartmoor is the single largest unbroken area of tranquillity not only in the south west of England but in southern England as a whole, followed by Exmoor. 70% of Dartmoor is classified as tranquil or very tranquil, with the most tranquil areas centred over the open moorland."

Summary

7.5.26 As part of the DNP, DTA forms a part of an important and highly valued landscape. In addition the relatively high tranquillity of the area is also recognised at a local, regional and national level.

Significance Evaluation Methodology

7.5.27 The methodology for the Landscape and Visual Effects Assessments has been based on the following guidelines:

- The Landscape Institute with the Institute of Environmental Management and Assessment (2002) *Guidelines for Landscape and Visual Assessment 2nd Edition*. Spon Press, London.
- Countryside Agency and Scottish Natural Heritage (2002). *Landscape Character Assessment Guidance for England and Scotland*. Countryside Agency, Cheltenham.
- Countryside Agency and Scottish Natural Heritage (2004). *Landscape Character Assessment Guidance for England and Scotland Topic Paper 6 Techniques and criteria for judging capacity and sensitivity*. Countryside Agency, Cheltenham.

7.5.28 **Appendix 7.3** includes further explanation of the methodology upon which the appraisal of landscape character and visual effects is based.

Assessment of Effects and Evaluation of Significance

Landscape Character: Effects on prevailing landscape character due to changes to features of cultural heritage importance (archaeological artefacts and buildings)

7.5.29 Military training on DTA may be considered part of the landscape character of Dartmoor. The area has been utilised for military training since the mid 1800's and the cultural heritage associated with such activity is recognised; for example Willsworthy Training Area has a nationally important assemblage of military archaeology⁶².

7.5.30 As stated in the Scoping Report, recent surveys of the historic environment of the DTA is one of 'good health'. In the past military activities are likely to have caused damage to some monuments although such damage would not be a regular occurrence. However, management measures introduced over recent years have sought to prevent damage and as noted in the Scoping Report, appear to have brought about an improvement in the condition of monuments on the DTA, in turn having a positive effect on landscape character.

7.5.31 Such management measures include the DTE SW SOs where tactical training and bivouacking is excluded within 20m of areas of archaeological significance (such as stone

⁶² Probert, S. (2002) *Willsworthy Training Area ILMP: Archaeological baseline condition survey November 2000-September 2001*. English Heritage, unpublished report for Defence Estates.

rows, cairns, hut circles, field boundaries and the Devonport Leat). SOs go on to prohibit the use of historic sites and tors as targets for live firing. In addition, all personnel taking part in exercises are fully briefed about the sensitivity of the DTA including the importance of the historic environment.

- 7.5.32 Other management measures include the general limitation of vehicles to permitted roads and tracks or to a maximum of 15 yds from public roads unless Comdt DTA agrees that there is a training need to move cross country. Clearance of unexploded ordnance is also required to be conducted with due regard to the historic environment.
- 7.5.33 Even after the introduction of management measures, some monuments are still subject to erosion. However, assuming adherence to the 20m exclusion rule, such erosion cannot be solely attributed to military activity; stock and/or visitors can also lead to the erosion of monuments. It is evident from the Scoping Report that stocking levels and visitors are a greater focus for concern in respect to the erosion of features of cultural heritage than military training (there is little evidence of current monument damage from military activity).
- 7.5.34 In respect to military artefacts and historic buildings, those of historic significance are maintained appropriately by DE, ensuring they do not depreciate.
- 7.5.35 Current changes to features of cultural heritage importance resulting from military activity are limited, having no more than a low magnitude of change. As a consequence changes to features of cultural heritage importance (archaeological artefacts and buildings) will not have a significant effect on the prevailing landscape character.

Effects upon prevailing landscape character due to loss of, or modification, to vegetation patterns.

- 7.5.36 DTA is a high moorland, comprising blanket bog and raised mires. Such attributes have been identified as key characteristics contributing to the area's landscape character. A large proportion of DTA is covered by both a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) designation. Such designations reflect the nature conservation importance of the area.
- 7.5.37 The Scoping Report notes that the military constraint on agriculture (along with other factors) has contributed to the unique conditions that have resulted in the survival of key biodiversity species (notably bird species).
- 7.5.38 In the past military training, specifically the use of artillery high explosive shells (discontinued 1991), has led to the damage of blanket bog habitat. However, management measures introduced over the years has sought to stop any such damage and as noted in the Scoping Report appear to have brought about an improvement in the condition of habitats on DTA, in turn having a positive effect on landscape character.
- 7.5.39 DTE SW SOs state that where digging is permitted, heather areas are to be avoided and ground reinstated as soon as possible after the exercise is completed. Also no bivouacking is to take place in heather areas.
- 7.5.40 As previously noted, SOs also generally limit vehicles to permitted roads and tracks although in some cases vehicles are allowed to move off the road. No tracked vehicles are allowed within DTA except BV206 and VIKING, the routes for which must be agreed with Comdt DTA. In addition, all personnel taking part in exercises are fully briefed about the sensitivity of DTA including the importance of the habitats that are present.
- 7.5.41 Other management measures include the back filling of any major holes created by live firing and the restoration of tracks where damage by military vehicles has occurred. The potential for uncontrolled fires damaging vegetation is managed through the HQ DTA fire risk warning system. This places limitations/restrictions on the use of pyrotechnics,

dependent on the level of fire risk. The clearance of unexploded ordnance is also required to be conducted with due regard to fire risk.

- 7.5.42 It is evident from the Scoping Report that stocking levels, in particular over grazing and stocking density, is the key focus for concern in respect to the loss of, or modification, to vegetation patterns. Although not a direct effect of military training, the need for clearing stock from areas of live firing has resulted in over/under grazing of certain areas.
- 7.5.43 **Chapter 9** indicates those habitats that have been adversely affected by military training.
- 7.5.44 Current changes to vegetation patterns resulting from military activity are limited with a resultant low to negligible magnitude of change. As a consequence any changes to vegetation patterns will not have a significant effect on the prevailing landscape character.

Effects on prevailing landscape character due to damage and/or erosion caused by military activities.

- 7.5.45 Military training on DTA introduces a number of features to the landscape. As indicated earlier some of these features contribute to the area's landscape character (eg military archaeology). Conversely, military features can also be considered to detract from the area's landscape character.
- 7.5.46 Military debris, military infrastructure such as FPs and OPs, other buildings, tracks, fixed firing ranges and trench digging are all elements that may be considered incongruous, bringing a human element into a landscape that is described as 'wild' and 'remote'. Effective management measures are already in place with the objective of limiting any such effects; a new measure is the employment of Training Area Marshals to monitor training activities and in particular adherence to SOs dealing with the state of areas on troop departure.
- 7.5.47 Much of the military infrastructure is sited sensitively, finished in recessive colours to blend into the landscape and where appropriate, built out of local materials. Okehampton Camp buildings are also finished in appropriate colours and as previously noted the Camp is subject to a Landscape Management Plan⁶³.
- 7.5.48 The above measures already limit the effect of military infrastructure on the prevailing landscape character. Use of local materials to reduce the effect of existing shelters and stables should be considered where not already applied. However, the number of military structures is limited and in many cases share the characteristics of other non military infrastructure present in the surroundings (including the same landscape character types and character areas).
- 7.5.49 For example, while from its immediate vicinity Okehampton Camp is clearly a military development, the location of the Camp, situated on the periphery of DTA is not dissimilar to settlement in the enclosed moorland elsewhere and hence it can be considered in keeping with the broader patterns of settlement around Dartmoor.
- 7.5.50 Prevention of vehicle access via certain tracks onto the high moor already occurs as a management tool, avoiding unnecessary damage to vegetation and soils and therefore also the consequent effects on landscape character.
- 7.5.51 The use of the former railway embankment within the Okehampton Training Area as part of the firing range helps to integrate activities within the landscape, by avoiding

⁶³ Okehampton Camp Landscape Plan.

unnecessary structures. However, grass cutting, where this occurs to maintain the training area, results in local distinction in the colour and texture of grass cover. This undermines the character of the locality, an important component of which is the more subtle mosaic of colour and texture provided by the moorland vegetation. As a localised effect due to training activity, this is not significant and while less regular mowing might enhance the prevailing landscape character, there is an overriding range safety requirement for this to take place.

- 7.5.52 Digging in is an important and unavoidable aspect of tactical training exercises. DTE SW SOs require that trenches are backfilled and re-turfed after use so that any temporary effects are removed as the ground recovers (DTA experience indicates typically within 12 months) and in the long term the landscape remains intact, with no significant effects on landscape character.
- 7.5.53 In the context of the landscape character of training areas as a whole, the magnitude of any change due to damage and/or erosion caused by military activities is negligible and effects on the prevailing character will not be significant.

Loss of tranquillity and consequent effects on landscape character due to visual and noise intrusion arising from military activities

- 7.5.54 The NPMP 2007-2012 Draft recognises tranquillity and remoteness can be adversely affected by: noise, lighting and intrusive development both within and beyond Dartmoor's boundaries; and traffic both within and on the boundaries of Dartmoor. Other aspects identified with the Plan to have adverse effects on tranquillity and remoteness are: "*the use of the military roads, green lanes and the open moor by motorised vehicles; military air traffic; the use of private helicopters over Dartmoor; a growth in security, road and street lighting; and signs and structures associated with military activity*".
- 7.5.55 Military activities include the use of helicopters in support of ground troops, vehicles, personnel movements, dry training including blank firing and pyrotechnics, and live firing. All of the activities have the potential to reduce the tranquillity of the area in providing negative factors such as 'negative landscape factors', 'noise' and 'prevalence of people'. (Refer **Figure 7.2**)
- 7.5.56 The baseline conditions relating to Tranquillity, including recent levels of military training activity, are indicated on the analysis undertaken by CPRE, which is presented on County level mapping (**Appendix 7.2**). As would be expected given its isolation, the area including DTA has been assessed as one of the most tranquil parts of the UK. Training activity is generally greater in the north than in the south at Cramber and Ringmoor.
- 7.5.57 As the public are not permitted to access the RDA during live firing at Okehampton, Willsworthy and Merrivale, loss of tranquillity arising from this activity and the consequent effects of landscape character due to visual evidence of training is unlikely to be significant.
- 7.5.58 The number of non military users of Cramber and Ringmoor at any one time was not available for this appraisal but is judged to be small and as such the effects of dry training activity on perceived tranquillity has been judged not to be significant. Consideration therefore needs to be given to the effects of noise from the use of blank ammunition and pyrotechnics.
- 7.5.59 In respect of noise, the controls already in place restrict live firing during the summer, weekends and bank holidays when recreational use of the moor is likely to be at its height (see **Chapter 11** for details). Existing measures seek to manage noise associated with military training and, as noted in **Chapter 10**, the effects of noise appear to have either limited or no effect on the ambient noise levels. As such, noise from military training is not

likely to influence the tranquillity of the area as long as current noise levels are not exceeded.

- 7.5.60 'Prevalence of humans' relates to both military and civilian activity on the DTA. The need for military personnel to be camouflaged and the dispersal of personnel (there is no set pattern to movements) would suggest that overall any effects on tranquillity are only partially attributable to military activity and in this respect are not significant.
- 7.5.61 As indicated at **Paragraph 7.5.52** the effects on landscape character of damage and/or erosion caused by military activities (i.e. 'negative landscape factors') are not significant.
- 7.5.62 Overall therefore it can be concluded that the loss of tranquillity and the consequent effect on landscape due to visual and noise intrusion will also not be significant. Given that the EA is based upon current training thresholds, it follows that overall, adverse effects upon tranquillity due to training on the DTA will also not increase. The military training baseline upon which the Tranquillity Mapping has been prepared will remain unchanged.
- 7.5.63 In addition the NPMP 2007-2012 Draft notes a number of means to achieve its ambition and goals in terms of tranquility. The ambition for tranquility and remoteness focuses on providing the opportunity to experience solitude, peace, dark night skies and a sense of space. Goals seek to prevent the loss of tranquility and to remove intrusive structures. The means of achieving these goals include minimizing the effect of military activities.
- 7.5.64 Landscape mitigation measures described elsewhere in this chapter provide opportunities for DTA and DNPA to work in partnership to investigate ways of reducing the effects of military training. In this respect HQ DTA can offer positive measures, also compensating for adverse effects on tranquility due to increasing pressures from non-military activities on the Dartmoor Area.

Cumulative Effects

- 7.5.65 The prevailing landscape character of DTA has clearly been shaped in part by the land uses taking place and by its management. This has given rise to both positive and negative effects on the landscape, arising principally from military activity but also due to agriculture and recreation. The contribution of military activity in shaping and maintaining the area's positive characteristic elements, in particular the pattern of land cover and conservation of its biodiversity and cultural heritage, is a significant consideration in conserving and enhancing the landscape. The cumulative effects of military training include these key elements, which potentially outweigh negative effects, which when considered individually and in the wider context, do not significantly affect landscape character.
- 7.5.66 Ongoing mitigation and management initiatives offer scope to further enhance landscape character through the DTA EMS and ILMP. However, the long term effects of these initiatives compared to any alternative management regime without military involvement cannot be predicted.

7.6 Assessment of Potential Effects: Visual Effects

Current Conditions

- 7.6.1 The baseline (current) conditions in terms of visibility towards DTA were established through initial desk study, followed up with site work investigating a series of 'key viewpoints'. These were selected by considering the extent of views potentially available combined with the sensitivity of those likely to experience the view.
- 7.6.2 The 'key viewpoints' also include those locations from which people potentially move onto DTA for recreational purposes (i.e. principally walking). No quantifiable information is available on the numbers of people accessing the high moor (refer also **Chapter 11, Access and Recreation**), however the number moving more than a short distance (ie a few hundred metres) from 'key viewpoints' is likely to be relatively small. For this reason, it can be concluded that although closer views of training activities may be experienced by such people, the relatively small numbers involved suggest that while further mitigation might be desirable, visual effects cannot be judged to be significant and therefore no further comment is made in this respect.
- 7.6.3 Viewpoint Assessment is one of the techniques used to assess both the level of visual effect that would be experienced by particular receptors, and to help guide the assessment of the overall effects on visual amenity. The assessment was conducted in periods of fine weather and good visibility. This accords with the over-riding principle of assessing a 'worst-case' scenario as it makes no concession to the influence of poor atmospheric/weather conditions.
- 7.6.4 The viewpoints were selected using professional judgement with the purpose of meeting the following:
- a balance of viewpoints from the main directions of view towards the DTA;
 - a range of foreground, middle and distant views of the DTA, although most of the viewpoints have been located within 4 km distance of the site; and
 - a proportion representing areas or routes known to be publicly accessible to the community where people may congregate in numbers.
- 7.6.5 The sensitivity of visual receptors identified as low, medium and high (see **Appendix 7.3**) has been considered in combination with the magnitude of any change in view which may occur as a result of the presence of military activities and facilities or structures associated with training. Consideration of the sensitivity of receptors and the magnitude of change in views has been used to establish whether military activities are likely to have significant visual effects. Significant effects may require particular attention during the re-negotiation of the license post 2012.
- 7.6.6 In the Appraisal, the approach has been to consider the visual effects of current levels of training activity (compared to non training days) and also the levels of activity represented by the threshold upon which the current license is based. An underlying assumption to the Appraisal has been that this threshold will not be exceeded in any future license agreement i.e. in the period post 2012 when renegotiation is due.

Assessment of Potential Visual Effects: Okehampton, Willsworthy and Merrivale Training Areas

Overview

7.6.7 **Figure 7.3** shows the boundary to the Okehampton and Willsworthy Training areas and the location of FPs and OPs. Key Viewpoints are shown on the plan and summarised at **Table 7.4**, below.

Table 7.4 Summary of Viewpoints Included in the Visual Assessment

Viewpoint Location/visual receptor	Receptor Type	Distance from DTA Boundary	Reason for Selection
1. Okehampton	Residential	~2.5km	Closest major settlement to the DTA and location of Okehampton Camp.
2. Meldon Reservoir and car park	Recreational	~100m/~290m	"Honey Pot" recreational destination.
3. Car Park north of Okehampton Camp	Recreational	~50 m	Popular public car Park.
4. Moorgate Cottage	Residential	~345 m	Residential property in close proximity to the northern boundary of DTA.
5. Car park near Moorgate Cottage	Recreational	~310 m	Popular public car park.
6. Moorgate Farm	Residential	~50 m	Residential property in close proximity to the northern boundary of DTA.
7. Moor Brook(linear feature)	Recreational	Within Boundary	'Honey Pot' brook.
8. Car park near Halstock Hill	Recreational	Within DTA Boundary	Popular public car park
9. Lower Halstock	Residential	~620 m	Residential property in close proximity to the northern boundary of DTA.
10. Old Rectory Farm	Residential	~1.3km	Residential property in close proximity to the northern boundary of DTA.
11. Watchet House	Residential	~600m	Residential property in close proximity to the northern boundary of DTA.
12. Cullever Steps	Recreational	Within Boundary	'Honey Pot' location popular with public
13. East Okement Farm	Residential	~160m	Residential property within DTA boundary but in its own exclusion zone
14. Cosdon Hill	Recreational	~1.3km	Popular recreational destination
15. Cranmere pool letterbox	Recreational	Within Boundary	'Honey Pot' letterbox location popular with public.
16. Fernworthy Forest	Recreational	~1.9km	Popular recreational woodland
17. Postbridge ancient Clapper Bridge	Recreational	~4.1km	'Honey Pot' location popular with public
18. Two Bridges	Residential	~1.8km	Popular settlement and recreational destination with large hotel
19. Holming Beam car park	Recreational	~80m	Popular public car park
20. Princetown	Residential	~3.1km	Settlement with wide appeal to public, location of central tourist information centre and prison
21. Rundlestone	Residential	~1.4km	Settlement within close proximity of southern boundary of DTA

Viewpoint Location/visual receptor	Receptor Type	Distance from DTA Boundary	Reason for Selection
22. Car Park on B3357 west of Rundle Stone	Recreational	~1.4km	Popular Car Park to south of Great Mis Tor
23. Car Park east of Merrivale	Recreational	~1.2km	Car Park near Merrivale
24. Merrivale	Residential	~1.1km	Settlement within close proximity of southern boundary of DTA
25. Pork Hill Car Park south of Cox Tor	Recreational	~1.9km	Popular car park and viewing point
26. Cox Tor	Recreational	~1.3km	Popular and easily accessible Tor
27. Wedlake	Residential	~520m	Residential property within close proximity of western boundary of DTA
28. Higher Godsworthy	Residential	~1.3km	Residential property within close proximity of western boundary of DTA
29. Lower Godsworthy	Residential	~1.5km	Residential property within close proximity of western boundary of DTA
30. Peter Tavy	Residential	~2.8km	Settlement within close proximity of western boundary of DTA
31. Cudlippstown	Residential	~2.2km	Settlement within close proximity of western boundary of DTA
32. Mary Tavy	Residential	~3.2km	Settlement within close proximity of western boundary of DTA
33. Horndon	Residential	~1.6km	Settlement within close proximity of western boundary of DTA
34. Bagga Tor	Recreational	~420m	Popular and easily accessible Tor
35. Lane End car park	Recreational	~10m	Popular car park
36. Nattor Farm	Residential	~10m	Residential property within close proximity of western boundary of DTA
37. Lane End House	Residential	~5m	Residential property within close proximity of western boundary of DTA
38. Prescombe Farm	Residential	~350m	Residential property within close proximity of western boundary of DTA
39. Lydford	Residential	~1.2km	Settlement within close proximity of western boundary of DTA
40. High Down car park near Dartmoor Inn, Lydford	Recreational	~560m	Popular car park
41. Fox and Hounds Inn	Recreational	~1.8km	Popular car park
42. High Willhays	Recreational	Within Boundary	Highest Tor on Dartmoor
43. Yes Tor	Recreational	Within Boundary	Second highest Tor on Dartmoor

7.6.8 In addition to these viewpoints there are a number of roads and other rights of way surrounding the Okehampton and Willsworthy training areas, including roads and footpaths on which visual receptors travel. The main features are listed below in **Table 7.5**.

Table 7.5 Summary of Roads/PROWs Included in the Visual Assessment

Roads/PROW	Receptor Type	Closest Distance from DTA Boundary	Reason for Selection
1. A30(T)	Transport	~1.1km	Major dual carriageway past Okehampton
2. A386	Transport	~At boundary	Main road to west of Dartmoor
3. B3557	Transport	~1.1km	Main B road to south of Merrivale
4. B3212	Transport	~2km	Road from Rundlestone to Princetown
5. B3260 Exeter Road	Transport	~4km	Road to east of Dartmoor from Okehampton
6. Unclassified roads	Transport	Varies	Network of unclassified roads to east of DTA around Chagford, Throwleigh and South Zeal
7. Dartmoor Way	Recreational	~1.4km	Route around DNP
8. Two Moors Way	Recreational	Within Boundary	Long distance recreational route from Lynmouth to Wembury via Dartmoor and Exmoor
9. Tarka Trail	Recreational	~160m	Recreational route through Devon
10. West Devon Way	Recreational	~700m	Recreational route from Okehampton to Plymouth
11. Two Castles Way	Recreational	~700m	Recreational route from Okehampton to Launceston
12. Taw-Teign Link	Recreational	~3.2km	Recreational route linking Tarka Trail to Two Moors Way
13. PROWs/Roads within or adjacent to Cramber and Ringmoor training areas	Transport/ Recreational	~At boundary or within training area	Principally used for recreational purposes

Significance Evaluation Methodology

7.6.9 Please refer to **Appendix 7.3**, which provides an overview of the methodology on which the Visual Appraisal has been based.

Viewpoint Description, Predicted Effects and Their Significance

1. Okehampton Town

7.6.10 Okehampton town is situated to the north of DTA with Okehampton Camp located to the south of the main town. The nature of the topography to the south of the town with East Hill rising steeply from the southern boundary of the town foreshortens views towards DTA. Military structures at Okehampton Camp are not visible from the main town although the lighting from the Camp can be perceived during the hours of darkness. The baseline visual effects of military activities on Okehampton town are negligible. The sensitivity of Okehampton town, being mainly residential, is classed as high; while the magnitude of change is negligible therefore any adverse effects will not be significant.

When live firing is taking place the magnitude of the changes are low so similarly the adverse effects will be not significant.

2. Meldon Reservoir and Car Park

- 7.6.11 Meldon Reservoir is a large body of water and dam situated between South Down and Longstone Hill. The dam has public access, allowing views of the Meldon viaduct to the north. The topography around the reservoir is steep, preventing walks around the reservoir and also restricting views to the training area. The Defence Estates Intervisibility Study indicates that Blackdown FP and OPs are visible. The car park for visitors to Meldon Reservoir is situated to the north of the dam. Users of the car park must walk up steps before dropping down along a road to the level of the reservoir. At this point Blackdown OP can be seen on the skyline above the large industrial sheds of the Meldon Quarry. The Intervisibility Study confirms that the Blackdown FP and OPs are visible from this location, along with Yes Tor FP. Longstone Hill FP is also positioned prominently on the hillside overlooking Meldon Reservoir.
- 7.6.12 The presence of major foreground features, i.e. the various elements making up Meldon Quarry also draws attention away from the more distant training area features up on the moor. As such, and allowing for the potential for an increase in current live firing days per annum (and hence more frequent evidence of the Blackdown, Longstone Hill and Yes Tor warning flags) the visual effects of these features are not judged to be significant from the reservoir and car park.
- 7.6.13 The Blackdown OP is a temporary building of steel construction some 900m north east of the footpath linking Meldon Reservoir to the high moor. Although as with all of the DTA observation posts, the building is small, in certain light conditions the external finish to the building is likely to be reflective, drawing attention in the otherwise open landscape. The number of people using this footpath is not known however there is the potential for visual effects to be significant at certain times. Mitigation might include relocation of the building (i.e. cutting back into the hillside a little) and/or treatment to its external facades to reduce light reflection.

3. Car Park North East of Okehampton Camp

- 7.6.14 This car park is one of many throughout the Dartmoor area, allowing people in vehicles access to the DNP, including the opportunity to walk out over the moor. The car park is situated to the north east of Okehampton Camp near St Michael's Bungalow and is used by the public on an ad hoc basis. There is no direct visibility to military activity; although the Intervisibility Study undertaken by Defence Estates shows that the car park is within the visual envelope of both the St Michael's FP and the Watchet Hill FP.
- 7.6.15 Based upon both current and future levels of training activity, the visual effect due to the presence of the FPs in views from the car park is not judged to be significant, however, raising of the flags to warn that live firing is taking place clearly increases the visual effect (as intended for public safety purposes).
- 7.6.16 The option may exist to relocate one or the other of the FPs to reduce the level of visibility i.e. on the presumption that visibility to a single flag from this location is acceptable from a public safety perspective and that relocation does not compromise the safety of those approaching the training area from elsewhere. Alternatively, additional planting to the perimeter of the car park could offer screening, again providing the location and design of any planting allowed visibility to a raised flag upon leaving the car park to approach the training area.

4. Moorgate Cottage

- 7.6.17 Moorgate Cottage is an isolated property within close proximity to the Okehampton training area and Okehampton Camp. St Michael's FP is likely to be evident from the cottage, although intervening topography will screen Halstock Hill FP. Tall trees around the cottage also contribute to screening of views to the South and east. Whilst potentially of high sensitivity (as a residential property), the proximity of the cottage to Okehampton Camp means that military activity in the immediate surroundings is part of its day to day setting.
- 7.6.18 Military movements are evident in relatively close proximity to the Cottage, between Okehampton Camp and the Range Danger Area. However, given that a single residential property is affected and that no increase in the current thresholds of activity is predicted the visual effect is not predicted to be significant.
- 7.6.19 No further mitigation measures identified.

5. Car Park near Moorgate Cottage

- 7.6.20 This is a popular car park for visitors to the high moor using the loop road heading south towards Row Tor. Data from the Intervisibility Study indicates that FPs at Yes Tor, Blackdown, Row Tor and St Michael's will be visible from this viewpoint. The OP at Yes Tor is also indicated as being visible although the distance to the Tor (some 3km) and the positioning of the OP below the skyline means that it is not readily visible.
- 7.6.21 During live firing the raised flags at these locations are likely to be clearly evident, particularly in fine weather conditions, although the number of people experiencing views at any one time is limited by the small size of the car park. Distances to the flag poles range from 0.5km to 3km and during live firing, warning flags will, as intended, be clearly evident and dependent the frequency of live firing training events and on the number of receptors over the course of a training event, potentially significant. The options for further mitigation of visual effects during live firing are clearly limited and outweighed by public safety considerations. During dry training flag poles are unlikely to be particularly evident and therefore visual effects will not be significant.
- 7.6.22 Yes Tor, as the highest point on the Moor, is a particularly important landscape feature and one that visitors are likely to specifically look out for. The OP at Yes Tor is already assimilated with the surrounding landscape by virtue of lying below the skyline and having a backdrop of granite outcrop from this viewpoint, the 'Loop Road' and other paths in the vicinity.
- 7.6.23 No further mitigation measures identified.

6. Moorgate Farm

- 7.6.24 Situated to the east of Moorgate Cottage the farm lies some 50m from the northern edge of the training area boundary. The Defence Estates Intervisibility Study indicates that Blackdown, Yes Tor, and St. Michaels FPs are visible from the Farm. However, field survey confirmed that the farm is surrounded by a boundary of trees which limits views from the Farm. As with Moorgate Cottage, a single residential property is affected and military activity is already a feature of the immediate surroundings. As no increase in the current thresholds of activity is predicted the visual effect is not predicted to be significant.
- 7.6.25 No further mitigation measures identified.

7. Moor Brook

- 7.6.26 Moor Brook and its immediate surroundings have been identified as a 'honey pot' feature, which includes the general area directly to the south of Okehampton Camp. The brook flows from the Moor along the east side of Okehampton Camp and crosses the 'Loop

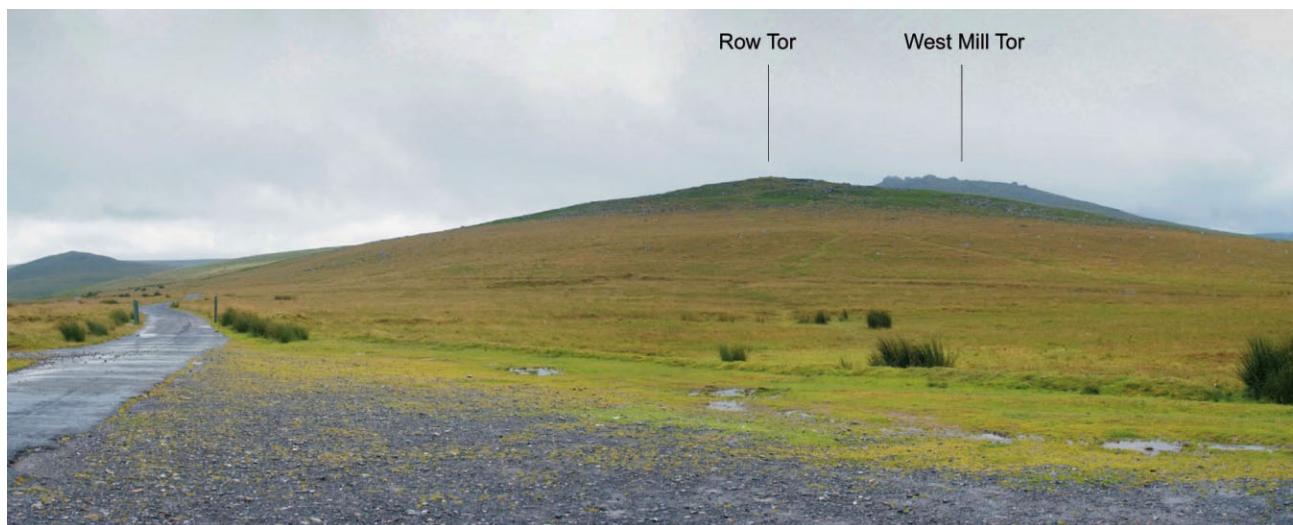
Road' as a ford between the Camp and Moorgate Cottage. From Moor Brook vicinity there are views to Row Tor, Blackdown, Halstock and St Michaels FPs. During live firing access to this 'honey pot' area is limited as the RDA boundary is quickly reached as the 'Loop Road is followed south of the Camp.

- 7.6.27 When live firing coincides with busy visitor periods, this could result in significant visual effects due to the presence of flags, allied to other military activity in the vicinity of the Camp. However, in any event it is likely that visitors would not wish to visit the vicinity during heightened training activity around the camp and the warning flag at St Michael's would indicate that live firing was occurring.
- 7.6.28 During periods when only dry training occurs, the immediate presence of Okehampton Camp and associated military activity (to be expected by those visiting the vicinity) is likely to be the key source of potential visual effects. The recent planting along perimeter areas of the Camp will, over time assist in reducing visibility to the activity associated with the Camp. While no changes are forecast in terms of significant future Camp development, perimeter tree planting should help further integrate the Camp with its surroundings. In doing so this will improve the visual amenity of its surroundings.
- 7.6.29 No further mitigation measures identified.

8. Car Park near Halstock Hill

- 7.6.30 The view from this location is illustration is shown at Photograph 1, below. (Refer **Figure 7.4** for photo viewpoint.)

Photograph 1 – Panorama from car park near Halstock (Location 8)



- 7.6.31 This viewpoint lies adjacent to the 'Loop Road' and well beyond the warning flag at St Michael's, which when raised is likely to deter many visitors from accessing the high moor area. The majority of receptors are therefore more likely to experience views during non firing days. Any change due to an increase in firing days (up to the threshold of c. 120 days per annum assumed post 2012) becomes less relevant to the appraisal as a consequence.
- 7.6.32 The car park is used by people visiting Row Tor (when access to the RDA is available) and also Cullever Steps, a walk of about 0.5km following the RDA boundary prior to turning downhill to the east. The Defence Estates Intervisibility Study indicates visibility to

FPs at Blackdown, Yes Tor, Hangingstone Hill, Steeperton Tor and Row Tor. Visibility to OPs at Hangingstone Hill, Oke Tor and OP22 is also indicated.

- 7.6.33 Of these features, some are a considerable distance away and not readily visible, although some, for example the FP at Row Tor, is clearly evident, although the combined effect upon the view, whilst detracting from the overall setting, is not judged to be significant given the scale of landscape within which these features are located.
- 7.6.34 The location of this viewpoint also allows direct views towards training activity in terms of movements of soldiers and supporting activities. Any increase in the number of days' activity per annum is very unlikely to affect those visiting the viewpoint as each visit represents a single (rather than continuous) experience.
- 7.6.35 While adverse visual effects are not judged to be significant within the wider landscape setting, there may be opportunities to mitigate the effect of flag poles, for example simply by painting these in a recessive colour where this has not been undertaken already.
- 7.6.36 The OPs evident from this viewpoint are of stone/concrete construction and hence less intrusive than others constructed of steel. No further mitigation measures are therefore proposed.

9. Lower Halstock

- 7.6.37 Lower Halstock is an isolated property situated just over one km. to the east of Okehampton Camp. The property is made up of a cluster of farm buildings interspersed with mature trees. Intervisibility Study 'viewsheds' indicate visibility to Halstock, Blackdown and Watchet Hill FPs. Any training activity is unlikely to intrude upon views from the property as views are distant and intervening topography provides screening to much of the high moor area where view might be evident.
- 7.6.38 No further mitigation measures identified.

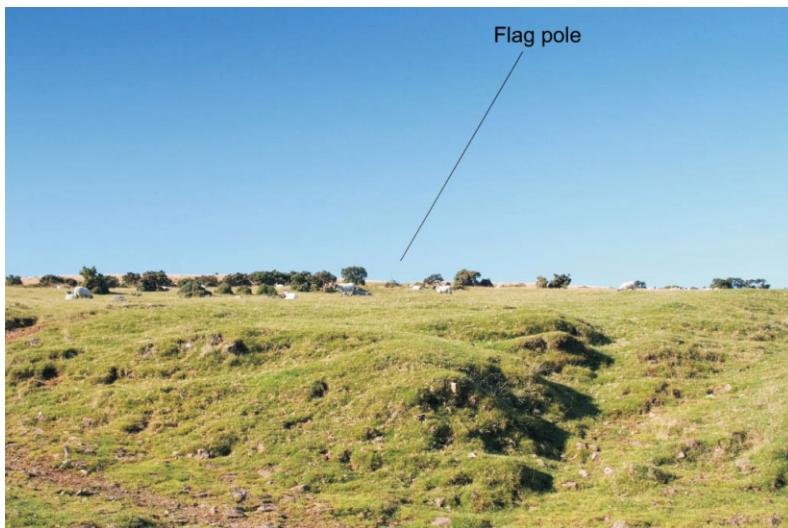
10. Old Rectory Farm

- 7.6.39 Old Rectory Farm is situated between the hamlet of Belstone and Lower Halstock. The property is surrounded by mature trees with an extensive woodland belt, Halstock Wood, situated to the west. The Defence Estates Intervisibility Study shows that FPs at Blackdown, Halstock and Yes Tor will be visible. However, the presence of foreground tree cover, combined with the distances involved (Yes Tor is over 4km distant) means that although as a residential property, receptors at the farm are categorised as of 'high sensitivity', visual effects will not be significant.
- 7.6.40 No further mitigation measures identified.

11. Watchet House

- 7.6.41 The view from this location is illustration is shown at Photograph 2, below. (Refer **Figure 7.4** for photo viewpoint.)

Photograph 2 – View from gate adjacent to Watchet House (Location 11)



7.6.42 Watchet House is situated on the south west edge of Belstone Hamlet. The house is surrounded by mature trees, however upper storey views include the Watchet Hill FP on the skyline some 300m to the south-west. The warning flag, although visually intrusive, is a part of the surrounding landscape and as no increase in the threshold for live firing events is predicted, the visual effect upon those using the property will not be significant.

7.6.43 Relocation of the Watchet Hill FP to a position below the skyline in views from the vicinity of Watchet House would be beneficial in terms of visual amenity, subject to detailed analysis to ensure that site lines for public safety purposes are maintained. The intrusion of the flag pole itself (when no flag is flying) would also be reduced, although this is minor. Painting the flagpole in a recessive colour would further reduce its effect against the backdrop provided by the hillside. Relocation would however potentially bring the flagpole closer to the vicinity of Watchet House and a balanced approach therefore needs to be considered.

12. Cullever Steps

7.6.44 Cullever Steps is a well known and popular ‘honey pot’ location at the convergence of the East Okemount River and Black-a-ven Brook. The Cullever Steps lie within the DTA boundary and as such public receptors would not be present during live firing days. The Defence Estates Intervisibility Study indicates visibility from Cullever Steps to FPs at Watchet Hill, Row Tor and Halstock. These FPs again represent a minor visual intrusion in the vicinity of Cullever steps, as a location from which the moorland environment can be enjoyed and as such the visual effect is not significant.

7.6.45 Mitigation measures considered in respect of other viewpoints may also improve the outlook from the vicinity of Cullever Steps, in particular a review of the positions of FPs at Watchet Hill and Halstead.

13. East Okement Farm

7.6.46 East Okement Farm is an isolated property nestling between Oke Tor and Harter Hill. The Farm has had a long history of interaction with the military, having been used since the

1880's to house livestock cleared from the danger area during live firing. The Farm is within the overall DTA boundary but is enclosed by its own exclusion zone. Two belts of woodland lie to the north and east of the property, providing a substantial visual barrier. Visual receptors at the Farm are categorised as of 'high sensitivity' however on the assumption that the woodland belts are retained for the foreseeable future, visual effects will not be significant.

- 7.6.47 The bivouac site at East Okement (Refer **Figure 2.2** location D16) is a temporarily used location during dry training exercises (for around 58 days per year). However, no change is anticipated to the level of use at the site, which may be visible from this property.
- 7.6.48 Mitigation measures to further break up views to the south could include more tree planting, however close consultation with the residents would be needed as they may not want their views changed in this way.

14. Cosdon Hill

- 7.6.49 Cosdon Hill is a popular recreational destination, lying 1.3km to the east of the DTA. Being at the relatively high elevation of 550m Above Ordnance Datum (AOD), receptors at the summit of Cosdon Hill will have a wide panorama of Dartmoor to the west. Intervisibility Study data indicates visibility to a number of FPs and OPs including St Michaels, Halstock, Row Tor, Watchet Hill, Steeperton Tor, Hangingstone Hill, Quintins Man, Kitty Tor, Yes Tor and Blackdown FPs along with Steeperton Tor, Oke Tor, OP22, Yes Tor, and Hangingstone Hill OPs. However, distances to these features range from some 2.6km to 5.6km. Within the wider landscape and a vista of this scale, these features are either not discernable or not sufficiently intrusive to have a significant visual effect.
- 7.6.50 No specific mitigation measures have been identified.

15. Cranmere Pool Letterbox

- 7.6.51 A popular recreational destination, Cranmere Pool draws the attention of people involved in the recreational activity of 'letterboxing'. Cranmere Pool is famous for being the site of the first letterboxes, a bottle placed by James Perrott in 1854. The location is also one of the most remote on Dartmoor, however it is possible to park within 1km. The Intervisibility Study data indicates that the location is within the viewshed of FPs and OPs at Yes Tor, Kitty Tor and Hangingstone Hill, and also the OP at Fordslands Ledge.
- 7.6.52 As the location is within the RDA boundary, FPs will be seen without flags flying. Combined with viewing distances of up to 5km this means that where evident, visual intrusion is minor and the effects not significant. The OPs are evident to differing degrees depending upon distance and external construction materials.
- 7.6.53 No further mitigation measures identified.

16. Fernworthy Forest

- 7.6.54 Fernworthy Forest provides a recreational destination as there is a forest and nature reserve at the Fernworthy reservoir. There are a number of woodland rides throughout the forest although there is one designated footpath which emerges at Long Ridge and links the forest to Postbridge. The Grey Wethers stone circles provide an added incentive to use this path. As walkers emerge from the Forest to the west, the DTA becomes visible. The Intervisibility Study indicates that both the FPs and the OPs at Hangingstone Hill and Quintins Man will be visible, although not dominant within the large scale, open landscape and as such visual effects at this location are not judged to be significant.
- 7.6.55 Although not dominant in the landscape, the potential 'skylining' of both FPs and OPs would benefit further detailed analysis and consideration as part of future mitigation. The

steel construction of the Quintans Man OP is also more intrusive than other more sensitive materials, however this feature is less significant than other steel constructed OPs where mitigation should initially be focused

17. Postbridge Clapper Bridge

- 7.6.56 The Clapper Bridge at Postbridge is an extremely popular recreational destination and another 'honey pot' location. The bridge, formed by flat slab stones resting on stone piers, spans the East Dart River and falls just beyond the 4km study area boundary. The Defence Estates Intervisibility Analysis indicates visibility to the FP at Rough Tor. However, at over 4km distance this is unlikely to be immediately evident and any adverse effects will not be significant.
- 7.6.57 The FP at Rough Tor may intrude upon the skyline in views from the east; the opportunity exists to carry out further detailed analysis to establish whether bringing the FP downslope to the east can further reduce visual effect while meeting overriding public safety requirements.

18. Two Bridges

- 7.6.58 Two Bridges is a popular settlement for recreational visits to the Dartmoor area. There are no views to FPs or OPs from the centre of the settlement although the site survey found that the Beardown Tor FP and OP are visible from Beardown Lodge to the west. Local topography and screening provided by woodland on Beardown Hill precludes other views. Whilst the residents of Two Bridges are categorised as being of 'high sensitivity' the magnitude of effect due to visibility to the single OP some 1.9km distant is low and the effect is not significant.
- 7.6.59 Mitigation opportunities include localised planting or re-positioning of Beardown OP, a temporary steel structure, to remove it from the skyline. Based on the impact to a single dwelling this cannot however, be considered a high priority.

19. Holming Beam Car Park

- 7.6.60 The view upon approaching this location from the north is shown at Photograph 3, below. (Refer **Figure 7.4** for photo viewpoint.)

Photograph 3 – Holming Beam Hut (Location 19)



- 7.6.61 This car park is open to recreational visitors and connects to a designated footpath leading north west towards Black Dunghill. The Holming Beam FP is immediately visible in the foreground and the car park lies adjacent to the OP, which having the appearance of a forestry shed is more in keeping with its surroundings than other temporary OPs elsewhere. The OP and car park provide a 'point of arrival' to the high moor and whilst functional in design are appropriate for their purpose and to the prevailing character of the surroundings.
- 7.6.62 Distinct views across to Beardown Tor FP and OP are possible from the car park, (refer Photograph 4, below). However, the trees of Long Plantation screen views to the west and north west. The vicinity of Holming Beam provides a Field Firing Area and also a Bivouac area. The public will not be present during field firing exercises. Use of the Bivouac area during dry training results in the introduction of temporary, short term activity that is unlikely to increase in future (as dry training overall will not increase in terms of numbers of days per annum). The temporary Bivouac area is not likely to be immediately evident other than to walkers moving north onto the Moor and the resultant visual effects will therefore not be significant.

Photograph 4 – View of Beardown Tor from Holming Beach Hut.(Location 19)



- 7.6.63 The Intervisibility Study also indicates that FPs and OPs are visible at White Tor, Great Mis Tor, and Rough Tor. However, existing tree screening reduces the visibility substantially, to the extent and visual effects are not been judged to be significant.
- 7.6.64 Great Mis OP is evident from the vicinity of Holming Beam Hut (and also, as noted below, from a number of viewpoints on the B3357, which passes to the south of the training area). The OP is located at a particularly notable landmark, suggesting that further mitigation (either relocation or possibly replacement of the current temporary steel building) should be considered.

20. Princetown

- 7.6.65 Princetown is the site of Dartmoor Prison and Prison Museum, along with a large regional Tourist Information office and draws numerous visitors. The town is situated some 3km from the training area. However, the Defence Estates Intervisibility Study indicates that long distance views towards Rough Tor, Holming Beam Hut and Lynch Tor FPs are possible. At this distance visual effects will not be significant, particularly in the context of

the wider landscape around Princetown, which is dominated by the 198m high TV and radio mast situated at north Hessary Tor.

- 7.6.66 No further mitigation identified.

21. Rundlestone

- 7.6.67 The view towards the training area from this location is shown at Photograph 5, below. (Refer **Figure 7.4** for photo viewpoint.)

Photograph 5 – Panorama from pumping station near Rundlestone



- 7.6.68 Situated to the north east of Princetown, residential properties at Rundlestone are indicated by the Intervisibility Study to have views of the Great Mis Tor and Roos Tor FPs. During periods of dry training, the flag poles are likely to be barely discernable, with minor change when warning flags are in place during live firing days. The sensitivity of residential receptors is categorised as 'high' but the magnitude of visual effect is low and hence visual effects will not be significant.

- 7.6.69 Mitigation should consider relocation/replacement of Great Mis Tor OP.

22-26. Car Parks on B3357 West of Rundle Stone, Cox Tor

- 7.6.70 Four car parks are located along the B3357, offering views towards the training area and points from which access to the high moor, including paths up to Great Mis Tor. In some cases, local topography precludes views to OPs and FPs from the immediate vicinity of the car parks, although elsewhere both Roos Tor and Great Mis Tor are evident, around 2km distant. The vicinity of Great Mis Tor is also designated a Field Firing Area, although public access and hence close views to field firing activity will not occur.

- 7.6.71 The large and popular car park on the B3357 to the north of Barn hill (refer **Figure 7.4** viewpoint 25) is indicated as a lookout viewpoint on Ordnance Survey mapping. The car park has capacity for over 100 cars and is favoured by people wanting an easy walk north to the top of Cox Tor (refer viewpoint 26) from where Roos Tor FP and Great Mis Tor FP and OP are likely to be visible.

- 7.6.72 The local topography of Cox Tor and Great Staple Tor screen the training area from the car park. However, a proportion of car park users will experience the view from Cox Tor having made the decision to walk up to this point. The military features evident at Roos Tor and Great Mis Tor, although detractors in an otherwise open vista, are small relative to the scale of the surrounding landscape and their visual effect is not judged to be significant.

7.6.73 Although military features evident from the various viewpoints to the south of the training area are of insufficient scale to result in significant adverse effects, there is potential for further mitigation through more detailed analysis to enable skyline locations to be avoided when FPs and OPs require renewal in future.

27. Wedlake

7.6.74 Wedlake is an isolated property situated 2.4km to the east of the village of Peter Tavy and some 500m from the training area boundary. Located in Colly Brook valley, Wedlake has limited views into the training area, these also being partially screened by tree planting. Views to military features are confined to the FP at Roos Tor and visual effects will be not significant.

7.6.75 No further mitigation identified.

28. Higher Godsworthy

7.6.76 As with Wedlake, the isolated Higher Godsworthy property is nestled into Colly Brook valley, about 1km from the training area boundary. Intervisibility Study data indicates that none of the FPs or OPs are visible from this location. Potential views are therefore confined to the possible presence of military personnel moving on foot across the training area and likely to be imperceptible at this distance. Visual effects would therefore not be significant.

7.6.77 No further mitigation measures have been identified.

29. Lower Godsworthy

7.6.78 Lower Godsworthy is situated some 1.6km from the training area boundary. Being situated on the northern side of the Colly Brook, the topography around Lower Godsworthy screens views to the east to a lesser extent. The Defence Estates Intervisibility Study indicates that the area's topography allows views to the FPs and OP at Great Mis Tor and FP at Roos Tor. Distances are some 3.6km and 1.8km respectively. Allowing for live firing activity and evidence of warning flags during these periods, the resultant magnitude of effect will be negligible and visual effects will not be significant.

7.6.79 No further mitigation measures have been identified.

30. Peter Tavy

7.6.80 Situated 3km to the north east of Tavistock, Peter Tavy is a village nestled on the eastern side of the River Tavy valley. Steep topography to the east around Smeardon Down restricts views into the DTA. Intervisibility Study data shows that military features are not visible. At 3km distance soldiers moving on foot will be imperceptible.

31. Cudlipptown

7.6.81 A small hamlet situated 1.6km to the north east of Peter Tavy, Cudlipptown is located on the eastern valley slope of the River Tavy valley. Site investigation through the hamlet as far as Broadmoor Farm confirmed that there are no views to the DTA. This is due to the steep aspect of the slope towards Cudlipptown Down and localised tree cover.

32. Mary Tavy

7.6.82 Mary Tavy is a large village settlement over 3.2km from the training area boundary and over 4km from the nearest military features. At these distances residents at this location will not experience noticeable visual effects.

33. Horndon

7.6.83 Horndon is a small hamlet on the upper slopes of the River Tavy valley. It is located 1km to the north of Cudlipptown and 1.3km to the east of Mary Tavy. The valley rises towards Standon Down from 250m AOD to 485m AOD although the valley slopes prevent views of Standon Down OP. Intervisibility Study data indicates that Roos Tor and Lynch Tor are visible, however military features here are some 4km or more distant. At these distances residents at this location will not perceive noticeable visual effects.

34. Bagga Tor

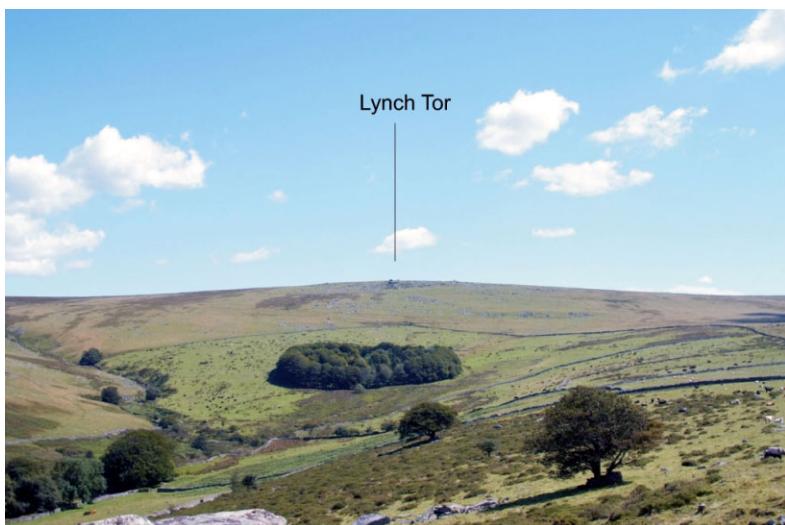
7.6.84 Views towards the training area from this location is shown at Photographs 6 and 7 below. (Refer **Figure 7.4** for photo viewpoints.)

Photograph 6 – View north from top of Bagga Tor towards Standon Hill (Location 34)



7.6.85 Bagga Tor is easily accessible for walkers leaving a small car park which lies at the foot of the Tor on the road east from Cudlipptown. Wide panoramic views are available from the Tor, sweeping over the River Tavy valley to the west and as far as Standon Hill to the north. Views eastwards along Bagga Brook valley extend beyond the distinctive circular South Common Plantation. The distance to the DTA boundary is 420m and the Bagga Tor OP is situated outside the boundary, 360m from the Tor. Intervisibility Study data indicated that visible FPs within a 4km radius included Lynch Tor, White Tor and Lane Head, while OPs included Standon Hill, White Hill and Bagga Tor.

Photograph 7 – View east from top of Bagga Tor towards Lynch Tor (Location 34)



7.6.86 Although extensive views are available from this location, including those to the above features, none of the OPs or FPs appear as skyline features and their effect is lessened accordingly. A designated Bivouac site is located at Bagga Tor, however according to DTE records the location appears infrequently used. A Field Firing Area is also situated close to the Tor. Public access is precluded during its use. Bagga Tor is sufficiently close to the training area for movement of soldiers on foot to be evident during dry training activities. However, in visual terms the magnitude of effect arising from military features and activities, combined with the number and sensitivity of receptors likely to be present at any one time indicates that any visual effects will not be significant.

7.6.87 No further mitigation measures identified.

35-37. Lane End Car Park, Lane End House and Nattor Farm

7.6.88 Views towards the training area from this location are shown at Photographs 8 and 9, below. (Refer **Figure 7.4** for photo viewpoints.)

Photograph 8 – View west from Lane End car park towards Willsworthy Range (Location 35)



- 7.6.89 Lane End Car Park is the furthest publicly accessible point to vehicular traffic from Horndon and Cudlipptown. The car park is situated on the training area boundary to the west of Standon Hill and east of Willsworthy Range. Lane End House and Nattor Farm are residential properties in close proximity to Lane End Car Park, experiencing similar views.
- 7.6.90 To the north, Ger Tor can be seen while views eastwards include the distinctive form of the Willsworthy rifle range butts on the skyline. Intervisibility Study data indicates that visible FPs within a 4km radius include Lane Head, Ger Tor, Doe Tor White Hill and Lookout One, while OPs include Lookout One and Bagga Tor.
- 7.6.91 Though distant, the presence of the Willsworthy rifle range on the skyline detracts from the otherwise open aspect. No change to this feature is planned in the foreseeable future however. Tree planting to mitigate the visual effects of the rifle butts would be inappropriate in the otherwise open landscape. The alternative, to construct screen mounding is also likely to be inappropriate given the extent of works that would be required and resultant physical damage and disturbance.

Photograph 9 – Lane End car park (Location 35)



- 7.6.92 The introduction of a new feature such as the Willsworthy Rifle Range butts as a skyline feature would constitute a significant visual effect, however in this case there is no change and hence the effect cannot be considered significant. The presence of a number of FPs in the view from this location further detracts, although no additional features are proposed and at any given time there will therefore be no change to the view. It follows therefore that visual effects are not significant.
- 7.6.93 Further mitigation: although visual effects are not significant, the opportunity exists to complete further review of the requirement for all of the FPs to be visible from this location and the high moor walking routes leaving the Car Park. Mitigation measures to shield views to the west from Lane End house could include localised tree planting, although the retention of an open aspect from this location may be preferred.

38. Prescombe Farm

- 7.6.94 Prescombe Farm is an isolated farm property 1km south west of Lydford, 500m west of Willsworthy Barracks and 320m west of the A386. The farm lies on the eastern slope of the upper Lyd valley at a height of 230m AOD. The property has views across the A386 to the east of White Hill and the Willsworthy rifle range, where the stop butts to the firing

range are visible. Intervisibility Study data indicates visible FPs at Lookout One, White Hill, Doe Tor, Hare Tor and Rattebrook Hill. The OP at Lookout One is also visible.

- 7.6.95 The stop butts are some 1.6km distant from this viewpoint and whilst evident, do not appear as a major feature within the wider landscape. The FPs are at distances ranging from approximately 1.3km (at Lookout One) upwards and whilst potentially visible under clear conditions, again do not represent major features from this viewpoint. Overall, visual effects are not judged to be significant.
- 7.6.96 Further mitigation: subject to more detailed analysis there may be opportunity to undertake planting of indigenous trees, grouped to the foreground of the view to screen the stop butts. The OP is of steel construction and hence more intrusive than others on the training area. However, the immediate vicinity, including the range barrier on the access track, and nearby firing ranges is clearly in military use and therefore the benefits of reducing the effect of the OP would be minimal compared to other examples elsewhere on the training area.

39. Lydford

- 7.6.97 Lydford is a large village 13km to the north of Tavistock, situated 1.2km to the east of the Willsworthy Range boundary. The village is popular with tourists interested in visiting the Lydford Gorge Waterfall, Lydford Castle and using the Moor for recreation. The Defence Estates Intervisibility Study indicates that Lookout One and Lookout Two OPs could be visible along with the FPs at Lookout One, White Hill, Doe Tor, Hare Tor and Rattlebrook Hill. The significant distances involved do however preclude any significant visual effects.
- 7.6.98 No further mitigation measures identified.

40. Car Park near Dartmoor Inn, Lydford

- 7.6.99 This location provides a large car park (with c. 60 car spaces), situated 200m from the Dartmoor Inn, 1km to the east of Lydford on the A386. The car park is popular start point for walkers taking the footpath north east to Great Links Tor. The Defence Estates Intervisibility Study indicates that from the car park, only Lookout One FP is visible. DTA records suggest that moderate levels of training use (2005-2006: 159 days) occur at Bearwalls, some 0.7km to 1.4km away. However, much of this area is subject to seasonal constraints due to ground nesting birds and at these distances the movement of soldiers on foot is unlikely to be intrusive. Overall therefore it can be concluded that visual effects will not be significant.
- 7.6.100 No further mitigation measures identified.

41. Fox and Hounds Inn Car Park

- 7.6.101 This car park (with c. 30 car spaces) is situated 1.4km north of the Dartmoor Inn on the A386. The car park is again popular for walkers taking the path up to Great Links Tor. Intervisibility Study data indicates that Hare Tor and Doe Tor FPs are visible from this point, with closer views potentially becoming evident as the footpath towards Great Links Tor climbs the hillside. Whilst the overall visual effects are not significant, 'Skylining' of the FPs is likely from various local viewpoints in the vicinity, suggesting further detailed analysis could be undertaken to investigate whether warning flags could be repositioned. However, once an elevated viewpoint is achieved upon climbing towards the Moor, the most appealing vista is that towards the west when extensive view across Devon becomes apparent. This suggests that future mitigation efforts should be focussed on other locations.
- 7.6.102 No further mitigation measures identified.

42-43. High Willhays, Yes Tor

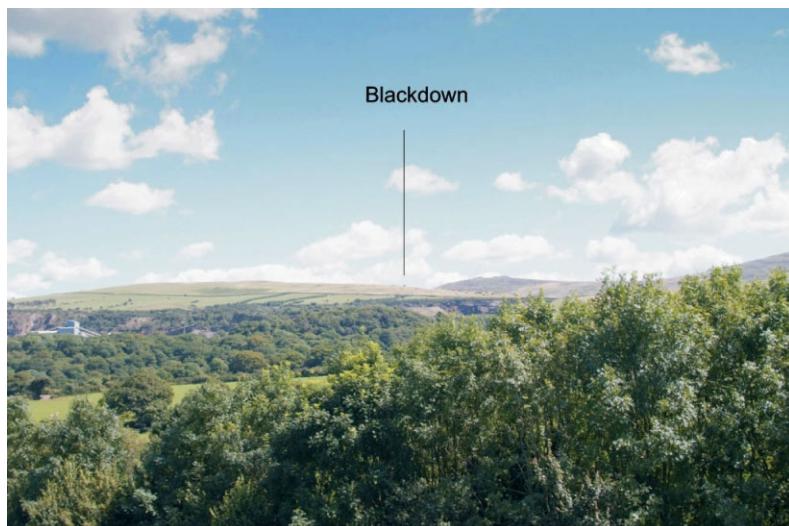
- 7.6.103 High Willhays is the highest point on Dartmoor at 621m; Yes Tor is situated some 750m to the north. Both offer extensive, panoramic views and as a consequence a focus for those walking on the Moor. The Intervisibility Study data notes Kitty Tor and Yes Tor FPs and Fordsland Ledge OP as being evident from High Willhays. As High Willhays is within the RDA the public will not be present when flags are flying. The presence of the FPs, particularly the closest of these, at Fordsland Edge, will detract from the wider views although again the scale of the setting is such that visual intrusion is minor. The OP at Fordlands Ledge is also close by High Willhays, suggesting that some further mitigation to reduce its effect would be beneficial. At certain times training activities including movement of soldiers and support activities will be evident from this vantage point, although at any one time the number of people experiencing activities is likely to be small. As there is predicted to be no change in the intensity of dry training in this area, visual effects will be not significant.
- 7.6.104 Mitigation opportunities include further analysis to establish whether FPs at the above locations can meet overriding public safety objectives whilst being repositioned to reduce their effect from the vicinity of High Willhays. Should this not be the case there may be an opportunity to reduce the intrusion of the FPs during times of public access for example by simply repainting them. The OP at Fordland Edge is a simple concrete structure that may have the potential to be better assimilated into its surroundings, possibly by recladding with stone at an appropriate point within the DTA forward maintenance plan.

Other Receptors

Roads

- 7.6.105 The A30T, passing to the north of DTA, is in cuttings past Okehampton and Meldon before rising towards the west. In addition to the cuttings, there is dense woodland around the Meldon area, largely preventing views towards the training area. Those travelling east towards Okehampton experience brief views towards Blackdown (refer Photograph 10). However, at this distance it is the prevailing landscape character that is evident rather than the visual effects of training activity.

Photograph 10 – View from bridge over A30 towards Blackdown.



- 7.6.106 Other public roads surrounding DTA variously offer brief views towards the high moor and in some cases (for example the A386 at Willsworthy) pass very close to training facilities, although views are screened by roadside vegetation. The characteristic high banks and hedgerows provide similar enclosure of views for many of the minor roads in the area, as does the local topography.

Recreational Routes

- 7.6.107 The **Dartmoor Way** is a 90 mile route around Dartmoor National Park extending in the east from Okehampton as far as Mortonhampstead before returning via Princetown and then north through Lydford. The route coincides with the West Devon Way and the Two Castles Trail as it passes to the north-west of DTA. Much of the route is sufficiently distant from DTA for views towards the high moor not to be affected by training activities. In the vicinity of King's Tor, (west of Princetown) views north are similar, although more distant, to those described for viewpoints 22-25, above. However, the additional distance of these views means that any visual intrusion due to military training is likely to be negligible.
- 7.6.108 The **Two Moors Way** is a 102 mile route linking Wembury on the southern edge of Lynmouth to the north Devon coast via Dartmoor and Exmoor. The route passes along the eastern side of the DNP before turning eastwards at Teigncombe. The route is sufficiently distant for receptors using this route not to be affected.
- 7.6.109 The **Tarka Trail**, a 180 mile route passing through Devon, is the closest national route to the DTA, passing within 160m of Watchet Hill FP, at Belstone (refer also viewpoint 11, above). The presence of the Tarka Trail, as an important footpath route, lends weight to the consideration of mitigation measures in this locality. However, due to the proximity of this route to the RDA, safety requirements must take precedence and signage must be clear and unambiguous.

Assessment of Potential Visual Effects: Cramber and Ringmoor Training Areas

- 7.6.110 Both Cramber and Ringmoor Training Areas are not used for live firing and therefore do not require the public safety measures (FPs and OPs) that are in place elsewhere. The absence of these features therefore confines potential visual effects to those directly associated with training activity such as soldiers moving across the area, supporting vehicle movements and the use of the area for bivouacs and other focussed, rather than dispersed activity.
- 7.6.111 Burrator Reservoir, situated to west, is an important recreational area, with a car park to its north east from where bridleways lead up onto the Moor, passing across Cramber and linking to a minor road and other bridle ways to the east. Minor road access from the southern end of Burrator reservoir also provides access onto Ringmoor.
- 7.6.112 Burrator Reservoir and other areas to the immediate west do not generally have direct or close views to the training areas. To the south, Brisworthy China Clay Works is a major, detracting element in the landscape.
- 7.6.113 To the north and east of the Training Areas, their boundaries abut unenclosed moorland.
- 7.6.114 **Figure 7.4** shows the boundary to the Cramber and Ringmoor Training Areas. Key viewpoints are shown on the plan and summarised below.
- 7.6.115 In terms of visual effects, the most sensitive locations are likely to be the bridleways crossing or bordering the Training Areas, the minor road leading to Whiteworks Tin Mine in the north east, and the minor road following the Ringmoor western boundary. A single

property, Ringmoor Cottage, is also close to the Ringmoor Training Area and the parachute drop zone at Ringmoor Down.

1. Ringmoor Cottage

7.6.116 Any activities in the vicinity of Ringmoor Cottage are temporary and transient. DTE records indicate only very occasional use of the Parachute Drop Zone and military vehicle use of the lane to its immediate south is forbidden. As a single property, in an environment where training activity will continue unchanged, any visual effects will not be significant.

2-3. Cramber and Ringmoor Bridleways

7.6.117 Users of the bridleways crossing and bordering Cramber and Ringmoor will potentially see training activity in progress, including activity focussed around Gutter Tor, a designated Bivouac site. The temporary and limited nature of training activity at any one location is such that visual effects will not be significant.

4. Minor Road West of Ringmoor

7.6.118 Users of this route are likely to see training activities in the vicinity of Gutter Tor on occasions. However, visual effects will not be significant for those reasons given above.

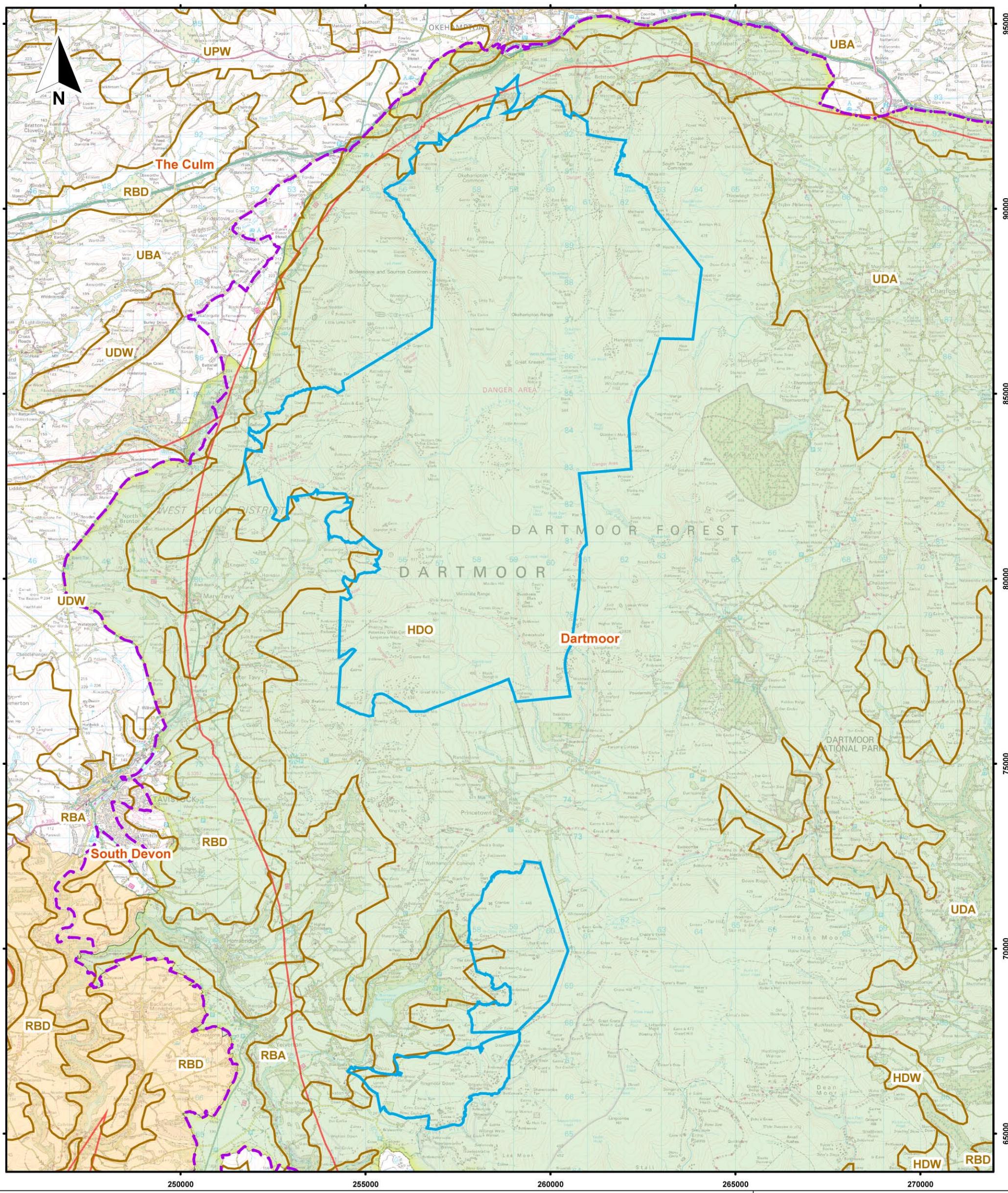
7.6.119 No further mitigation measures are identified in connection with training at Cramber and Ringmoor training areas.

7.7 Summary of Significance Evaluation

7.7.1 The appraisal of Landscape and Visual Effects is summarised in **Table 7.6** below.

Table 7.6 Summary of Significant Effects: Landscape and Visual Effects

Receptor and summary of predicted effects	Type of effect ¹	Significance ²
Landscape character: Effects on prevailing landscape character due to changes to features of cultural heritage importance (archaeological artefacts and buildings)	-ve	NS Current changes to features of cultural heritage importance resulting from military activity are considered to be limited in extent and magnitude. As a consequence changes to features of cultural heritage importance (archaeological artefacts and buildings) are not having a significant effect on DTA's landscape character, particularly considering the positive contribution military archaeology has to landscape character
Landscape character: Effects upon prevailing landscape character due to loss of, or modification, to vegetation patterns.	-ve	NS Current changes to vegetation patterns resulting from military activity are considered to be limited and of low magnitude. As a consequence changes to vegetation patterns are not having a significant effect on DTA's landscape character.
Landscape character: Effects on prevailing landscape character due to damage and/or erosion caused by military activities.	-ve	NS Damage and/or erosion of landscape character caused by military activities are considered to be limited in extent and of low magnitude. As a consequence damage and/or erosion caused by military activities are not having a significant effect on DTA's landscape character.
Landscape character: Loss of tranquillity and consequent effects on landscape character due to visual and noise intrusion arising from military activities including helicopters in support of ground troops, vehicles, personnel movements, dry training, blank firing and pyrotechnics, and live firing.	-ve	NS Currently DTA has a high relative tranquillity. Assuming existing management measures will continue it is unlikely that this level of tranquillity will change in the future as a result of military activity.
Viewpoints: Effects on views from the presence of military infrastructure such as FPs and Ops	-ve	NS The appraisal of visual effects (under Section 7.6) has shown that the presence of such infrastructure is not considered to be having a significant effect on views. However, mitigation measures to minimise effects further have been identified.
Key/footnotes:		
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S Significant or NS Not-significant



DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Key:

- | | |
|---|---|
| Dartmoor Training Area | Joint Character Area Boundary (name provided) |
| National Park | National Typology Boundary (code provided) |
| Area of Outstanding Natural Beauty | |
| Environmentally Sensitive Area Boundary | |

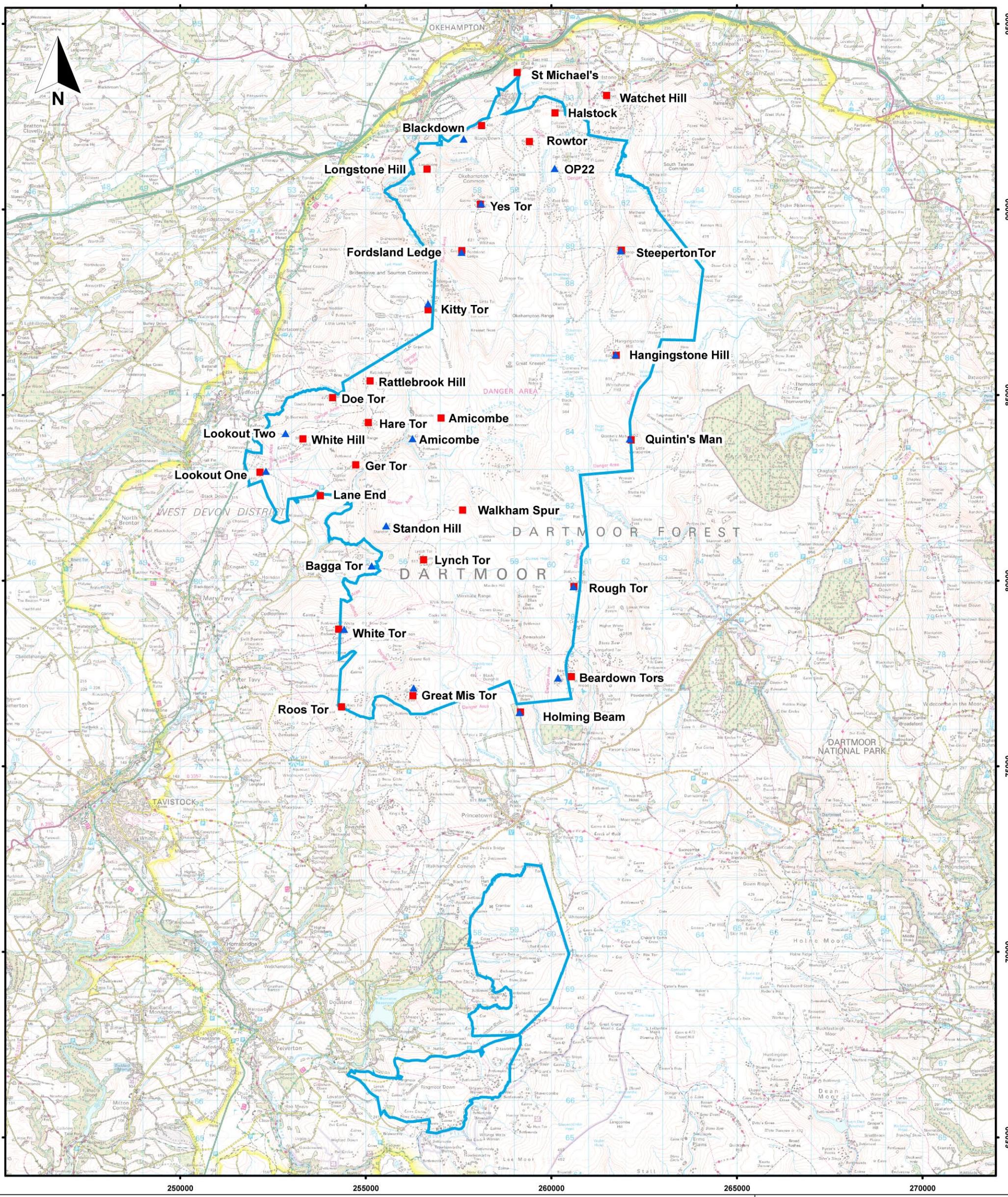
Dartmoor Training Area
Environmental Appraisal

Figure 7.1
**Landscape Designations and
Character Information**

Scale: 1:100,000 @ A3
Prepared for the Ministry of Defence, Defence Estates, contract DE4/4513

September 2007
17774-L028b adamk

Entec



Key:

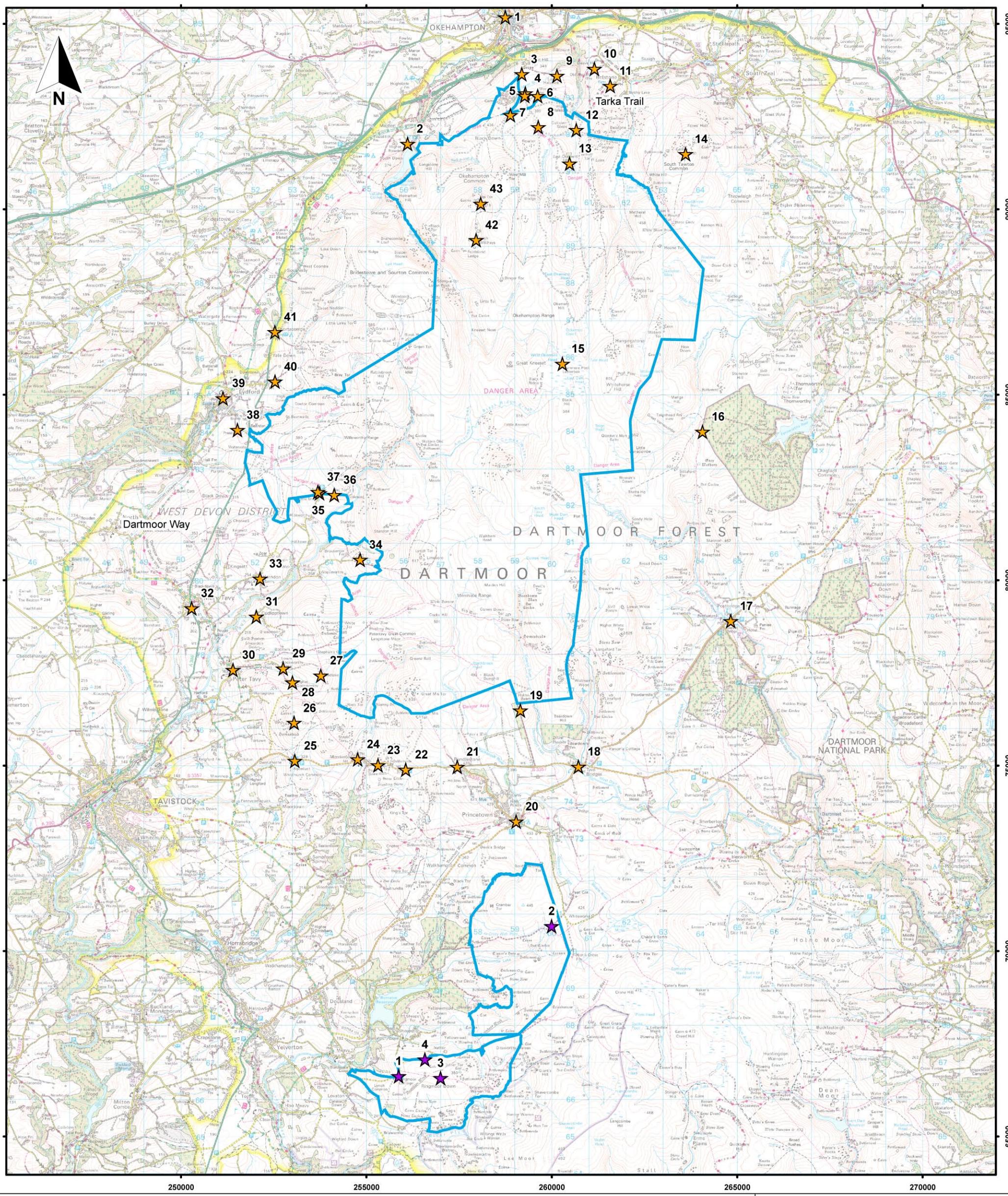
- [Blue Box] Dartmoor Training Area
- [Red Square] Flag Pole
- [Blue Triangle] Observation Post

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 7.3
Observation Posts and Flag Poles

Scale: 1:100,000 @ A3
Prepared for the Ministry of Defence, Defence Estates, contract DE4/4513



Key:

 Dartmoor Training Area

★ View Points (Okehampton, Willsworthy and Merrivale)

★ View Points (Cramber and Ringmoor)

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 7.4
Visual Receptor Locations



DARTMOOR TRAINING AREA

Environmental Appraisal

Land Use

8

8. Land Use

8.1 Introduction

- 8.1.1 Potential effects from military training in relation to land use include effects on stock grazing, as stock is cleared from the training area when live firing is taking place. This in turn has indirect effects in relation to nature conservation and socio-economic issues. This chapter was completed by Rachel Dimmick (BSc, MSc, AIEMA) and Lt. Col. (Retd) Tony Clark OBE.

8.2 Context

Legislative Context

- 8.2.1 The majority of the occupants of homesteads on Dartmoor had Commoners Rights, which were registered under the *Commons Registration Act 1965*. The *Dartmoor Commons Act 1985*, created the Commoners Council as the over-arching governing body for Dartmoor with Associations for each Common around the Moor. The Commoners Council looks after the interests of approximately 8,300 Commoners of which the large majority are inactive in that they no longer release stock on to the Moor or practice other rights of common. The Commoner's rights over MoD's freehold at Willsworthy, were bought out by MoD in 1908.

Policy Context

- 8.2.2 This section provides a review of relevant policies relating to Land Use within the local area in and around DTA, which are outlined in **Table 8.1**.

Table 8.1 Land use planning policies relevant to DTA

Policy Reference ¹	Implications
DNPMP MA2	Through the work of the Dartmoor Steering Group and Working Party current training will be harmonised with the needs of conservation and public access, military infrastructure will be sympathetically related to the landscape, untoward impact or damage will be restored, and the parties will work to secure other objectives of this Management Plan on military training land.
PPS7	Little weight should be given to the loss of lower grade agricultural lands such as uplands except where particular agricultural practices may themselves contribute in some special way to the quality and character of the environment or local economy.

Note 1 – The full names of the plans and guidance cited are given in Appendix 4.4, which details all policies and guidance that are relevant

8.3 Scope of the Assessment

Consultations

8.3.1 A total of five Land Use Working Group (LU WG) meetings were held on 14th February, 21st March, 25th April, 20th June and 18th July 2007. The attendees at one or more of these meetings are outlined in **Table 8.2**.

Table 8.2 Attendees at Land Use Working Group Meetings

Attendee	Organisation
Colin Able	Dartmoor Commoners Council
Jeremy Bailey	Environment Agency
Bill Cann	South Tawton Parish Council
Lt Col (Retd) Tony Clark	Comdt DTA
Linda Cole	Lydford Parish Council
Sue Goodfellow	Dartmoor National Park Authority
Katie Graham	West Devon Borough Council
Andy Guy	Natural England
Dave Hatton	Throwleigh Parish Council
Tony Leech	Okehampton Town Council
Fran Luxton	Okehampton Town Council
Tim MacDonald	Burrator Grouped Parish Council
Pat Martin	Lydford Parish Council
Graham Palmer	Burrator Grouped Parish Council
Terry Pearce	Mary Tavy Parish Council
Derek Webber	Okehampton Hamlets Parish Council

8.3.2 The issues discussed during these meetings specific to land use were:

- whether the distribution of live firing should be more evenly spread in order to avoid inappropriate grazing patterns;
- whether the movement of livestock should be minimised to allow ESA objectives to be achieved and to reduce the efforts involved in shepherding stock;
- the importance of payments to commoners for the right to train, and issues around the formula and recipients of payments.
- disturbance effects from low flying aircraft on livestock; and

- the beneficial effects of MoD employment and license payments to landlords, commoners and local communities
- 8.3.3 The LU WG was also used as a forum to discuss direct effects relating to noise, landscape and visual, water, land quality and socio-economics on the local communities, all of which have been assessed by Entec. Such issues raised in the WG meetings have been identified in the relevant chapters of this Report.
- 8.3.4 Informal discussions were also held with commoners and farmers regarding the military presence on Dartmoor and the implications for grazing issues.

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

- 8.3.5 It was considered that the following effects require further appraisal:
- Potential effects on the local economy as a result of employment to clear people and stock from the Range Danger Areas (RDAs) before live firing takes place: Local farmers are employed to clear people and stock from the RDAs before live firing takes place. Approximately twenty clearers have been employed for this purpose. It is considered that this form of employment supplements the income of existing farmers and commoners on DTA. Therefore, this effect has been considered as part of the potential effects on the local economy (see **Chapter 12**).
 - Potential effects on the local economy as a result of payments associated with military activities: Landowners receive payment for the MoD's right to train. Commoners affected by clearance and training receive payments from MoD. This may affect the income of local people and therefore will be considered further as part of the assessment of socio-economic effects (see **Chapter 12**).
 - Potential effects on nature conservation as a result of stock clearance from RDAs: The effects of stock clearance on nature conservation and the achievement of the ESA objectives have been considered further under the nature conservation chapter (see **Chapter 9**).

Effects Subsequently Scoped-in to the Appraisal

- 8.3.6 The WG meetings also identified that military training can result in the disturbance of breeding livestock, which in turn can have socio-economic effects on local farmers. Therefore, such effects have also been considered in the Appraisal (see **Chapter 12**).

Effects Scoped-out in the Scoping Report

- 8.3.7 The effects of grazing Willsworthy in-bye land and moorland do not require further appraisal. The majority of the SSSI moorland on the MoD freehold has been upgraded to 'unfavourable recovering' indicating that the management regime is satisfactory. The in-bye land is mostly in ESA schemes is monitored by RDS.

Effects Subsequently Scoped-out of the Appraisal

- 8.3.8 No further effects relating to land use have been identified scoped-out of the Appraisal since the issue of the Scoping Report.

8.4 Environmental Management Measures

- 8.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant (Comdt) DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs).
- 8.4.2 The existing mitigation and compensation measures in relation to land use effects include the following.
- Livestock are cleared out of the exercise danger area for the minimum distance prior to live firing by local farmers employed by MoD's Service Provider to areas which have been agreed with the commoners. Stock is moved in a humane manner using horses and dogs.
 - Observation over approximately 70% of the RDA boundary is maintained by clearers employed by MOD's Service Provider during live firing, including main access areas. The clearers have local knowledge of the moor and good stock husbandry. Clearers often notice stock, which is clearly marked to identify the owner, that is ill or in difficulty and report back to the owner or assist as necessary.
 - Commoners' stock is leared onto a particular part of Dartmoor. This they consider home and will return to it if moved. Clearance for the stock's safety during live firing interferes with this pattern. Because commoners exercising their rights of common are not bound by Military Land byelaws, it is necessary for MoD to reach agreement with each commoner affected by live firing. In exchange MoD pays commoners a sum based on livestock numbers, distance cleared and numbers of days firing. A slightly different formula applies to those commoners whose stock is affected by clearance. These commoners are paid for loss of grazing and disturbance.
 - Live firing is advertised 6 weeks in advance of firing which helps to keep farmers and commoners informed of the need for movement of livestock. Large (battalion level), dry tactical training exercises and exercises involving four or more aircraft cooperating with ground troops are announced in the media and reinforced by direct communication with farmers and commoners.
 - Military personnel are briefed through their Exercise Conducting Officer to be considerate of commoners and their agricultural enterprises.
 - DTA undertakes effective communication and liaison with the commoners and farmers, including
 - attendance by DTA representatives at commoners' association meetings on request and at least once a year;
 - a clear route of communication between the Commoners and the Defence Estates Land Agents.
 - the employment of farmers and agricultural workers leading to a sound understanding of each others aims and objectives;
 - representation of the Commoners Council, a statutory body, on the Dartmoor Steering Group (since 1998);
 - an annual lunch held in the Autumn for Commoners Association chairman and other representatives of Dartmoor's rural community;

- feedback from the Commoners to HQ DTA regarding matters of concern, such as breaches of standing orders, etc; and
- no live firing on Okehampton and Merrivale in the week preceding the stock clearance weeks in November each year, which are set aside on the direction of the Commoners Council for worming, etc.
- Tenants are members of DEFRA's ESA scheme, which reinforces good environmental practice in relation to grazing.
- In more recent years, stock have been allowed to remain within the less dangerous areas of the weapon templates, either out of the direct line of fire, or in the cover of valleys or behind hills. This reduces the distance stock are cleared and allows them back onto their grazing areas (lears) more quickly after firing thereby fulfilling the ESA grazing obligations.
- Rural inspections are completed by MOD's Service Provider in accordance with the Rural Inspection Methodology Document. Audits of these inspections are conducted by Defence Estate's Land Agents. Remediation is put in place as a result of these reports.
- Two training area marshals are employed to assist with the management of training on Dartmoor which will enhance the training area supervisor's and Head clearer's liaison with the farmers and commoners.
- With the increasingly urban population and their lack of understanding of country life, DTA will educate personnel;
 - on how stocks deliberately leave their young in cover while they graze and the consequences of not leaving them alone; and
 - in order to understand the potential danger of getting between parents and their young during training.
- The need to foster and maintain the relationship through understanding of each others objectives and problems, working together for the good of Dartmoor and interdependence should continue to be given a high priority.

8.4.3 Through the Land Use Working Group meetings, further mitigation measures have been identified and are outlined as follows.

- The review of warning signal locations will take into account implications for stock clearance in order to ensure that stock is not driven back to the moor's edge.
- In order to try to meet NE objectives for stock to be left undisturbed to graze the blanket bogs, MOD will look into minimising stock movement and leaving them to graze deep in the Dartmoor Forest providing the commoners accept that the stock are deep in the moor and the risks associated with this.
- Payments to graziers will undergo review. Payments are expected to remain at current levels despite reductions in the number of animals affected. This is partly because the commoners' workload is constant and because of the greater difficulty being experienced in leaving and shepherding stock, and the need to deal with stock at weekends when there is guaranteed access to RDAs.
- DTA will aim to procure food locally wherever possible and increase existing procurement of local food.

- MoD should continue to engage with the farming community to explain why it is not possible to purchase food locally within the UK, where relevant.



DARTMOOR TRAINING AREA

Environmental Appraisal

Nature Conservation

9

9. Nature Conservation

9.1 Introduction

- 9.1.1 Military activities could affect species or habitats of nature conservation interest that are known to be present across Dartmoor Training Area (DTA). Given the dynamic nature of these features and the migratory habits of some birds, these activities could also affect off site areas. The continuation of military training has therefore been subject to a nature conservation appraisal carried out by Dominic Ash BSc (Biology), MSc (Protected Area Management), a qualified ecologist within Defence Estates (DE) Environmental Support Team (EST).

9.2 Context

- 9.2.1 MoD manages its responsibilities across DTA through compliance with MoD policy, statutory responsibilities, legislation, memorandums of understandings, declarations of intent, and through licences and agricultural agreements. An Environmental Management System (EMS), complying with BS ISO 14001, has been produced to take full account of these responsibilities and to manage all military environmental activities and effects across DTA.
- 9.2.2 DTA includes a number of areas designated for their nature conservation interest. These include the Dartmoor Special Area of Conservation (SAC), North Dartmoor Site of Special Scientific Interest (SSSI), and Black a Tor Copse National Nature Reserve (NNR). Much of this interest from habitats and species is captured in the Dartmoor Biodiversity Action Plan (BAP). The designations present on DTA are shown in **Figure 9.1** at the end of this Chapter.
- 9.2.3 The extensive area of land covered by the open moor and surrounding enclosed 'hill-farms' provide a full range of habitats from the high exposed open moor with wet plateau of blanket bog down to the sheltered small fields with surviving relicts of semi-natural habitats like the rhôs pasture and the unusual invertebrates associated with that habitat.
- 9.2.4 The extensive moorland, which comprises DTA has some of the best examples of habitats on base poor substrates in the south-west of England. The full spectrum of associated habitats includes those that are typical, in a European context, of the Atlantic seaboard. The blanket bogs of Dartmoor, an internationally rare habitat, are designated under European legislation as are the North Atlantic wet and dry heaths. There are also a few old sessile oak woods associated with Dartmoor, which are renowned for their ecological interest. The Southern Damselfly, a very local species in the UK, is also associated with the wet seepage habitats present within DTA.
- 9.2.5 Surface water draining from DTA provides clean fast flowing streams which support good habitat and breeding conditions for Salmon and other freshwater fish. These clean rivers support Otters which occasionally wander up into the streams of the open moor. These features are of European interest but do not occur in the numbers or abundance to form primary reasons for the designation of Dartmoor.
- 9.2.6 With the identification of Dartmoor as a Site of Community Importance it follows that Dartmoor supports habitats and species that are of national and local importance, with large parts of Dartmoor being designated as SSSIs. There is also a wide range of protected features present, eg Fir Clubmoss and important populations of birds like Whinchat, which have declined enormously across southern England. The presence of

some species like Golden Plover, at one of its most southerly breeding localities has added some emphasis to the importance of Dartmoor though these species do occur in some numbers nationally. Other species are also at the northern end of their distribution.

Legislative Context

9.2.7 Relevant European legislation includes:

- EU Habitats Directive 1992; and
- EU Water Framework Directive 2000

9.2.8 Relevant UK legislation includes:

- The Conservation (Natural Habitats, &c.) Regulations 1994
- Wildlife and Countryside Act 1981 (as amended)
- Countryside and Rights of Way Act 2000
- The Hedgerows Regulations 1997
- The Protection of Badgers Act 1992
- Deer Act 1991
- The Wild Mammals (Protection) Act 1996.

Policy Context

9.2.9 **Table 9.1** outlines planning policies relevant to nature conservation.

Table 9.1 Planning Policy Context: Nature Conservation

Policy Reference	Policy Content
DNPLP Policy GP2	Planning permission will be granted where development will conserve or enhance nature conservation interests.
DNPLP Policy NC3	Planning permission will not be granted for development that would damage, either directly or indirectly, the nature conservation interests of sites of particular ecological or geological significance; unless it can be shown that the need for the development clearly outweighs the harm to the nature conservation value of the site. Such sites comprise: <ul style="list-style-type: none"> (i) non-statutory nature reserves managed by trusts or other bodies; (ii) moorland, heath and woodland shown on the Proposals Map as being of conservation importance; (iii) road verges containing significant flora and fauna; (iv) regionally important geological sites.
DNPLP Policy NC4	In considering development proposals, the Authority will support measures that would increase the number, size and diversity of sites of nature conservation value.
DNPMP Policy WG1	Important species and habitats listed under UK and EU legislation will be protected. SSSIs and candidate SACs will be safeguarded from potentially damaging operations and optimal conditions for wildlife will be encouraged.
DNPMP Policy WG3	Existing rock exposures, whether natural or man-made, natural landforms and other geological features which are important for wildlife and/or for understanding the origin and geological development of Dartmoor, will be identified, maintained and protected from damaging activities.
DNPMPD Policy HW.M1	The Dartmoor Biodiversity Action Plan (BAP) and Moorland Vision are implemented
SWRSS ENV1	Priority will be given to preserving and enhancing sites of international or national landscape, nature conservation, and geological, archaeological or historic importance. Tools such as characterisation and surveys will be used to enhance local sites, features and distinctiveness through development, including the setting of settlements and buildings within the landscape and contributing to the regeneration and restoration of the area.
SWRSS ENV4	The distinctive habitats and species of the South West will be maintained and enhanced in line with national targets and the South West Regional Biodiversity Action Plan. Local authorities should use the Nature Map to help map local opportunities for biodiversity enhancement in Local Development Documents (LDDs) taking into account the local distribution of habitats and species, and protecting these sites and features from harmful development.
DLP Policy CO9	The biodiversity and earth science resource of Devon's natural environment should be sustained and, where possible, enhanced in accordance with Biodiversity Action Plan objectives and targets. Its diversity and distinctiveness should not be diminished.
DLP Policy CO10	Sites of National and International importance for nature conservation will be protected from development which would harm their nature conservation interest or conflict with their conservation objectives. Where practical, opportunities for enhancement should be sought.
	Local Plans should also define sites and features of local nature conservation importance, including landscape features which provide wildlife corridors, links or stepping stones between habitats, and seek to protect these sites and features from harmful development and promote their beneficial management.

Policy Reference	Policy Content
	Development likely to have an adverse effect on a specially protected species should only be permitted where appropriate measures are taken to secure its protection. Special consideration should be given to any development proposals likely to affect a European Protected Species.
PPS1 Policy 20	Development Plan Policies should consider the protection of the wider countryside and the impact of development on landscape quality; the conservation and enhancement of wildlife species and habitats and the promotion of biodiversity; the need to improve the built and natural environment in and around urban areas and rural settlements, including the provision of good quality open space; the conservation of soil quality; and the preservation and enhancement of built and archaeological heritage.
PPS9 Policy 1	Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests.
	In taking decisions, local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.
	Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources..
BGC Policy 84	The potential effects of a development, on habitats or species listed as priorities in the UK BAP, and by Local Biodiversity Partnerships, together with policies in the England Biodiversity Strategy, are capable of being a material consideration in the preparation of regional spatial strategies and local development documents and the making of planning decisions.
BGC Policy 98	<p>The presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult English Nature before granting planning permission.</p> <p>They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species.</p> <p>They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned.</p>
BGC Policy 99	It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision.
MoD Policy - The Defence Estate Strategy (2006)	The new Defence Estate Strategy was launched by the Secretary of State in March 2006. The Strategy recognises the importance of protecting and enhancing the natural environment whilst integrating management of the estate with the primacy of military training.
MoD Policy - Sustainable Operations on the Government Estate (2006)	The MoD is committed to achieving the UK government sustainable development targets set in the Sustainable Operations on the Government Estate. These targets apply to each government department and they replace those set in the Framework for Sustainable Development on the Government Estate (originally published between 2002 and 2004). There is one target that relates to management of biodiversity, which states each government department must meet or exceed the aim of having 95% of SSSIs in sole ownership or control in target condition by 2010.
MoD Policy - The Secretary of State Policy Statement (2005)	The Secretary of State Policy Statement 2005 outlines strategic principles for management of the environment across the defence estate. The Statement aims to deliver sustainable defence capability through excellence in safety and environmental performance and to provide a safe and healthy workplace, and to protect Defence assets, the environment, and members of the public.
MoD Policy - Joint Services Publication (JSP) 362, The Defence	JSP 362 Chapter 5 (Nature Conservation) provides the basis and mandatory procedures for addressing MoD's statutory and non-statutory obligations to manage and enhance the natural environment and countryside interest of the defence estate.

Policy Reference	Policy Content
MoD Policy - JSP 418, The MOD Sustainable Development and Environment Manual	JSP 418 provides a framework for the protection of the environment in the MoD, having regard for the globally accepted general principles of environmental protection and sustainable development. It sets out MoD policy and provides some practical guidance to assist those working across the defence estate to drive this agenda forward.
MoD Policy - Declaration of Intent between the MoD and the Association of National Park Authorities, 2005	The Declaration of Intent is signed between MoD and the Association of National Park Authorities, as the representative body for the National Park Authorities (NPA's). The Declaration aims to set a framework for maintaining and enhancing working relationships between the MoD and the NPAs and its landlords and relates to any areas subject to MoD training or other rights in areas, including DTA that lies within Dartmoor National Park.
MoD Policy - Declaration of Intent between MoD and English Nature, 2002	The Declaration of Intent signed between MoD and English Nature (now Natural England) is a mechanism for the reconciliation of the Government's twin responsibilities towards defence and conservation on designated sites. The DoI includes a commitment from MoD that it will manage or use SSSIs so as to maintain and where possible enhance the nature conservation value for which it is notified.

9.3 Scope of the Assessment

Consultations

- 9.3.1 Prior to the Environmental Appraisal (EA) being undertaken, DE EST had been running consultations on two survey and research projects to map the vegetation of DTA's northern training areas and to undertake a bird survey of DTA as well as some external areas to consider the possible effects from military activities and other land-uses. These projects involved discussions with relevant statutory bodies and Non Governmental Organisations (NGOs). As this work is closely linked to that completed for the EA, much discussion about the potential issues associated with military activities had already taken place.
- 9.3.2 Nature Conservation Working Group (NCWG) meetings were held on 14th February and 18th July 2007. Few issues were identified in addition to those already listed in the Scoping Report and the final meeting was undertaken with the statutory bodies to confirm that DE had correctly identified the issues to be appraised. A formal letter was sent to attendees and to other interested parties who had responded to the Scoping Report, which confirmed the issues to be addressed. There were no requests for further changes to effects to be appraised. In addition, the NCWG Chairman attended Working Group meetings for other subject areas.
- 9.3.3 Those organisations at meetings or included in subsequent correspondence were:
- Dartmoor National Park Authority (DNPA);
 - Natural England(NE);
 - Environment Agency(EA);
 - Council for National Parks (CNP);
 - Dartmoor Society;
 - The Ramblers Association;
 - Dartmoor Livestock Protection Society;

- Open Spaces Society (OSS);
- Dartmoor Preservation Association (DPA);
- Royal Society for the Protection of Birds (RSPB);
- Dartmoor Commoners Council; and
- Dartmoor Study Group.

9.3.4 The issues discussed at the NCWG meetings were:

- effects of military activities on Otters;
- erosion of blanket bog habitat;
- effects of climate change on the distribution of sensitive species/habitats;
- localised hotspots of erosion;
- noise and disturbance;
- increased disturbance due to improved public access;
- effects of refuelling activities on natural features;
- effects of increased siltation in streams on migratory salmonid spawning due to military activities;
- accidental fires;
- disturbance of birds due to military activities and Ten Tors event;
- damage to vegetation from digging activities; and
- damage from high explosive (HE) mortars.

9.3.5 The primary receptors are considered to be the habitats and communities, which may be affected by military activities and the habitats that are available for key species, ie those that might be affected by military activities. The key aim of the EA is to investigate whether there are any different effects on key species or habitats on DTA compared to areas outside the defined training area.

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

9.3.6 The following effects were scoped-in in the Scoping Report prior to detailed discussion with stakeholders through the NCWG.

- Potential effects of military activities on vegetation: activities which could result in the disturbance of vegetation such that its composition has changed to the point that it is outside the span of normal stable Dartmoor plant communities.
- Potential effects of disturbance from military activities on populations of common (widespread) birds:

Effects Subsequently Scoped-in into the Appraisal

9.3.7 Following Scoping Report responses and discussion at the NCWG meetings it was decided that some of the issues originally scoped-out of the EA should be given further consideration and the scope was further refined to identify the effects that needed to be considered in detail. The following potential effects from military activities have therefore been scoped-in to the Appraisal.

- Erosion effects on blanket bog habitat from military training (troop movement on foot, military vehicles off track and mortar fire): It was suggested at the NCWG meetings that there is evidence that in certain locations the blanket bog is drying and eroding at the edges (outcrops and edges). This makes wet habitats and these eroding areas fragile and susceptible to physical damage by vehicles (rutting and secondary effects), people and animals as well as natural processes of weathering (water, freeze thaw and wind) with extensive areas of peat hags developing. It was suggested that erosion is thought to be worst across approximately 200ha of DTA.
- Potential erosion effects on habitats (other than blanket bogs) from military training: Areas subject to erosion by other factors could be exacerbated by military activity.
- Effects on the distribution of sensitive species/habitats (blanket bogs and dry heaths) from climate change effects exacerbated by military training: Possible changes in future climate (e.g. more extreme short term weather events) may affect the way military training effects on natural features. In this case new mitigation measures may be required to offset these effects.
- Damage effects on habitats from military activities.
- Damage effects on habitats from accidental fires: There is a higher risk of wild fires on Dartmoor due to increased vegetation caused by reduction in stock grazing. Fires can damage the natural environment and wildlife.
- Damage effects on dry vegetation habitats from military training (digging activities): Digging can kill or retard vegetation if turfs are not replaced carefully.
- Damage effects on habitats from use of HE mortars: HE mortars can create small holes if delayed fuse setting used and scythe vegetation if impact (super quick) fuses used.
- Pollutant effects on habitats within watercourses from vehicle and aircraft refuelling activities: Some bulk refuelling does take place on the open moor but this happens infrequently (approximately four times each year) when necessary for operational training. Jerry cans are used more frequently up to 30 times a year.
- Effects on Otters (SAC feature and UK BAP priority species) from military training. The species is known to occur within the training area boundary. In upland environments Otters are known to use even small streams to migrate between catchments and move through the landscape
- Siltation effects on migratory spawning salmonid from military training. Increased siltation within DTA may arise from eroding blanket bog-organic matter and fines, silt from tracks (fine, medium and large particulates) or mobilisation of fine sediment at fords. Blanket bog erosion and the wash from track run off are considered the primary sources.
- Disturbance effects on breeding birds from military activities:

- Disturbance effects on birds if public access to Tavy Cleave, Yes Tor and High Willhays is increased to 365 days a year: the potential effect on breeding Ring Ouzel in particular should be considered.
- There is some potential for disturbance of priority bird species due to military training but equal risk of disturbance from other recreational uses during the bird breeding season. Effects relating to Ten Tors are discussed separately in **Appendix 1.1**.
- Effects on nature conservation as a result of clearance, to prevent injury, of stock from areas being used for live firing: The effects of stock clearance on nature conservation and the achievement of Environmentally Sensitive Areas (ESA) objectives were identified as part of the scoping process relating to land use issues however, as the effects relate to nature conservation this effect has been considered as part of the appraisal of nature conservation effects.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

9.3.8 For certain elements of military activity it is known that there is no effect with regard to habitats and species as in general there has been no indication that potentially damaging activities are occurring. Therefore, the following effects and issues will not be considered further.

- Species that are covered by the BAP, which are known not to occur on DTA, will not be considered in the EA. However, habitats identified by the NVC survey, which may support unknown colonies of BAP species, will be considered further in the EA.
- Potential effects from military activities on bats: while a number of bat species are known to be present on DTA, it is considered that training on foot is unlikely to have an effect upon such species. The effect of military activities on bats has been scoped-out of the EA.
- Potential effects from military training on water voles: this species may potentially be present on any suitable watercourse. As no change in the type of training to be undertaken on DTA is proposed and the use of vehicles will remain limited, the effects of military training on water voles has been scoped-out.
- Potential effects from military activities on amphibians and reptiles: these species are likely to be widespread and activities on foot are unlikely to have a major effect due to the short-term nature of the activities. As there is no change in the type of training to be undertaken on DTA the effects of military activities on amphibians and reptiles has been scoped-out.
- Effects on nature conservation from overgrazing because of stock clearance during live firing. Management measures to prevent this effect have been implemented.
- Effects associated with changes to run-off rates from off-road vehicle use, drainage pools due to rutting from vehicle activity, spillages and chemical toilet waste; as these effects are managed through DTA's EMS and DTE SW SOs.

Effects Subsequently Scoped-out of the Appraisal

9.3.9 There were wide ranging discussions about a number of topics that were not originally scoped-in to the report. However, no additional effects have been scoped-out of the appraisal.

9.4 Environmental Management Measures

- 9.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs). The following measures are currently in place.
- Military bivouac sites are not located on river/ stream edges. This mitigates the potential effect of military training on otters.
 - To mitigate potential effects of military training on blanket bog habitat erosion, troop movements across the moor are controlled and managed with care for possible erosion. This includes the controlled use of tracks and paths. In addition MoD is working in partnership to re-wet some areas of blanket bog.
 - To mitigate the potential effects of climate change and in anticipation of an increased risk of fire during dry summer periods, MoD will continue to cut fire-breaks in dry heath habitats at Willsworthy.
 - To mitigate potential effects of military training causing localised hotspots of erosion, DTA liaises with the National Park Rangers to identify erosion in order that measures to remove the cause can be put in place.
 - Since 2002, MoD's Dartmoor Maps have shown the tracks that can routinely be used as double dashed lines, while other tracks are shown as paths with single dashed lines in order to simplify compliance with DTE SW SOs.
 - Off track activity is carefully planned and controlled to reduce the risk of erosion.
 - There is currently no access to Tavy Cleave, Yes Tor and High Willhays during live firing and letterboxing is prohibited in Tavy Cleave during the bird breeding season. This reduces the potential effect of public access.
 - To mitigate the potential effects of refuelling activities during military training activities, DTA's EMS and DTE SW SOs cover this; sites are carefully selected away from water courses, spill kits are required as a precaution and major spill emergency plans are in place.
 - To mitigate the potential effect of increased siltation caused by military training or track maintenance, high level carriers and cross drains divert most water off the tracks and onto the moor, where it is filtered by the vegetation.
 - To mitigate the potential effect of accidental fires, DTA is a member of the National Park Fire Liaison Group and the Forest Fire Group, which aim to prevent fires and establish appropriate fire management controls across Dartmoor.
 - In addition MoD manages military activities to minimise the risk of accidental fires.
 - Fire breaks have been cut at Willsworthy to prevent fires spreading and during any controlled burning MoD observes the swaling code.
 - To mitigate the potential effects of military training and Ten Tors event on birds due to disturbance MoD has agreed with DNPA and NE that sensitive bird breeding areas are to be avoided where possible and where it is necessary for troops to enter these areas military personnel will not linger. To support this, an amendment to the sensitive bird breeding areas has been promulgated.

- To mitigate the potential effects of digging activities damaging vegetation, digging sites are carefully selected to avoid geologically and ecologically sensitive areas. DTE SW SOs require military users to ensure that earth and vegetation is carefully replaced. No digging takes place in sensitive bird breeding areas during the breeding season.
- To mitigate the potential effects of HE mortars causing damage to vegetation an impact super quick fuse setting is normally used to reduce any damaging environmental effect. In addition the impact areas where mortars are fired are selected to minimise effect on sensitive species and habitats.
- MoD undertakes remediation where military training is considered to be the cause of erosion

9.4.2 The following additional mitigation measures have been identified during the appraisal.

- To mitigate further the potential effect of military training on otters, any areas that are identified as being important for otters will be avoided when planning military activities. Any new information about otters will be used to amend training activities and applied through DTE SW SOs. In addition MoD will agree with nature conservation stakeholders the need and TOR for further survey and/or research to assess possible effects.
- To mitigate further potential effects of military training on blanket bog habitat through erosion, Natural England will make data on erosion hotspots available to MoD to assist with planning of military training activities.
- The effects of tracked vehicles will be dealt with through an Appropriate Assessment.
- To mitigate further the potential effects of climate change and an increased risk of fire, MoD will actively consider and address future effects as necessary and identify suitable mitigation.
- To mitigate further potential effects of localised hotspots of erosion from military training causing, some management of Western Gorse may be required.
- To mitigate further the potential effect of increasing public access to Tavy Cleave, Yes Tor and High Willhays, it is necessary to assess how different types and levels of access may influence the potential level of disturbance. This can be used to inform appropriate mitigation. To support this MoD will investigate the effect of public access disturbance on Ring Ouzel breeding success at other sites.
- DNPA could control the levels and type of public access by managing the size of Willsworthy and Lane Head car parks, prohibiting letterboxing, appropriate signage and path management. The more extreme measure of closing the area could also be invoked.
- To mitigate further the potential effects of refuelling activities during military training activities, DTA will continue to review and enforce existing DTE SW SOs.
- To mitigate further the potential effect of increased siltation caused by military activities, MoD will consult the Environment Agency to gather available spawning location and parr data. This will be used to determine the importance of this issue and any appropriate mitigation.
- MoD will continue to ensure track maintenance diverts surface water off tracks onto the moor to reduce surface water wash off from tracks

- MoD will continue to work in partnership to minimise peat erosion as primary source of silt.
- To mitigate further the potential effect of an increase in accidental fires MoD's Service Provider is providing training for their staff so that they can assist in fire prevention and controlling small fires.
- To mitigate further the potential effects of military training and Ten Tors event on birds due to disturbance, the DTA map will be reprinted with the revised sensitive bird breeding areas and information overprinted.
- To mitigate further the potential effects of digging activities damaging vegetation, the NVC will be used to create ecological sensitivity maps that can be used to inform the location of digging activities.
- To mitigate the potential effects of HE mortars causing damage to vegetation, the NVC survey will be used to create ecological sensitivity maps that can be used to inform military personnel of the location of affected areas.

9.5 Assessment of Potential Effects

Data Gathering and Survey Work

Data Sources

9.5.1 The data sources that have been used in compiling this Chapter are as follows:

- Dartmoor National Park Authority and English Nature, 2001, The Nature of Dartmoor; A Biodiversity Profile, (2nd Edition) ISBN 0 905981 52 9;
- Action for Wildlife The Dartmoor Biodiversity Action Plan (BAP), 2001, ISBN 0 905981 53 7;
- English Nature, 1989, North Dartmoor Site of Special Scientific Interest (SSSI) citation;
- English Nature, 1989, South Dartmoor Site of Special Scientific Interest (SSSI) citation;
- Joint Nature Conservation Council (JNCC), 2002, Dartmoor Special Area of Conservation (SAC) site selection criteria;
- Kaczanow JJ, 2002, MoD: Okehampton Training Camp, Chiropteran Appraisal;
- Rodwell et al (1991), British Plant Communities;
- RPS Planning, Transport and Environment, 2006, Dartmoor Training Area; Ecological Review;
- Gregory et al (1996, 1997) The Breeding Bird Survey 1994 – 1995. British Trust for Ornithology;
- Dartmoor Steering Group (1987), the Environmental Baseline; first resurvey of the Crater Zone Plots;
- Cramber Training Area National Vegetation Classification (NVC) Survey 2002;
- Defence Estates (2002), NVC Survey of Willsworthy Training Area, Dartmoor, WSP Environmental UK;

- West Country Rivers Trust, telephone discussion on use of streams by salmonids;
- Environment Agency, telephone discussion on Salmonid data;
- Various NVC surveys (2005 and 2006), DE reports; and
- Stanbury A et al, (2006), Breeding Bird Survey, DE/RSPB report.

Survey Work

9.5.2 Two major pieces of work have been commissioned over the last three years to inform the management of military activities on Dartmoor.

National Vegetation Classification survey

9.5.3 A National Vegetation Classification (NVC) survey was undertaken over two years with four different consultants undertaking the work to survey 10,000 ha of land. This followed the standard recording methodology of the NVC. To ensure adequate definition was achieved the area was divided up into polygons by the EST, Natural Environment Team and each polygon was then surveyed. This has produced the most detailed survey available of DTA.

9.5.4 As a supplement to the NVC survey, the surveyors were asked to record peat depth which helps with quantifying the communities present and to identify if there were any areas that clearly showed the effects of military activities.

Breeding Bird Survey

9.5.5 A survey of breeding birds was commissioned to quantify the bird species present and to give an idea of magnitude of population. The survey covered not only the training area but areas surrounding the training area to see if there were differences in population index levels present within DTA and the surrounding area to provide information on whether there were effects from military activities on the birds present within DTA.

9.5.6 The survey covered all of DTA rather than a sample of survey squares inside and out of the training area and is considered to give the most comprehensive coverage of bird populations ever undertaken on Dartmoor.

9.5.7 Using the data collected it was possible to research certain aspects of population indices with environmental factors. This extrapolation of extra research not normally undertaken when doing these surveys has added greatly to the understanding of Dartmoor's birds.

9.5.8 Additional survey work was undertaken to identify where certain species occurred on Dartmoor. This data has been used to produce a sensitivity map of where these bird species are present during the breeding season. Species covered by this new map are Ring Ouzel, Dunlin and Golden Plover. The bird breeding areas are shown on **Figure 9.2**.

Current Conditions

Overview

9.5.9 Okehampton, Merrivale and Willsworthy form a contiguous entity in terms of the training area on North Dartmoor, of which a large proportion is designated as North Dartmoor SSSI and Dartmoor SAC. Cramber and Ringmoor, which lie on South Dartmoor, are two areas of land that link along a small boundary and lie outside of but adjacent to the South Dartmoor SSSI and Dartmoor SAC. Effects from military activity on statutory nature conservation sites are therefore primarily issues for Okehampton, Merrivale and Willsworthy. MoD only has the freehold for Willsworthy, with the remainder held under licence. Therefore, the maintenance of semi-natural (plagioclimax) habitats and control of

agricultural livestock management and intensity of grazing (except where caused by clearance) is outside MoD's responsibility on Okehampton and Merrivale.

- 9.5.10 The overall current status (at 1st June 2006) of the North Dartmoor SSSI is that 81.29% is meeting the Public Service Agreement (PSA) target (23.19% 'favourable' and 58.10% 'unfavourable recovering') and 18.71% is failing to meet the target (17.55% 'unfavourable no change' and 1.17% 'unfavourable declining'). On MoD freehold land at Willsworthy all the units are classified as 'unfavourable recovering'.
- 9.5.11 The Dartmoor BAP is relevant to the entire DTA. Again, although MoD actively supports the Plan, it does not have responsibility for environmental management other than of effects caused by military activity except on its freehold at Willsworthy.
- 9.5.12 The Environmental Impact Assessment (EIA) supporting the planning application for military training on Cramber (outside the designated areas of the SSSI and SAC) indicated that the primary areas of concern in terms of ecological receptors identified by a review of the statutory designations and the BAP were limited to habitat features and possibly common birds. A high proportion of the key issues highlighted by the BAP are associated with habitats occurring on the unimproved new takes and in bye land off the open moor and outside the areas used by the military.
- 9.5.13 New takes are enclosed moorland that historically was used extensively but controlled by individual farmers unlike the open moor. It forms part of the core of a farm holding, but in a typical upland farming system, it usually remains in use as permanent pasture or meadow. In bye land is usually located on lower ground and as a result of a variety of factors such as soil conditions, micro-climate and historic management, the land often supports habitat that are botanically rich, providing it has not been adversely affected by agri-chemicals. The land often contains water features (e.g. flushes) which are circum-neutral, and support rich invertebrate communities, e.g. populations of marsh fritillary butterfly or the rarer odonata.
- 9.5.14 As a result of Dartmoor's designation as a National Park, full surveys of habitats and species within the area have been undertaken on a regular basis by a variety of organisations and this process is continuing. The areas in question are therefore well surveyed.

Okehampton and Merrivale

- 9.5.15 Okehampton and Merrivale are on the highest part of the moor and remote in terms of access irrespective of constraints on access resulting from its use for live firing. Grazing has brought about the present vegetation and conservation interests. Stock clearance from the areas used for live firing within the Range Danger Areas (RDAs) may have had an effect. While Government agricultural policy since the 2nd World War has driven farm production and led to over-grazing of the moor, the military constraints on agriculture, remoteness (in terms of distance from farm holdings), vegetation (blanket bog) and topography have contributed to unique conditions where some key biodiversity species have survived, especially bird species.
- 9.5.16 Okehampton and Merrivale support small populations of Red Grouse, Dunlin and Golden Plover as well as Ring Ouzel; all species of upland and/or montane habitats. These species occur here at the very southerly edge of their range. In part, the available habitat dictates a small population but again agricultural grazing pressure has probably been the main cause for the decline in at least the grouse population as grazing pressure effects the abundance of heather, which is the grouse's primary food plant. Stocking density could also have affected habitat characteristics for the other wader species as well as trampling of nests, which, with such a low population, could be an important contributing

factor. The longer-term effects of climate change cannot be ruled out as key habitats such as blanket bog may be lost or degraded. The weighting of how important each factor is in affecting such small populations of birds is difficult to quantify but general habitat degradation by grazing livestock is probably the key effect and the new agri-environment policy tools ie environmental stewardship should help to reduce this effect.

9.5.17 The habitats of Okehampton and Merrivale that are covered by European and National legislation are:

- Northern Atlantic wet heaths with *Erica tetralix* (ref: H4010) defined by the NVC as M15, M16 and M21 communities;
- European dry heaths (ref: H4030) defined by the NVC as H4 and H12 communities; and
- Blanket bogs (ref: H7130) defined by the NVC as M17.

9.5.18 The SSSI designation supports the wider extent of habitats as does the BAP. For the habitats covered by both, there is an intention stated in CROW Act 2000 to enhance certain degraded habitats. Past surveys have not quantified the extent of each habitat and MoD is in the process of delivering a full and detailed quantification of the extent of the key communities that need to be considered within the MoD licensed area. To date fifty percent of the Okehampton and Merrivale areas of DTA have been surveyed.

9.5.19 It has been suggested that past shelling of areas of blanket bog was damaging to this habitat however, the use of artillery HE shells ceased in 1991. Assessments of its ecological effect indicated that it might have been important in creating spatial diversity by providing wet areas required for key species of biodiversity importance, especially where large areas of uniform *Molinia* dominated vegetation existed.

9.5.20 The key ecological issues within Okehampton and Merrivale Training Areas are habitat effects and some key bird effects. Generally, there are no significant effects in relation to the species present within the in-bye habitats or on the edge of the moor, though some BAP species are present.

9.5.21 An appraisal of the bat species in and around Okehampton Camp was undertaken in 2002. Brown Long-eared, Common Pipistrelle, Daubenton's, Noctule, Pipistrelle sp., Soprano Pipistrelle, Natterer's and Whiskered/Brandt's bats were found. It is likely that the habitat around the edge of Dartmoor is important for these species in providing feeding areas but generally it is considered that military activities do not affect these species. There are no records for key species such as Greater Horseshoe Bat, in terms of roosting or breeding sites, on the Okehampton and Merrivale Training Areas.

Willsworthy

9.5.22 The majority of Willsworthy is freehold, however a small part on the north-eastern side is licensed. Most of the holding, lying on the periphery of Dartmoor, has been subject to the intensive grazing typical of the area. Therefore the vegetation has been degraded to some extent by its agricultural use such that approximately half of Willsworthy comprises grass-dominated communities. The dry heathland vegetation types account for about a quarter of the vegetation types present. The more distant north-eastern and eastern parts of Willsworthy have been less intensively affected by agricultural use when compared to other margins of Dartmoor. In character, this area starts to support some of the wetter habitats more typical of Okehampton and Merrivale.

- 9.5.23 The NVC Report of Willsworthy identified no rare or scarce plants. The only BAP species present is heather. However, this survey did not cover lichens or bryophytes except where covered by the NVC hence only the key species were identified.
- 9.5.24 Five farms fall within the Willsworthy holding and support some interesting wet flush communities.
- 9.5.25 Tavy Cleave has long been renowned as a site for Ring Ouzel.

Cramber

- 9.5.26 Assessment work completed as part the Cramber EIA included an NVC survey to identify the habitats present. Bird surveys are being undertaken in order to try to identify if there are any differences in bird abundance compared to areas outside of DTA. No other species of biodiversity interest on Cramber has been identified.
- 9.5.27 The results of the NVC survey were used to identify abundances of food-plant or potential habitats, which might have supported some overlooked areas for key biodiversity species for example Marsh Fritillary (*Eurodryas aurinia*) and Southern damselfly (*Coenagrion mercuriale*) respectively. No further colonies of BAP listed invertebrates were found.
- 9.5.28 Following the NVC survey, a number of plant communities typical of Dartmoor as a whole were identified. As expected, plant communities, which are a product of agricultural management over centuries of pastoral and industrial use, were also found. There was no evidence of disturbance communities, which might have been indicative of the effects of military activity.

Ringmoor

- 9.5.29 Ringmoor has not been covered by MoD in the recent surveys of vegetation but the requirements for appropriate surveys will be looked at as part of the EA. The breeding bird survey has incorporated Ringmoor and will be analysed as part of the EA.

Significance Evaluation Methodology

Overall Approach

- 9.5.30 In order to assess the effects on flora and fauna, it is necessary to define the habitat areas and species that need to be considered as part of the assessment. The approach that has been taken in the EA is to identify 'valued ecological receptors' and, separately, to consider legally protected species (in accordance with guidelines produced by the Institute of Ecology and Environmental Management (IEEM), 2006). The use of these categories is explored below.
- 9.5.31 Consideration has been given to the sensitivity of different species and habitats to environmental changes resulting from military activities, reflecting the fact that certain species/species groups/habitats are more sensitive than others to certain changes. It should also be noted that, although this Chapter focuses on specified receptors, the assessments that have been undertaken always involve consideration of the relevant aspects of the ecosystem that supports these receptors.

Identification of Valued Ecological Receptors

- 9.5.32 This Appraisal focuses on species populations, habitats and designated sites of nature conservation importance (notwithstanding legally protected species, which are discussed separately below) that are of sufficiently high value in terms of 'biodiversity conservation' (which relates to the need to conserve representative areas of different habitats and the

genetic diversity of species populations) that an effect upon them could be significant – in these cases, the species population/habitat/site is treated as a receptor in its own right.

Biodiversity Conservation Value

- 9.5.33 In terms of biodiversity conservation value, species' populations, habitats and sites have been valued using the following scale:
- international;
 - UK;
 - national (i.e. England);
 - regional (i.e. West of England);
 - county;
 - district;
 - parish;
 - less than parish.
- 9.5.34 The valuation of sites makes use of established value systems (eg SSSIs are of at least national importance). Typically sites are only identified at the international, national and county levels, although in some areas of the country sites of lower value (eg district importance) are also identified. For each designated site, the habitats or species that qualify the site for designation have been identified, although for some non-statutory sites (eg Wildlife Sites), the qualifying features may not have been formally defined. In these circumstances, the features have been agreed with the designating authority (eg local authority or county wildlife trust).
- 9.5.35 For habitats and species, the identification of valued ecological receptors has been undertaken using a structured process to determine which species/habitats need to be subject to valuation and then making decisions about the value of species populations/habitats using professional judgement, informed by data derived from various sources.
- 9.5.36 The approach taken in this EA is that valued ecological receptors are defined as:
- species populations that are considered to be of county or greater importance in biodiversity conservation terms - therefore if a species population is considered to be of district value or less, there can be no significant effect on biodiversity ; and
 - habitats and sites that are of district or greater importance - no significant biodiversity effect can therefore occur to habitats of lower value.
- 9.5.37 These threshold levels of value have been selected, as they are the agreed level of importance within the statutory bodies with an interest in Dartmoor and reflect how valuable a receptor should be for an effect upon it to be material to licence re-negotiation. The selection of a lower threshold for habitats primarily reflects the fact that habitats are important for the communities of plants and the assemblages of animal species that they support, and that they may also have a function in terms of linking other habitats. The Dartmoor area as a defined threshold therefore captures a clearly defined and agreed working area of management.

Legal Protection of Species

- 9.5.38 Notwithstanding what has been said above, there is also a need to identify all legally protected species that could be affected in order that measures can be taken to ensure that contravention of the relevant legislation is avoided. Such measures should be acceptable to NE. By implication, therefore, it is inappropriate to assess the significance of effects within the context of species' legal protection - effects on such species have to avoid contravention of the law (ie to be 'non-significant'),
- 9.5.39 In certain situations, however, adherence to measures that are designed to ensure that the law is not contravened may not prevent a significant effect relating to a species' biodiversity conservation, social or economic value (ie in the context of the species being a 'valued ecological receptor' - see above). For example, it may be possible to avoid contravening the law regarding a legally protected species by translocating the population or the activity. However, if the species is sufficiently rare in the locality and is considered to be a valued ecological receptor, it may be concluded that the loss of the population from the site could be a significant effect in biodiversity conservation terms and that translocation would not adequately compensate for the loss. Such an effect would therefore need to be subject to detailed assessment and significance evaluation

Significance Evaluation

- 9.5.40 The significance evaluation process is described below in relation to negative and positive effects.

Negative Effects

- 9.5.41 For habitat areas and species, an effect is considered to be significant if the favourable conservation status of a valued ecological receptor is compromised by military activities. Conservation status is defined by IEEM (2005) as being:
- "for habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area; and
 - for species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area".
- 9.5.42 The decision as to whether the conservation status of a valued ecological receptor has been compromised has been made using professional judgement drawing on the results of the assessment of how each receptor is affected by military activities. The decision is informed by an understanding of relevant ecological processes.
- 9.5.43 A similar procedure has been used for designated sites that are affected by military activity, except that the focus is on the effects on the integrity of each site, defined as "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified" (see **Box 9.1**). For SSSIs and European wildlife sites, this assessment has been made with reference to the features for which the site has been classified/notified and involves combining assessments of the effects on the conservation status of each of these features.

Box 9.1 Effects on Integrity

The term 'integrity' was first adopted for assessing effects on biodiversity within the context of Appropriate Assessments for European wildlife sites, as required under the Habitats Directive. The principle of integrity in terms of the structure and function of sites is, however, equally relevant to designated sites that are not European sites. For this reason, the term was adopted by IEEM (2006) in its *Guidelines for Ecological Impact Assessment in the United Kingdom*.

Positive Effects

- 9.5.44 A positive effect is considered to be significant if training activities are considered to cause:
- an ecological receptor to become valued at a higher level on the scale set out above and for this value to be sustained;
 - an improvement in the condition of a habitat/species population from unfavourable to unfavourable recovering or favourable;
 - partial or total restoration of a site's favourable condition.
- 9.5.45 If a species population, habitat or site is already in favourable condition and there is no scope for an increase in the level of value of the receptor, it is still possible for there to be a significant positive effect. There is, however, no simple formula for determining when such effects are significant. In such cases, decisions about significance have therefore been made on a case by case basis, in the context of whether the effect should be considered material when making a decision about the licence renegotiation.

Assessment of Effects and Evaluation of Significance: Effects on Habitats***Erosion Effects on Blanket Bog Habitat***

- 9.5.46 Consultation with key stakeholders has indicated that erosion due to troop movement on foot, military vehicles off track and mortar fire may be affecting blanket bog habitat within DTA. However discussions with Natural England indicate that although this may have been an issue in the past it is not now seen to be significant.
- 9.5.47 Natural England and other stakeholders have recognised that in certain locations the blanket bog is drying and eroding at the edges (outcrops and edges). These wet habitats and eroding areas are fragile and susceptible to physical damage by vehicles (rutting and secondary effects), people and animals as well as natural processes of weathering (water, freeze thaw and wind) with extensive areas of peat hags developing. Congregation by livestock has been identified as probably the main contributor to the problem
- 9.5.48 Natural England has identified the areas where erosion is thought to be worst, which covers an area of approximately 200ha. Detailed work to map the areas is being undertaken by Natural England and stakeholders are discussing ways of addressing erosion effects.
- 9.5.49 MoD currently controls erosion effects by managing troop movements across the moor with consideration for possible erosion effects. This includes the controlled use of tracks and paths.
- 9.5.50 The erosion effects that are occurring have identified a need for further management, which comprises the following measures:

- MoD will be working in partnership to re-wet the blanket bog and an appraisal will be made to assess and cost what work is required.
- Natural England will make data on erosion hotspots available to MOD to assist with planning of military training activities.

9.5.51 The Blanket Bog areas are of prime concern as a primary European habitat that needs protecting. MoD is working with other stakeholders to take proactive management measures to mitigate damage. It is considered that the military effect on Blanket Bog is not significant.

9.5.52 An Appropriate Assessment will undertaken to assess the effect of tracked vehicles on the Dartmoor SAC. The information from the NVC survey will be used to inform the assessment work. The improved definition of the vegetation resource will add to the understanding of where sensitive areas are located and an overview will be produced for wider dissemination.

Erosion of Habitats Other than Blanket Bogs

- 9.5.53 Localised areas of erosion that could be exacerbated by military activity were raised as a potential effect through the NCWG consultation process.
- 9.5.54 During the 1980s, surveys of all tracks were undertaken and erosion areas identified. As a result, measures were taken to limit the quantity of tracks used routinely by troops, tracks were blocked off and encouraged to revert to moorland and repairs made to those retained in routine use.
- 9.5.55 In addition, current management measures are in place to mitigate erosion effects from military training, including:
 - liaison between Comdt DTA and the National Park Rangers to identify areas of erosion in order that measures to remove any military cause can be put in place;
 - mapping (since 2002) of DTA to show those tracks which can be routinely used for military use (shown as double dashed lines) and those which are to be used as paths (shown as single dashed lines) in order to simplify the implementation of DTE SW SOs; and
 - the careful planning and control of off track activity to reduce the risk of erosion.
- 9.5.56 Information from the recent NVC survey work has been used to identify any significant damage to vegetation that could lead to alteration of the plant community. No obvious areas of erosion were identified in terms of acute or chronic change due to the effects of wear from vehicle or human use. Only 'normal' wear was present and this was located along clearly defined walking routes.
- 9.5.57 As a result of recent survey work, it has been identified that some management of Western Gorse may be required to reduce erosion risk caused by channelling. However, overall the extent of areas of erosion is considered to be small and from a training perspective it is possible to manage the use of such areas if they become of concern and prevent aggravation of the problem. The information from the recent NVC survey work would indicate that there are no significant erosion effects occurring on habitats within DTA as a result of military activities. Furthermore, the management measures that are in place can be used to control any such erosion effects which may occur in the future and reduce those that are currently occurring.
- 9.5.58 The issues of erosion are now of relatively low concern. If they occur it is difficult to identify whether it is occurring due to military activities or recreational use. This issue has

been raised in the past and action was taken to minimise military effects. If areas are identified as being of concern, there is a standing working protocol between MoD and DNPA to manage the issue. The effects of military activities are considered to be not significant.

Climate Change Effects

- 9.5.59 Potential changes in the future climate as a result of climate change (eg more extreme short term weather events) may affect the way military activities affect natural features. In this case new mitigation measures may be required to offset these effects. The most likely change is that periods of dry weather will increase leading to a heightened risk of fires (see discussion below). However dryer periods will also aggravate erosion of the exposed peat areas. This would indicate that the proposed management measures in relation to the existing acute problems of the exposed peat should be made a priority and that re-vegetation is implemented as soon as possible. When the condition of blanket bog systems is improved, any effects from adverse periods of dry weather are likely to be reduced.
- 9.5.60 Climate change may also lead to an increased risk of fire during dry summer periods and therefore it is essential that the measures outlined below in relation to accidental fires are implemented.
- 9.5.61 It is considered that, provided the identified mitigation measures are implemented, the effects of climate change on erosion and accidental fire effects resulting from military activities will be minimised and are not significant.

Effects from Accidental Fires

- 9.5.62 The risk of wild fires on Dartmoor is heightened by the increasing quantity of vegetation caused by the reduction in stock grazing. Fires can damage the natural environment and wildlife resulting in the loss of habitats and species. Changes in the climate may increase vegetation growth further, increasing the risk.
- 9.5.63 There are several measures in place to control and minimise the risk of fires across DTA. These include:
- Comdt DTA is a member of the National Park Fire Liaison Group and the Forest Fire Group, which aim to prevent fires and establish appropriate fire management controls across Dartmoor;
 - management by MoD of military activities to minimise the risk of accidental fires, these include frequent risk assessments, restrictions on the use of pyrotechnics and tracer rounds, availability of first aid fire fighting equipment;
 - observation of the swaling⁶⁴ code by MOD;
 - provision of training for MoD's Service Provider's staff in order that they can assist in fire prevention and controlling small fires; and

⁶⁴ Swaling, the agricultural burning of heather and grass, though lawful between 1st October and 15th April, by custom on Dartmoor is completed before the end of March because of its potential disturbance to moorland breeding birds. Swaling during January and February is preferred but current weather patterns make this difficult. Properly carried out, swaling promotes the growth of young heather and is important for maintaining moorland habitats. Particularly sensitive areas for vulnerable bird species are now avoided through annual Fire Plans prepared by the Dartmoor Commoners' Council and local Commoners' Associations, assisted by the National Park Authority, English Nature and DEFRA. (Taken from DNPA Leaflet on Ground Nesting Birds).

- fire breaks cut to control the spread of fires on Willsworthy. Implementation of similar preventive measure across the rest of the open moor is still the subject of discussion between stakeholders.
- 9.5.64 The risk of accidental fires spreading across Okehampton and Merrivale remains a great concern, however, management of the risk by curtailing training, management measures and rapid reaction to small fires reduces the risk and it is considered to not be significant. On Willsworthy the cutting of firebreaks has reduced the risk to not significant. Cramber and Ringmoor, with no live firing, the risks of effects are considered to be negligible and not significant.

Effects from Digging Activities

- 9.5.65 Digging associated with military training can create disturbance that can result in the removal of vegetation and the disturbance of habitats. However, such effects from digging activities are considered to be not significant for the following reasons:
- the amount of digging is very small (around 100 trenches/shell scrapes a year) and is only undertaken in dry vegetation; more sensitive wetland and heather areas are avoided;
 - any holes that are dug comprise small trenches or scrapes, which are refilled and covered with replaced cut turfs; and
 - as the disturbance from digging is considered to be small scale, any disturbed areas will re-vegetate to be similar to the surrounding vegetation and form part of the same community.

Effects from HE Mortars

- 9.5.66 HE mortars can create small holes if a delayed fuse setting is used and scythe vegetation if impact (super quick) fuses are used. The following measures are in place to minimise the effects from HE mortars on vegetation:
- the impact (super quick) fuse setting is normally used to reduce the environmental effect; and
 - the impact areas where mortars are fired are selected to minimise effects on sensitive species and habitats.
- 9.5.67 Although mortars are used, the results from the NVC surveys would indicate that there are no areas where use is so heavy that changes in vegetation have occurred over even a limited area. Overall, the use of mortars is not resulting in a change in the habitats present, although the mortars do create areas of small scale disturbance which re-vegetates in the short to medium term. Disturbance from larger HE munitions has been monitored in the past but now these areas are difficult to re-locate and have re-established as typical vegetation on the moor. Therefore, overall it is considered that the current use of mortars is not having a significant effect on habitats present within DTA. In order to further minimise the effects on vegetation, it is considered that the results from the NVC survey should be used to create ecological sensitivity maps that can be used to plan military training so as to avoid sensitive areas.

Pollutant Effects from Refuelling Activities

- 9.5.68 It is possible that refuelling activities both within Okehampton Camp and out on the open moor could have an effect on watercourses should accidental spillage occur whilst this activity is being carried out. This could have a subsequent effect on the vegetation and species present in any such affected watercourse.

- 9.5.69 Bulk refuelling on the open moor happens infrequently (approximately 4 times each year) when it is necessary for operational training. More frequently (up to 30 times each year) jerry cans are used for refuelling. Within Okehampton Camp, refuelling takes place within a bunded area to minimise the spread of any spillages should they occur.
- 9.5.70 DTA's EMS and DTE SW SOs are designed to minimise the risk of pollution incidents; sites are carefully selected away from water courses, spill kits are required as a precaution and major spill emergency plans are in place. DTE SW SOs have been reviewed and have been found to be practical and effective. (Further information on mitigation is included in **Chapter 14**).
- 9.5.71 The risk of pollutant effects on watercourses is therefore not significant as the existing management measures minimise the risk of spillage and the spread of any pollutants should spillage occur. The risks are further minimised by the low frequency of refuelling activities on the open moor.

Assessment of Effects and Evaluation of Significance: Effects on Otters

- 9.5.72 Otters are a supporting feature of the SAC and UK BAP priority species. The species is known to occur within DTA. Any military activities occurring on rivers that form part of core otter territories combined with any recreational use in such areas could result in temporal use of the habitat. Most if not all otter populations are affected by disturbance on lowland rivers and have adapted their use of rivers to times of minimal human activity ie dusk and night. In upland environments otters are known to use even small streams to migrate between catchments and move through the landscape.
- 9.5.73 The distribution of otters on DTA and the way they use the catchment is not well understood. Therefore the effects of military training are not understood, however they are assumed to be very low due to the low level of military activity affecting rivers and streams.
- 9.5.74 If otters are using the streams within DTA it is likely to be primarily when young animals are searching for vacant territory, using marginal areas away from established territories or transiting between catchments. In these circumstances the effects of disturbance from military training is likely to have a limited negative effect, which is not considered to be significant.
- 9.5.75 Military training within DTA is managed so that bivouacs are not located on river or stream edges and tactical routes rarely follow streams as they make ideal sites for booby traps or ambush sites. These factors help to minimise any negative effects.
- 9.5.76 Military activities outside of the designated DTA (ie TOPL and walkover) on rivers that form part of core otter territories follow landowner and/or DNPA guidance. The level of military activities in such areas is very low and comprise of troops carrying out similar activities to the public with normally no more than 12 soldiers walking cross country across unenclosed land on any one route on any day.
- 9.5.77 These factors help to minimise any effects. However, further consultation with nature conservation stakeholders is required to establish whether any additional survey work is required in relation to this issue. National surveys have been undertaken by the Mammal Society. Other surveys have been undertaken but do not specifically address whether disturbance from military activities are having an effect on Otter populations. Areas thought to be important for Otters, which are identified through survey work, should then be avoided when planning military activities.
- 9.5.78 The effects from military activities on Otters are considered to be not significant.

Assessment of Effects and Evaluation of Significance: Effects on Migratory Spawning Salmonid

9.5.79 Increased siltation within DTA may arise from:

- eroding Blanket bog- organic matter and fines;
- silt from tracks – fine, medium and large particulates; and
- mobilisation of fine sediment at fords.

9.5.80 The blanket bog erosion and the wash from track run off are the primary sources that are considered to be a potential threat to the salmonid populations.

9.5.81 There are 2 fords on the Loop Road: one at White Bridge, which is normally bypassed over the bridge; and one at Deep Ford. Other fords on the open moor, such as at Cullever Steps, where the bridge is normally used, Henry's Ford and West Okement Sandy Ford are rarely used by vehicles. Most fords have hard or compacted bases. Wash, although a potential effect appears on further investigation to be an insignificant factor due to the base of the ford and the particulate size within the fords.

9.5.82 MoD has consulted the Environment Agency and West Country Rivers Trust to obtain spawning location and parr data. The Environment Agency data on water quality has not indicated that there is a problem in water quality with regard to the typical pollutants of water courses eg nitrates. There has also not been any concern or evidence of silt being created on the DTA that would be a problem to fish or invertebrate stocks. As discussed in **Chapter 14**, data indicate that the water quality is of a high level and able to support a good salmonid fishery. However the acidic water restricts growth of food sources and sudden changes in flow and depth reduce the capacity to hold fish.

9.5.83 In addition, DE EST has undertaken kick samples to assess invertebrate species diversity above and below fords to assess potential pollution effects of silt. Initial sampling showed no change in species diversity or population status above or below the ford areas.

9.5.84 By mapping the track network and areas of concern where there is eroding peat it is possible to visualise the rivers that would be affected. The track network on Okehampton primarily affects the East and West Okement watercourses which feed into the Torridge, the track network on Willsworthy feeds into the Tavy while the eroding bog areas are on the watershed of the North Teign and Tavy with possibly a minor input into the East Dart. Analysis of the Trout fry and parr data over a ten year period on the East and West Okement watercourses show a very stable and consistent level of population close to where the waters come off the training area. Numbers of fish typically range between 9 and 22 parr per 100 square metres of watercourse. These figures are considered to indicate a healthy level of population with no evidence of catastrophic pollution incidents. The Willsworthy brook which feeds into the Tavy supports higher numbers of juvenile trout with counts consistently up to 30 to 60 per 100 square metres of watercourse and smaller numbers but healthy counts of Salmon. The Tavy could also be affected by silt from the eroding peat but there is no evidence that this is a real negative effect. Finally the North Teign which might be expected to be primarily affected by silt from the eroding peat has consistent numbers of trout in the 6 to 16 parr per 100 square metres over the last ten years.

9.5.85 Existing management measures also help to ensure the siltation effects are avoided or minimised. For example, track maintenance, including the use of high level carriers and cross drains, diverts most water off the tracks and onto the moor, where it can be filtered. It is also recommended that Comdt DTA work in partnership with the National Park Rangers to minimise peat erosion as primary source of silt.

- 9.5.86 Although the issues of salmonid populations have been and remain of concern with affects of over fishing at sea and with poor water quality in rivers and silting of spawning beds the data for the rivers coming off Dartmoor are that the populations are healthy and stable. However we will continue to work with our fellow stakeholders to make further improvements and to prevent any deterioration in the catchments of these healthy clean rivers.
- 9.5.87 Overall, given the existing management measures in place and the information from data held by the Environment Agency and the results of survey work that there are no significant siltation effects associated with military activities on DTA.

Assessment of Effects and Evaluation of Significance: Effects on Birds

Noise and Disturbance Effects

- 9.5.88 Research into disturbance from noise has to be specific to the receptor species. Unless a species can be observed, as with larger species of birds where their populations are high enough to be able to observe a sample of the population, it may only be possible to look at relative abundances in different areas that are exposed to different levels of noise. If there is no danger associated with a particular noise many species will habituate to it or locally they may move.
- 9.5.89 The breeding bird survey did not indicate that there were any patterns of distribution in and around DTA that suggested there was a conservation problem. This would indicate that noise is having no significant effects on breeding birds.

Disturbance Effects from Improved Public Access

- 9.5.90 Currently when live firing is programmed, there is no access to Tavy Cleave, Yes Tor and High Willhays. Some consultees have requested that public access to these areas is increased, possibly up to 365 days a year. This would result in more public access and Natural England and DNPA have highlighted the potential for increased disturbance of breeding Ring Ouzel should this take place.
- 9.5.91 MoD have examined this issue and considered the possibility of reducing the RDA boundaries. Further discussion is included in **Section 11.5** on this issue.
- 9.5.92 If access was increased it would still be on days where usage would be lower as access is already available on most holidays and weekends. Research on bird species has identified that there is a hierarchy of disturbance from people with dogs, to people without dogs and then people in vehicles. In the areas mentioned above, it is probable that the biggest risks to birds failing to settle to breed or failing in breeding attempts are if birds are regularly disturbed or if birds are kept away from breeding sites over a prolonged period. As the levels of disturbance will be slightly higher if access was increased due to changes in the RDA boundary, the best management measures would be to ensure people moved through sensitive areas rapidly and did not stop, as well as keeping to regular i.e. predictable routes. In summary open access, congregating points, walkers with dogs could all increase the risk of disturbance.
- 9.5.93 DNPA could control the levels and type of public access by accepted management techniques like controlling the size of car parks and education i.e. appropriate signage and path management.

Potential Effects on Nature Conservation as a Result of Stock Clearance for Live Firing

- 9.5.94 The semi-natural habitats of Dartmoor are a product of diverse management over thousands of years. However the primary management to retain the existing habitats is grazing.
- 9.5.95 The situation until as little as 10 years ago has been concern over grazing levels. These have been far too high, which has had a major negative effect on many of the plant communities that are considered to be valuable on Dartmoor especially those with dwarf ericaceous species as a major component of the community.
- 9.5.96 Moving stock to areas of safety during live firing caused some aggravation to limited areas of ground. This was within the context of generally high grazing levels which were already considered to be damaging.
- 9.5.97 Recent changes in stocking levels associated with changes brought about by ESA agri-environment scheme and other developments on headage payments for example has changed the acute problems that were being faced a few years ago. The reversal of the high levels of grazing has lowered the damage caused by overgrazing and removed the aggravation of the situation caused by movement of stock.
- 9.5.98 MoD, in consultation with the Department of the Environment, Food and Rural Affairs (DEFRA) Rural Development Service (RDS), now part of Natural England, and commoners, only clears stock the minimum distance required for its safety. Ten years ago, the clearers were required to move all stock outside of the RDA boundary
- 9.5.99 Different bird species use or select different vegetational structures as their preferred habitat. The grazing levels and hence structure of the vegetation has started to change due to the changes in the grazing levels. These structural changes to the vegetation will cause some changes to the bird species that use certain areas. These local dynamic changes in bird populations have not caused concern to stakeholders.
- 9.5.100 The reduction in grazing levels and MoD's revised clearance pattern have reduced the effects of moving stock to places of safety to not significant.

General disturbance effects on birds

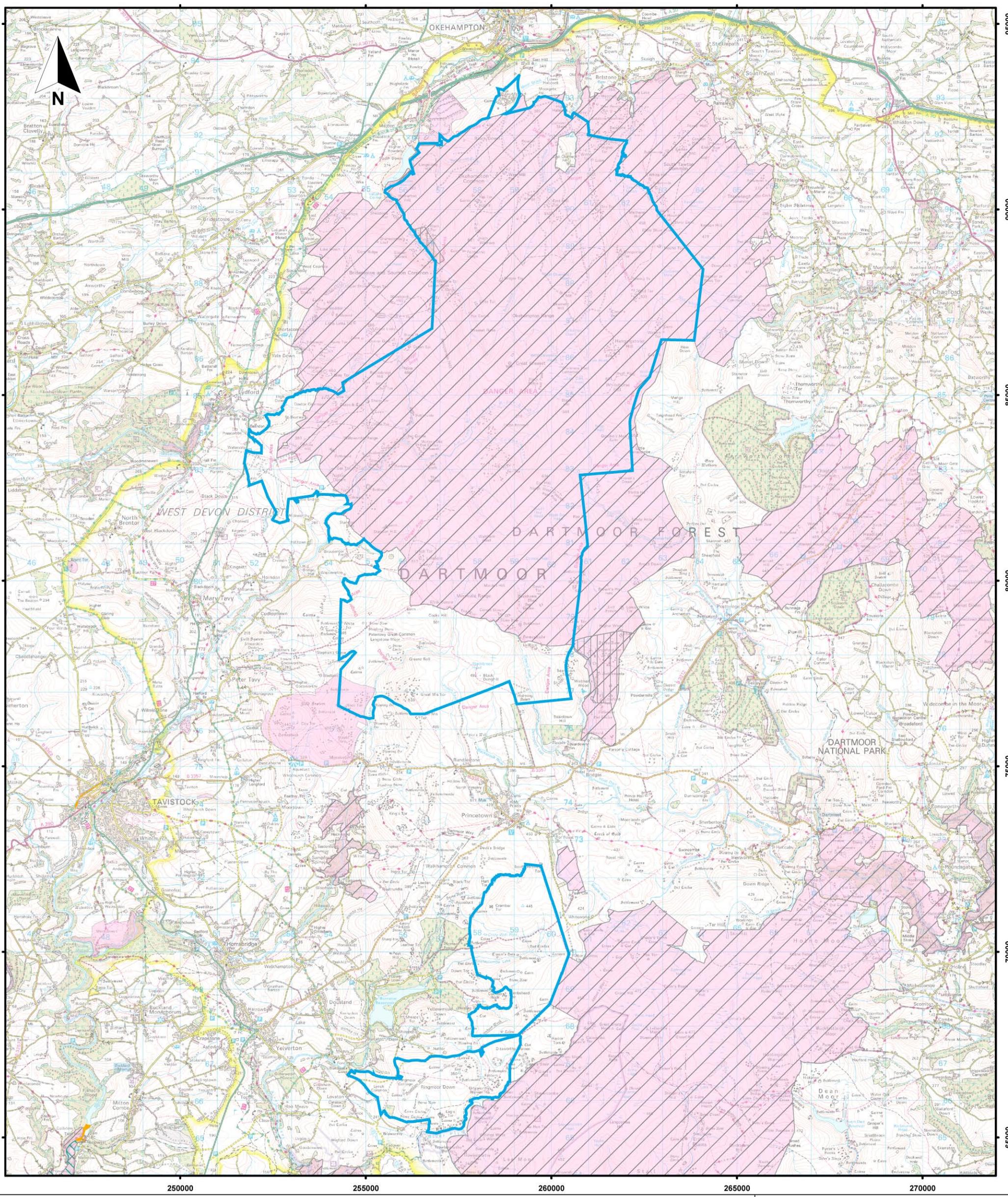
- 9.5.101 BBS 2006 has identified the key areas where the sensitive bird species breed. It provides a good base-line survey with analysis of past surveys brought into context and is a sound basis for the management of activities on Dartmoor.
- 9.5.102 MoD has agreed with DNPA and NE that sensitive bird breeding areas are to be avoided where possible and if necessary to cross these sensitive areas, military personnel do not linger.
- 9.5.103 A temporary mapping amendment to the sensitive bird breeding areas has been promulgated. This has been a major product from the SMTOD project.
- 9.5.104 MoD's Dartmoor map is to be reprinted with the revised sensitive bird breeding areas and information overprinted.
- 9.5.105 In conclusion, MoD now has a better understanding of the bird populations on the North Moor as more accurate data is now available. This data has allowed MoD to refine the sensitivity of DTA so that management of training can be improved to minimise effects on bird populations. The effects of training on the bird populations are considered to be not significant.

9.6 Summary of Significance Evaluation

9.6.1 **Table 9.2** summarises the findings of the appraisal for the nature conservation effects.

Table 9.2 Summary of Significant Effects: Nature Conservation

Receptor and summary of predicted effects	Type of effect ¹	Significance ²	
Habitats: erosion effects on blanketed bog and other habitats, climate change effects (in combination with military training), effects from accidental fires, digging, high explosive mortars and refuelling	-ve	NS	Overall, it is considered that the management measures currently in place control the effects of military activities and therefore such activities are not having a significant effect on habitats. This is confirmed by the results of survey work. The survey work has identified specific areas of erosion which will be avoided by the Military in the future as part of new mitigation measures identified in the Appraisal.
Otter: off-site disturbance from military training close to rivers and streams	-ve	NS	Effects are not considered to be significant because of the control measures implemented in relation to military activities. Further consideration will be given to undertaking survey work, any areas identified which may be important for Otters will then be avoided when planning military activities.
Migratory spawning Salmonid: effects from siltation associated with military activities	-ve	NS	Water quality and biological data for those rivers draining from DTA which may be used by these species is of good quality which would indicate that military training is not having a significant effect.
Birds: noise and disturbance from military activities, increased public access to Tavy Cleave, Yes Tor and High Willhays.	-ve	NS	The results of survey work indicate that military training is not having a significant effect on birds. The results of the surveys have also been used to plan military activities in order to reduce effects on breeding birds even further.
Key/footnotes:			
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2.	S Significant or NS Not-significant



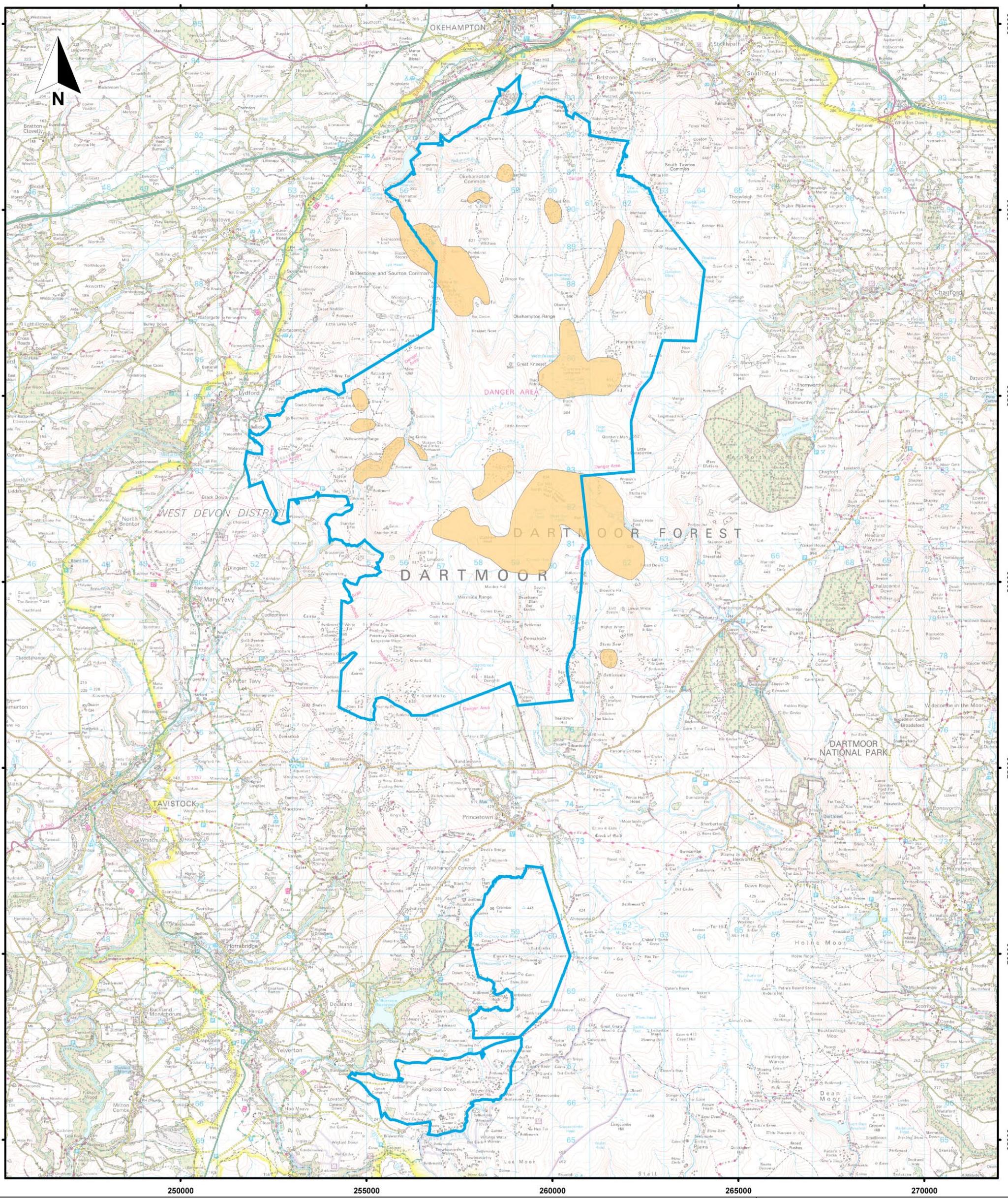
- Key:**
- [Blue Box] Dartmoor Training Area
 - [Pink Box] SSSI
 - [Hatched Box] SPA
 - [Vertical Stripes Box] National Nature Reserve
 - [Diagonal Stripes Box] SAC
 - [Orange Box] Local Nature Reserve

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 9.1
Nature Conservation Designations

0 1 2 3 4 5 Kilometers
Scale: 1:100,000 @ A3



Key:

- Dartmoor Training Area
- Rare Bird Nesting Areas

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 9.2
Rare Bird Nesting Areas

0 1 2 3 4 5 Kilometers
Scale: 1:100,000 @ A3



DARTMOOR TRAINING AREA

Environmental Appraisal

Noise

10

10. Noise

10.1 Introduction

10.1.1 This chapter reports on the appraisal of potential noise effects arising from the continued use of Dartmoor Training Area (DTA) as a military training area. Potential effects on residential dwellings near DTA, and recreational users on DTA are appraised. A noise assessment was carried out by Entec. John Bremner PGDip (Acoustics), AMIOA, undertook the assessment and wrote this chapter.

10.2 Context

- 10.2.1 Noise can have an effect on the environment and on the quality of life enjoyed by individuals and communities.
- 10.2.2 A noise assessment has been undertaken to determine the effects of noise at the nearest dwellings to DTA, as well as other DTA users, as agreed with Defence Estates (DE). The assessment compares noise levels that have been predicted using appropriate techniques, to noise limits presented in Government guidance to determine whether significant adverse effects are likely to occur.

Legislative Context

- 10.2.3 Legislation on noise issues is generally aimed at either noise nuisance or the control of noise at work. DTA must be operated in such a way as to avoid causing either a private (affecting one person or a small group of people), or public (affecting a greater number of people) nuisance. In addition, the noise exposure of military personnel will be subject to legislative control.
- 10.2.4 Key relevant legislation on noise issues includes:
- Environmental Protection Act 1990, Part III; as amended by the Noise and Statutory Nuisance Act 1993;
 - Control of Pollution Act 1974 as amended;
 - Pollution Prevention and Control Regulations (2000); and
 - The Control of Noise At Work Regulations 2005.

Policy Context

National Planning Policies

Planning Policy Guidance 24: Planning and Noise (PPG24)

- 10.2.5 The key national planning guidance document which provides guidelines on the assessment of noise issues associated with new developments is PPG24 *Planning and noise* (1994). This document gives general guidance to local authorities on the use of the planning system to:

“...minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.”

- 10.2.6 The guidance outlines the considerations to be taken into account in determining planning applications, both for noise sensitive developments and for activities which will generate noise. PPG24 recommends appropriate levels of noise exposure for residential development near existing noise sources and expresses this as noise exposure categories (NEC) for different noise sources.
- 10.2.7 The general principle of the approach is that the planning system should, wherever practicable, ensure separation of noise sensitive development and noisy activities. Where this is not possible, local planning authorities should consider whether it is practicable to sufficiently reduce the effects of noise through the use of conditions or planning obligations.

MoD Noise Management and DTE Impulse Noise Policy 2006

- 10.2.8 The MoD has an exemption on noise for operational purposes. However, a Policy Statement on the Management of Safety and Environmental Protection in the MoD indicates that:

“MoD policy is to fully comply with legislation, and only invoke exemptions on the grounds of National Security when such action is essential for the maintenance of operational capability. MoD will manage and limit noise to the minimum level compatible with the delivery of military capability.”

- 10.2.9 The DTE currently limits impulse noise exposure at training area boundaries to 130dB(C). This noise level was not imposed as a result of scientific reasoning or data but because it was considered that the 140dB(C) limit on impulse noise (from the Noise at Work Regulations of 1989) would be unacceptable to the general public and would lead to numerous complaints. This limit is not laid down in a formal document and is based on a statement made in the House of Lords to that effect, and does not constitute a legislative obligation, or Government or MoD policy per se.
- 10.2.10 130dB(C) is below the more stringent noise limits imposed by the current **Control of Noise at Work Regulations 2006**, which comprise a lower action limit of 135dB(C), a higher action limit of 137dB(C) and an absolute limit of 140dB(C). Where it is anticipated that 130dB(C) will be exceeded, DTE Commanders are to assess the operational risk incurred from stopping further training against the likely health and safety risk incurred from continuing. Where a significant operational penalty will be incurred DTE Commanders are authorised to increase the noise limit to 135dB(C). HQ DTE must be informed in these circumstances. The 140dB(C) limit is never to be exceeded.
- 10.2.11 With regards to setting precedents, MoD have stated the following:

“MoD are concerned that no precedent should be set on any environmental work that might limit its capacity to deliver its operational and training output. It recognises that there are civilian methodologies available for addressing the issue of noise in general, and the possibility of any increase in noise, significant or otherwise. However, it is essential that the operational imperative be protected unless legislation, or MoD commitments and undertakings, direct otherwise.”

Circular 02/99: Environmental Impact Assessment (EIA)

- 10.2.12 Circular 02/99 gives guidance on many types of development, none of which are directly applicable to DTA. However, whilst there are no airfields on Dartmoor, helicopters are used to support the training of military personnel. This document does give general guidance as to whether EIA is required for airfields, as follows:

"The main impacts to be considered in judging airfields are noise, traffic generation and emissions. New permanent airfields will normally require EIA. Smaller scale development at existing airfields is unlikely to require EIA unless it would lead to significant increases in air or road traffic."

- 10.2.13 The use of helicopters on Dartmoor can be described as small scale, approximately 11 flights per month on average, and it therefore follows that it would be unnecessary to undertake a full EIA on helicopter noise. However, for completeness, helicopter flights have been assessed in Section 5 of this chapter.

Regional Planning Policies

South West Draft Regional Spatial Strategy (SWRSS)

- 10.2.14 This document mentions noise in the context of new buildings and highways. The policies related to noise are not therefore applicable to DTA.

Local Planning Policies

Dartmoor National Park Local Plan First Review 1995 – 2011 (DNPLP)

- 10.2.15 Policy GP2 of this document states that:

"Planning permission will be granted where development will not unreasonably detract from the amenity enjoyed by neighbours by reason of factors such as noise... etc."

- 10.2.16 Though the continued use of Dartmoor as a military training area is not strictly 'development', noisy activities arising through military training are assessed as such, later in this chapter. Noise level criteria relating to the amenity of dwellings is available in the form of BS 8233 and the WHO Guidelines for Community Noise, described later in this Section.

Devon Structure Plan 2001 – 2016 (DSP)

- 10.2.17 Policy CO16 of this document states that:

"Development should not be located where it would result in a significant increase in the level of noise affecting existing or proposed land uses in the vicinity, and noise sensitive land uses should not be located in areas affected by significant existing noise."

- 10.2.18 The assessment of noise arising from military activity will indicate whether the continued use of Dartmoor as a military training area will result in significant increases in noise level at nearby sensitive receptors, compared to the theoretical situation where no training would occur. Where significant increases are predicted, potential mitigating circumstances are discussed.

Other Policies

Dartmoor National Park Management Plan Draft 2006 (DNPMPD)

- 10.2.19 The above publication sets out policies intended to retain the area of tranquillity as identified through the tranquillity mapping of CPRE (2006). A means to achieve this objective is stated as follows:

"The noise impact of both military and private low flying aircraft is minimised."

National Standards and Other Guidance

World Health Organisation (WHO) Guidelines for Community Noise (1999)

- 10.2.20 This guidance contains guideline values for community noise in specific environments, including inside and outside bedrooms. Compliance with these criteria should ensure that residents do not experience any significant disturbance from noise. External noise levels for outdoor living areas in terms of $L_{Aeq, 16h}^{65}$ during the daytime and evening periods, are recommended to be less than 55 decibels⁶⁶ (dB(A)) to avoid serious annoyance and 50 dB(A) to avoid moderate annoyance. With respect to the internal environment, noise guidelines for inside bedrooms so as to avoid critical health effects such as sleep disturbance are also specified by WHO in the publication. For example, to avoid sleep disturbance with the window open, outdoor values should be less than 45 dB $L_{Aeq, 8h}$ or 60 dB L_{Amax}^{67} .
- 10.2.21 It is however, important to view these guideline values in context. The WHO document also states that approximately 40% of the population of the European Union is exposed to road traffic noise in excess of the 55dB(A) value, and that half of all European Union residents live in areas that do not ensure acoustical comfort. These guideline values are therefore often viewed as aspirational long term targets and should not be considered as mandatory limits. The WHO guideline values are set at levels below which there is no impact from annoyance on human health i.e. there would be no significant health effects for the population at large. The UK Government considers that the guideline values are very low i.e. extremely cautious.

BS 8233:1999 Sound Insulation and Noise Reduction for Buildings

- 10.2.22 BS 8233 presents design criteria for internal noise levels for different rooms within a dwelling. Compliance with these criteria should ensure that residents do not experience any significant disturbance from noise.

⁶⁵ The equivalent continuous sound level. A notional noise level (in dB(A)) which has the same acoustic energy as a fluctuating A-weighted sound level over a specified measurement period T. Broadly this type of noise measurement can be considered to be representative of an average noise level over a given time period (T) (i.e. 16 hours).

⁶⁶ Decibels are a unit of noise. The threshold of normal hearing is about 0 dB and the threshold of pain between 120 and 140 dB. Decibels measured using an electronic weighting network ('A' weighting) which differentiates between sounds of different frequency in a similar manner to the human ear.

⁶⁷ The maximum noise level recorded, normally during a given monitoring period.

10.2.23 The criteria for bedrooms and living rooms which have been set to avoid sleep disturbance and ensure suitable resting conditions are as follows:

- Bedrooms Good $L_{Aeq,8hr}$ 30dB
 Reasonable $L_{Aeq,8hr}$ 35dB
- Living Rooms Good $L_{Aeq,16hr}$ 30dB
 Reasonable $L_{Aeq,16hr}$ 40dB
- For a reasonable standard in bedrooms at night, individual noise events should not normally exceed L_{AFmax} 45dB.

10.2.24 This information is based on World Health Organisation (WHO) guidelines for Community Noise (1999).

10.3 Scope of the Assessment

Potential Receptors

10.3.1 There are a number of individual properties located near the DTA boundary that have been considered as potentially representative sensitive receptors for this noise assessment. A shortlist of locations was subsequently drawn up and agreed with Defence Estates. The agreed locations are shown on **Figure 10.1** (at the end of this Chapter) and listed below under **Paragraph 10.5.13**. It should be noted that location 14 was identified later in the appraisal process.

Consultations

10.3.2 The locations agreed with DE were subsequently presented to David Sexton, an Environmental Health Officer at West Devon Borough Council for comment. The EHO was satisfied with the proposed monitoring locations as well as the proposed data gathering and assessment methodology. He also confirmed that WDBC has not received any complaints regarding live firing on Dartmoor. Planning officers at Dartmoor National Park Authority (DNPA) were also contacted regarding the noise monitoring proposals. DNPA was unable to provide specific details of complaints.

Effects Requiring Further Consideration

Effects scoped-in in the Scoping Report

10.3.3 The following effects were scoped-in to the appraisal in the Scoping Report:

- Noise effects outside of the RDA associated with live fire tactical training.
- Noise effects from dry tactical training on members of the public visiting DTA.
- Noise effects from off-road vehicle and helicopter movements.

Effects Subsequently Scoped-in to the Appraisal

10.3.4 No effects have subsequently been scoped-in to the appraisal. However, the monitoring locations were refined after visiting the site, and two extra receptors have been considered; that is recreational users on Dartmoor during dry (non-live firing) training and Ingo Brake Field, which is very close to Ingo Brake where the ambient noise monitoring was undertaken.

Effects not requiring further consideration

Effects Scoped-out in the Scoping Report

10.3.5 The following effects were considered to not require further appraisal in the Scoping Report.

- Potential noise effects associated with the majority of training activities: The majority of the activities associated with the above training including, for example running, crawling, digging, walking, camping are all inherently quiet and will have no effect on the noise climate of nearby sensitive locations in the vicinity of DTA.
- Noise effects associated with the use of wheeled vehicles on public roads: This has not been perceived as an issue historically and has therefore been scoped-out of the EA.
- Vibration effects associated with military activities: No significant vibration sources have been identified.

Effects Subsequently Scoped-out of the Appraisal

10.3.6 Noise effects from individual military vehicles on DTA, such as Land Rovers and personnel carriers, have subsequently been scoped-out of the appraisal. The noise levels associated with these activities are minimal.

10.4 Environmental Management Measures

10.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant (Comdt) DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing orders (SOs). The following measures are currently in place.

- The delivery of goods and stores by road is kept to a minimum to reduce associated road traffic and noise levels associated with road traffic.
- RDAs are closed during live firing which minimises noise effects on visitors to DTA.
- Allocated users are required to be considerate of other users when conducting adventurous and dry tactical training.
- SOs prohibit blank firing and use of pyrotechnics within 100m of civilians and within 200m of habitation.
- Times and locations of intense firing activity likely to cause inconvenience are carefully considered by HQ DTA when dry tactical training exercises are being planned. Observations are communicated to HQ DTA and recorded.
- Warnings of military training are given in DTA Walks and Rides brochure, information boards, High Moorland Visitors Centre display, DTA website.
- Public are notified of major exercises involving 4 or more aircraft supporting ground troops regulated by HQ DTA.
- Helicopter pilots are briefed to avoid horse riders and stock

10.4.2 Additional mitigation has also been identified and includes the following measures:

- Operation bright eyes (see **Paragraph 11.5.77** for further information).
- Dry training to avoid honey pot sites during popular times of the year thus minimised the noise effects of dry training on visitors to DTA (see **Section 11.4** for further information)

10.5 Assessment of Potential Effects

Data Gathering and Survey Work

Noise Monitoring

- 10.5.1 Continuous noise monitoring was undertaken at several receptors between 23 and 31 July 2007, for periods ranging from 48 hours to one week.
- 10.5.2 Noise levels were recorded at these receptors in order to determine typical ambient noise levels affecting the facades considered most likely to be affected by firing noise. Noise monitoring equipment was therefore installed on or next to each property near the façade facing DTA. The microphones were positioned 1.2 m above ground level, at least 3.5 m away from reflecting facades. Photographs of the equipment deployed at each location are presented in **Appendix 10.1**.
- 10.5.3 Noise levels were logged continuously over fifteen minute periods using Class 1 Rion NL-31 integrating sound level meters (SLM). The equipment was environmentally sealed and the microphones incorporated a large windshield to minimise the effect of wind on the measured data.
- 10.5.4 The measurement methodology was based on that contained within BS 7445:2003 '*Description and measurement of environmental noise - Part 1: Guide to quantities and procedures*'. The calibration levels of the SLM were checked before and after each set of measurements, with no significant drift in calibration recorded. Battery levels were also checked before and after the survey to ensure that they had remained within acceptable operating limits throughout.
- 10.5.5 Weather conditions during the monitoring period varied but remained broadly dry, with the exception of some periods of precipitation on 25th, 26th and 28th July. Recorded noise levels coinciding with periods of heavy precipitation or wind which has caused noise levels to be affected have been omitted from the data set, in order to prevent the average noise levels being artificially raised. Wind speeds varied, with some light to strong west and south westerly winds. Due to the exposed nature of some of the properties it is considered that the sometimes strong wind conditions experienced during the monitoring period were not atypical of this area.
- 10.5.6 Additional attended monitoring was undertaken for 15 minute measurement periods at various times during the day and night-time between 23 and 27 July 2007. The weather during each of these 'spot measurements' was conducive to environmental noise monitoring.

Noise Data for Noise Modelling

10.5.7 Noise level data for firearms has been sourced from a previous study for Warcop Training Area⁶⁸. This study lists L_{Aeq} , Sound Exposure Level⁶⁹ (SEL) and L_{Amax} noise levels in octave bands for weapons used at Salisbury Plain Training Area. The weapons for which noise levels are provided are as follows:

- Rifle, single shot and burst shooting modes;
- Light support weapon (LSW), single shot and burst shooting modes;
- General purpose machine gun (GPMG); and
- Hand held thunderflash (L28);

10.5.8 Helicopter noise data has been sourced from a report by QinetiQ⁷⁰. This report includes charts for predicting the noise levels of both Apache and Lynx helicopters at different heights, bearings and speeds. Noise data for Lynx helicopters has been used in the modelling process as Apaches are not routinely used as part of DTA operations. Other helicopters used on Dartmoor are Chinook, Merlin, Sea King, Puma, Gazelle, and Squirrel. Further information on helicopter statistics is included in **Table 2.4**.

Other Noise Modelling Data

10.5.9 Noise levels have been predicted using the computer noise model LIMA. LIMA uses the methodology contained within ISO 9613 “Acoustics - Propagation of sound outdoors” to calculate noise levels. The noise modelling process is complex, but in simple terms it involves the input of the following source data:

- receptor locations: (taken from Mastermap Ordnance Survey (OS) data);
- ground contours: (taken from Landline OS data);
- location of noise sources: each noise source is a point source, but its location is not necessarily fixed during an attack, or during target practice. Therefore the source is assigned a ‘track’ within its training area. LIMA then calculates the source position on the track which will result in the greatest noise level at the receptor, assuring a worst case scenario for each noise source; and
- location of barriers (e.g. dry stone walls, etc.).

Current Conditions

10.5.10 Noise sources within and around DTA, other than noise associated with military activities; include road traffic noise from the A30 dual carriageway, which bounds the site to the north, the A386 to the west and the A38 dual carriageway to the south. The B3357 and the B3212 roads bisect the northern and southern training areas. The nearest railway to DTA is approximately 1km north of Okehampton Camp on the northern fringe of DTA.

⁶⁸ ‘Appendix to Noise Evidence MOD/P/7/P Warcop Training Area, Proposals to Acquire Commoners’ Rights, Non-Statutory Local Inquiry’ (January 2001).

⁶⁹ The Sound Exposure Level if the total noise energy produced from a single noise event. The Sound Exposure Level is a metric used to describe the amount of noise from an event such as an individual aircraft flyover.

⁷⁰ QinetiQ, *Higher Level Environmental Assessment of the Noise Levels of WAH64 (UC)*.

The nearest major airports to DTA are adjacent to Plymouth and Exeter. Substantial china clay workings operated by Imerys and WBB Minerals are approximately 1 km south of Ringmoor and there is a large active quarry at Meldon on the northern boundary of Okehampton Training Area.

- 10.5.11 The noise environment around the southern part of DTA was characterised during the EIA for the Cramber Training Area. Measured background noise levels at six locations around the Training Area were between $L_{A90,15\text{min}}$ 27dB to 41dB. The dominant source of noise was described as “*naturally occurring such as birdsong and vegetation moving in the breeze*”. Aircraft activity was observed including civilian fixed wing and helicopters, and police helicopters. Very few man-made noise sources were perceived and localised road traffic was described as “*infrequent*”. This type of noise climate is typical of other areas around DTA away from main roads and areas of habitation.
- 10.5.12 Sensitive receptors, which have the potential to experience noise effects resulting from the continuation of military use of DTA, comprise mainly of residential properties close to DTA. Properties in larger villages and towns are further away from the main areas of DTA and will experience higher background noise levels than those measured during the Cramber study. The closest village or hamlet to DTA from which there have been occasional concerns regarding noise is Lydford, approximately 1 km to the west of the Willsworthy Training Area. Any surrounding industrial premises (including the china clay operations to the south) and farms are not normally considered sensitive receptors; as such sites are themselves commonly sources of noise.
- 10.5.13 Baseline monitoring was carried out at the fourteen receptor locations detailed below. The results from noise monitoring are presented in **Appendix 10.1** and shown in **Figure 10.1**.
- 1: Moorgate Cottage, to the north of Okehampton RDA (Unattended Monitoring Location: 259270 093132): The Moor Brook River was the dominant noise source at this location. Other noise sources included infrequent vehicles passing on the adjacent track, bird song and noise from sheep and ducks to the rear of the property. The microphone was positioned on the west side of Moorgate Cottage facing the Okehampton Camp in a free field position, 1.2m above the ground.
 - 2. East Okement Farm, within the north east area of Okehampton RDA (Unattended Monitoring Location: 260400 091200): Noise sources at this location included wind in the trees, noise from sheep and bird song. It is likely that farm operations such as agricultural vehicles manoeuvring would also have contributed to the ambient noise climate. The microphone was located in a free field position on the east of the property at 1.2m above ground.
 - 3. Higher Bowden, to north west of Okehampton Range and south east of the A30 (Unattended Monitoring Location: 255700 091800): The dominant noise source at this location was road traffic noise from the A30 (north of location). The microphone was positioned 1.2m above the ground and situated in a free field position to the north of the property.
 - 4. Higher Beardon, close to the A386 to the west of Willsworthy Camp and Range (Unattended Monitoring Location: 251800 084200): At this location road traffic noise on the A386, which bounds the property to the east, was the dominant noise source. Other noise sources included bird song and wind in the trees. The microphone was placed 1.2m above the ground, level with the gable end of the property facing the training area, in a free field position.

- 5. Ingo Brake, on the eastern side of Lydford village to the west of Willsworthy Range (Unattended Monitoring Location: 251100 084600): Noise sources at this location included wind in the trees, bird song and noise from ducks. Road traffic noise from the A386 was barely audible in the distance. The microphone was placed in a free field position to the east of the property, 1.2m above the ground.
- 6. Lanehead, south of Willsworthy Range (Unattended Monitoring Location: 253700 082200): At this location the dominant noise source was wind in the trees. Other noise sources included bird song, a dog barking and occasionally cars parking at the front of the Lanehead Cottage. The microphone was located in a free field position on the north western side of the property at 1.2m above the ground.
- 7. Brousentor Farm, south of Willsworthy Range and north west of Merrivale Range (Unattended Monitoring Location: 254500 080600): The dominant noise source at this location was wind in the trees. Other noise sources included noise from farm vehicles and farm animals such as cows, sheep and horses. The microphone was located at the north-west side of the farm in a free field position and 1.2m above soft ground.
- 8. Beardown Farm, south of southern end of Merrivale Range and north of B3212 (Attended Monitoring Location: 260400 075400): At this location the dominant noise source was wind in the trees and road traffic on the B3357 road. Other noise sources included the West Dart River, bird noise and aircraft noise (non-military). The microphone was positioned 1.2m above the ground in a free field position near to Beardown Farm on the public foot path to the west of the property. It should be noted that during the night-time measurement the wind in trees was a significant source of noise, though the microphone itself was shielded from wind effects directly on the microphone.
- 9. Tor Royal, North of Cramber Range and south east of Princetown (Unattended Monitoring Location: 260000 073100): At this location wind in the trees, bird song and noise from distant farm animals was heard. Occasionally, noises from a neighbouring residence (bangs and clangs) were also heard. The microphone was positioned 1.2m above the ground in a free field position on the south side of the property.
- 10. Yellowmead, south west of Cramber Range and north of Ringmoor Range (Attended Monitoring Location: 257100 067700): Due to difficulties with access to Yellowmead itself, noise monitoring was undertaken adjacent to the entrance to the farm complex. The microphone was located approximately 10m from the road. At this location the main noise sources were noises from animals in the fields; wind in nearby vegetation and agricultural vehicles working in Coliton and Gutter Tor fields in the distance. The microphone was positioned 1.2m above the ground and placed in a free field position.
- 11. Meavy, north west of Ringmoor Range and south of Burrator Reservoir (Unattended Monitoring Location: 254400 067200): At this location the dominant noise source was road traffic using the Dousland to Meavy road through the village, as well as bird song and wind in trees. Other noise sources were children playing at the nearby Meavy School and agricultural machinery in local fields. The unattended measurement location was in the rear garden of a property opposite the village school on Marchants Way, while the attended measurement was undertaken on the public footpath to the east of the village. During the attended measurement period some construction/refurbishment works were being undertaken within the school grounds and were producing some intermittent audible noise at the footpath location. In both instances, the microphone was positioned 1.2m above the ground in a free field position.

- 12. Brisworthy, south of Ringmoor Range (Attended Monitoring Location: 256000 065200): The microphone was located 1.2m above the ground in a free field position on the footpath to the north east of the property. Noise sources at this location included distant road traffic on local roads, wind in the trees and bird song. Other noise sources included intermittent dog barking and distant lowing of cattle in sheds at the farm to the south west. During the night-time survey the microphone was placed 20m to the west of the main dwelling road so as to avoid potentially disturbing residents in this property. The dominant noise source was wind in trees for the whole night-time measurement period.
 - 13. Postbridge, east of Merrivale Range on B3212 (Attended Monitoring Location: 264700 078900): Road traffic noise from the B3212 was the dominant noise source in this location. Other noise sources included bird song, wind in the trees and aircraft noise. The microphone was located to the west of the Postbridge Information Point, in a free field position, 1.2m above the ground.
 - 14. Willsworthy Range Boundary (Attended Monitoring Location: 252234 083257): Wind noise was the dominant noise source in this location. Other noise sources included bird song and distant road traffic on the A386. The microphone was located near to the Range Warden's Hut, in a free field position, 1.2m above the ground.
- 10.5.14 In order to facilitate a suitably conservative assessment it was considered that the 25th percentile noise level should be used for the assessment (further discussion is contained in **Appendix 10.1**). The 25th percentile is the value (or noise level) above which 75 percent of the observations may be found. For the daytime period, the 25th percentile $L_{Aeq,1hr}$ (between 0700 and 2300) has been used, and for the night-time period, the 25th percentile $L_{Aeq,15min}$ (between 2300 and 0700) has been used. The results are presented below in **Tables 10.1** and **10.2**. These will be used for the assessment in the next Section.

Table 10.1 25th Percentile Daytime Noise Levels

Location	Daytime	L_{Aeq,1hr} (dB)	L_{A90,1hr} (dB)
1. Moorgate Cottage	Weekday	47.6	40.7
	Weekend	45.1	40.4
2. East Okement Farm	Weekday	44.0	29.6
	Weekend	42.5	30.3
3. Higher Bowden	Weekday	48.6	45.5
4. Higher Beardon	Weekday	56.0	36.4
5. Ingo Brake	Weekday	41.3	36.6
	Weekend	38.0	36.1
6. Lanehead	Weekday	41.6	31.1
	Weekend	37.4	30.6
7. Brousentor Farm	Weekday	44.0	35.0
	Weekend	39.7	34.4
8. Beardown Farm*	Weekday	49.4	42.6
9. Tor Royal	Weekday	44.3	33.5
	Weekend	37.5	30.3
10. Yellowmead*	Weekday	44.2	38.1
11. Meavy	Weekday	41.0	31.1
	Weekend	39.5	31.1
12. Brisworthy*	Weekday	42.5	34.7
13. Postbridge*	Weekday	42.6	33.9

* 25th Percentile based on 15 minute periods due to limited data

Table 10.2 25th Percentile Night-time Noise Levels

Location	Daytime	L_{Aeq,15min} (dB)	L_{A90,15min} (dB)
1. Moorgate Cottage	Weekday	40.8	38.5
	Weekend	45.1	40.4
2. East Okement Farm	Weekday	32.0	28.4
	Weekend	36.6	31.2
3. Higher Bowden	Weekday	40.0	35.0
4. Higher Beardon	Weekday	43.4	33.4
5. Ingo Brake	Weekday	36.8	36.0
	Weekend	35.8	35.5
6. Lanehead	Weekday	32.2	28.3
	Weekend	26.2	24.7
7. Brousentor Farm	Weekday	38.3	36.3
	Weekend	35.6	33.7
8. Beardown Farm*	Weekday	45.9	44.1
9. Tor Royal	Weekday	34.6	29.9
	Weekend	30.3	36.2
10. Yellowmead**	Weekday	30.4	29.1
11. Meavy	Weekday	30.4	29.1
	Weekend	30.6	29.1
12. Brisworthy*	Weekday	36.0	29.2
13. Postbridge*	Weekday	37.9	33.7

**No night-time data. Data substituted from nearest receptor Meavy.

Significance Evaluation Methodology

Overview

10.5.15 The determination of significance is usually based on the relevant assessment criteria for the specific noise issue being assessed (e.g. PPG 24 NECs are used for site suitability for development, BS4142 criteria are used for industrial noise), although these assessment criteria are not directly related to the categories of 'Significant' and 'Not significant' that underpin EIA. The determination of significance in EIA is normally based on the sensitivity of a particular receptor (which depends on local circumstances), as well as the magnitude of change in noise levels (which is related to existing ambient and background noise levels and predicted noise levels due to the development). In this case, magnitude is also determined by the predicted noise levels due to military training and whether the predicted noise levels, following the incorporation of mitigation either exceeds or complies with relevant guideline noise limits.

Noise Sensitivity

- 10.5.16 PPG 24 focuses on residential properties as being noise sensitive, although it does cite developments such as hospitals and schools as containing buildings and activities that are potentially noise sensitive. However, it does not differentiate between these and therefore it is considered appropriate to determine sensitivity on a case by case basis at a local level.
- 10.5.17 Typically, the proposed residential properties on-site would be considered to be of medium sensitivity. For reference, receptors such as hospitals or care homes may be considered of high sensitivity and commercial or industrial units as of low sensitivity.

Noise Magnitude

- 10.5.18 The magnitude of change in noise terms is determined by two key factors, i.e. the amount of increase (or decrease) in noise levels due to the development, and the total amount of noise that will occur (or has been predicted to occur).
- 10.5.19 In terms of the amount of change in noise levels, this will only potentially become significant if the change is perceptible. **Table 10.3** summarises typical responses to changes in noise levels.

Table 10.3 Perception of Changes in Noise Levels

Change in Noise Level dB(A)	Response
< 3	Difficult to perceive
> 3	Perceptible
3 – 10	Up to a doubling of perceived loudness
> 10	Over a doubling of perceived loudness

- 10.5.20 With respect to the total amount of noise that would be potentially significant in a given development situation, magnitude also takes into account noise levels and limits outlined in the relevant guidelines relating to environmental noise, such as WHO and BS 8233.
- 10.5.21 The WHO guidelines recommend that for outdoor living areas, noise levels should not exceed $L_{Aeq,16hrs}$ 55dB to prevent the majority of people from being seriously annoyed. Noise levels below $L_{Aeq,16hrs}$ 50dB will prevent moderate annoyance. The WHO guidelines also state that at night-time, façade noise levels outside open bedroom windows should not exceed $L_{Aeq,8hr}$ 45dB (equivalent to 42 dB(A) free field), in order to prevent sleep disturbance. Design criteria for internal noise levels within dwellings presented in BS8233 is based upon these WHO guideline noise levels.
- 10.5.22 In summary, since the noise predictions undertaken for this assessment have been based on worst-case assumptions, it would be inappropriate to conclude that a high magnitude of effect has arisen simply because the relevant guideline limits have been exceeded. The apportionment of magnitude from low to high has therefore taken this situation into account by applying an element of professional judgement and this is guided by the amount that the predictions exceed the limits, together with the duration of the effects. **Table 10.4** therefore provides a summary of how noise magnitude will be determined for this assessment.

Table 10.4 Summary of Noise Magnitude Criteria

Noise Issue	Low	Medium	High
Daytime: Change in Ambient Noise Level, AND	Predicted ambient noise level less than 3dB(A) greater than baseline ambient noise level, AND	Predicted ambient noise level greater than 3dB(A), but less than 6dB(A), above baseline ambient noise level, AND	Predicted ambient noise level greater than 6dB(A) above baseline ambient noise level, OR
WHO Guidelines (daytime)	Predicted daytime noise levels below $L_{Aeq,16hr}$ 50dB in at least one outdoor living area per dwelling. Subject to frequency of occurrence and duration of effect	Predicted daytime noise levels less than $L_{Aeq,16hr}$ 55dB in outdoor living areas. Subject to frequency of occurrence and duration of effect	Predicted daytime noise levels exceed $L_{Aeq,16hr}$ 55dB in all outdoor living areas. Subject to frequency of occurrence and duration of effect
Night-time: Change in Ambient Noise Level, AND	Predicted ambient noise level less than 3dB(A) greater than baseline ambient noise level, AND	Predicted ambient noise level greater than 3dB(A), but less than 6dB(A), above baseline ambient noise level, OR	Predicted ambient noise level greater than 6dB(A) above baseline ambient noise level, OR
WHO Guidelines	Predicted night-time façade noise levels below $L_{Aeq,8hr}$ 45dB at bedroom window (42dB(A) free field). Subject to frequency of occurrence and duration of effect	Night-time façade noise levels exceed $L_{Aeq,8hr}$ 45dB at bedroom window (42 dB(A) free field), but internal noise levels comply with BS8233 'reasonable' criterion. Subject to frequency of occurrence and duration of effect	Night-time façade noise levels exceed $L_{Aeq,8hr}$ 45dB at bedroom window (42dB(A) free field) and exceedence of BS 8233 'reasonable' internal criterion by internal noise levels. Subject to frequency of occurrence and duration of effect

Summary of Determination of Noise Significance

10.5.23 As stated previously, significance is related to sensitivity and magnitude. **Table 10.5** presents a matrix which shows the interaction between sensitivity and magnitude, and how this has been used to determine the significance of any noise effects.

Table 10.5 Significance Matrix

Magnitude	Sensitivity		
	High	Medium	Low
Low	Not Significant	Not Significant	Not Significant
Medium	Significant	Not Significant	Not Significant
High	Significant	Significant	Not Significant

Assessment of Effects and Evaluation of Significance: Simulated Dry Fire Section Attack

Overview

10.5.24 The dry firing prediction calculations have been undertaken based on a typical small section attack, located in a position at the closest approach to each receptor, and in a location in the centre of the training area, in order to represent a worst case scenario, and a more representative typical scenario.

10.5.25 Based on information provided to Entec by the MoD, a representative section attack will take place over a fifteen minute period with intense firing lasting just two to three minutes. However, for tactical reasons, simulated attacks generally take place during first or last light.

10.5.26 A typical section attack would comprise of the weapons and ammunition detailed in **Table 10.6**.

Table 10.6 Weapons and Ammunition used in a Representative Section Attack (Dry Firing)

Weapon	Type	Ammunition	No. of Rounds per Attack
5.56mm Rifle	L85A2	5.56mm Blank	20
5.56mm Light Support Weapon	L86A2	5.56mm Blank	600
General Purpose Machine Gun	L7A2	7.62mm Blank Belted	200
Battle Noise Simulator	L28A1/A2	N/A	2

10.5.27 Noise measurements of such a typical section attack have been undertaken for the MoD previously, and this information has been made available to Entec⁷¹. The noise measurements comprised 1 minute sample periods over a five minute measurement period at distances of 10m, 500m and 1,000m from the attack location. This information is shown in Appendix 10.2. The noise measurements indicate that the intensive firing generally occurs during the first two to three minutes of measurement.

10.5.28 The 10m measurement of $L_{Aeq,5min}$ 90.1dB can be used to calculate the sound power level of the attack, using standard acoustic formulae. The shortest (10m) measurement distance is used in this instance as it should prove more accurate due to the closer proximity to the activity. With the longer distance measurements, it becomes more complex to accurately predict a sound power level due to the interaction of sound with the intervening air, ground cover and topography.

10.5.29 The predicted sound power level can be used for the prediction of noise levels at the noise sensitive receptors identified in **Sections 10.5**. The calculated sound power level for a simulated section attack is $L_{Aeq,5min}$ 118.1dB, based on the 10m measurement.

10.5.30 Using this calculated sound power level, predicted $L_{Aeq,T}$ noise levels over reference periods of 1 hour and of 5 minutes (used for day and night-time assessment respectively), have been predicted using the noise modelling package LIMA (taking ground cover, topography, etc. into consideration), for the selected noise sensitive receptors. Where a receptor is a building with more than one floor, noise predictions have been made at each floor height and the highest predicted noise level presented.

Dry Training at Centre of Training Areas

10.5.31 The predicted noise levels at the selected receptors for a simulated dry training section attack located in the centre of Okehampton/Willsworthy/Merrivale; and Cramber and Ringmoor Training Areas are presented in **Table 10.7** below. This can be thought of as an average or typical scenario when dry training is located at the centre of the Training Areas.

⁷¹ WSP Environmental, September 2002, Cramber Tor Training Area, Dartmoor, Environmental Statement

Table 10.7 Summary of Noise Predictions for a Simulated Section Attack in Centre of Range

Receptor	$L_{Aeq,1hr}$ (dB)	$L_{Aeq,5min}$ (dB)	L_{Amax} (dB)
1. Moorgate Cottage*	0.0	0.0	0.0
2. East Okement Farm*	0.0	0.0	8.6
3. Higher Bowden*	0.0	0.0	5.1
4. Higher Beardon*	0.0	2.5	11.4
5a. Ingo Brake*	0.0	1.6	10.5
5b. Ingo Brake Field*	0.0	0.0	7.7
6. Lanehead*	0.0	10.6	19.5
7. Brousentor Farm*	0.0	8.4	17.3
8. Beardown Farm**	0.0	10.3	19.2
9. Tor Royal**	1.7	12.5	21.4
10. Yellowmead***	26.4	37.2	46.1
11. Meavy***	15.4	26.2	35.1
12. Brisworthy***	25.7	36.5	45.4
13. Postbridge*	0.0	0.0	0.0
14. Civilian Recreational User of Dartmoor (100m)	65.1	75.9	84.8

* Exercise located in south east of Okehampton Range (Centre of Okehampton, Willsworthy and Merrivale Ranges)

** Exercise located in centre of Cramber Range

*** Exercise located in centre of Ringmoor Range

Results: Dry Training taking place in the Centre of Training Areas during the Daytime

Local Residents

10.5.32 The predicted $L_{Aeq,1hr}$ results show that without exception, noise levels for dry training in the centre of the Training Areas do not increase existing ambient noise levels at any residential receptor during both weekdays and weekends. In addition, the predicted noise levels at all receptors are below the $L_{Aeq,16hr}$ 50dB limit for outdoor living areas recommended in the WHO Guidelines. It should be noted that the existing noise level at Higher Beardon is $L_{Aeq,16hr}$ 65dB, which is above the upper WHO guideline noise level of $L_{Aeq,16hr}$ 55dB. However, this existing noise level is due to road traffic noise on the A386 and is unrelated to military training noise.

10.5.33 A magnitude of 'low' has been assigned to all of the effects at all receptors (see **Table 10.4**). When these magnitudes are considered alongside the 'medium' sensitivity assigned to the residential receptors, it is concluded that the noise effects would be not significant for dry training activities in the middle of the Training Areas during the daytime periods on both weekdays and weekends.

Members of the public on DTA

10.5.34 Members of the public using the DTA for recreational purposes are also considered to be sensitive to noise from daytime military dry training activities. As part of management

measures dry training activities must not take place within a minimum distance of 100m from members of the public. Therefore 100m has been taken as the closest approach distance in the modelling as a worst-case approach, however, typically exercises take place at a greater distance than this.

- 10.5.35 Spot measurements were made on Willsworthy Range in the absence of military training and ambient noise levels in the region of $L_{Aeq,15min}$ 37 to 38dB were recorded. The $L_{Aeq,1hr}$ is predicted to be 65dB from dry training activities at a distance of 100m. Predicted noise levels of this magnitude would be clearly discernible at a distance of 100m and would be likely to increase the ambient noise level by more than 6dB(A). Thus a magnitude of 'high' would be assigned to this effect, when using the methodology in **Table 10.4**. However, when this magnitude is considered alongside the 'low' sensitivity assigned to recreational receptors such as footpaths, it is concluded that the noise effects would be 'not significant' for dry training activities within 100m of members of the public in the middle of Training Areas during the daytime periods on both weekdays and weekends. The relatively short duration of such effects and the transient nature of the receptor location (walking along a predetermined footpath) would tend to reinforce this assessment.
- 10.5.36 It should be noted that blank firing on DTA is conducted so as to exercise consideration dependent upon the perceived sensitivity of the walker or rider. Whilst the 100m separation rule is a minimum, it is nearly always exceeded as a function of not disturbing other users more than is essential to complete training activities.

Results: Dry Training taking place in the Centre of Training Areas during the Night-time

Local Residents

- 10.5.37 The predicted $L_{Aeq,5min}$ results show that with the exception of Brisworthy and Yellowmead, noise levels for dry training in the centre of the Training Areas does not increase existing ambient noise levels at any receptor by more than 2dB(A) during both weekdays and weekends.
- 10.5.38 Predicted $L_{Aeq,5min}$ results indicate that noise levels for dry training in the centre of the Training Areas do not exceed the WHO guideline limits of $L_{Aeq,8hr}$ 42dB free field noise levels at any receptor both during the weekday and weekend. A magnitude of 'low' has been assigned to the effects at all of the receptors with the exception of Brisworthy and Yellowmead, when using the methodology outlined in **Table 10.4**. When these magnitudes are considered alongside the 'medium' sensitivity assigned to the residential receptors, it is concluded that the noise effects would be 'not significant' for dry training activities in the middle of Training Areas during the night time periods on both weekdays and weekends.
- 10.5.39 The predicted ambient $L_{Aeq,5min}$ noise levels at Brisworthy and Yellowmead exceed the existing ambient $L_{Aeq,5min}$ by 3.3dB(A) and 7.6dB(A) respectively, resulting in a magnitude of 'medium' and 'high' respectively, when using the noise magnitude criteria in **Table 10.4**.
- 10.5.40 Both of these noise levels ($L_{Aeq,5min}$ 39.3dB at Brisworthy and 38.0dB at Yellowmead) are below the WHO guideline limit of $L_{Aeq,8hr}$ 42dB free field. In addition, the predicted L_{Amax} noise levels of 45.5dB and 46.1dB respectively, are well below the WHO guideline noise level of L_{Amax} 60dB, outside open bedroom windows, which has been set to avoid sleep disturbance.
- 10.5.41 Given that most people during the time period 2300 to 0700 hours will be sleeping, the absolute noise level and the L_{Amax} noise levels are considered more appropriate, in terms of assigning noise magnitude, than the relative change in noise level, which might occur for around 15 minutes during a night. In this case therefore, it is considered more

appropriate to assign both Brisworthy and Yellowmead receptors a 'medium' magnitude of effect, as it is very unlikely that sleep disturbance will occur, even with open bedroom windows, but taking into account the relative change in noise levels at both these receptors. When these magnitudes are considered alongside the 'medium' sensitivity assigned to the residential receptors, it is concluded that the noise effects would be 'not significant'.

Members of the public on DTA

- 10.5.42 It is assumed that members of the public would not be using the DTA for recreational purposes at night and therefore this assessment is considered unnecessary

Dry Training at Closest Approach from Training Areas

- 10.5.43 The predicted noise levels at the selected receptors for a simulated dry training section attack located at closest approach to the boundary (taken to be 100m from the boundary nearest to each receptor) of each of the Okehampton, Willsworthy, Merrivale, Cramber and Ringmoor ranges are presented in **Table 10.8** below. This can be considered to be a worst case scenario as dry training is not permitted within 200m of residential dwellings.

Table 10.8 Summary of Noise Predictions for a Simulated Section Attack at Closest Approach

Receptor	L _{Aeq,1hr} (dB)	L _{Aeq,5min} (dB)	L _{Amax} (dB)
1. Moorgate Cottage	33.2	44.1	52.9
2. East Okement Farm	47.9	58.7	67.6
3. Higher Bowden	18.0	28.8	37.7
4. Higher Beardon	34.6	45.4	54.3
5a. Ingo Brake	21.0	31.8	40.7
5b. Ingo Brake Field	18.7	29.5	38.4
6. Lanehead	51.2	62.0	70.9
7. Brousentor Farm	27.7	38.6	47.4
8. Beardown Farm	11.6	22.4	31.3
9. Tor Royal	17.2	28.0	36.9
10. Yellowmead	28.8	39.7	48.5
11. Meavy	27.5	38.3	47.2
12. Brisworthy	35.0	45.8	54.7
13. Postbridge	0.0	4.5	13.4

Results: Daytime Dry Training at Closest Approach from the Training Areas

Local Residents

- 10.5.44 The predicted $L_{Aeq,1hr}$ results show that, with the exception of East Okement Farm and Lanehead, noise levels for dry training at closest approach from the ranges do not increase existing ambient noise levels at any receptor by more than 1dB(A) during both weekday and weekend periods.
- 10.5.45 In addition, the predicted noise levels at all receptors are below the $L_{Aeq,16hr}$ 55dB limit for outdoor living areas recommended in the WHO Guidelines ($L_{Aeq,16hr}$ 55dB is suggested as the threshold beyond which, serious annoyance may occur). All but the Lanehead receptor, which is 50m from the DTA boundary, are below the lower threshold limit of $L_{Aeq,16hr}$ 50dB, at which point it is suggested moderate annoyance may occur.
- 10.5.46 A magnitude of ‘low’ has been assigned to all the effects with the exception of those at East Okement Farm and Lanehead, when using the methodology outlined in **Table 10.4** above. When a ‘low’ magnitude is considered alongside the ‘medium’ sensitivity assigned to residential receptors, it is concluded that the noise effects would be ‘not significant’ for dry training activities at closest approach during daytime periods on both weekdays and weekends.
- 10.5.47 The predicted ambient $L_{Aeq,1hr}$ noise levels at East Okement Farm and Lanehead exceed the existing ambient $L_{Aeq,1hr}$ by 5.4dB and 10.1dB respectively, resulting in a magnitude of ‘medium’ and ‘high’ respectively, when using the noise magnitude criteria in **Table 10.4**.
- 10.5.48 Dry training is not permitted within 200m of residential properties. Taking into account the fact that these exceedences are only predicted to occur when training is at very closest approach to these properties and during a short, but nevertheless relatively intense, 2-3 minute time periods it is considered that the normal magnitude of ‘high’ is inappropriate in this instance. A magnitude of “medium” has therefore been assigned to effects at Lanehead when considering a one hour period. When this magnitude is considered alongside the ‘medium’ sensitivity assigned to residential receptors, it is concluded that the noise effects would be ‘not significant’ for dry training activities at closest approach distances to East Okement Farm and Lanehead during the daytime periods on both weekdays and weekends.

Members of the public on DTA

- 10.5.49 Members of the public using the DTA for recreational purposes have already been assessed for dry training activities within 100m of their location (see above), which is the closest approach distance for such activities.

Results: Night-time Dry Training at Closest Approach from Training Areas

Local Residents

- 10.5.50 The predicted $L_{Aeq,5min}$ results indicate that at Higher Bowden, Ingo Brake, Beardown Farm, Tor Royal and Postbridge noise levels for dry training at closest approach do not increase existing night-time ambient noise levels at any of these receptors by more than 3dB(A) during both weekdays and weekends. A magnitude of ‘low’ has been assigned to the effects at these receptors, when using the methodology outlined in **Table 10.4**.
- 10.5.51 At Moorgate Cottage, Higher Beardon and Brousentor Farm night-time noise levels are increased by up to 5dB(A) and as such, have been assigned a ‘medium’ magnitude of effect.

- 10.5.52 When the above receptors' magnitudes of effect are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for dry training activities at closest approach during the night-time periods on both weekdays and weekends.
- 10.5.53 At East Okement Farm, Lane Head, Yellowmead, Meavy and Brisworthy noise levels are increased by more than 6dB(A) and as such, should be assigned a 'high' magnitude of effect, according to the noise magnitude criteria presented in **Table 10.4**.
- 10.5.54 Predicted ambient noise levels at Yellowmead, Meavy and Brisworthy are below the WHO guideline limit of $L_{Aeq,8hr}$ 42dB free field. In addition, the predicted L_{Amax} noise levels at these receptors are well below the WHO guideline noise level of L_{Amax} 60dB, outside open bedroom windows, which has been set to avoid sleep disturbance.
- 10.5.55 As most people will be sleeping between 2300 to 0700 hours, the absolute noise level and the L_{Amax} noise levels are considered more appropriate, in terms of assigning noise magnitude, than the relative change in noise level. It is therefore considered more appropriate to assign Yellowmead, Meavy and Brisworthy receptors a 'medium' magnitude of effect, as it is very unlikely that sleep disturbance will occur, even with bedroom windows open, but taking into account the relative change in noise levels at both of these receptors. When these magnitudes are considered alongside the 'medium' sensitivity assigned to the residential receptors, it is concluded that the noise effects would be 'not significant'.
- 10.5.56 There are two exceedances of the $L_{Aeq,8hr}$ 42dB free field criterion at East Okement Farm and Lanehead when 5 minute periods are considered. In addition, the predicted L_{Amax} noise levels at these receptors are above the WHO guideline noise level of L_{Amax} 60dB, outside open bedroom windows, which has been set to avoid sleep disturbance. This means that if a dry fire exercise takes place during the night at closest approach to either East Okement Farm or Lanehead when either of these properties has bedroom windows open, there is the potential for sleep disturbance.
- 10.5.57 Both these properties lie close to the boundary of DTA and therefore could be considered most sensitive to military activities. However, dry training is not permitted within 200m of residential dwellings. Bearing in mind that the above exceedances are only predicted to occur when training is at very closest approach to these properties it is considered that the normal magnitude of 'high' is inappropriate in this instance.
- 10.5.58 A magnitude of 'medium' has therefore been assigned to effects at East Okement Farm and Lanehead when 5 minute periods are considered. When these magnitudes are considered alongside the 'medium' sensitivity assigned to these residential receptors, it is concluded that the noise effects would be 'not significant' for dry fire training activities at closest approach distances from the ranges during the night-time periods on both weekdays and weekends.

Members of the public on DTA

- 10.5.59 Since members of the public are unlikely to be using the DTA at night it is considered that this element does not require further assessment.

Assessment of Effects and Evaluation of Significance: Simulated Live Fire Section Attack

Overview

- 10.5.60 The live fire prediction calculations have been undertaken based on the same typical small section attack used for the dry firing scenario, including the same weapons, time scale and number of rounds, and the same positions, i.e. in the centre of the RDAs and at the closest approach to each receptor.
- 10.5.61 For live firing, Entec have obtained more detailed noise data for each of the individual weapons, in the form of L_{Aeq} , SEL and L_{Amax} values in octave bands. This data has been used as the source-input data for the noise model and is presented in **Appendix 10.2**.
- 10.5.62 C weighted peak noise levels are not included in the provided data set (included in **Appendix 10.2**) and therefore direct comparison with the MoD's self imposed boundary noise limit of 130dB(C) is not possible. However, an indication of the LCpk noise levels can be predicted based on previous Entec firearm measurements. These previous noise measurements show that measured linear peak noise levels are always between 24dB and 30dB higher than the measured L_{Amax} noise level, with an average difference of 27dB. The difference between linear and C weighted noise levels with respect to the weapons under assessment is likely to be negligible. As a worst case assessment, if 27dB is added to the loudest weapon under assessment; the general purpose machine gun, the likely sound power level is LCpk 183dB. The live firing machine gun will clearly not be pointed toward the boundary at 100m (the closest approach distance to the boundary) and the firing direction is likely to be 90 degrees to the boundary at most, which would result in a reduction of the order of 17dB. At 100m the distance attenuation is around 48dB, indicating a worst case noise level at the boundary of LCpk 118dB. This is considerably below the MoD's self imposed boundary noise limit of LCpk 130dB. Based on the above it is considered that the MoD's self imposed boundary noise limit is unlikely to be exceeded by the continued use of DTA.
- 10.5.63 Noise predictions at each receptor have been undertaken. **Table 10.9** presents the predicted noise levels for a simulated live fire section attack in the centre of the RDAs, and **Table 10.10** presents predicted noise levels with a simulated live fire attack at the closest approach to each receptor.

Table 10.9 Summary of Noise Predictions for a Live Firing Exercise in Centre of Range

Receptor	$L_{Aeq,1hr}$ (dB)	$L_{Aeq,5min}$ (dB)	L_{Amax} (dB)
1. Moorgate Cottage*	12.9	23.7	36.6
2. East Okement Farm*	19.2	30.0	41.9
3. Higher Bowden*	17.3	28.1	40.2
4. Higher Beardon*	20.9	31.6	43.3
5a. Ingo Brake*	19.3	30.1	42.0
5b. Ingo Brake Field*	18.8	29.5	41.5
6. Lanehead*	26.0	36.8	48.1
7. Brousentor Farm*	24.6	35.3	46.7

Receptor	$L_{Aeq,1hr}$ (dB)	$L_{Aeq,5min}$ (dB)	L_{Amax} (dB)
8. Beardown Farm*	16.6	27.4	40.3
9. Tor Royal*	0.0	0.0	0.0
10. Yellowmead*	0.0	0.0	0.0
11. Meavy*	0.0	0.0	0.0
12. Brisworthy*	0.0	0.0	0.0
13. Postbridge*	14.4	25.2	37.8

* Exercise located in south east of Okehampton Range (Centre of Okehampton, Willsworthy and Merrivale Ranges)

Results: Daytime Live Firing Training at Centre of the RDAs

- 10.5.64 The predicted $L_{Aeq,1hr}$ results show that without exception, noise levels for live training in the centre of the ranges do not increase existing ambient noise levels at any receptor both during the weekday and weekend. In addition, the predicted noise levels due to live military training at all receptors are below the $L_{Aeq,16hr}$ 50dB limit for outdoor living areas recommended in the WHO Guidelines. A magnitude of 'low' has been assigned to all of these effects, when using the methodology outlined in **Table 10.4**.
- 10.5.65 When these magnitudes are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live firing training activities in the middle of the range during the daytime periods on both weekdays and weekends.
- 10.5.66 As part of their management plan DE specify that when live firing exercises are held, members of the public are prevented from using the DTA for recreational purposes, therefore, it is considered that noise effects from live firing on members of the public visiting DTA do not require further assessment.

Results: Night-time Live Firing Training at Centre of the RDAs

- 10.5.67 The predicted $L_{Aeq,5min}$ results show that with the exception of Lanehead, noise levels for live training in the centre of the ranges does not increase existing ambient noise levels at any receptor by more than 3dB(A) during both weekdays and weekends. At Lanehead, the existing ambient noise level is predicted to be exceeded by 5.9dB(A).
- 10.5.68 Predicted $L_{Aeq,5min}$ noise levels from live training in the centre of the ranges do not exceed the WHO guideline limits of $L_{Aeq,8hr}$ 42dB free field noise levels at any receptor both during the weekday and weekend.
- 10.5.69 In addition, the predicted L_{Amax} noise levels at all receptors, are well below the WHO guideline noise level of L_{Amax} 60dB, outside open bedroom windows, which has been set to avoid sleep disturbance.
- 10.5.70 A magnitude of 'low' has been assigned to the effects at all of the receptors with the exception of Lanehead, which has been assigned a magnitude of 'medium' when using the methodology outlined in **Table 10.4**. When these magnitudes are considered alongside the 'medium' sensitivity assigned to the residential receptors, it is concluded that the noise effects would be 'not significant' for live training activities in the middle of the range during daytime periods on both weekdays and weekends.

10.5.71 Since members of the public are prevented from using DTA for recreational purposes when live firing is undertaken and would be unlikely to use the DTA at night it is considered that this element does not need further assessment.

Live Firing Training at Closest Approach from Ranges

10.5.72 The predicted noise levels at the selected receptors for a simulated live fire section attack located at the closest approach to each receptor (based on recorded locations and frequency of live firing activity between April 2004 and October 2005) are presented in **Table 10.10** below. This should be considered to be a worst case scenario.

Table 10.10 Summary of Noise Predictions for a Live Firing Exercise at Closest Approach

Receptor	$L_{Aeq,1hr}$ (dB)	$L_{Aeq,5min}$ (dB)	L_{Amax} (dB)
1. Moorgate Cottage	41.6	52.4	64.6
2. East Okement Farm	63.2	73.9	85.6
3. Higher Bowden	26.7	37.5	51.2
4. Higher Beardon	35.4	46.1	60.6
5a. Ingo Brake	28.0	38.8	53.5
5b. Ingo Brake Field	29.2	39.9	54.3
6. Lanehead	69.6	80.4	92.1
7. Brousentor Farm	36.0	46.8	60.6
8. Beardown Farm	14.0	24.8	42.5
9. Tor Royal	15.7	26.5	41.3
10. Yellowmead	0.7	12.8	29.3
11. Meavy	4.8	15.7	31.4
12. Brisworthy	0.0	6.8	25.8
13. Postbridge	8.3	19.5	36.0

Results: Daytime Live Firing Training at Closest Approach from the RDAs

10.5.73 The predicted $L_{Aeq,1hr}$ results show that, with the exception of East Okement Farm and Lanehead, noise levels for live training at closest approach from the ranges do not increase existing ambient noise levels at any receptor by more than 2dB(A) during both weekday and weekend periods.

10.5.74 In addition, predicted noise levels at all but East Okement and Lanehead receptors are below the $L_{Aeq,16hr}$ 50dB limit for outdoor living areas recommended in the WHO guidelines ($L_{Aeq,16hr}$ 50dB is suggested as the threshold beyond which, moderate annoyance may occur). East Okemont and Lanehead receptors, which are close to the DTA boundary, are above the upper threshold limit of $L_{Aeq,16hr}$ 55dB, at which point it is suggested serious annoyance may occur.

- 10.5.75 A magnitude of 'low' has been assigned to all the effects with the exception of those at East Okement Farm and Lanehead, when using the methodology outlined in **Table 10.4**. When a 'low' magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live training activities at closest approach during daytime periods on both weekdays and weekends.
- 10.5.76 The predicted ambient $L_{Aeq,1hr}$ noise levels at East Okement Farm and Lanehead exceed the existing ambient $L_{Aeq,1hr}$ by more than 6dB(A), resulting in a magnitude of 'high', when using the noise magnitude criteria in **Table 10.4**.
- 10.5.77 Whilst activities on DTA will be determined by future deployment requirements for the armed forces, DE have indicated that based on present levels of deployment daytime live training activities within 400m of these two receptors has not occurred within the last 10 years. Taking into account the fact that these exceedances are only predicted to occur when training is at very closest approach to these properties it is considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of 'medium' has therefore been assigned to effects at East Okement Farm and Lanehead when considering a one hour period. When this magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live training activities at closest approach distances from the ranges during daytime periods on both weekdays and weekends.
- 10.5.78 DTA EMS and DTE SW SOs already state that the potential for noise disturbance when choosing the exact locations for live firing exercises in close proximity to neighbouring properties must be taken into account.
- 10.5.79 Since members of the public are prevented from using the DTA for recreational purposes when live firing is undertaken it is considered that this element does not require further assessment.

Results: Night-time Live Firing Training at Closest Approach from the RDAs

- 10.5.80 The predicted $L_{Aeq,5min}$ results show that at Higher Bowden, Beardown Farm, Tor Royal, Yellowmead, Meavy, Brisworthy and Postbridge noise levels for live training at closest approach do not increase existing night-time ambient noise levels at any receptor by more than 2dB(A) during both weekdays and weekends. A magnitude of 'low' has been assigned to the effects at these receptors, when using the methodology outlined in **Table 10.4**.
- 10.5.81 At Higher Beardon and Ingo Brake night-time noise levels are increased by up to 5dB(A) and as such, have been assigned a 'medium' magnitude of effect.
- 10.5.82 When the above receptors' magnitudes of effect are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live training activities at closest approach during the daytime periods on both weekdays and weekends.
- 10.5.83 At Moorgate Cottage, East Okement Farm, Lane Head and Brousenter Farm noise levels are increased by more than 6dB(A) and as such, should normally be assigned a 'high' magnitude of effect.
- 10.5.84 Predicted ambient noise levels at Moorgate Cottage, East Okement Farm, Lane Head and Brousenter Farm are all above the WHO guideline limit of $L_{Aeq,8hr}$ 42dB free field. In addition, the predicted L_{Amax} noise levels at these receptors are above the WHO guideline noise level of L_{Amax} 60dB, outside open bedroom windows, which has been set to avoid sleep disturbance. This means that if a live fire exercise takes place during the night at

closest approach to any of the aforementioned receptors when these properties have bedroom windows open, there is a potential for sleep disturbance.

- 10.5.85 All of these properties are located in close proximity to the danger area boundary (RDA) of the DTA and are therefore sensitive to military training activities. Whilst activities on the DTA will be determined by future deployment requirements for the armed forces, DE have indicated that based on present levels of deployment night-time live fire training activities at closest approach to these receptors has not occurred within the last year. Bearing in mind that these exceedances are only predicted to occur when training is at very closest approach to these properties it is considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of 'medium' has therefore been assigned to effects at Moorgate Cottage, East Okement Farm, Lane Head and Brousester Farm when 5 minute periods are considered. When these magnitudes are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live firing training activities at closest approach distances from the ranges during night-time periods on both weekdays and weekends.
- 10.5.86 DTA EMS and DTE SW SOs already state that the potential for noise disturbance when choosing the exact locations for live firing exercises in close proximity to neighbouring properties must be taken into account.
- 10.5.87 Since members of the public are unlikely to be using DTA at night it is considered that this element does not require further assessment.

Assessment of Effects and Evaluation of Significance: Live Fire Target Range (Willsworthy)

Overview

- 10.5.88 The MoD has stated that the target range is normally used for a seven hour day between 0930 and 1630 hours, and that 5.56mm and 7.62mm ammunition is predominantly used, with a typical number of 5000 rounds used per day. The range can on occasion be used into the night, but activities always cease before 2400 hours.
- 10.5.89 For the purpose of modelling it has been assumed that 2500 rounds are fired with a light support weapon and 2500 rounds are fired with a general purpose machine gun, with the firing spaced evenly across the seven hour day. For potential night-time firing between 2300 and 2400, the intensity of firing is assumed to be similar to that during the day. Both weapons have been located on each of the three ranges (A, B and C), and modelled in turn. The worst case predicted noise levels are presented in **Table 10.11**.

Table 10.11 Summary of Noise Predictions for Live Target Firing on Willsworthy Range

Receptor	LAeq,1hr (dB)	LAeq,5min (dB)	LAmax (dB)
1. Moorgate Cottage***	0.0	0.0	24.2
2. East Okement Farm***	5.6	5.6	26.7
3. Higher Bowden***	0.0	0.0	22.1
4. Higher Beardon***	35.7	35.7	56.4
5a. Ingo Brake***	28.2	28.2	48.8
5b. Ingo Brake Field***	25.3	25.3	45.9
6. Lanehead**	52.5	52.5	73.6
7. Brousentor Farm*	29.4	29.4	50.0
8. Beardown Farm	0.0	0.0	0.0
9. Tor Royal**	0.0	0.0	16.6
10. Yellowmead	0.0	0.0	0.0
11. Meavy	0.0	0.0	0.0
12. Brisworthy	0.0	0.0	0.0
13. Postbridge	0.0	0.0	0.0

* Target Range A

** Target Range B

*** Target Range C

Results: Daytime Live Target Firing at Willsworthy Range

- 10.5.90 The predicted $L_{Aeq,1hr}$ results indicate that, with the exception of Lanehead, noise levels for live target firing at the closest target range to each receptor do not increase existing ambient noise levels at any receptor by more than 1dB(A) during both weekday and weekend periods.
- 10.5.91 In addition, the predicted noise levels, at all but the Lanehead receptor, are below the $L_{Aeq,16hr}$ 50dB limit for outdoor living areas recommended in the WHO Guidelines ($L_{Aeq,16hr}$ 50dB is suggested as the threshold beyond which, moderate annoyance may occur). The Lanehead receptor, which is within 50m of the DTA boundary, is above the lower threshold limit of $L_{Aeq,16hr}$ 50dB by less than 3dB(A).
- 10.5.92 A magnitude of 'low' has been assigned to all effects with the exception of those at Lanehead, when using the methodology outlined in **Table 10.4**. When a 'low' magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for live target firing activities at the closest range to each receptor during daytime periods on both weekdays and weekends.
- 10.5.93 The predicted ambient $L_{Aeq,1hr}$ noise level at Lanehead exceeds the existing ambient $L_{Aeq,1hr}$ by more than 6dB(A), resulting in a magnitude of 'high', when using the noise magnitude criteria in **Section 10.5.3**. This property lies within 50m of the RDA boundary

and therefore is one of the most sensitive to military training activities particularly from the closest target range (Range B). Whilst the activities on DTA will be determined by future deployment requirements for the armed forces, DE have indicated that based on present levels of deployment daytime live target firing activities on the closest target range to Lanehead on Willsworthy has occurred on approximately 99 days in 2006. Bearing in mind that these exceedances are only predicted to occur when firing is occurring on the closest target range to Lanehead (if firing is undertaken on either Range A or C, the existing ambient $L_{Aeq,1hr}$ during the week is exceeded by the order of just 3dB(A), which would constitute a magnitude of either 'low' or 'medium'), it is considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of 'medium' has therefore been assigned to effects considered at Lanehead when one hour periods are considered. When this magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effect would be 'not significant' for live target firing activities on Willsworthy range during the daytime periods.

- 10.5.94 Since members of the public are prevented from using the DTA for recreational purposes when live firing is undertaken it is considered that this element does not need further assessment.

Results: Night-time Live Target Firing at Willsworthy Range

- 10.5.95 The predicted $L_{Aeq,5min}$ results show that, with the exception of Lanehead, noise levels for live target firing at the closest target range do not increase existing ambient noise levels at any receptor by more than 1dB(A) during both weekday and weekend periods at night (between 2300 and 2400 hours).
- 10.5.96 In addition, the predicted $L_{Aeq,5min}$ results show that with the exception of Lanehead, predicted noise levels from live target firing do not exceed the WHO guideline limit of $L_{Aeq,8hr}$ 42dB free field at any receptor both during the weekday and weekend.
- 10.5.97 A magnitude of 'low' has been assigned to all the effects with the exception of those at Lanehead, when using the methodology outlined in **Table 10.4**. When a 'low' magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that noise effects would be 'not significant' for live target firing activities at the closest range to each receptor between 2300 and 2400 hours on both weekdays and weekends.
- 10.5.98 The predicted ambient $L_{Aeq,5min}$ noise level at Lanehead exceeds the existing ambient $L_{Aeq,15min}$ by more than 6dB(A), resulting in a magnitude of 'high', when using the noise magnitude criteria in **Table 10.4**. DE have indicated that based on present levels of deployment night-time live target firing activities on the closest target range to Lanehead on Willsworthy has occurred on approximately 4 nights in 2006. Bearing in mind that this exceedence is only predicted to occur when firing is occurring on the closest target range to Lanehead, and only between 2300 and 2400 hours provided target practice is occurring during this period, it is considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of "medium" has therefore been assigned to effects considered at Lanehead when 5 minute periods are considered. When this magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effect would be 'not significant' for live target firing activities at the closest target range to Lanehead between the hours of 2300 and 2400.
- 10.5.99 Since members of the public are unlikely to be using DTA at night it is considered that this element does not require further assessment.

Assessment of Effects and Evaluation of Significance: Helicopter Movements

Overview

- 10.5.100 Noise level predictions for helicopters has been characterised in the QinetiQ report '*Higher Level Environmental Assessment of the Noise Levels of WAH64*' (HLEA). Although the main subject of this report is the Apache Attack Helicopter, the Lynx helicopter is used for comparison throughout. The aim of the HLEA was to provide realistic predictions of noise levels for general helicopter training operations. This is facilitated through the use of HELIAC (HELIcopter Acoustic Contouring Tool). QinetiQ state that there is sufficient confidence in the use of HELIAC to believe that the results mimic what would be measured, and therefore provide a reliable alternative to measurement.
- 10.5.101 In summary, the report presents Sound Exposure Level (SEL) noise contours of both Apache and Lynx helicopters for various flight conditions concerning height, speed and bearing for lateral distances of -3000m (port side) to + 3000m (starboard side). To simplify the prediction process, given the large number of various flight conditions represented, the worst case flight condition has been used to predict noise levels at each receptor. The generally worst case flight condition for the Lynx helicopter is a level flight at 120kts at a height of 20m and travelling with a heading of 180 degrees.
- 10.5.102 As the SEL distribution charts only extend to 3km either side of the helicopter, and the distance from each receptor to the centre of the training area is greater than 3km, just a closest approach helicopter flight has been predicted. The SEL at -3km (port side) for a Lynx helicopter flying at 120kts and at an altitude of 20m is around 44dB(A), equating to a $L_{Aeq,1hr}$ of 8.4dB and a $L_{Aeq,5min}$ of 19dB.
- 10.5.103 The predicted noise level at each receptor, based on a closest approach (where the helicopter flight path intersects the closest DTA boundary) worst case helicopter flight condition, is presented below in **Table 10.12**.

Table 10.12 Summary of Noise Predictions for Single Lynx Helicopter Flight at Nearest Boundary to Receptors

Receptor	SEL (dB)	L_{Aeq,1hr} (dB)	L_{Aeq,5min} (dB)
1. Moorgate Cottage (130m to boundary)	94.0	58.4	69.2
2. East Okement Farm (50m to boundary)	101.0	65.4	76.2
3. Higher Bowden (600m to boundary)	69.0	33.4	44.2
4. Higher Beardon (100m to boundary)	98.0	62.4	73.2
5a. Ingo Brake (700m to boundary)	67.0	31.4	42.2
5b. Ingo Brake Field (700m to boundary)	67.0	31.4	42.2
6. Lanehead (0m to boundary)	103.0	67.4	78.2
7. Brousentor Farm (310m to boundary)	90.0	54.4	65.2
8. Beardown Farm (1360m to boundary)	58.0	22.4	33.2
9. Tor Royal (860m to boundary)	68.0	32.4	43.2
10. Yellowmead (600m to boundary)	69.0	33.4	44.2
11. Meavy (400m to boundary)	77.0	41.4	52.2
12. Brisworthy (200m to boundary)	89.0	53.4	64.2
13. Postbridge (4,000m to boundary)	< 40.0	< 8.4	< 19.2
14. Civilian Recreational Users of Dartmoor (100m)	98.0	62.4	73.2

Results: Daytime Helicopter Movements at Closest Approach

10.5.104 The predicted L_{Aeq,1hr} results show that at Higher Bowden, Ingo Brake, Beardown Farm, Tor Royal, Yellowmead and Postbridge noise levels from worst case helicopter movements at closest approach do not increase existing ambient noise levels by more than 2dB(A) during both weekdays and weekends. A magnitude of 'low' has been assigned to the effects at these receptors, when using the methodology outlined in section 10.5.3.

10.5.105 At Meavy existing ambient noise levels are increased by up to 4dB(A) at weekends and as such, has been assigned a 'medium' magnitude of effect.

10.5.106 Of the above receptors, all are below the L_{Aeq,16hr} 50dB lower limit for outdoor living areas recommended in the WHO Guidelines (L_{Aeq,16hr} 50dB is suggested as the threshold beyond which, moderate annoyance may occur). The predicted L_{Aeq,1hr} noise level at Brousentor Farm is above the lower limit but below the upper limit of L_{Aeq,16hr} 55dB, at which point it is suggested serious annoyance may occur.

10.5.107 When the above receptors' magnitudes of effect are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for helicopter movements at closest approach during daytime periods on both weekdays and weekends.

10.5.108 At Moorgate Cottage, East Okement Farm, Higher Beardon, Lanehead, Brousentor Farm, Meavy and Brisworthy noise levels are increased by more than 6dB(A) and are all above the WHO guidelines upper limit of $L_{Aeq,16hr}$ 55dB and as such, should be assigned a 'high' magnitude of effect when using the methodology outlined in section 10.5.3.

10.5.109 Whilst the activities on the DTA will be determined by future deployment requirements for the armed forces, data for January 2004 until August 2007 indicates that on average over each calendar year helicopter movements fluctuate between 4 and 18 movements per month, with the majority of landings taking place at Okehampton Camp. The likelihood of one of these helicopters flying across and at closest approach to the above receptors, in a manner which produces the loudest noise contours, is minimal. In addition, pilots receive briefing from DTA staff which includes the avoidance of sensitive areas. It is therefore considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of 'medium' has therefore been assigned to effects at Moorgate Cottage, East Okement Farm, Higher Beardon, Lanehead, Brousentor Farm, Meavy and Brisworthy when considering a one hour period. When this magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for helicopter movements at closest approach distances from the range during daytime periods on both weekdays and weekends.

10.5.110 Members of the public using DTA for recreational purposes are also considered to be sensitive to noise from daytime military dry training activities. As part of their management plan DE specify that dry training activities would not be undertaken within 100m of members of the public using the DTA thus 100m has been taken as the closest approach distance for the approach of helicopters.

10.5.111 Spot measurements were made on Willsworthy Range in the absence of military training and ambient noise levels in the region of $L_{Aeq,15min}$ 37 to 38dB were recorded. The $L_{Aeq,1hr}$ is predicted to be 62dB from a worst case helicopter movement at a distance of 100m. Predicted noise levels of this magnitude would be clearly discernible at a distance of 100m and would be likely to increase the ambient noise level by more than 6dB(A). Thus a magnitude of 'high' would normally be assigned to this effect, when using the methodology outlined in **Table 10.4**. However, when this magnitude is considered alongside the 'low' sensitivity assigned to recreational receptors such as footpaths, it is concluded that the noise effects would be 'not significant' for helicopter movements associated with dry training activities within 100m of members of the public during daytime periods on both weekdays and weekends. The relatively short duration of such effects and the transient nature of the receptor location (walking along a predetermined footpath) would tend to reinforce this assessment.

Results: Night-time Helicopter Movements at Closest Approach

10.5.112 The predicted $L_{Aeq,5min}$ results show that at Beardown Farm and Postbridge noise levels from worst case helicopter movements at closest approach does not increase existing ambient noise levels by more than 1dB(A) during both weekdays and weekends. A magnitude of 'low' has been assigned to the effects at these receptors, when using the methodology outlined in **Table 10.4**.

10.5.113 At Higher Bowden existing ambient noise levels are increased by up to 6dB(A) and as such, this receptor has been assigned a 'medium' magnitude of effect.

10.5.114 Of the above receptors, Beardown Farm and Postbridge predicted helicopter noise levels are below the WHO guidelines limit of $L_{Aeq,8hr}$ 42dB. The predicted $L_{Aeq,5min}$ noise level at Higher Bowden is above this limit by just 2dB(A). However, the free-field prediction of $L_{Aeq,5min}$ 44.2dB outside an open bedroom window would result in an internal noise level of approximately 32dB (result of adding a 3dB(A) façade effect to the external

free-field noise level, and subtracting 15dB(A), which WHO provides as an example of the noise reduction from outside to inside with an open window), which is below the BS 8233 'reasonable' criterion of $L_{Aeq,8hr}$ 35dB. The noise effect at Higher Bowden is therefore assigned a magnitude of 'medium'.

10.5.115 When the above receptors' magnitudes of effect are considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for helicopter movements at closest approach during the night on both weekdays and weekends.

10.5.116 At Moorgate Cottage, East Okement Farm, Higher Beardon, Ingo Brake, Lanehead, Brousentor Farm, Tor Royal, Yellowmead, Meavy and Brisworthy noise levels are increased by more than 6dB(A) and are all above the WHO guidelines limit of $L_{Aeq,8hr}$ 42dB free field and as such, should normally be assigned a 'high' magnitude of effect when using the methodology outlined in section 10.5.3 above.

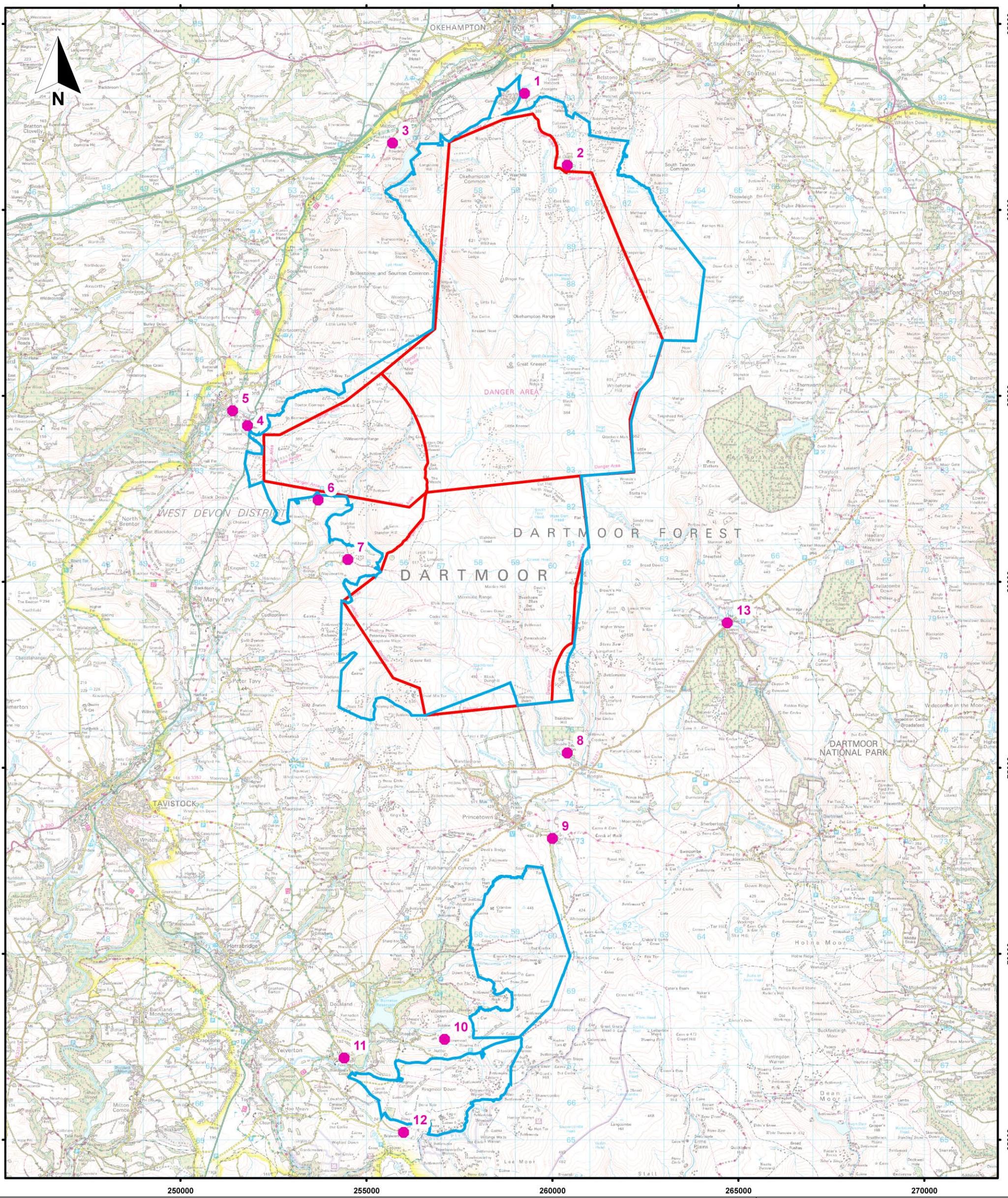
10.5.117 As described above, the likelihood of one of these helicopters flying across the closest approach to the above receptors, in a manner which produces the loudest noise contours, is minimal. In addition, pilots receive briefing from DTA staff which includes the avoidance of sensitive area. It is therefore considered that the normal magnitude of 'high' is inappropriate in this instance. A magnitude of 'medium' has therefore been assigned to effects at Moorgate Cottage, East Okement Farm, Higher Beardon, Ingo Brake, Lanehead, Brousentor Farm, Tor Royal, Yellowmead, Meavy and Brisworthy when considering a 5 minute period. When this magnitude is considered alongside the 'medium' sensitivity assigned to residential receptors, it is concluded that the noise effects would be 'not significant' for helicopter movements at closest approach distances from the ranges during night-time periods on both weekdays and weekends.

10.6 Summary of Significance Evaluation

10.6.1 **Table 10.13** summarises the findings of the appraisal for the noise effects. The recorded and predicted noise levels would all indicate that there are no significant effects on any identified receptors. Noise predictions also indicate that levels likely to be experienced at the RDA boundary do not exceed the MoD self imposed limit of 130dB(C)

Table 10.13 Summary of significant effects: Noise

Receptor and summary of predicted effects	Type of effect¹	Significance²	
All local residential and civilian receptors: Simulated dry-fire section attack on all DTA ranges	-ve	NS	The modelled results show that sensitive receptors will either experience no audible increase when training is taking place or that the increase will still be within the defined criteria.
All local residential receptors: Simulated live-fire section attack on Okehampton, Willsworthy and Merrivale ranges	-ve	NS	The modelled results show that sensitive receptors will either experience no audible increase when training is taking place or that the increase will still be within the defined criteria
All local residential receptors: Live-fire target practice on Willsworthy range	-ve	NS	The modelled results show that sensitive receptors will either experience no audible increase when training is taking place or that the increase will still be within the defined criteria
All local residential and civilian receptors: Helicopter movements	-ve	NS	The modelled results show that sensitive receptors will either experience no audible increase when training is taking place or that the increase will still be within the defined criteria
Key/footnotes:			
1. Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2.	S Significant or NS Not-significant



Key:

Dartmoor Training Area

Range Danger Area

Noise Locations

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Dartmoor Training Area
Environmental Appraisal

Figure 10.1
Noise Monitoring Locations

0 1 2 3 4 5 Kilometers
Scale: 1:100,000 @ A3



DARTMOOR TRAINING AREA

Environmental Appraisal

Public Access and Recreation

11

11. Public Access and Recreation

11.1 Introduction

11.1.1 Military training on Dartmoor Training Area (DTA) restricts public access to Merrivale, Willsworthy and Okehampton training areas when live firing takes place as for safety reasons, members of the public cannot access the Range Danger Area (RDA). However, these three training areas as well as Cramber and Ringmoor are open to the public during dry training exercises and days on which live firing can take place are restricted to ensure public access. Therefore, public access effects have been appraised as part of the EA process. This was undertaken by Defence Estates (DE). Richard Brooks, Head of Access and Recreation within the DE Environmental Support Team (EST) undertook the assessment and wrote the chapter.

11.2 Context

11.2.1 This section outlines the legislative and planning policy context relating to public access issues on DTA.

Legislative Context

11.2.2 The main elements of legislation relevant to public access to DTA are:

- Countryside and Rights of Way Act 2000 (CROW)
- Dartmoor Commons Act 1985 and related Byelaws
- National Parks and Access to the Countryside Act 1949

Planning Policy Context

11.2.3 The main elements of policy relevant to public access to DTA are set out in **Table 11.1**.

Table 11.1 Public Access Policy Relevant to DTA

Policy Reference¹	Implications
MoD SDiG Access and Recreation Vision	MOD has a declared presumption in favour of safe public enjoyment of the estate wherever this is compatible with military training and operational requirements, safety, security, conservation and the interests of our tenants.
MoD SDiG Access and Recreation High Level Targets	<ul style="list-style-type: none"> • Ensure that people are at the heart of management of access and recreation on the defence estate. • Focus on enabling access and recreation at appropriate places where a good quality experience can be provided in a safe environment. • Provide adequate information to enable users to make informed choices about responsible public access and recreation on the defence estate.
Declaration of intent between the MoD and the Association of National Park Authorities (ANPA).	MoD and ANPA will make and maintain close working relationships, and will endeavour to develop and promote an understanding of their respective interests and requirements through dialogue, information exchange and training.
DNPLP Policy ML1	Development will not be permitted within any areas of moor and heath unless it would lead to maintaining or improving public access arrangements.
DNPMP MA2	Current training will be harmonised with the needs of conservation and public access, military infrastructure will be sympathetically related to the landscape, untoward impact or damage will be restored
DNPMPD Policy MT.G3	The quality of public access to the military training areas will be improved
DNPMPD Policy MT.M2	Levels of public access will be improved through negotiation between the DNPA, the Defence Estates and the Duchy of Cornwall which seeks to reduce the area of public exclusion during live firing and to increase the number of days on which the public have access to the military ranges.
DNPMPD Policy MT.M3	Improvement to the quality of public access through acceleration of the clearance of unexploded ordnance, the removal of redundant military artefacts, where they have no historic value, avoiding erosion and damage by military vehicles and reduction of the impact of dry training on the public.
PPG17 Policy 32	Local authorities should seek opportunities to provide better facilities for walkers, cyclists and horse-riders, for example by adding links to existing rights of way networks.
EA3 Policy 13	The National Park Authorities should continue to promote the widest range of opportunities for recreation to reflect the variety of ways in which the Parks can be enjoyed.
	The National Park Authorities will need to take into account the Parks' limited environmental capacity. It will not be appropriate for all forms of recreation to take place in every part of the Parks and the Government accepts that some recreational activities could cause unacceptable damage or disturbance to their natural beauty, wildlife or cultural heritage
EA3 Policy 14	In most instances, it should be possible to reconcile any conflict which may arise by co-operation between relevant interests and the National Park Authorities, and through careful planning and positive management strategies.

Note 1 – The full names of the plans and guidance cited are given in Appendix XX, which details all policies and guidance that are relevant to the development

11.3 Scope of the Assessment

Consultations

11.3.1 A total of 4 Public Access Working Group (PA WG) meetings were held between 14th February 2007 and 26th June 2007. The attendees at these meetings are outlined in **Table 11.2**.

Table 11.2 Attendees at Public Access Working Group Meetings

Attendee	Organisation
Dominic Ash	DE EST (Chair NCWG)
Ian Brooker	DNPA
Richard Brooks	DE EST (Working Group Chairman)
Martin Brown	DE EST (Chair CH WG)
Lt Col (Retd) Tony Clark	Comdt DTA
John Cooper	Dartmoor Commoners Council
Peter Harper	Dartmoor Access Forum
Colin Jones	Natural England
John Loch	DTE SW SLA
Lt Col (Retd) Peter Mellor	HQ 43 (Wx) Bde
Maj Hamish Miln	HQ DTE (Secretary)
Lt Col Paul Norrington-Davies	HQ DTE

11.3.2 Invitations were also extended for specific meetings to Simon Bates (Natural England), Helen Booker (RSPB) and Norman Baldock (DNP). Unfortunately none were able to attend.

11.3.3 The issues discussed during these meetings were:

- assessing the demand for access and recreation by members of the public within DTA
- the potential for removing all military training on DTA to allow unrestricted public access;
- the potential for reducing the number of days allowed for live firing;
- the potential for adjusting the Range Danger Areas (RDAs) to allow access to certain areas such as Yes Tor, High Willhays, Tavy Cleave and Beardown Tor;
- the need for a review of guaranteed public access days, including the relevance of current open periods;

- dry training;
- helicopter activity
- Okehampton Loop Road;
- the potential for extending Firing Notices;
- the depiction of DTA on Ordnance Survey (OS) mapping;
- Ten Tors and Jubilee Challenges; and
- dissemination of DTA access information.

11.3.4 In addition, the following effects were also discussed at PA WG meetings. These effects have been assessed in other chapters of this Report, as indicated, and are not considered any further in this chapter:

- unexploded ordnance (UXO) clearance (**Chapter 13**);
- visual effects on visitors from military infrastructure (**Chapter 7**); and
- noise effects on visitors to DTA (**Chapter 10**).

11.3.5 **Table 11.3** outlines information on external consultations which were undertaken with interested NGO's outside of the Working Group meetings.

Table 11.3 Consultation Outside of the Working Group Meetings

NGO	Meeting date	Attendees	Organisation
DPA	10 th May 2007	Richard Brooks Lt Col (Retd) Tony Clark John Loch Jonathan Cardale	DE EST Chairman PA WG Comdt DTA DTE SW SLA DPA Chief Executive
Ramblers Association	10 th May 2007	Richard Brooks Lt Col (Retd) Tony Clark John Loch John Howell John Skinner George Coles Alan Bennett	Chairman PA WG Comdt DTA DTE SW SLA Devon Ramblers Association Devon Ramblers Association Dartmoor Ramblers Dartmoor Ramblers
Open Spaces Society	5 th July 2007	Richard Brooks Lt Col Paul Norrington-Davies Kate Ashbrook	Chairman PA WG HQ DTE Open Spaces Society

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

11.3.6 All potential effects relating to public access to DTA were scoped-in in the Scoping Report, as at that time it was considered that further assessment was required to fully understand the relationship between the demand for access and recreation and current levels of training. The scope of the assessment has been refined through PA WG meetings which have identified in more detail which particular effects need to be considered further.

Effects Subsequently Scoped-in to the Appraisal

11.3.7 The PA WG meetings identified that the following effects should be considered further as part of the assessment of public access effects in the EA.

- Effects on members of the public due to a restriction on the number of days that access to DTA is available. The EA has assessed the potential for reducing the number of days for live firing and has reviewed the guaranteed public access days, including the relevance of current open periods as part of the assessment. Consideration has been given in undertaking the assessment to determining the current levels of use and demand.
- Effects on members of the public due to a restriction to access to Yes Tor and High Willhays Ridge and Tavy Cleave. The EA has assessed the potential for adjusting the RDAs to allow continuous access to Yes Tor, High Willhays and Tavy Cleave.
- Effects on members of the public due to a perceived restriction to access to DTA due to dry training activities. The EA has considered the effects of dry training on public access and the notification of such training.
- Effects on members of the public wishing to plan access to DTA in advance due to the amount of notice provided about live firing. The EA has assessed the potential for extending Firing Notices.
- Effects on members of the public wishing to plan access DTA due to the depiction of DTA on OS maps. The EA has considered how information about DTA and training activities is distributed and portrayed; the depiction of OS mapping covering the training area in relation to access has been reviewed as has the interpretation and communication of public access information.
- Effects on member of the public using DTA as a result of 'startle' effects from helicopters. This particularly affects horses and riders.

11.3.8 Although not part of the scope of the appraisal, as it is not considered to be a military training activity, the potential public access effects associated with Ten Tors are outlined in **Appendix 1.1**.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

11.3.9 No effects relating to public access were scoped-out in the Scoping Report.

Effects Subsequently Scoped-out of the Appraisal

11.3.10 The PA WG meetings have identified that the following effects can be scoped-out of the EA and for the reasons provided do not require any further appraisal.

- The potential for removing all military activity from Dartmoor. The Military Needs Paper¹⁰ concluded that “DTA makes an essential contribution to the delivery of light force training (about 70% of available dry training and 53% of live fire training) and therefore remains a key asset of the MoD estate”. This potential has been scoped out.
- Effects on members of the public due to restricted access to Beardown Tor. Commandant (Comdt) DTA has confirmed that Beardown Tor lies outside Merrivale RDA and therefore access to this Tor is not restricted when the RDA is closed due to live firing. This has been scoped out.
- Effects on members of the public due to restricted access to northern parts of DTA via the Okehampton Loop Road due to the condition of the Loop Road. The Loop Road is owned by the Duchy of Cornwall and they are responsible for the policy on its state of maintenance. As part of the current license MoD maintains the road for logistic re-supply and safety of training on the Moor. Whilst Statutory Body and Public comment ranged from either extreme end of the spectrum of complete degradation to full access for vehicles this decision does not lie within MoD’s gift. This is a decision for the Duchy of Cornwall in liaison with DNPA. Therefore the Loop Road has been scoped out.

11.4 Environmental Management Measures

- 11.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Comdt DTA assisted by the Senior Land Agent (SLA) DTE SW and MoD’s Service Provider. Implementation and compliance will be ensured through DTA EMS, management plans and DTE SW Standing Orders (SO).
- 11.4.2 The following management measures are currently implemented on DTA.
- Careful control of military aircraft activity which takes into account when activities will occur, number of aircraft, flying heights, which are normally limited. Low flying requires prior authorisation. Helicopter pilots are briefed to avoid habitation, riders and livestock.
 - RDAs are closed during live firing, which is notified by the raising of warning signals (red flags or lamps).
 - Blank firing and use of pyrotechnics is prohibited within 100m and 200m of civilians respectively.
 - It is ensured that all troops are briefed on their responsibilities as regards the general public on DTA, reinforcing DTE SW SOs requiring troops to be considerate of other users.
 - Byelaws are published and displayed in main car parks around the RDAs.
 - People are cleared from the RDAs and stock from the exercise danger area before day firing, as is necessary during the daytime and half an hour before last light if night firing is programmed.

¹⁰ The Continuing Need for Military Training on Dartmoor (RPS June 2005).

- Good relations are maintained with the police, in order to help with crime prevention and assist by locating and identifying any UXO reported within the National Park.
- The quantity and certainty of access and recreational quality is maximised where possible.
- Every effort is made to ensure that the public is aware of public access opportunities.
- Comdt DTA and wider DE community publish and make available to the public the 'Walks and Rides on Dartmoor' leaflet and website www.dartmoor-ranges.co.uk revising the text at least triennially.
- Information boards in the main car parks are well maintained and revisions to the information are considered at least triennially.
- Maintenance of information displays and a video at the High Moorland Visitor Centre and a smaller display at Postbridge.
- Development of a display at Okehampton Camp including a history of the military on Dartmoor, for loan to museums and libraries.
- Publishing Guaranteed Access Periods at least annually on the web, in the Dartmoor Visitor Centre and in the 'Walks and Rides on Dartmoor' leaflet.
- Publishing six weeks notice of firing programme on the website, for active graziers and in the Express and Echo, Western Morning News and Okehampton/Tavistock Times/Gazette and for broadcast daily on Radio Devon. Updated firing is shown in bold in each week's firing programme to indicate cancellations
- Informing the National Park Authority and Radio Devon of last minute changes, so that they can publicise them.
- Seeking reductions in the gap between programmed and actual use for live firing. In particular, dialogue with allocated users to identify potential cancellations at the earliest opportunity.
- Ensuring that the training area, ranges and training facilities are as safe as possible, and users, authorised personnel and members of the public are warned of the remaining military hazards (including unexploded ordnance) and cautioned about action that should be taken.

11.4.3 Additional mitigation measures have been identified from the WG meetings.

- In order to improve dissemination of information about dry training known horse riding establishments, hunts and individual riders will receive an annual brief on dry training and relevant contact numbers.
- Operation Bright Eyes information will be promoted and disseminated through this briefing mechanism.
- A review of the existing interpretation boards and their locations will be undertaken in order to improve the clarity of information about what dry training comprises plus additional military information in agreement with DNPA
- Improvements to the High Moorland Visitor Centre military display will be considered to better inform the public of military issues

- Training will be programmed to avoid agreed honey pot sites when the public are likely to be making extensive use of them. eg. Cullever Steps, Row Tor, car parking areas and East Okement River valley near Antony Stile.
- The possibility of extending the firing time notice will be kept under review.
- The OS and MoD will continue to review wording published on OS map sheets covering DTA.
- The DTA website will continue to develop and add information to increase the quality of experience gained from accessing DTA. Specifically a description of what dry training entails and what the public are likely to encounter will be added.
- A suite of access leaflets covering each of the 3 range areas within DTA will be produced.
- Ground exercises supported by four or more aircraft will be notified on the Firing Notice.
- A training DVD will be produced to reinforce DTE SW SOs and to inform troops of the National Park Purposes, care of the moor and consideration of other users.
- Comdt DTA has been authorised to negotiate minor local amendments to guaranteed public access periods.

11.5 Assessment of Potential Effects on Members of the Public Accessing DTA

Data Gathering and Survey Work

Data Gathering

11.5.1 Data about the access patterns to Dartmoor has been obtained from the Tourism Associates report⁷². Information on guaranteed access days has also been taken from the DTA website (www.dartmoor-ranges.co.uk). Information on mitigation has been taken from the DTA EMS, DTA ILMP and DTE SW SOs.

Survey Work

11.5.2 No further survey work has been undertaken as part of the appraisal of public access effects. A discussion of the findings from survey work completed as part of the Tourism Associates report is provided under **Paragraphs 11.5.15 to 11.5.21**.

Current Conditions

Current Availability of Public Access on DTA

11.5.3 The majority of DTA is identified as either open country or registered common land under the CROW (2000) Act. Most of the land comprising the Okehampton and Merrivale Training Areas is shown as registered common land, whilst that comprising Willsworthy, Cramber and Ringmoor is predominantly depicted as open country (mountain, moor,

⁷² Tourism Associates, March 2007, Sustainable Military Training on Dartmoor: Final Report

heath or down). However, military byelaws exempt the RDAs from the provisions of the Act and consequently, for uniformity across the UK, the RDAs are not shown as CROW access land on OS mapping. Nevertheless, the level of access provision on DTA is unchanged, since the Dartmoor Commons Act 1985 recognised a right of public access by foot or horse for recreational purposes to the unenclosed moorland. Under the military byelaws, access to the RDAs is restricted when live firing is notified.

- 11.5.4 In addition to the general right of access, there are 6 bridleways and 1 footpath in the southern Training Areas (Cramber and Ringmoor); 3 bridleways and 2 footpaths within Merrivale; and two footpaths within Willsworthy. In total, there are some 724km of Public Rights of Way (PRoW) across the whole of the National Park.
- 11.5.5 Generally, the majority of tracks tend to provide access to the moor rather than across it and most of the northwest of Dartmoor is inaccessible except on foot or by horse, although some tracks do exist. The Loop Road from Okehampton provides access 5km into the northern part of DTA. Some argue that the Loop Road allows vehicles to penetrate too far into Dartmoor's wild open spaces. Others argue that the Loop Road enables people to access and enjoy the moor. Farmers point out that the Road and MoD maintained tracks enable them to clear and care for their stock deeper on the moor. The MoD license from the Duchy of Cornwall for the use of Dartmoor for military training requires that the Loop Road as far as East Okement Farm, a working farm, be maintained for two-wheel drive vehicles and allows the remainder of the Road to be maintained to the standard required for military two-wheel drive vehicles. Other tracks may be maintained by MoD to the standard required for four-wheel drive vehicles. A policy of managed decline, developed with the relevant local statutory bodies, requires MoD to allow the Loop Road and tracks to deteriorate to the minimum standard required thus limiting access.
- 11.5.6 In 1998, the Dartmoor Commons Byelaws were amended to control off-road mountain biking, which is now restricted to bridleways, byways and routes agreed with landowners. Public access to DTA is managed in a similar fashion to other parts of the Dartmoor with unrestricted access by foot and horse to the moor for the majority of the time.
- 11.5.7 Under the military byelaws, public access to the RDAs is forbidden when live firing is notified. Restrictions are only imposed to the specific RDA being used. There are periods, particularly during public holidays and at weekends, when there is guaranteed public access. **Table 11.4** outlines the number of guaranteed public access days per year.

Table 11.4 Live Firing and Guaranteed Public Access

Range Danger Area	Live Firing (days per year)	Guaranteed public access (days per year)
Okehampton	120	245
Merrivale	180	185
Willsworthy	245	120

- 11.5.8 **Table 11.5** outlines the guaranteed non-firing dates for 2007.

Table 11.5 Guaranteed Non-firing Dates for 2007

Month	Okehampton	Merrivale	Willsworthy
Every Month	Every Sat, Sun & Mon Public Holidays	Every Sat, Sun & Mon Public Holidays	Every Sat, Sun and Public Holidays except the weekend containing the second Sun in the month
Jan	1 - 3	1 - 3	1 - 3
Feb	-	-	-
March	-	-	-
April	1 - 30	4 - 9	6 - 9
May	1 - 31	7 and 28	7 and 28
June	-	-	-
July	1 - 31	-	-
Aug	1 - 31	1 - 31	1 - 31
Sep	1 - 15	-	-
Oct	-	-	-
Nov	12 - 16	12 - 16	-
Dec	20 - 31	20 - 31	20 - 31

11.5.9 The booking and notification process runs through two iterations. Initially a number of programmed live firing days become available for access once detailed military planning has taken place. The details are published in firing notices six weeks in advance and changes are published in the firing notice. Subsequently, further days become available at short notice, mostly because poor visibility prevents observation of the RDA, or because good weather permits training objectives being achieved more quickly, and some due to users cancelling at short notice due to operational commitments or other reasons beyond their control. Wherever possible, cancellations are announced by 1600 hrs the previous day and the public informed through the DTA web site, DNPA Information Centres and Radio Devon. Further information is outlined in **Chapter 2** of this Report.

The Demand for Access on DTA

11.5.10 Overall, the more popular areas, where visitor levels tend to be concentrated are:

- stream and tor locations adjacent to or within 1km of metalled roads such as Cullever Steps, East Mill Tor, Oke Tor and the area directly to the south of Okehampton camp;
- the Yes Tor / High Willhays ridge taking in Dartmoor's highest points; and
- Tavy Cleave.

11.5.11 Beyond these areas access across DTA is difficult with the terrain limiting access to the more adventurous walker or rider as tracks are limited. The commonest recreational activities undertaken across DTA are walking (including dog walking), horse riding, letterboxing, picnicking and observing wildlife. Historically there has been some demand for unrestricted access to all of DTA i.e. a cessation of live firing. Additionally, there has been a request for increased access to specific areas of the moor including Yes Tor, High Willhays and Tavy Cleave. Whilst DNPA, OSS, RA, and DPA all stated a demand for additional access to DTA there is no forthcoming statistical evidence available to support

this aspiration. It is acknowledged by these bodies that these demands are based on a principle of unrestricted access to DTA.

- 11.5.12 There are no accurate and accepted records of number of visitors to Dartmoor. In 1994 the 'All Parks Survey' conducted a measurement of visitation for each of the then 10 National Parks in England and Wales, as well as the Norfolk Broads and the New Forest. This survey calculated a figure of 3.8 million total visitor days for Dartmoor. For the same year, in its 'Recreation and Tourism Dartmoor Fact Sheet' DNPA suggests that this figure should be 11.42 million visits.
- 11.5.13 The innumerable number of access routes into the National Park makes an accurate assessment of visitor numbers virtually immeasurable. Visitors can cross the National Park Boundary from any direction and the number of formal and informal parking areas is so numerous that accurate counting cannot be achieved.
- 11.5.14 This can be applied on a smaller scale to undertaking a detailed visitor count to the DTA. There are countless parking and innumerable access points onto the moorland areas of DTA and indeed walkers and riders can enter DTA from any direction across open moorland.

Information from the Tourism Associates Report

- 11.5.15 The discrepancy in available figures and the lack of additional information about visitor patterns and use of Dartmoor, specifically DTA, led the MoD through its consultant RPS to engage Tourism Associates at the University of Exeter to undertake a socio-economic and socio-cultural study to try and assess the current use and demand for access on DTA in relation to military training.
- 11.5.16 A comprehensive multi-method approach was devised, including: secondary research; a general visitor survey; a series of semi-structured interviews; and a programme of discussion groups. A combination of quantitative and qualitative data was collected, analyzed and interpreted. The year long study focussed on 6 specific terms of reference, 4 of which were directly related to public access issues.
- A. Understand more clearly and completely the claims made by special interest groups about the military presence on Dartmoor and the potential changes in tourism and leisure use patterns, were the military use of Dartmoor to change or the military to depart.
 - B. Investigate current spatial and temporal usage and spending patterns by visitors on Dartmoor, with special reference to DTA.
 - C. Assess potential spatial and temporal usage and spending patterns by visitors on Dartmoor, with special reference to DTA.
 - F. Provide recommendations about the interface between military activities, the local community and visitors to inform the future management of DTA.
- 11.5.17 The full report⁷³ from this study highlights a huge amount of information about current access use and associated demand. The report can be accessed at the DTA website (<http://www.dartmoor-ranges.co.uk>) but the key findings for the specific terms of reference are reproduced below:

⁷³ Sustainable Military Training on Dartmoor Final Report By Tourism Associates Exeter University March 2007

11.5.18 The key finding for term of reference A were:

- A.1. Military training on Dartmoor has generated considerable debate since Dartmoor was first designated as a National Park in 1951. At the crux of this debate has been whether military training is compatible with the Sandford Principle where conservation takes a higher precedence over other National Park purposes.
- A.2. The Sharp Report is often quoted by opponents to military training on the moor, in particular her memorable phrase that 'military training and a National Park are discordant, incongruous and inconsistent'.
- A.3. By and large, debate has not moved on significantly in substance in the past 25 years. Today broadly the same debates are rehearsed in the print media, but contemporary twists characterise the presentation.
- A.4. Academic analysis would suggest, though, that the MoD's tactics are to attempt to connect its activities on DTA with broader debates on national training and environmental stewardship, while its opponents tend to deploy a more localised focus.
- A.5. There is an imbalance in favour of negative stories compared with positive stories in the press about military training on the moor. The key themes covered by the negative stories include: pressure for the military to withdraw training from the moor; calls for a public enquiry; perceived access restrictions; risk to safety, and environmental damage caused by training.
- A.6. With respect to tourism and recreation, claims have been made that military alienation would lead to increased public access and large increases in visitor numbers and spend. This speculation is not grounded in empirical research, nor do existing studies offer a reliable baseline for such claims. Importantly, they also overlook the feasibility of increasing tourism in the areas currently covered by DTA as well as governance issues surrounding the Sandford Principle, were large volumes of visitors to access these areas.
- A.7. Interviews with organisations and pressure groups connected with the management of DNP revealed that the majority are in favour of current management arrangements on the moor including the military presence. There were some dissenting voices including DPA and OSS, which are opposed to the continuing presence of the military on Dartmoor.

11.5.19 The key finding for term of reference B were:

- B.1. The most popular activities on Dartmoor are sightseeing / picnicking, walking, and driving / touring. The most popular areas on the moor are Princetown, Haytor, Widecombe, Burrator and Postbridge.
- B.2. Of those visitors staying on Dartmoor and day visitors respectively the average length of stay was 7 nights and 4 hours 19 minutes.
- B.3. The average spend per night by staying visitors on accommodation was £18.44 per head and average spend per day excluding accommodation for all visitors was £8.43 per head.
- B.4. Only 1.39% of the respondents to the visitor survey planned to visit DTA during their trip and the average duration of this visit was 113 minutes.
- B.5. 11.1% of respondents to the visitor survey claimed to have visited DTA in the past year.

- B.6. 64.7% stated that the military presence had no effect on their visits to Dartmoor. 16.1% stated that the military presence had a positive effect.
- B.7. Less than a third (32.9%) of those who were aware of training looked for access information. Red flags, firing range telephone and newspapers were the most popular sources.
- B.8. Less than 2% of visitors were fully conversant with the access restrictions.

11.5.20 The key finding for term of reference C were:

- C.1. 86.1% of visitors were aware that the military trains on Dartmoor.
- C.2. Were the military to depart from Dartmoor, 3.8% claimed they would make more visits to the moor (6.13 per year).
- C.3. Were the military to depart from the training area, 5.4% claimed they would make more visits (4.85 per year).
- C.4. Claims that the removal of the military would lead to large numbers of new visitors to the (former) DTA were tempered by interviewees and discussion group participants who questioned how visitors would get there, what facilities are there to support them, and whether existing visitation patterns would be modified. There were also notes of caution over the potential impact on the environment of developing new facilities and much increased visitor use.

11.5.21 The key finding for term of reference F were:

- F.1. There is a gap between what the military thinks the local community knows and understands (i.e. about access issues, location of training area boundaries, and its activities on Dartmoor) and what the local community actually does know.
- F.2. In general, local people are not against the presence of military training on Dartmoor but their enthusiasm is curbed by a lack of knowledge of what goes on and why.
- F.3. There is little knowledge about the environmental and community-related activities of the military on Dartmoor. More could be made of this good work.
- F.4. There is much speculation that tourism is worth far more to the local economy than military spend, but this is speculation and based on a simple lack of public understanding in the absence of fuller information.

Significance Evaluation Methodology

11.5.22 The determination of significance is based on the use of professional judgement, with reference to the following considerations:

- the extent to which the public accessing DTA are affected by the restrictions in access from military training; and
- the duration of the effect resulting from restrictions in access (i.e. whether such restrictions are permanent or temporary, if the latter for how long).

11.5.23 The evaluation of the significance of public access effects depends on the sensitivity of the receptor in question and the magnitude of change/effect that is predicted to result from the activity.

Sensitivity of Receptors

11.5.24 It is not possible to provide a single overarching description of the sensitivity of the public who access DTA for recreation. The sensitivity varies to include the different types of receptors (who may respond differently to a particular effect) and nature of the effect. In determining the sensitivity or value of receptors the particular needs or concerns that are specific to DTA and surrounding area were considered. This focused on:

- Statutory bodies and other organisations with vested interests;
- local communities, groups and individuals; and
- external groups and individuals (i.e. not local).

11.5.25 Based on the approach described above, the sensitivity of public access receptors is expressed as High, Medium, or Low. **Table 11.6** provides as summarised definition of sensitivity.

Table 11.6 Definition of Sensitivity

Sensitivity	Definition
High	The recognised needs or concerns of the receptor (e.g. community, organisation or individual) indicate that it will be highly sensitive to change as a result of the effect
Medium	The recognised needs or concerns of the receptor (e.g. community, organisation or individual) indicate that it will be moderately sensitive to change as a result of the effect
Low	The recognised needs or concerns of the receptor (e.g. community, organisation or individual) indicate that it will have a low/negligible sensitivity to change as a result of the effect

Magnitude of Effects

11.5.26 The determination of the magnitude of an effect depends on informed judgement rather than any measurable scale of effects. The magnitude of effect on a given receptor takes into account:

- the spatial extent and number of people or firms affected (for example, individuals, neighbourhoods, local area, region, UK economy);
- the duration of the effect (for example, temporary or permanent, irreversible or reversible, short-term, medium-term or long-term); and
- thresholds: where an effect might create an unacceptable step change.

11.5.27 The magnitude of public access effects is expressed as High, Medium, or Low. **Table 11.7** provides a summarised definition of magnitude.

Table 11.7 Definition of Magnitude

Magnitude	Extent	Duration	Thresholds
High	<ul style="list-style-type: none"> • High number of firms/people – for example; UK or region 	<ul style="list-style-type: none"> • Permanent and or irreversible change 	<ul style="list-style-type: none"> • A dramatic 'step change'
Medium	<ul style="list-style-type: none"> • Sub-region or local authority area/district 		<ul style="list-style-type: none"> • Moderate or partial difference
Low	<ul style="list-style-type: none"> • Low number of firms/people – for example; individuals or neighbourhood 	<ul style="list-style-type: none"> • Temporary and or reversible change 	<ul style="list-style-type: none"> • Minor or negligible discernable difference

11.5.28 Direct effects tend to have a greater magnitude but secondary or indirect effects can also be important and contribute towards an assessment of magnitude. Informed judgement is necessary to evaluate the overall importance of an effect.

Summary of Determination of Significance

11.5.29 It is assumed that significance is related to sensitivity and magnitude and **Table 11.8** presents a matrix illustrating how the definitions of sensitivity and magnitude are to determine the significance of recreation and socio-economic effects:

Table 11.8 Definition of Significance

Magnitude	Sensitivity		
	High	Medium	Low
High	Significant	Significant	Not Significant
Medium	Significant	Significant/Not Significant	Not Significant
Low	Significant	Not Significant	Not Significant

11.5.30 Importantly, an effect's significance is also a product of the policy importance of the effect and judgement is required in assessing how an effect either contributes or is counter to national, regional or local policies.

Assessment of Effects and Evaluation of Significance

Assessment of Effects Resulting from Restrictions to Access to DTA

Demand for Access

- 11.5.31 In assessing the effects from restricted access to DTA, the level of demand for access has been taken into consideration. Through discussion within the PA WG and individual meetings between the Chair of the PA WG and the RA, OSS, and DPA it was apparent that no one organisation was aware of other significant survey work undertaken beyond that covered within the Tourism Associates report.
- 11.5.32 In summary, whilst there is an acknowledgement of a demand for increased public access to the DTA through a reduction of military training it is clear that this has been a long standing debate that has lasted for over 25 years. Whilst the MoD has broadened this debate to national training requirements and environmental stewardship the localised focus has been on the withdrawal of the military from Dartmoor National Park and the perceived access restrictions imposed by training. Historically there has been a lack of grounded empirical research undertaken to inform this debate until the production of the Tourism Associates report.
- 11.5.33 The Tourism Associates study has revealed the following key facts.
- The majority of those surveyed were in favour of the current management regime within DTA but there are some dissenting voices who continue to oppose the military restrictions.
 - Only a very small percentage of visitors to Dartmoor plan to visit DTA and the average length of stay (less than 2 hours) indicates that the demand for access is low.
 - The vast majority of those surveyed were aware that the military trained on Dartmoor but over 80 % claimed this had either no effect or a positive effect on their visit.
 - It was calculated that only 5.4% of respondents would make more visits to DTA should the military leave the training area. This relatively low figure was backed by interviewees and discussion group participants who questioned if existing access patterns would be modified.
 - Communication of simple messages may be an issue in the management of access on DTA. A very low percentage of people were fully conversant with access restrictions and only a third of those aware of military training looked for access information.
 - There appears to be a gap between what the local community and visitors know about range boundaries and access and what the MoD perceive them to know. Clearly better communication of these messages will facilitate a better access experience and answer some of the criticism of restriction over demand. The military and visitor require certainty and clarity to maximise opportunity and minimise interruption. The visitor needs to be clear on where and when access is available. This in turn will give the military confidence to carry out its training activities uninterrupted when access is restricted.

Assessment of the Potential for Reducing the Number of Days Allowed for Live Firing;

- 11.5.34 The statement of military need in the independent RPS paper “The Continuing Need for Military Training on Dartmoor” published in June 2005 available on the DTA website (www.dartmoor-ranges.co.uk) identified a shortage of live firing range space pan UK. As

already noted in Chapter 3 (3.4.15) all UK sites are running at or near full capacity. Other factors to be considered include the current tempo of operational commitments, Future Army Structures (FAS) and the geographical basing of the Armed Forces in the future which envisages a further 20,000 troops returning to permanent bases in the UK from overseas. On this basis it is considered that relinquishing live firing capacity is not a feasible course

Review of Guaranteed Public Access Days

Background

- 11.5.35 Live firing and guaranteed public access days are shown in **Tables 11.4** and **11.5** above. Whilst the firing calendar will vary from year to year due to the changing dates of public holidays it remains otherwise unchanged from year to year.
- 11.5.36 Comments received on the initial Scoping Report and subsequent discussions within the PA WG and with NGOs have indicated a number of requests to alter this calendar to allow guaranteed access on alternative dates within the year. Assuming that the number of required firing days remains the same (as above) then this would require a re-allocation of the same number of days.
- 11.5.37 **Table 11.9** shows the varying requests from different organisations.

Table 11.9 Firing Calendar Proposals

	Jan	Feb	March	April	May	June	July	Aug	Sept	October	Nov	Dec	Comments
Existing Firing Calendar													
Current: Merrivale	1-3 Non firing		Week before and after Easter							Week beginning 2 nd Monday of month*	20 -31 Non-firing		Weekend, public holiday and Mondays are non-firing
Current: Willsworthy	1-3 Non firing										20 -31 Non-firing		
Current Okehampton	1-3 Non firing		Week before and after Easter								20-31 Non Firing		Weekend, public holiday and Mondays are non-firing
Consultation responses													
DNPA	1-3 Non firing		Week before and after Easter						1-15 Non Firing	Week beginning 2 nd Monday of month*	20 -31 Non-firing		Weekend, public holiday and Mondays are non-firing
RDA (Okehampton only)											1-15 Non Firing		
Ramblers Association	Week after New Year Bank holiday		Week before and after Easter						1-15 Non Firing	Week beginning 2 nd Monday of month*	Week before Bank Holiday		Weekend, public holiday and Mondays are non-firing
D of E (duke of Edinburgh)	1 – 3 Non Firing		Week before and after Easter						1-15 Non Firing		20 – 31 Non Firing		Weekend, public holiday and Mondays are non-firing
Schools timetable													
Devon School Holidays (07/08)	1 st – 2 nd	18 th -22 nd	21 st and 24 th	7 th -18 th	26 th -30 th			24 th – 31 st		22 nd -26 th		24 th – 31 st	
Key													

Assessment

11.5.38 As can be seen from **Table 11.9**, complications have arisen in that requests received from the various sources are disparate and conflict with each other. In particular, it was noted that school holidays are developing an ever diverging timeline, caused by the new semester system and a lack of common dates between Devon and Cornwall and 2 further unitary authorities in Devon. In order for schools to have a holiday of a week this can be spread over a period of up to 4 weeks, and statutory periods such as Easter are no longer necessarily taken. It is obvious that to incorporate all these suggestions would not be possible within the existing number of non-firing days. If all suggestions were taken the MoD could not maintain viable Live Fire Ranges. It was concluded that the current annual publication of the programme represents the best case. However, it was also noted that Comdt DTA should be authorised to negotiate minor local amendments to the firing programme as a result of specific requests from organised bodies.

Assessment of Effects Resulting from Restrictions to Access to DTA (defined areas within DTA)

Access to Yes Tor and High Willhays

Background

11.5.39 Some organisations have requested that MoD exclude Yes Tor and High Willhays and access routes to them from the RDA. Both these features are contained in the Okehampton RDA which under the terms of the Duchy of Cornwall license is available for 120 days live firing each year. Therefore, the public is already guaranteed access on 245 days per year. Further days become available for access once detailed programming takes place. As well as specialist fixed target ranges, the main use of Okehampton is for firing with a number of free manoeuvre areas or boxes for tactical live fire. As the largest of the 3 RDAs, Okehampton offers the most scope for tactical freedom and larger live fire exercises. Current annual usage is running below capacity because of operational commitments overseas.

11.5.40 A scenario was examined where the range movement boxes were moved in order that Yes Tor and High Willhays, and a suitable access route would be available for guaranteed public access at all times. This involves a move of RDA some 1.5km south.

Assessment

11.5.41 In analysing this issue the following points have been noted.

- A reduction in the RDA might signal an increase in the amount of space available for dry training. However, the area freed up is close to a honey pot site (Moor Brook) and the summits within this area would also have to be avoided. Therefore there is no increase in dry training availability should the range movement boxes be moved.
- Similarly there would appear to be increased space to clear stock for live firing; however, as most Forest stock cannot be driven onto Okehampton Common, this too, is not advantage.
- Amendment of the RDA would cause the loss of the Anti-tank range. This is the only range of its type on Dartmoor with fixed and moving anti-tank targets.
- Roads are currently used to deploy targetry, for logistic re-supply, command and control, and medical evacuation for those operating on the Moor. Moving the firing area further south, where roads and tracks do not exist will increase the difficulties in setting up and running ranges. Setting up ranges will require considerable additional effort. Targets are placed out for each firing day, rarely in the same place, and are

collected at the end of firing. (This also has the advantage of reducing wear and tear on the Moor by not repeatedly placing targets in the same place.) This effort is not only a function of distance but comprises:

- a lack of roads to move targetry;
- a need for all terrain vehicle to place targetry;
- no clearance of stock on horseback because of blanket bog; and
- an increase in clearance and setting up timings thereby reducing the time available for firing.
- The depth of range available will be reduced; additional time will be required to transit troops back to a start line to re-run an exercise as opposed to the ability to continue south with a second iteration. Training continuity will be lost.
- Live firing can only proceed if all of the exercise danger area can be observed. Hill fog often sits in the centre of the Moor and observation posts are not sited to observe this area. If more days are lost to bad visibility then there would be a need to programme more days for live firing in order to achieve the mandated training objectives.
- MoD already takes account of the bird breeding and nesting seasons which reduces utility. Any move further south risks bringing troops closer to these sensitive areas and will further reduce the ability to live fire.
- Moving the RDA south will prevent concurrent exercises being conducted from Hangingstone Hill, West Okement and Amicombe. This reduction in capacity will greatly reduce the utility of the ranges.
- A reduction in the area available for live fire is likely to increase the wear and tear on a smaller part of the Moor.

- 11.5.42 In addition, it should be noted that both DNPA and NE highlighted the potential for disturbance of breeding Ring Ouzel as a particular concern if the public were given increased access to this area.

Conclusion

- 11.5.43 All of these measures lead to a reduction in utility of Dartmoor as a realistic live fire training facility. It is assessed that this factor in addition to increased administration would result in a reduction in effective training. The disadvantages heavily outweigh any advantage which might accrue. It is clear that mandated training objectives could not be achieved within a reduced area. Therefore the MoD has rejected the proposal.

Access to Tavy Cleave

Background

- 11.5.44 Some organisations have requested that MOD exclude Tavy Cleave from the RDA. This feature is contained in the Willsworthy RDA the majority of which is MOD freehold. Currently firing is programmable for 245 days per year giving 120 days guaranteed public access. Further days become available for access once planning and booking take place. The nature of the fixed target ranges at Willsworthy (gallery, MMTT and ETR) are particularly suitable for initial training and they are heavily used by Commando Training Centre Royal Marines Lympstone. In addition, field firing is conducted at Willsworthy.

11.5.45 A scenario was examined where adjustments were made in order that Tavy Cleave would be available for guaranteed public access at all times.

Assessment

11.5.46 In analysing this issue the following points have been noted.

- This adjustment would remove the possibility of field firing from Willsworthy, as the resulting area is too small to allow free manoeuvre with acceptable arcs of fire.
- The MMTT and ETR ranges could no longer operate as their RDAs include Tavy Cleave, and would need to be removed. Any adjustment to RDA on the southern boundary would result in the need for at least 2 more lookouts with associated infrastructure including stables for range clearers.
- Similarly sniper firing would not be possible as the danger area includes Tavy Cleave.
- Tavy Cleave is a breeding area for at least 4 pairs of the locally scarce ring ouzel. Further opening of this area to the public will bring the prospect of access restrictions and the requirement to police the area.

11.5.47 Further technical study of the gallery range at Willsworthy is to be undertaken using the Weapon Danger Area Assessment and Prediction System (WDAAPS) in order to determine whether the range template type can be changed. If this were to be the case there would not be a need to observe the high ground outside the template and allow firing even when observation of this area is not possible due to mist, thereby reducing range closures making more efficient use of programmed time. A result from these deliberations is not expected before mid 2008.

Conclusion

11.5.48 The removal of 4 types of firing from Willsworthy is an unacceptable loss of training capability which cannot be provided elsewhere, particularly as Willsworthy is the range with the heaviest use. Therefore the MoD has rejected the proposal.

Assessment of the Effects Due to a Perceived Restriction to Access to DTA Due to Dry Training Activities

Background

11.5.49 Dry tactical training can take place over any part of the DTA. By its nature dry training cannot be contained within a small area and it is difficult to allocate and confine specific areas for this activity. It can occur 24 hours a day on 365 days a year. Responses to the Scoping Report and discussion within the PA WG and meetings with other organisations have raised a number of issues relating to dry tactical training.

- There appeared to be a lack of understanding as to what exactly dry training entailed.
- There was a perception that dry training activity detracted from the quality of access onto the DTA because of blank fire noise. Noise effects are considered in **Chapter 10**.
- There was concern that the startle effect of noise, particularly in relation to horses and riders, was an issue. Noise is covered in **Chapter 10** of this EA.
- Interest was expressed in undertaking dry training notification along similar lines to that of Firing Notices. However because the whole of DTA can be used at any time this was agreed by the majority as unworkable and likely to reduce the clear safety message of Firing Notices relating to live firing and the displaying of warning signals.

- There was a request to segregate the public from dry training to ensure separation. Separation of troops and civilians was considered but dismissed as this would naturally lead to additional closures of the DTA. This suggestion was subsequently retracted.
- Concerns were raised about dry training being undertaken in areas of high visitor numbers during peak visitor periods (sites known as 'honey pots'). These sites were identified by DNPA and discussed within the PA WG.
- The Tourism Associates report highlights a lack of information about the dry training activities undertaken by the military as an issue that could be addressed.
- Comdt DTA currently briefs user units at the highest level on National Park purposes, care of the Moor and consideration of other users. It was recommended that a training DVD be produced to ensure all troops receive a direct brief.

Assessment of Effects

11.5.50 There is no measurable effect on recreational users from dry training. The Tourism Associates Report clearly states that were the military to leave the training area that those interviewed would make in the region of 5.4% more visits but this is not broken down to differences between live and dry training. However, information from the PA WG meetings, and from the Tourism Associates report would indicate that the two main effects on public access in relation to dry training are:

- a perceived rather than an actual effect on public access due to a lack of understanding of what dry training involves; and
- potential effects on public access when dry training takes place close to honey pot sites during peak visitor times.

11.5.51 In response to the potential perceived lack of access during dry training, several mitigation measures have been identified in order to improve knowledge and communication of information about dry training. These are outlined in **Section 11.4** and comprise:

- an annual reminder to known horse riding establishments, hunts and individual riders as to what exactly dry training entails and what riders should expect to come across whilst within the DTA boundary;
- a clear and simple definition of what dry training entails and what members of the public should expect to come across outlined in the DTA website (www.dartmoor-ranges.co.uk);
- clear safety messages and simple explanations of all dry training activity in all revised/new information provision (see "Review of Information/Interpretation/Communication" below); and
- Commandant DTA will investigate production of a training DVD to reinforce DTE SW SOs and inform exercising troops of National Park purposes, care of the Moor and consideration of other users.

11.5.52 The perceived public access effects relating to dry training have the potential to affect a wide range of users of DTA and at a varying scale. It was clear from both the PA WG and from discussions with other organisations that increased and clearer information was the key to solve these perceived problems. It would appear that effects relate to a perceived lack or limitation of access rather than actual lack or limitation of access. It is considered

that with the above mitigation in place effects would be greatly reduced and unlikely to be significant.

- 11.5.53 The second identified effect relates to the presence of dry training activities close to popular visitor locations known as 'honey pot sites'. Current management measures help to mitigate these effects as blank firing and use of pyrotechnics is prohibited within 100m and 200m of civilians respectively. However, honey pot sites have been identified and agreed by DNPA and 'Voluntary Training Avoids' put in place in order to ensure that dry tactical training does not occur in or around these sites at peak visitor periods.. This has now been included in the DTA ILMP and covered within the brief received by all units training on the DTA. It is considered that this mitigation will ensure that significant effects will be avoided as honey pot sites are more likely to attract a greater number of high sensitivity visitors. The ease of accessibility at these sites, for example, car parks and well defined paths, are likely to allow access for more vulnerable users such as the elderly, small children and disabled. Furthermore, because of the facilities and popularity of these sites there is the potential for a higher magnitude of effects as more visitors are likely to visit such sites. Placing a voluntary avoid around these sites will ensure that significant effects are avoided.

Assessment of Effects Resulting from Amount of Notice Provided by Firing Notices

Background

- 11.5.54 Currently, there are several measures in place to ensure that the public and interest groups are well informed about live firing in order to plan visits and walks on DTA. These measures are outlined in **Section 11.4** and comprise the following.

- **Guaranteed Non-Firing Days:** These are published annually on the DTA website (<http://www.dartmoor-ranges.co.uk>) and in a number of publications widely available including the MoD publication 'A Guide to Walkers and Riders' and within DNPA's 'Dartmoor Visitor'.
- **Publication and display of Firing Notices:** Days and nights on which firing is to take place are advertised 6 weeks in advance on the DTA website, in neighbouring police stations, some Post Offices, some public houses and hotels, and in National Park and Tourist Information Centres. Cancellations in the 6 week period are highlighted in bold. No increase is permitted except for urgent operational necessity.
- One week in advance details of weekly firing programmes can be obtained by using the Freephone telephone answering service on 0800-4584868 and the firing notices are published in the Tavistock and Okehampton Times on Thursdays, and in The Western Morning News and Express and Echo every Friday and on BBC Radio Devon every morning.
- **Last minute cancellations:** On days when firing has been advertised, if the red flags are not flying by 09:00hrs from April-September inclusive and by 10:00hrs from October-March inclusive no firing will take place that day or that night. The DTA website, BBC Radio Devon and the Dartmoor National Park Information Centres are informed of cancellations as soon as they occur.

- 11.5.55 Advance notice: A trial of an increase from two to six weeks in the Firing Notice was conducted during 2006. Although there was some loss of flexibility in programming live firing, the advantage of increasing the certainty of public access was accepted and the increase in notice adopted in Sep 2006. This allows better forward planning by recreational users.

- 11.5.56 Potential effects have been identified relating to notice of when live firing is taking place (known as Firing Notice) as DNPA and other organisations, which plan guided walks would wish to see the Firing Notice extended to three months, as it is considered that this would better facilitate the production of guided walks programmes which are compiled before the six week notice is available. The PA WG Chair took this forward to Comdt DTA and other military personnel for discussion.

Assessment of Effects

- 11.5.57 An extension of the current 6 week firing notice period to three months (13 weeks) will affect both the military and public alike. The military will have to commit to activity programmes further in advance which are likely to be subject to change as a result of operational commitments leading to changes in the programme. These changes may involve additional firing time or cancellations in order to complete other tasks. It is acknowledged that late cancellations are an area of concern for those wishing to see a decrease in the discrepancy between booked days and actual use. These alterations would similarly affect public access as changes inside the 13 week limit would have the potential to cancel planned walking activities. The present system provides a degree of flexibility which it is assessed limits inconvenience to the public and their ability to plan recreational activities. In addition, it is considered that the guaranteed public access days can be used to programme events up to 12 months in advance. Within the published calendar there are guaranteed days available for the organisation of guided walks in every three month period. Walk leaders have the opportunity to choose a guaranteed non firing day for any event. Regular reviews of this arrangement will continue and any feasible extensions to the Firing Notice implemented.
- 11.5.58 Changing to a 13 week firing notice has the potential to negatively affect public access. Operational commitments are likely to lead to alterations to published programmes with additional firing dates as well as cancellations thereby increasing disruption to programmes for both the military and those wishing access.

Assessment of Effects Resulting from the Clarity of Information about DTA

Review of the Depiction of OS Mapping

- 11.5.59 New OS mapping, post CROW 2000, denotes access land with a yellow colourwash. Concerns have been raised that the DTA RDA is not depicted on OS mapping with the yellow colourwash. The view was expressed that this may be misleading to potential visitors wishing to access the area.
- 11.5.60 MoD and OS policy during the production of new OS mapping was that no MoD RDA would have the yellow colourwash to ensure that there could be no mis-interpretation by the public that they had access at all times. This approach was to ensure safety, clarity and certainty for both the public and for MoD.
- 11.5.61 Military byelawed land is excepted from CROW legislation and therefore does not fall within the criteria of access land. On the majority of MoD ranges this allows for the simple removal of the yellow colourwash.
- 11.5.62 However when the military byelaws are not enacted during non-firing periods on DTA then the Dartmoor Commons Act does allow for open access on foot and on horse. This led to the discussions on how DTA should be depicted on the OS Maps indicating that at times there is open access under this Act. During the CROW roll out period discussions this was raised to Ministerial level where it was agreed that to ensure public safety the colourwash would not be applied.

- 11.5.63 To prevent the possibility of misinterpretation that DTA RDA does not have any open access it was agreed with all parties involved that additional wording would be published on the OS maps covering the DTA. This wording states 'Range Danger Area - Access may be restricted'. Additionally the DTA website address and telephone number are also given on the map.
- 11.5.64 During the process of this EA both MoD and OS discussed their policy approach and agreed that the Ministerial statement remains unaltered. The PA WG undertook a review of the explanatory wording on the OS map but no suggested improvement on the current wording was forthcoming.
- 11.5.65 Both MoD and OS continue to be open to further suggestions for improving the wording depicted on the OS map covering the DTA RDA.
- 11.5.66 In summary, there may be an effect that concern remains that the lack of colourwash may not demonstrate that there is public access when live firing is not taking place. However, the MoD and OS approach endorsed by Minister Armed Forces is to promote the safety of the general public. Furthermore, it is considered that the availability of the website address and telephone number on the map, as well as other information about DTA which is displayed around the local area does ensure that anyone wishing to enter the DTA RDA can easily obtain up to date information on access. Therefore, the depiction of the RDAs on the OS mapping is considered to have effects of a very low magnitude and thus is unlikely to be significant.

Review of Information / Interpretation and Communication

- 11.5.67 Current access information and interpretation on DTA consists of 14 information panels located at visitor car-parks. These have been in place for a number of years and DNPA have stated a wish to see a review of the location of these panels as well as the information they contain. A lack of clear messages and good information provision can affect public perception of what the military activity in a given area consists of, which can therefore have an effect in preventing or deterring members of the public from accessing DTA. Messages need to have clarity so that visitors can be certain of where and when they can visit and what to expect when they arrive.
- 11.5.68 As a result, it was agreed that MoD would seek funding for renewal of these information boards and that DNPA would be consulted over location and content. PA WG members were shown examples of best practice demonstrating what had been achieved in conjunction with Northumberland National Park.
- 11.5.69 Offsite information is available through a number of other sources including the MoD publications 'Guide for Walkers and Riders' and a public information leaflet. The DNPA annual visitor publication 'Dartmoor Visitor' includes information on the military use of Dartmoor. DNPA also produce a 'Military on Dartmoor' education fact sheet and the DNPA website (<http://www.dartmoor-npa.gov.uk>) includes a large amount of useful information for the public on the military use of Dartmoor. The MoD also has an area within DNPA's High Moorland Visitor Centre where there is a display and video loop on military activity on Dartmoor.
- 11.5.70 The DTA website (<http://www.dartmoor-ranges.co.uk>) also contains a large amount of information for the public on the military use of Dartmoor. The website has been greatly improved in recent months and contains information on a number of topics including public access, military use and conservation management.
- 11.5.71 Despite the existing information and interpretation, concerns were raised by a number of parties that not enough was being done to communicate simple messages about military activity on Dartmoor.

11.5.72 Therefore, as part of the assessment the following mitigation has been identified (see **Section 11.4**).

- The DTA website (<http://www.dartmoor-ranges.co.uk>) continues to develop and improve. Greater information provision will continue to enable members of the public to find out more about the military activities on DTA and the surrounding area.
- The existing interpretation boards outlining Military activities currently located at car-parks around DTA will be reviewed. This review will involve consultation with DNPA over location and content to ensure clarity of messages enables the public to fully understand the concept of dry training. Funding has been secured to complete this project in the financial year 2008-09.
- In order to further inform the public of the nature of activities across the DTA, including dry training, funding has been secured to refurbish the existing military display within the DNPA High Moorland Visitor Centre. This refurbishment will obviously have to be in agreement with DNPA and in line with any plans they may have for the Centre. Other alternative information provision options for this allocation will also be considered as part of this review.
- A suite of access leaflets is being developed to guide visitors around the 3 training areas. These leaflets will contain simple and concise safety messages relating to the military activities when live firing is not being undertaken as well as points of interest.

11.5.73 The MoD will continue to invest in communication with visitors to ensure that ample opportunity is provided for the delivery of safety information and interpretation to improve the safety and quality of experience for the public. It is considered that although a lack of clear messages and good information provision may be affecting public perception of military activity and therefore preventing or deterring members of the public from accessing DTA, this is only likely to be affecting a small number of people. Therefore, with the above mitigation measures in place, effects are unlikely to be significant.

Assessment of Effects from Aircraft (in Support of Ground Troops)

Background

11.5.74 Helicopters and fixed wing aircraft provide support to ground based troops. Aircraft activity is agreed with Comdt DTA and is required to conform to the rules set out in DTE SW SOs, specifically:

- other than in an emergency or with prior authority of the landowner, helicopters are allowed to land only within the DTA;
- helicopters are normally required to transit above 250 feet Minimum Separation Distance (MSD). Helicopters may fly at any height over a training area;
- care be taken to avoid undue disturbance of livestock; and
- planning constraints require that helicopter landings should not occur within the perimeter of Willsworthy Camp.

11.5.75 Within DTA, there is no set pattern to the movement of helicopters, or landing sites. There are however, designated Helicopter Landing Sites both at Okehampton Camp and near Willsworthy Camp.

11.5.76 Existing mitigation measures in place to minimise the startle effect of helicopters on riders, horses and walkers include:

- notification in the media of training exercises likely to cause inconvenience; and
- briefing pilots to avoid horse riders where safe to do so.

11.5.77 Through the Working Group meetings, additional mitigation has been identified, which comprises:

- The existing dry training brief to all horse riders, centres, stables and hunts is extended to include a reminder about helicopter activity;
- notification in the Firing Notice, which is published on the website some 6 weeks in advance of ground exercises which employ 4 or more aircraft;
- inclusion of Operation Bright Eyes information in any brief presented to horse riders. This project was a joint undertaking by the MoD and the British Horse Society (BHS) promoting the wearing of high visibility attire for horse and rider to ensure maximum visibility of horse and rider to pilots. The project also alerts riders to the 'Pryer Reflex' which indicates where a horse may have heard or sensed a helicopter (or other noise) long before the rider. The BHS promote this operation and have awarded the MOD with a safety award as a result of this work. Details of this project can be found on the MoD access website (<http://www.access.mod.uk>) and the BHS website (<http://www.bhs.org.uk>).

Assessment of Effects

11.5.78 Concerns have been raised as to the startle effect of aircraft on the general public accessing the training area, and in particular the effect on horses and riders. The PA WG discussed this at length; it is difficult to distinguish between aircraft activity in support of ground troops, aircraft undertaking pilot training and non military aircraft transiting Dartmoor airspace. However, additional mitigation has been identified through the Working Group meetings in order to improve notification of exercises which are supported by aircraft and to improve the visibility of riders whilst out riding and their general awareness of aircraft activity.

11.5.79 Whilst helicopter activity in support of ground troops will continue, mitigation will minimise any startle effect by briefing pilots and ground troops and by maximising information available to the public.

11.6 Summary of Significance Evaluation

Table 11.10 Summary of Significant Effects: Public Access

Receptor and summary of predicted effects	Type of effect ¹	Significance ²
The public: limitations to access due to live firing taking place	-ve	S Access is not allowed when live firing is taking place as a matter of public safety. However, notice is provided through phones lines, websites and radio in order to maximise public access. Every effort is being made to minimise inconvenience, and reduce the significance.
The public: limited access to areas of particular interest (Yes Tor, High Willhays, Tavy Cleave)	-ve	NS MoD has examined the possibility of opening these areas to permanent access. Unfortunately the reduction in utility of the ranges precludes this option, but as Yes Tor /High Willhays is already guaranteed to be available 245 days each year this is not considered to be significant.
The effect of dry training on public access	N	NS It is considered that with improved information about dry training, and with limits on dry training near popular locations during peak visitor times that there will be no significant effects on the public. Those wishing to visit popular locations during peak tourist periods will not be disturbed by dry training as it will not be taking place at these areas. Those who have previously avoided visiting DTA due to a misconception about dry training should now be fully informed and be aware that access to DTA is possible during dry training periods.
The public: effects on planning visits to and walks around DTA due to the amount of notice provided about live firing.	N	NS Consideration has been given to extending Firing Notices from 6 weeks to 13 weeks, to allow the public increased planning time. However, the assessment has shown that whilst the time available to the public will remain broadly the same there is potential for disruption as this extended timescale will reduce military flexibility. Alterations to published programmes are likely, causing difficulties for both sets of users of the Moor. Furthermore, organisations have the ability to plan ahead on guaranteed access days, which are published annually, and include a number of days within each 3 month period. Therefore the effect is not considered significant
The public: limited access to RDAs due to OS mapping depiction of DPA	N	NS A review of access information on OS maps has been undertaken, however, the mapped information will remain the same for safety reasons. There are contact details on the OS maps where visitors can find information on accessibility. Therefore the effects are unlikely to be significant.
The public: new and improved information about access on DTA	+ve	NS It is considered that with the proposed mitigation in place, which will improve the interpretation around the local area about military training, that members of the public will have more information about how they can access DTA. It is considered that this may have beneficial effects as more people may become aware that it possible to visit DTA. Effects are not considered to be significant.
The public: startle effects from aircraft in support of ground troops	N	NS Mitigation has been identified which will help to provide more information about the use of aircraft in support of ground troops and improve the visibility of riders and as well as ensuring pilots are briefed regarding potential startle effects on riders.
Key/footnotes:		
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S Significant or NS Not-significant This simple significance scale should not be altered



DARTMOOR TRAINING AREA

Environmental Appraisal

Socio Economic Effects

12

12. Socio Economic Effects

12.1 Introduction

- 12.1.1 This chapter assesses the potential economic and social effects that may arise as a result of the military training activities that take place on Dartmoor. The military activities may affect a number of socio-economic characteristics of the local area including tourism, agriculture, local employment and income as well as the quality of life of local residents.
- 12.1.2 This chapter has been prepared by Alistair Donohew, Senior Consultant at Entec UK Ltd (member of IED and associate member of the IEMA).

12.2 Context

Legislative Context

- 12.2.1 There is no legislation that is directly relevant to the social and economic specific issues within this Chapter.

Policy Context

- 12.2.2 The policies outlined in **Table 12.1** serve to set the context within which this Appraisal has been considered.

Table 12.1 Planning Policy Context: Socio-Economics

Policy Reference	Context
National	
PPG17 Policy 31	Activities requiring particular natural features should be allowed where the impact on natural features can be minimised.
Environment Act 1995	Environment Act 1995 (EA95) Part III Section 62 amended the National Parks and Access to the Countryside Act 1949 (NP49) by inserting 'A National Park authorityin pursuing the National Park purposes shall seek to foster the economic and social well-being of local communities within the National Park' it goes on to say 'but without incurring significant expenditure in doing so, and shall for that purpose co-operate with local authorities and public bodies whose function include the promotion of economic or social development within the area of the National Park.'
Regional	
SWRSS Policy T01	<p>Local authorities, stakeholders and the tourism industry will promote the development of tourism by:</p> <ul style="list-style-type: none"> (I) Improving the quality and diversity of existing facilities and accommodation throughout the region, particularly where this would reduce seasonality. (II) Realising the potential of the region's environmental, cultural and heritage assets as a basis for the development of sustainable tourism, where consistent with their conservation. (III) Identifying opportunities for the development of new facilities and accommodation related to recreational cycle and footpath networks within the region.
Local	
DNPMP Policy T1	Coordination and integration of the work of all those public and private sector bodies engaged in the promotion and marketing of Dartmoor will be promoted through the Dartmoor Partnership (the tourism forum for the Dartmoor area)
DNPMP Policy T2	Tourism initiatives based upon the special qualities of Dartmoor will be developed and visitors will be encouraged and assisted to learn about and appreciate the character of Dartmoor, its landscape and its people.
DNPMP Policy T3	Tourism-based businesses will be encouraged and assisted to undertake environmental sustainability audits of their operations and enterprises, within the framework of the European Charter for Sustainable Tourism in Protected Areas.
Other	
GGPPT Policy 2.4	Tourism can bring many broader benefits that will contribute to the economic and social well being of local communities as well as to individuals.
GGPPT Policy 3.25	<p>RSS and LDF policies should therefore engender a positive approach to rural tourism proposals, applying the following principles:</p> <ul style="list-style-type: none"> (I) Wherever possible, tourist and visitor facilities should be housed in existing or replacement buildings, particularly where they are located outside existing settlements. (II) In statutorily designated areas 15 they should seek to conserve and enhance the qualities and features that justified the designation (III) Large-scale tourist proposals must be assessed against the whole range of sustainable development objectives16. This includes not only their transport implications but also other sustainability considerations such as how they assist rural regeneration and the well being of communities.

Note 1 – The full names of the plans and guidance cited are given in Appendix 4.4, which details all policies and guidance that are relevant

12.3 Scope of the Assessment

12.3.1 The scope has been identified based on an understanding of the activities undertaken at Dartmoor Training Area (DTA), the site context and professional experience of undertaking assessments of similar proposals. The *EIA Regulations* indicate that the potential significant effects on ‘population’ should be considered and described in an Environmental Statement (ES). This section describes the process undertaken to define the scope of the assessment and the nature of the effects that are included in the assessment. Each effect has the potential to affect a range of receptors across a wide geographic area.

Type of potential effects

12.3.2 There is a strong relationship between different socio-economic effects, and direct effects are almost always accompanied by wider indirect effects. For instance any increase in the amount of employment in an area may generate expenditure on local goods and services, stimulating the wider economy.

Spatial extent of effects

12.3.3 Socio-economic effects may affect local residents or individuals within the wider regional area. Correctly defining the geographical scope of the assessment is therefore fundamentally important. The principal ‘areas of interest’ in this assessment are the Dartmoor National Park (DNP) and the towns and villages located in and around DNP. The area of analysis takes into account a 5km buffer around DNP where it is considered appropriate for the receptor being analysed and depending on the data source. The local area will be qualified where appropriate. The local effect is also assessed within the context of the wider regional area of Devon and Cornwall to which economic and social flows and interactions are expected to extend.

Identification of receptors

12.3.4 A number of receptors have been identified through scoping and subsequent phases of the EA that were considered to be of sufficient importance that they could be significantly affected, namely:

- the local and wider economy (businesses both indigenous, inward investors and those within the supply chain) and the labour market (employees);
- residents (current) - addressed broadly as ‘local community’ in the assessment; and
- visitors or tourists (regular visitors).

12.3.5 These encompass a wider range of specific receptors that may be discussed throughout the EA, such as those residents living immediately adjacent to DTA, or specific groups such as tourists or ‘the elderly’.

Consultations

12.3.6 Consultations have been held as part of the Land Use Working Group meetings (see **Chapter 8**). The issues identified in these working groups meetings have been taken into account and informed the scope of the assessment of socio-economic effects.

Effects Requiring Further Consideration

Effects scoped-in to the Environmental Appraisal

12.3.7 Based on the approach defined above, the following effects have been scoped-in.

- Potential effects on the local economy and employment caused by presence of the military and its activities, specifically relating to:
 - direct employment and expenditure by the military,
 - wider potential effects on the tourism economy, and
 - effects on the livelihoods of local farmers and the agriculture sector.
- Potential effects on local residents and potential for nuisance associated with military activities.
- Potential effects on the perceptions and behaviour of regular visitors (tourists) caused by military activities.

Effects subsequently scoped-in to the Environmental Appraisal

12.3.8 There are no additional effects that have been subsequently identified and scoped-in to the environmental appraisal.

Effects not requiring further consideration

12.3.9 No socio-economic effects have been scoped-out of the EA.

12.4 Environmental Management Measures

12.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs).

12.4.2 The existing mitigation and compensation measures comprise the following.

- Interference with livestock: Military personnel and attendees to training and events such as Ten Tors are instructed to avoid livestock. Ten Tors managers' weekend is held annually and managers are required to attend every 5 years. MoD pays for rights to train and provides compensation for stock injured or killed.
- Economy - sustainable procurement: Approximately 80 staff are employed on DTA, with preference given to local purchasing where cost effective. Local farmers are employed for stock clearance
- Tourism and recreation: Leaflets and information boards are used to encourage access outside the live firing programme, information about guaranteed public access and firing programme is made available on website, information boards, information centres on local radio and in military and civilian publications, cancellations of firing publicised in a similar way.

12.5 Assessment of Potential Effects

Approach

- 12.5.1 The approach to the EA generally follows available best practice and developing guidance for undertaking socio-economic assessments, including:
- The Green Book, Appraisal and Evaluation in Central Government, HM Treasury 2003;
 - A Standard Approach to Assessing the Additional Impact of Projects, English Partnerships, Second Edition 2004;
 - Impact Assessment Guidelines, European Commission SEC (2005) 791, June 2005;
 - Circular 04/06 (ODPM): Planning Inquiries Into Major Infrastructure Projects: Economic Impact Reports, DCLG (then ODPM) 2006;
 - Assessing the Impacts of Spatial Interventions: Regeneration, Renewal and Regional Development, DCLG (then ODPM) 2003; and
 - Introduction to EIA, Spon, 3rd Edition, 2004.

Data Gathering and Survey Work

- 12.5.2 Preliminary data gathering for the assessment of social and economic effects was undertaken as part of a scoping exercise for the EA and was informed by a number of sources of information including:
- MoD websites, www.army.mod.uk;
 - The Dartmoor Society (2003), The 6th Dartmoor Society Debate, 'The Military on Dartmoor', Buckfast Abbey, Saturday 27 September 2003;
 - Devon County Council (2006), *State of the Devon Economy*, January 2006;
 - Devon County Council (2004), 'Tourism Trends, Devon and Districts- Distribution of Tourists by District, Peak of 2003 Season', Source: Corporate Consultation Services;
 - South West Tourism and South West of England Regional Development Agency (2005), *Towards 2015- Shaping Tomorrow's Tourism*, January 2005;
 - The Office for National Statistics, neighbourhood statistics website (www.neighbourhood.statistics.gov.uk);
 - Tourism Associates (2006), *Sustainable Military Training on Dartmoor*, Final Report, March 2007; and
 - Dartmoor National Park Authority, *The Dartmoor Economy 1994 – 2004*.
- 12.5.3 A site visit was also undertaken as part of the scoping exercise to identify the characteristics of the area around the site and the location of potential socio-economic receptors.
- 12.5.4 This Report draws significantly on information contained within a report prepared by Tourism Associates (March 2007) carried out as part of the assessment process. The methodology of this report has been summarised in the section below (**Section 12.5**). The key findings of the specialist reports have been reviewed, and have been used where

appropriate to help establish the current baseline and the predicted future baseline, and to assist in identifying the key effects upon the community and their significance.

Sustainable Military Training on Dartmoor Final Report, March 2007, Tourism Associates, University of Exeter

12.5.5 This work had been specifically commissioned and the aims of the research undertaken was to *"inform a holistic case for sustainable military training on Dartmoor; and to inform the further development of the Environmental Management System for the Dartmoor Training Area (DTA)."* Specifically, the report describes the results of research to:

- investigate claims regarding the effect of a military presence on Dartmoor on land use, tourism, leisure uses and how this may change if current operations at site change or cease;
- investigate and assess visitor spend in light of military presence;
- investigate 'importance' of visitors and military presence on local businesses;
- understand effect of military procurement and other associated expenditure on local area/businesses; and
- explore how the military and local community interact and make recommendations for the future management of DTA.

12.5.6 The report describes a 'multi-method' approach including a number of studies undertaken between 1 January 2005 to 4 January 2006:

- research of secondary sources of information, including contextual information as well as research on the expenditure of the MoD (tenders, contracts, procurement, service agreements, etc.);
- a visitor survey - both day and overnight/longer stay visitors;
- semi-structured reviews - with day visitors and walkers (in the county);
- discussion groups - with visitors, Dartmoor residents and businesses;
- a survey of Ten Tors participants (2005 questionnaire survey);
- a survey of military personnel (survey of expenditure whilst at the DTA); and
- a local business survey - telephone survey.

12.5.7 This report was updated with information on MoD expenditure and issued as a Final Report in March 2007.

Survey of soldier expenditure, Ongoing 2007, Entec

12.5.8 Entec have been commissioned to produce an up date of the soldier expenditure survey. The results of this study are not available at this stage and will be incorporated into an addendum to this Report.

Significance evaluation methodology

- 12.5.9 There are no recognised standards for direct employment effects or easily applicable 'state of local society' standards⁷⁴ against which predicted effects of an activity may be assessed. This section describes some of the key factors that have been taken into consideration when determining significance.

Review of Key Factors

Distribution, duration and spatial extent of effects

- 12.5.10 The DTA may provide a number of employment opportunities to the local area as well as representing a better economic use than is otherwise possible. In the context of the positive gain there may also be negative effects from the activities and these effects will be felt differentially between different sectors of the community (for example; ethnic groups, occupational groups, poor, house owners, unemployed, elderly, young, women, etc.). Therefore, the number of people affected (individuals, neighbourhood, local area, region, etc.) by a particular effect, either adversely or beneficially, is a key measure of the significance. Similarly, the likely duration of effect will also be important in the assessment, especially when considering whether it is reversible or irreversible. It should be noted that many economic effects are typically described as short, medium or long term in duration. Short-term in the context of this chapter, is broadly considered to be over the course of one to two years; medium term around two to five years; and long term greater than five years (this is provided as a guide to these definitions and should not be considered absolute).

Thresholds

- 12.5.11 It may be possible to predict where an activity may produce an unacceptable step change, for example, where the leakage of benefits (e.g. employment) out of the local area is substantially disproportionate to those within.

Policy or contribution to recognised regeneration targets / outcomes

- 12.5.12 The assessment also considers the effect of military activities in relation to current social and economic policy. The effects may also be significant when considered in relation to a recognised regeneration or economic target,

'Triangulation'

- 12.5.13 Multiple perspectives on significance are helpful. Triangulation refers to the practice whereby a number of perspectives can be used to interpret a single set of data, particularly taking evidence from wider research, interviews, consultations and representatives from interest groups (e.g. local residents, local economic development officers, etc.). These perspectives may help reveal either perceived or actual significance of particular effects. A method (not employed as part of this Report) may include a survey to estimate the measure of agreement with certain statements relating to the effects⁷⁵.

- 12.5.14 Taking the various factors described above, the evaluation of the significance of socio-economic effects depends on the sensitivity or value of the receptor in question and the magnitude of change/effect that is predicted to result from military activities.

⁷⁴ Glasson, J, Chadwick, A and R Therivel (2004) *Introduction to EIA: 3rd Edition*. Spon: London

⁷⁵ Measures of agreement (MoA) is defined as the number of respondents who agree with the statement, minus the number who disagree, divided by the total numbers of respondents (MoA of 1 = full agreement, -1 = complete disagreement). In: Glasson, J, Chadwick, A and R Therivel (2004) *Introduction to EIA: 3rd Edition*. Spon: London

Sensitivity of receptors

12.5.15 There are a wide range of potential socio-economic effects as a result of the training activities that affect a range of different people and areas making a single overarching description of the sensitivity of the local community difficult to define. Therefore, the sensitivity varies to take into account the different types of receptors, who may respond differently to a particular effect, and the nature of the effect. For the purposes of this assessment the following are used to determine the sensitivity or value of receptors:

- potential for a differential effect on a vulnerable or sensitive group or community such as ethnic group, occupational groups, poor, house owners, unemployed, elderly, young, women, etc.;
- society and its economies are dynamic and can often have a considerable capacity to respond to cope or respond to change; and
- particular local needs or concerns that are specific to the site/surrounding area.

12.5.16 Based on the approach described above, the sensitivity of socio-economic receptors is expressed as High, Medium, or Low. **Table 12.2** provides a summarised definition of sensitivity for the purposes of this assessment.

Table 12.2 Definition of Sensitivity

Sensitivity	Definition
High	<ul style="list-style-type: none"> • The receptor is predominantly comprised of vulnerable groups or communities. Therefore, the receptor is likely to be totally or substantially affected by an effect • The receptor is an economy* that is susceptible to total or substantial change as a result of the effect • The recognised needs or concerns of the receptor (e.g. community or firms) indicate that it will be highly sensitive to change as a result of the effect
Medium	<ul style="list-style-type: none"> • The receptor is comprised, in part of vulnerable groups or communities. Therefore, the receptor is likely to be partially or moderately affected by an effect • The receptor is an economy* that is susceptible to partial or moderate change as a result of the effect • The recognised needs or concerns of the receptor (e.g. community or firms) indicate that it will be moderately sensitive to change as a result of the effect
Low	<ul style="list-style-type: none"> • Minor or negligible affect on vulnerable groups or community • The receptor is an economy* that is susceptible to minor or negligible change as a result of the effect • The recognised needs or concerns of the receptor (e.g. community or firms) indicate that it will have a low / negligible sensitivity to change as a result of the effect

* An economy in this instance means the economic system of interest and this may comprise anything from number of local interrelated firms and individuals, to the entire UK economy.

Source: Entec

Magnitude of effects

12.5.17 The determination of the magnitude of an effect essentially relies on professional judgement rather than using any measurable scale of effects. The magnitude of effect on a given receptor takes into account the following factors:

- the spatial extent and number of people or firms affected (for example, individuals, neighbourhoods, local area, region, UK economy);

- the duration of the effect (for example, temporary or permanent, irreversible or reversible, short-term, medium-term or long-term); and
- thresholds - where an effect will create an unacceptable step change.

12.5.18 Based on the approach described above, the magnitude of socio-economic and community effects is expressed as High, Medium, or Low. **Table 12.3** provides a summarised definition of magnitude for the purposes of this assessment.

Table 12.3 Definition of Magnitude

Magnitude	Extent	Duration	Thresholds
High	<ul style="list-style-type: none"> High number of firms / people – for example; UK or region 	<ul style="list-style-type: none"> Permanent and or irreversible change 	<ul style="list-style-type: none"> A dramatic 'step change'
Medium	<ul style="list-style-type: none"> Sub-region or local authority area / district 		<ul style="list-style-type: none"> Moderate or partial difference
Low	<ul style="list-style-type: none"> Low number of firms / people – for example; individuals or neighbourhood 	<ul style="list-style-type: none"> Temporary and or reversible change 	<ul style="list-style-type: none"> Minor or negligible discernable difference

Source: Entec

12.5.19 It is possible that an effect affects a large number of people (high magnitude) but is only temporary (low magnitude). For example, a demand for a large construction workforce for a project. In this instance professional judgement is required to evaluate the overall magnitude of an effect. A further consideration, particularly for economic effects such as job creation or investment, relates to the 'additionality' of an effect, for example: 100 new jobs may be demanded by a development. However, a proportion of these may be taken by people from outside of the local area ('leakage') and a proportion may be taken by people who leave jobs in the local area to take up new jobs ('displacement'). Therefore the magnitude needs to take into account the net effect of a development: net of leakage, displacement, substitution and deadweight effects.

Summary of Determination of Significance

12.5.20 As stated previously, it is assumed that significance is related to sensitivity and magnitude. **Table 12.4** presents a matrix which shows how the definitions of sensitivity and magnitude have been used to determine the significance of socio-economic effects:

Table 12.4 Definition of Significance

Magnitude	Sensitivity		
	High	Medium	Low
High	Significant	Significant	Not Significant
Medium	Significant	Significant / Not Significant	Not Significant
Low	Significant	Not Significant	Not Significant

Source: Entec

12.5.21 Therefore, this method may recognise an effect as significant when:

- a few sensitive (high sensitivity) individuals (low magnitude) are affected; as well as
- a large effect (high magnitude effect) on a sensitive regional economy (considered to be of high sensitivity, in this example).

12.5.22 Importantly, the significance of an effect is also a product of the policy importance of the effect and judgement will be required to assess how an effect may either contribute or be counter to regional/local policy objectives or regeneration targets. Policies relevant to socio-economic effects are summarised in **Section 12.2**.

Potential Effects on Local Economy and Employment Caused by Presence of Military and its Activities

12.5.23 This section considers the significance of the effects that the military and its training activities have on the local economy and employment. The economic effects are potentially diverse and the scoping process has identified a need to examine a number of specific effects, namely:

- employment and expenditure effects on the local economy;
- wider potential effects on the tourism sector; and
- effects on the livelihoods of local farmers and the agriculture sector.

12.5.24 This section then collates the information on the various economic effects to produce a conceptual model of the economic flows that relate to DTA to help identify and understand the total economic effect of military activities.

Current Baseline Conditions

Employment and expenditure effects on the local economy

12.5.25 The Dartmoor Economy 1994 - 2004 produced by the DNP Authority (DNPA) provides a detailed overview of the local economy and has been used here as the authoritative source for data. The Dartmoor economy (national park boundary) experienced a growth rate of 6.2% in per capita Gross Value Added (GVA) per annum between 1994 and 2004 outperforming both Devon and the national economy. For the period 2003-2004 this

growth rate was as high as 9.4% for Dartmoor. Strong output growth was a feature of the region as well and Devon also grew faster than the national economy. This strong local growth trend is also evidenced in employment terms with Dartmoor enjoying a growth rate of 3% pa between 1994 and 2004 compared to 2.1% for Devon over the same time period.

- 12.5.26 A breakdown of employment by sector in Dartmoor shows the hotels and catering sector to be the largest employer, accounting for 16.4% of the workforce (Dartmoor Economy 1994 - 2004). This is unsurprising given the existence of the National Park and importance of tourism in the local area. Other important local sectors in employment terms include distribution - wholesale and retail (15.9%), real estate/other business services (12.8%), construction (11%) and manufacturing (7.8%). These five sectors account for nearly 65% of the workforce.
- 12.5.27 There are high levels of part-time employment, largely due to one third of the workforce being involved either in retail or hotels and catering. 40.6% of the workforce is part-time compared with 25.8% nationally.
- 12.5.28 Sector outputs (that is economic output of different economic sectors) reveal the five largest sectors to be real estate/other business, distribution, construction, hotels and catering, and manufacturing. These sectors together contributed over 70% of Dartmoor's economic output for 2004.
- 12.5.29 Agriculture and forestry as a sector has not performed well and has experienced a decline of 1.6% per annum between 1994 and 2004. Mining and quarrying also declined over the time period by 2.9% per annum.

Table 12.5 Sector outputs and growth rates for Dartmoor

Sector	Proportion of total output (2004)	Growth rate (1994 – 2004)
Agriculture/Forestry	3.2	-1.55
Fishing	0.0	-21.09
Mining & Quarrying	1.5	-2.93
Manufacturing	8.0	5.63
Electricity/Gas/Water	0.3	5.95
Construction	14.9	12.72
Distribution	15.3	4.30
Hotels and Catering	8.9	4.78
Transport and Communication	4.3	6.27
Financial Services	1.6	6.44
Real Estate/Other Business	25.0	10.35
Public Admin	2.8	2.07
Education	3.3	3.51
Health	2.8	4.61

Sector	Proportion of total output (2004)	Growth rate (1994 – 2004)
Social Services	3.3	4.62
Sanitary Services	0.1	4.94
Other	4.6	5.28
Total	100.0	100.00

Source: The Dartmoor Economy: 1994-2004

12.5.30 Direct effects from the presence of the military on the local economy will arise from various economic actions that the military undertake as part of their operations and related activities. The various sources of expenditure were categorised and baseline contributions for each of these categories have been collected. This information has been taken from surveys undertaken as part of this assessment and *Sustainable Military Training on Dartmoor* (Tourism Associates, Exeter University, 2007). As data for each category has not been available for every year, the time period for the basis of this analysis is 2004/05. The categories are as follows:

- direct operational expenditure by DTA to suppliers (contracts, regular maintenance and other stock procurement - '**Supply chain**');
- direct expenditure by DTA to hotels for other personnel visiting the camp ('**Hotel spend**');
- direct expenditure of soldiers visiting the training camp ('**Soldier spend**');
- direct expenditure and other economic benefits from DTA hosting the Ten Tors and related events ('**Ten Tors event**'); and
- indirect/induced effects as a result of the knock-on flow of expenditure through the remainder of the economy ('**Indirect/induced effects**').

12.5.31 Information about each of these categories is described in fuller detail below.

12.5.32 **Supply chain.** A profile of expenditure was been created as part of the Tourism Associates Report based on the day-to-day core activities made by the MoD on DTA through the Army Training Estates - South West (ATE SW). Data was collected for contracts, tenders, procurement agreements and other spending with third parties with Devon and Cornwall used as the sampling frame. The estimates of the contribution of DTA to the local economy does not include indirect or induced spend and assesses only the core contract of Landmarc, the MoD's service provider, to service DTA.

12.5.33 The MoD service provider has been contracted to take care of the running and maintenance of the estate, administration and administration support to the rural dimensions of the estate, unit bookings, catering and training area management. It does not include individual military personnel unit spend on things such as entertainment and social activities.

12.5.34 The total spend reported is based on the spend categories which are shown in **Table 12.6** below. This Appraisal is interested in the level of expenditure within Dartmoor and estimates have been made of the proportion of each category that would be local (i.e. money that is spent and circulated in the local Dartmoor economy) and the proportion

within Devon and Cornwall, based on the figures produced in the Tourism Associates report. These figures and assumptions are shown in **Table 12.6**, below:

Table 12.6 Direct spending on contracts, tenders and procurement; Dartmoor, and Devon and Cornwall (2004 - 2005 financial year)

Spend category	Description	% Local to Dartmoor	Assumption
Utilities	Includes gas, water, electricity, heating, oil, telephone bills.	0%	Assume will be paid to national institutions, therefore spending will not be felt locally.
Rates	Paid to West Devon Borough Council.	100%	Local area will benefit from local authority spending on local infrastructure and services.
Estate management	Property and grounds maintenance.	100%	All in local area.
Staff costs	Gross staff costs for ATE SW personnel, does not include Landmarc personnel (at Dartmoor and Exeter).	80%	Of the total 78 jobs created it is understood that 72 jobs are located on Dartmoor and 6 located in Exeter (see below)
Professional fees	Consultants and professional services (e.g. solicitors).	5%	DTA is likely to appoint professionals from a wider region than locally.
Fuels (non-utilities)	Spend on diesel fuel.	70%	The majority of this spend will be local as units will buy fuel locally for planned trips. There may be some spend that occurs outside the local area for return trips.
Stock	Consumables to service operation of ranges.	100%	Assumes purchasing occurs locally.
Information technology	Purchasing computer equipment.	0%	Assumes that IT purchasing undertaken centrally.
Equipment support	Admin items such as photocopiers and tem assistance etc.	0%	Assumes that equipment purchasing undertaken centrally.
Contract	Refers to spend on recurrent contracts – e.g. the value of the contract with Landmarc to run the DTA and vehicle hire company, Lex.	60%	Estimate recognises that not all purchasing will be possible locally.

Source: Sustainable Military Training on Dartmoor (Tourism Associates, 2007) and Entec

12.5.35 **Table 12.7**, below, shows the average total spend attributable to DTA in the local economy. In 2004/05 total direct spending on contracts, tenders and procurement through ATE SW was £2,163,145 in the Dartmoor local economy and £3,103,695 in the wider region of Devon and Cornwall.

Table 12.7 Total estimated annual spend attributable to DTA; Dartmoor, and Devon and Cornwall (2004 – 2005 financial year)

Year	Total spend (comprised of categories above)	
	Devon and Cornwall (inclusive of Dartmoor)	Dartmoor
2002/03	3,149,256	2,220,848
2003/04	2,936,664	2,047,971
2004/05	3,103,695	2,137,717
2005/06	3,299,145	2,147,937

Source: Sustainable Military Training on Dartmoor (Tourism Associates, 2007) and Entec

12.5.36 It is estimated, in the Tourism Associates report, that in 2005/06 there were 78 FTEs directly attributable to DTA in the local economy. Seventy two of these jobs are located on Dartmoor while 6 are located in Exeter. The majority of these jobs are taken by people living in West Devon and Okehampton. The total gross wage bill for personnel working at Okehampton Camp was reported to be £1,008,684 for Landmarc employees. This wage bill is divided between the categories of staff costs and contracts.

12.5.37 **Hotel spend.** In addition to spending on contracts, tenders and procurement, the MoD makes additional spending on hotels for personnel stationed elsewhere and visiting DTA. This is estimated at approximately £10,040.50 for the period Nov 2004 to June 2005 (Tourism Associates, 2007). It is estimated that it is likely that the total amount for the whole year would be less than double this amount. Establishments in Okehampton, Tavistock and Yelverton benefit most from this additional spending.

12.5.38 **Soldier spend.** Information concerning soldier spend will be obtained from the soldier surveys undertaken as part of this assessment and is ongoing. **This information will be included in an addendum to this Report once available.**

12.5.39 **Ten Tors event.** Further information relating to this issue is outlined in **Appendix 1.1**.

12.5.40 **Indirect/induced effects.** Indirect effects are the extra production, employment and income generated in other sectors of the local economy as a result of the additional military expenditure and is measured using an economic multiplier. A multiplier is an economic tool used to measure how much additional spending may be generated in the local economy as a result of increased spending in one sector. The size of the multiplier can vary depending on a number of factors including the level of leakage (expenditure leaving the area), deadweight (expenditure that would have happened anyway), and displacement (expenditure that occurs at the expense of other expenditure). For example

the multiplier will typically be smaller for a more rural economy where a greater level of leakage occurs.

- 12.5.41 **An estimate of the total economic effect will be provided once the soldier spend work, has been completed.**

The tourist economy

- 12.5.42 Tourism is an important sector Dartmoor's local economy and since 1994 this sector has accounted for approximately 9% of GVA. Dartmoor is an important tourist attraction and many of the surrounding towns are highly dependent on this sector's contribution to their local economies. The Tourism Associates Report notes that there are conflicting estimates of the number of annual visitors to Dartmoor and currently no accurate and acceptable estimate exists. However, Tourism Associates point out that it is generally assumed to be approximately 11 million visitors per year (Tourism Associates Report, 2007). The sector is important not only in output terms but employment as well and it provides the largest sectoral contribution to employment. 16.4% of the local workforce work in hotels and catering and this sector contributes to much of the seasonal and part time employment in the local economy.
- 12.5.43 This sector has seen relatively slow levels of annual growth in output, experiencing 2.7% growth per annum between 1994 and 2004. This is possibly due to the declining importance of hotels and the growth in other types of accommodation as well as shocks from the outbreak of Foot and Mouth. Hotels account for 33% of the sectors total output but this contribution has fallen over the 10 year time period whilst the output of other lodgings (for example self catering) has grown steadily (although below the overall rate) and provides 16% of the sector's output (Dartmoor Economy 1994 – 2004).

Local agriculture

- 12.5.44 The forestry and agriculture sector has been performing poorly in the local context (Dartmoor Economy 1994 - 2004). Agriculture has seen a steady decline in output over the last ten years (average of -1.6% each year), mainly as a result of waning employment levels and low incomes (Dartmoor Economy 1994 - 2004) as well as shocks from the outbreak of Foot and Mouth. Mining and quarrying has also declined (average of -1.5% each year). These two industries have also been very erratic in their performance over the last 10 years which can be closely related to market values, demand and rapid changes in an industry's productivity (Dartmoor Economy 1994 - 2004).
- 12.5.45 A large part of Dartmoor is used for agricultural purposes and where these land uses overlap with MoD usage, the MoD pays for rights to train on the land that they use and provides compensation for stock injured or killed. Local farmers are employed for stock clearance which they do on horseback with trained dogs from those parts of the Range Danger Area (RDA) programmed for use prior to the commencement of live firing.
- 12.5.46 The Military enters into three types of financial arrangements with landowners with whom their activities intersect – training rights payments, commoners' disturbance payments and payments for Training On Private Land (TOPL). It is possible for one landowner or organisation to receive payments in one or more categories in any given year. These are shown in **Table 12.8**, below:

Table 12.8 Financial Contributions (2004/05)

Type of arrangement	Number of beneficiaries	Total amount paid
Training rights	10	£525,292.96
Commoner's disturbance payments	66	£224,251.50
Training on Private Land (TOPL)	5	£34,608.52
Total value of payments		£784,152.98

Source: Sustainable Military Training on Dartmoor (Tourism Associates, 2007)

Assessment of Effects and Evaluation of Significance

12.5.47 Effects are assessed here first in terms of the sensitivity of the receptor, then in terms of the expected magnitude of the change caused by the effect. This establishes the basis for determining whether an effect will be significant or not. The assessment has been broken down into the employment and expenditure effects and each category of effect, tourism and agriculture.

Employment and expenditure effects on local economy

12.5.48 The size of the receptor (the local economy and labour market) may in some instances effect the sensitivity to economic changes. However, the baseline has indicated that Dartmoor local economy has experienced strong and sustained growth over the last ten years and displays a healthy level of diversification in a number of key sectors. This indicates a robust local economy that is better able to handle adverse economic shocks and therefore the general sensitivity of the local economy is assessed to be low.

12.5.49 Comment on effects:

- a. The full geographical extent of soldier spend and the likely monetary contribution are unknown at this stage, pending the survey results. Soldier spend may represent a sizeable contribution to the local economy however in the context of Dartmoor the overall importance of military trade to the economy appears to be much smaller than other sources of spending, notably tourism. A local survey of businesses undertaken in the Tourism Associates Report indicates that businesses (in retail, accommodation and transport industries) derive approximately 2.44% of their gross turnover from military personnel spend compared to 65.73% from tourists. The overall contribution is fairly small in relative terms and given the strong and diversified local economy this is expected to initiate a moderate or partial difference.
- b. Spending in the supply chain can have a far reaching effect on the local economy and can generate significant supply chain multiplier effects. Not all of this spending will however be local (in and immediately surrounding the Dartmoor economy) and is likely to occur in the wider Devon and Cornwall area. The size of this spend is not considered to be of a significant magnitude in relation to the local economy especially in light of the importance of other sources of spending in the local economy, for example tourist spending.
- c. The Hotel spend made by the military may be important to the local tourism economy given the fact that hotels are declining in comparison to other preferred

forms of accommodation among tourists. This spend may therefore represent an important contribution to this sub-sector of the hotel and catering sector of the economy.

- d. Indirect and induced: **This will be completed when the soldier spend information is available.**

12.5.50 The assessment of the effect on the local Dartmoor economy can not be estimated at this stage and will be completed when the soldier spend information is available.

Potential effects on the tourist economy

- 12.5.51 In assessing the sensitivity of the local economy to changes in tourism it is necessary to understand the relative importance of this sector to the economy and the level of diversification or strength of other sectors to sustain a loss in this sector. Information in the baseline section of this report has shown tourism output to be declining, although this may be largely due to changes in the composition of tourism or potentially as a result of the foot and mouth outbreak. For example there is a decline in the contribution of hotels (a high generator of output) and increase in self catering which would typically generate lower levels of output.
- 12.5.52 Although the overall Dartmoor economy appears to be diversified with strengths in other sectors, (notably real estate and other business activities, construction, distribution and manufacturing) tourism (represented by hotels and catering) remains the largest generator of employment locally and any loss in tourism trade would therefore have a notable negative effect on the local economy and employment. The local economy and labour market is therefore assessed to be of medium sensitivity.
- 12.5.53 The magnitude of the effect is influenced by how and to what degree tourism behaviour may change if the military training activities were to cease. This requires an understanding of current perceptions of military activities by tourists and local visitors and how they are affected by the training activities.
- 12.5.54 There are a large number of visitors to Dartmoor comprised of both people from within the area (locals) and outside of it (tourists) and their daily spend contributes a significant injection into the local economy. Significantly (for this assessment) this industry currently thrives alongside the current military training activities on Dartmoor, and the general consensus among both visitors and local business people surveyed as part of the Tourism Associates Report is that military cessation is unlikely to have a significant effect on the number of people visiting Dartmoor. Reasons given to justify Tourism Associates' views included that the military activities are located on a relatively inaccessible part of the moor that only more 'adventurous walkers' expressed a desire to visit and that military activities do not currently interfere with visitors enjoyment of the moor in any major way. Most attitudes towards the military's presence appeared to be accepting of their presence and displayed understanding of their need to train there and was even favourable amongst some people (Tourism Associates Report).
- 12.5.55 Respondents (from the Tourism Associates' visitor survey) were asked if and how their behaviour would change were the military to depart Dartmoor, 93% said they would make the same number of visits to Dartmoor were the military to leave and only 4% said they would make more visits. Amongst a survey of local businesses, when asked their expectations of changes in visitor numbers were the military to depart the DTA, 72% said there would be no change in the number of visitors and 20% felt that visitor numbers would increase.
- 12.5.56 The Tourism Associates report suggests that most visitors and tourists to Dartmoor appear impartial about the presence of the military. The majority of those visitors surveyed

indicated they would not visit Dartmoor more often if the military were to depart. Furthermore it has not been shown that the military are keeping people away. Therefore, the magnitude of the effect of military training activities on the tourist economy is assessed to be low as there is likely to be only a minor discernable difference to the local tourism economy if the military were to leave. The effect of military training activities on the tourism sector is assessed to be neutral and not significant.

Potential effects on the agriculture economy

- 12.5.57 The agriculture sector has a number of features that suggest a highly sensitive local economy. This sector is declining in terms of both employment and output and is therefore already susceptible to negative changes. The departure of the military would mean a loss of income for farmers and employment (range clearers).
- 12.5.58 Total payments made to farmers and landowners in 2004/05 amounted to £784,152.98. The total sector output for 2004 was approximately £12.19 million (Dartmoor Economy 1994 – 2004). The duration of this effect is likely to be long term as the agriculture sector is already in decline and opportunities such as that which the military provides for diversifying and supplementing local farming incomes are therefore very important. New and other means of diversification may be difficult to find. The magnitude of this change is expected to be medium. This effect is assessed to be positive and significant.

Potential Effect on Local Residents and Potential for Nuisance Associated with Military Activities

- 12.5.59 This section looks at the potential disturbance to local residents that may be caused (either directly or indirectly) by the presence of the military and their training activities on Dartmoor.

Current Baseline Conditions

- 12.5.60 There were approximately 32,320 people living within Dartmoor National Park in 2001 (Census, 2001) in more than 30 towns and villages within the Park boundary. There are few residential properties within DTA or close to these training areas.
- 12.5.61 The Tourism Associates Report undertook a number of exercises to gather public perceptions regarding the military and their presence in the local area. These included a general visitor survey, semi-structured interviews with visitors, discussion groups that included local residents, local business people and day visitors (from within Devon but outside the DNP boundary). Whilst a variety of issues were raised relating to possible interference with walkers on the moor, when asked about effects on social and local community life, the discussion groups did not raise any major issues. Most concerns relating to the presence of the military related to disturbance to visitors to the moor and not to community life.
- 12.5.62 Some potential effects that were discussed as issues during discussion groups among residents and business people concerning the military's effect on local life were generally favourable. The positive effects that were cited were mainly economic in nature and included increase in local income, contributions to local B&B business, commoners' compensation and protection of flora and fauna. The military's C-FAR programme was specifically mentioned. This is a project for young offenders and is regarded as being a major positive for local community life. Negative issues that were raised included interference with local livelihoods (farmers), military traffic congestion, and the perception that military personnel 'create trouble' on local nights out.
- 12.5.63 Perceptions relating to the departure of the military for the local economy, society and community and culture, it was felt that the effects would be mainly negative. Jobs and

supplementary income would be lost, the area would become subject to additional tourism with which the existing infrastructure could not cope and the physical environment would decline and fall into disrepair without management of MoD. There was the general perception that the advantages of the military outweighed the disadvantages and they are preferred to other alternative neighbours such as increases in day visitors with dogs and litter.

Assessment of Effects and Evaluation of Significance

- 12.5.64 The sensitivity of the local community is assessed to be medium as although they are unlikely to be comprised of large numbers of vulnerable groups or groups that may be particularly sensitive to changes, it is often found that communities in quiet rural areas value these characteristics of their location very highly and may be more sensitive to disturbances.
- 12.5.65 The magnitude of the effect is dependent on the extent of the level of interference or disturbance caused to local life. From the baseline information collected in surveys and discussion groups it appears that opinion is generally favourable towards their presence in general and neutral towards how they may affect social or community life. The nature of the issues raised in relation to local community life were more often positive than negative. The magnitude of the effect on local community life is therefore considered to be low. This effect is therefore considered to be neutral and not significant.

Potential Effect on Tourists and Regular Visitors Caused by Military Activities

- 12.5.66 This section considers the potential effects that the military and its training activities may have on visitors (both local and tourists) to Dartmoor.

Current Baseline Conditions

- 12.5.67 It is estimated that 11 million visitors visit DNP annually. A general visitor survey was undertaken as part of the Tourism Associates Report of visitors to the park. Some key characteristics are highlighted below:
- 47% of those visiting the park were day visitors and 53% were tourists (staying guests) of which 32% were staying on Dartmoor or within 5km buffer zone and 21% were staying in locations outside this area;
 - The most popular towns where tourists were staying outside of Dartmoor were Dartmouth, Exeter, Torquay, Paignton, Newton Abbot and Plymouth. The average stay for those staying outside Dartmoor was 10 nights and 7 nights for those staying on Dartmoor. Average spend on accommodation per person per night was £18.44;
 - Total spend on the day of the interview was an average of £8.43 per person across the entire sample. The greatest spend was indicated by tourists staying on Dartmoor (£11.18), tourists staying elsewhere had a daily spend of approximately £9.74 and day visitors spent an average of £6.55;
 - The number of previous leisure trips to Dartmoor undertaken in the previous 12 months was 23 for day visitors and 1.68 for staying visitors;
 - 86% of visitors knew that military trained on Dartmoor with the highest levels of awareness among day visitors; and
 - Respondents (from visitor survey) were asked whether military activities have had any positive or negative effects on previous trips to Dartmoor. 65% answered that military

training has had no effect, 16% reported a positive effect and 18% reported a negative effect.

- 12.5.68 Respondents (to the visitor survey in the Tourism Associates Report) were asked whether military activities have had any positive or negative effects on previous trips to Dartmoor. 65% answered that military training has had no effect, 16% reported a positive effect and 18% reported a negative effect. The most frequently cited responses relating to positive effects included enjoyment from seeing military activity, appreciation for the military need to train and that Dartmoor is an ideal location, feelings that the moor is big enough to share with the military and that military restricted areas encourage wildlife to thrive. The main responses relating to negative effects were general unhappiness with military usage of moor, perceived risk from live firing and unexploded ordnance, noise disturbance and restricted access. Military objectors mention access restrictions, noise, visual intrusions of warning devices and unsightly buildings, destruction of topography through ordnance and digging, and vehicle access by military and civilians.

Assessment of Effects and Evaluation of Significance

- 12.5.69 To assess the extent that military activities affect visitors it is important to understand visitors perceptions of the military and more importantly how these may affect visitor behaviour. Although a number of negative perceptions exist relating to risks and threats associated with the presence of the military on Dartmoor, it is important to understand how relevant these perceptions are to the reality of the situation. Just over half of visitors interviewed had seen evidence of military training, with the most common forms being military vehicles and aircraft, military personnel and notices and warning signs. Only a small minority of walkers had actually seen or heard evidence of firing. There were no reports of finding ordnance of any kind.
- 12.5.70 Over three quarters of those interviewed answered that they do not access the military training area. Of those who suggested they do, they note that access was infrequent due to remoteness. The majority said that they would not use that part of the moor more often even if access permitted it. Of those who would, their motives were curiosity, desires to climb highest peaks and walk in less populated areas. Most of those interviewed answered that the military had no impact on their use or enjoyment of moor. There is a general consensus that the military must train somewhere and Dartmoor offers the perfect natural environment (Tourism Associates Report, 2007).
- 12.5.71 Respondents (from the visitor survey) were asked if and how their behaviour would change were the military to depart Dartmoor, 93% said they would make the same number of visits to Dartmoor were the military to leave. 4% said they would make more visits.
- 12.5.72 Whether the military training activities represent a positive or a negative presence depends largely on peoples interests. It appears that the majority of people are neutral to the military and its training activities. The baseline information indicates that the receptor (visitors) is unlikely to be susceptible to change as a result of the effect, the majority of visitors surveyed indicated they will not visit park more often if the military departs. In support of this there are a high number of repeat visits to the park among local visitors. Thus the receptor is considered to be of a low sensitivity. The magnitude is assessed to be medium as there is likely to be only a minor or negligible discernable difference in visitor behaviour were military training activities on the moor to cease. This effect is therefore assessed to be neutral and not significant.

12.6 Summary of Significance Evaluation

12.6.1 A number of socio-economic effects have been assessed in the preceding sections and the following table provides a summary of the assessment of their significance:

Table 12.9 Summary of significant effects: Socio-Economics

Receptor and summary of predicted effects	Type of effect ¹	Significance ²	
The Local economy: direct and indirect employment and expenditure effects	TBC	This effect will be determined when the results of the soldier spend survey become available later on in the year.	
The Tourism economy: indirect effects resulting from military presence on DTA	N	NS	The results of the Tourism Associates Survey work would indicate that the majority of visitors to Dartmoor would not visit the area more frequently if the military were to leave.
The Agricultural economy: direct effects as a result of payments to landowners and employment of local people	+ve	S	The employment and payments that the military provide to the local agricultural economy are considered to be having a significant positive effect for this declining sector.
The local community: nuisance effects resulting from the presence of the military	N	NS	Information from surveys and consultation would indicate that generally the local community is generally neutral with regards how the military may affect community life.
Tourists and regular visitors to DTA: effects resulting from the presence of the military	N	NS	Results from visitor surveys show that few visitors access that training areas and would not use that part of the moor even if the military were to leave. Most of those interviewed answered that the military had no impact on their use or enjoyment of moor.
Key/footnotes:			
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S or NS	Significant Not-significant This simple significance scale should not be altered

This page is intentionally left blank.



DARTMOOR TRAINING AREA

Environmental Appraisal

Soils, Geology and Groundwater

13

13. Soils, Geology and Groundwater

13.1 Introduction

13.1.1 Potential effects from military training in relation to soils, geology and groundwater include pollutants from vehicles used to move troops, to access Okehampton and Willsworthy Camps, and from sources within the camps themselves. This chapter was completed by Rachel Dimmick (B.Sc., M.Sc., AIEMA) and replicates information from a Land Quality Assessment completed by Entec.

13.2 Context

Legislative Context

13.2.1 The regulatory regime for defining, identifying and remediation of contaminated land is Part IIA of the Environmental Protection Act (EPA) 1990. It is supported by the Contaminated Land Regulations and Statutory Guidance and provides a new regime for the identification and remediation of contaminated land.

Policy Context

13.2.2 **Table 13.1** provides information on the policy context relating to soils, geology and groundwater.

Table 13.1 Policy Context: Soils, Geology and Groundwater

Policy Reference	Policy Content and Guidance
DNPLP Policy GP2	Planning permission will be granted where development will not lead to pollution of air, water or soils.
SWRSS Policy RE7	Local authorities, other agencies and the private sector will promote an integrated approach to land management by developing area-specific packages which achieve multiple benefits, reinforce and enhance the specific natural and cultural features of local areas.
PPS23-2 Policy 2.5	Contaminated land is any land which appears to the local authority to be in such a condition, by reason of substances in, on, or under the land that significant harm is being caused or there is a significant possibility of such harm being caused; or pollution of controlled waters is being, or is likely to be caused
PPS23-2 Policy 2.18	A potential developer will need to satisfy the local authority that unacceptable risk from contamination will be successfully addressed through remediation without undue environmental impact during and following the development.
PPS23-2 Policy 2.17	Developer should carry out an adequate investigation to inform a risk assessment to determine whether the land in question is already affected by contamination through source – pathway– receptor pollutant linkages, whether new linkages by which existing contaminants might reach existing or proposed receptors will be greater and whether it will introduce new vulnerable receptors; and what action is needed to break those linkages and avoid new ones.
PPS23-2 Policy 2.42	Where contamination is known or suspected or the proposed use would be particularly vulnerable, sufficient information should be required to determine the existence or otherwise of contamination, its nature and the risks it may pose and whether these can be satisfactorily reduced to an acceptable level.
PPS23-2 Policy 2.44	A desk study and site reconnaissance will assist in determining the need for and scope of further investigation, the problems that may require remediation and whether remediation can be secured by means of planning conditions.

Policy Reference	Policy Content and Guidance
PPS23-2 Policy 2.44	Where the desk study and site reconnaissance does not provide sufficient information to assess the risks and appraise remedial options, further investigations will need to be carried out before the application is determined.
PPS23-2 Policy 2.44	In determining applications, the LPA will need to be satisfied that the development does not create or allow the continuation of unacceptable risk arising from the condition of the land in question or from adjoining land.

13.3 Scope of the Assessment

Consultations

13.3.1 Soils, geology and groundwater effects were considered as part of the discussions which took place in the Land Use Working Group (LUWG) meetings. As a result of these discussions, no changes to the scope of the assessment were identified, however the issue of clearance of Unexploded Ordnance (UXO) was raised in these meetings. This issue is discussed further under **Section 13.5**. For further information on the LUWG meetings see **Chapter 8**.

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

13.3.2 The context for assessment of land quality and groundwater effects has not been defined in any detail and therefore historical site use may have residual effects, which are not related to current land uses. Therefore, the following potential effects will be considered further in the EA:

- Effects from the historical and/or current storage and loss of motor fuels, aviation fuels, heating oils and other hydrocarbons;
- Effects from the historical and/or current disposal of waste including broken/surplus material and explosive ordnance remnants (as both a detonation risk and a toxicity risk);
- Effects from the historical and/or current use, storage and disposal of any other potential contaminating materials with potential for contamination of soils; and
- Effects from the historical and/or current shallow digging.

Effects Subsequently Scoped-in to the Appraisal

13.3.3 Stakeholders raised the issue of clearing UXO from the moor in the LUWG meetings. Although this issue has not been appraised in detail further discussion is provided under **Section 13.5**.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

13.3.4 The following potential effects will not be considered further in the EA:

- Potential effects from military activities on geological outcrops: Such effects are managed through the EMS, which includes measures to prevent damage to outcrops, and areas of educational importance. These outcrops are included (by the County

Council) on the Educational Register of Geological Sites in the county. Effects on locations that are used for adventurous training have been scoped out of the EA on the basis that standard climbing practices are used, which prevent permanent damage to the outcrops.

- Potential soil erosion effects from use of military vehicles: Vehicle use off road is limited and any ruts resulting from the use of vehicles are repaired. The majority of military training is on foot and there is no empirical evidence of significant footpath erosion being caused by military activities. Therefore, erosion effects have been scoped out of the EA.
- Groundwater and land quality contamination resulting from wind-blown dusts: Wind blown dust is not a significant source of groundwater and land quality contamination inside or outside DTA and has therefore been scoped out of the EA.

Effects Subsequently Scoped-out of the Appraisal

13.3.5 No additional effects have been scoped-out of the appraisal.

13.4 Environmental Management Measures

- 13.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant (Comdt) DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs).
- 13.4.2 The existing management measures which are in place to minimise potential effects in relation to soils, geology, groundwater and overall land quality are outlined as follows.
- Spillage plan to minimise risk of pollution effects from fuel spillages. Staff are trained in order to ensure that fuels are stored and dispensed correctly and risks are minimised in the event of fuel spillage.
 - POL points are purpose built with impervious surface and separated from other buildings at the bottom of Okehampton Camp
 - The intake lid and fuel nozzles on the POL points are locked when not in use
 - The sewage farm is designed to contain spillages from POL points
 - Trucks Tanker Fuel (TTF) park in the POL point
 - The storage and delivery of fuels is limited to 7,000 litres per tank in order to be within the capacity of the Sewage Farm in the event of a spillage
 - Fuel tank levels are checked twice each week
 - Empty ammunition cases are removed from the training areas and returned as salvage
 - Fuel storage, refuelling and vehicle and helicopter parking points are carefully controlled and sited appropriately. The siting of portaloos is also carefully controlled to minimise the potential for pollution. Areas used for training exercises are cleared after exercise.
 - Digging is only allowed in areas specifically allocated by the Training Area Marshall (TAM) and in areas where EOD has been cleared. Where digging is permitted the ground must be reinstated afterwards

- Distribution and display of information (leaflets, newspapers, information boards, Dartmoor ranges website) to the public warning of the dangers of UXO and the actions that should be taken should UXO be found. DNPA Rangers and guided walk leaders are also briefed about UXO as are Year 6 pupils in the WDBC catchment area.
 - Searches for UXO after exercises have been completed and periodic sweeps of the training area to ensure they are free of military debris
- 13.4.3 The Land Quality Assessment (LQA) work completed by Entec (September, 2007) has identified three options for the management and possible further investigation of any potential sources of contamination identified through the desk study work completed for the LQA.

13.5 Assessment of Potential Effects

Data Gathering and Survey Work

- 13.5.1 Information to inform the assessment has been taken from the LQA (Entec, 2007). The LQA is based on data from general mapping sources and public body records, including the relevant topographical, geological and groundwater vulnerability maps of the area, British Geological Survey, the Landmark Information Group and aerial photographs from the Camp records office. MOD sources included the site Camp Commandant and the Landmarc Support Services. A site walkover was completed as part of the LQA work.

Current Conditions

Site Description

- 13.5.2 Okehampton Camp comprises of over 150 military buildings and associated services. These buildings include POL points, Accommodation, Dining Halls, Sewage Treatment works and a Hospital. Some of the buildings are known to contain asbestos bound cement. There is also history of demolished buildings, which again are thought to have contained asbestos bound cement.
- 13.5.3 The site was originally developed in the 1870s and was used by the army; by 1893 construction of the original permanent camp began. Military training has taken place on Dartmoor since the early 1800s, artillery firing started in 1875. The area was used intensively for tactical exercises with live ammunition during the Second World War.
- 13.5.4 The first Willsworthy Camp was constructed prior to 1965, it was then demolished and in 1997 a new building was built at Willsworthy close to the area where the original buildings were.

Environmental Setting and Site Sensitivity

- 13.5.5 A variety of people use Dartmoor Training Area (DTA) including both military and civilian personnel. All have the potential to come into contact with site derived soils through activities such as trench digging (military only), walking, climbing, farming etc. A moderate sensitivity is therefore assessed for all human receptors.
- 13.5.6 The site is underlain by either granite or a variety of metamorphosed sedimentary rocks with only thin drift cover of either low or intermediate leaching potential. All of these are classed as a minor aquifer and are known to have groundwater abstractions at a number of locations across DTA. As such the aquifer is assessed as being of moderate sensitivity. A number of small streams and rivers flow from DTA. These form the catchment and source for a number of larger rivers and reservoirs, used for drinking water

off site. Several abstractions (potable and other) are also taken from these waters within DTA. These are therefore assessed as being of high sensitivity.

- 13.5.7 Ecological receptors comprising bog, heathland, trees and bird species cover the majority of DTA and are assessed as having a high sensitivity to site derived contaminants.
- 13.5.8 Grazing animals, predominantly sheep, roam the majority of DTA. As such they are likely to ingest site derived contaminants either through vegetation, which may have absorbed contaminants or via soil attached to the vegetation. Consequently it is assessed that grazing animals have a high sensitivity.

Potential Site Contamination

- 13.5.9 DTA encompasses an area of considerable size, and varying land use. The intensity of these past uses will be inherently variable and as such the spatial distribution and likely degrees of contamination will differ across the site. Camp areas are likely to comprise small well defined areas of contaminants. Ranges are likely to be characterised by generally lower concentrations of contaminants, which are sporadically distributed over a wider, poorly defined area. However several areas within the ranges, have been identified as containing potential sources, which are spatially well defined and likely to contain greater levels of contaminants. These are likely derived from more intensive use and includes small arms ranges and artillery target areas.
- 13.5.10 A further division can be made as to those sources of contaminants attributable to current and former MoD use and those formed by historical (non-MoD) use or natural characteristics of the area. Potential contamination caused by MoD use include use of fuels (primarily identified on Okehampton Camp), waste disposal (including Sewage Treatment Works (STW) and Ad Hoc tipping), electrical substations, old forges, incinerators and small arms ranges. It must also be assumed that, in the absence of any information to the contrary, there is a potential for contaminants to be present at the location of the former Willsworthy Camp. Long term use of explosive ordnance on the ranges, is also applicable to MoD use and may have led to a more widespread, low levels distribution of explosive residues and heavy metals. Non MoD sources of contamination include the more extensive distribution of heavy metals and radon gas associated with the natural geochemistry of the area. The legacy of historical mining activities will also present a potential source of heavy metals and acid mine drainage, which has the potential to effect both soil and groundwater.
- 13.5.11 To summarise it is assessed that the majority of DTA will be affected by relatively low level contamination with a widespread, irregular spatial distribution relating to both natural geochemistry or use of explosive ordnance. More significant concentrations are likely to be associated with limited source areas of contamination relating to both military and civilian use.
- 13.5.12 It should be noted that the assessment carried out in the LQA has not involved a comprehensive survey of the entire DTA. Rather it has sought to identify the most notable contaminants thought to be present, by appraisal of limited information. Assumptions on the distribution and presence of contaminants must therefore be qualified as being indicative of the issues likely to be present rather than a definitive representation of all potential contamination within the entire area.
- 13.5.13 It is also currently recognised that the potential for and risk posed by buried explosive ordnance has not yet been fully characterised and that this is an issue that requires further consideration.

Significance Evaluation Methodology

13.5.14 The evaluation of significance is based on the risk assessment approach set out in the LQA Report. This approach considers sources of pollution, pathways by which a pollutant can move from the source and receptors (such as human beings and other living organisms, controlled waters, physical systems and built structures) which could be affected by the pollutant. The relationship between sources, pathways and receptors has been used to assess the potential environmental risk, which is based on the nature of the source, the degree of exposure of a receptor to a source and the sensitivity of the receptor.

Assessment of Effects and Evaluation of Significance

13.5.15 The assessment has considered the potential effects identified in the Scoping Report, which included the following:

- effects from the historical and/or current storage and loss of motor fuels, aviation fuels, heating oils and other hydrocarbons;
- effects from the historical and/or current disposal of waste including broken/surplus material and explosive ordnance remnants (as both a detonation risk and a toxicity risk);
- effects from the historical and/or current use, storage and disposal of any other potential contaminating materials with potential for contamination of soils; and
- effects from historical and/or current shallow digging.

13.5.16 The following assessment has considered the potential effects in relation to each of the identified receptors.

Humans

13.5.17 Current Human users of DTA comprising both military and civilian personnel are assessed as being subject to a generally low to moderate risk from identified contaminants.

13.5.18 Military users were in general assessed as having a low to moderate risk from contamination although moderate risks were thought applicable to the small arms ranges and identified areas of munitions use, contaminants associated with the deposition of mine wastes, organic vapours from POL installations on Okehampton Camp, and the demolished Willsworthy Camp. It is possible that all of these risks could be mitigated to a low risk by the use of appropriate Personal Protection Equipment (PPE) and application of suitable management procedures.

13.5.19 A high risk to MoD personnel is assessed with respect to radon gas in buildings, assuming that no current monitoring or management procedures are currently in place.

13.5.20 The risks posed by asbestos to MoD personnel are currently assessed as low to moderate with potential sources being unlikely to release fibres. This does however assume that adequate H&S procedures are adhered to in buildings where Asbestos Containing Material (ACM) has been identified. Risks could be reduced further to a low classification, with the implementation of an appropriate management plan, which is understood to be in the process of being compiled.

13.5.21 Non-MoD site users are characterised as either having a *moderate sensitivity*, where activities would lead to increased contact with soils and waters or *low sensitivity* where contact with soils and water is less likely

- 13.5.22 Where a *moderate sensitivity* is thought to be applicable, users are generally assessed as having a low to moderate risk, with the exception of sources including mine waste and the demolished Willsworthy Camp, where a moderate risk is assessed. Sources on areas used intensively by the MoD (e.g. small arms ranges and those on Okehampton Camp) were generally assessed as low due to the inherent access restrictions. Radon Gas is assessed as posing a high risk within enclosed buildings, although elsewhere the risk will be low.
- 13.5.23 For users with an assessed *low sensitivity* risks are generally reduced to an assessment of low.

Surface and Groundwater

- 13.5.24 Surface water, used for potable water abstraction throughout the area, were assessed as having a generally low or negligible risk although this rises to moderate with respect to tin mining waste.
- 13.5.25 Groundwater is also used for potable water abstraction within the site and in surrounding areas. The site is underlain by a Minor Aquifer, and a low to moderate risk has been assessed for the majority of the larger sources identified. The exceptions to this include the current and former POL and infilled quarry, both of which are on Okehampton Camp which are assessed as having a moderate risk. A moderate risk applied to the demolished Willsworthy Camp is attributable to a lack of information on the former infrastructure.

Buildings and Buried Services

- 13.5.26 The risks to current buildings and buried services are assessed to be negligible to low across the site.

Grazing Animals

- 13.5.27 Risks to grazing animals are assessed as generally low although moderate risks were assessed with respect to identified sources of potential contamination including areas of munitions use, such as small arms ranges former artillery targets, as well as areas of mine waste and the STW outfall adjacent to Okehampton. The potential for uncertainty over contaminant distribution was also assessed as requiring a moderate risk with regards to the demolished Willsworthy Camp and unidentified contaminants on the ranges.

Ecological Systems

- 13.5.28 Ecological systems (fauna) were assessed as having a generally applicable risk assessment of low to negligible. In areas of identified contamination, likely to be found in significant concentrations, which fall within ecologically designated areas a moderate risk was applied. This related to both occurrences of mining waste as well as the Small Arms Ranges on Willsworthy and former artillery targets found across the Okehampton, Willsworthy and Merrivale Ranges as well as the demolished Willsworthy Camp. Plants (flora) were similarly found to be generally at low to negligible risk from identified contaminants although as with fauna a moderate risk was applied with respect to mining waste as well as the Small Arms Ranges on Willsworthy and former artillery targets.

Unexploded Ordnance

- 13.5.29 The historic use of DTA for live firing has resulted in the presence of unexploded ordnance (UXO) under parts of the moor.

Definition of Ordnance

- 13.5.30 MoD defines UXO as '*Ordnance which has been primed, fused, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected or placed in*

such a manner as to constitute a hazard to operations, installations, personnel or material and remains unexploded either by malfunction or design or for any other cause.' [Ref. JSP 403]

- 13.5.31 Evidence of live firing has been found dating back to the mid 19th century and by 1895 artillery training was being undertaken on Okehampton Range. In the early 1900's Willsworthy Range was acquired and its fixed ranges established. During the Second World War the entire moor was used for live firing.
- 13.5.32 Ground conditions across a large part of the unenclosed moorland consist of peat varying from some 50cm to over seven metres in depth. The combination of climate and ground conditions can result in significant movement within the peat layers as this material expands and contracts in response to soil moisture and temperature. As a result items of UXO can migrate to the surface.

Risk Management

- 13.5.33 UXO presents a hazard to walkers, riders etc if impacted. However, the MoD view is that if UXO did not explode when fired or detonate on landing then it is therefore unlikely to explode without considerable physical force or heat being applied. That said management procedures are in place to minimise the potential risks associated with UXO.
- 13.5.34 The existing controls applied comprise:
 - 1. providing information to users of DTA using leaflets, weekly newspaper notices, information boards, signs on boundary poles around the present RDA warning of the hazard and advising that if found military debris should be left alone, a note made of the location, the area marked and to inform the police or Commandant DTA;
 - 2. searching areas used for training after each exercise to collect expended military debris and to report any UXO found;
 - 3. carrying out periodic sweeps of the designated training area to ensure that they are free of military debris;
 - 4. briefing DNPA Rangers and guided walk leaders on the action to be taken if UXO are found; and
 - 5. informing, as part of the Junior Life Skills, Year 6 pupils in the WDBC catchment area of the hazards and action to be taken should UXO be found.

Future Management

- 13.5.35 Active clearance of UXO has been undertaken and historical clearance records held by MoD dating back to 1900 indicate the extent of clearance tasks. The locations are summarised in **Table 13.2**, below.

Table 13.2 UXO Clearance

Location	Grid Reference	Area cleared (ha.)
Great Mis Tor	SX 563, 769	44.0
Oke Tor	SX 612, 901	16.0
Scary Tor	SX 607, 925	17.78
Kitty Tor	SX 567, 875	16.0
Bagga Tor	SX 558, 798	2.0
Row Tor	SX 593, 917	18.5
Henry's Ford Bivouac Site	SX 579, 913	1.0
Red-a-Ven Brook Bivouac Site	SX 605, 911	1.0
Oxheadwater Bivouac Site	SX 609, 889	1.13
Sammy Arnold's Bivouac Site	SX 603, 389	2.1
Dinger Tor Bivouac Site	SX 587, 881	1.68
Knack Mine Bivouac Site	SX 614, 886	2.9
Total		124.09

Notes

1: At Little Mis Tor (grid ref. SX 563, 763) 129.01 ha. has also previously been cleared, although there remains the possibility of unexploded ordnance in this area

13.5.36 Other areas of historic clearance have also occurred to varying extents but again these cannot be considered comprehensive due to the narrow width of areas covered and the potential for UXO movement within the peat.

13.5.37 Consideration has been given to the actions required to achieve complete clearance of UXO on DTA. In order to achieve complete clearance, visual searches followed by non intrusive geophysical surveys to establish the presence of remaining UXO, would be required. The surveys would need to be followed by excavation and removal. This would result in temporary disturbance of ecologically sensitive habitats and the further need to manage the regeneration of the vegetation in areas affected. In addition, and importantly, the ongoing movement within the peat would result in the need for repeat operations. Due to the extent of land involved, i.e. the whole of the DTA, the MoD estimate that the process could take up to forty years to complete.

13.5.38 The disadvantages of clearing DTA are considered by MoD to be that:

- no device exists that will allow assessment to be made of the density of UXO;
- clearance needs to be by location and then digging out the UXO before deciding whether it is dangerous and needs blowing or is expended;
- it is impossible to be certain that all UXO has been cleared;

- bogs and rivers cannot be searched or completely cleared;
- peat would be damaged by digging down to investigate UXO and therefore, the clearance itself would cause effects on nature conservation sites;
- clearance activities could also effect cultural heritage features which would therefore have to be avoided;
- access to the areas to be cleared for machinery would be potentially damaging to the landscape; and
- workers undertaking clearance work would require huts etc to be erected to comply with HSW which would also effect landscape quality.

13.5.39 Given the extent of the task and taking account of risk, clearance as a single project (as opposed to ongoing removal of UXO that becomes visible), is not considered by MoD to be feasible. For the purpose of this EA, it is therefore assumed that conditions, in terms of the presence of UXO, will not change significantly in the future.

13.6 Summary of Significance Evaluation

- 13.6.1 The majority of DTA is considered to have widespread, sporadically distributed contamination at generally low levels relating to both military (use of explosive munitions) and non-military use (natural geochemistry & tin mining). Smaller more localised areas, more likely to contain higher levels of contaminants have also been identified which are attributable to military use.
- 13.6.2 It should however be considered that the majority of contaminants are derived from historical practices and current and future use is likely to present a significantly lower possibility of allowing contamination.
- 13.6.3 The suitability of continued military use of DTA is therefore based on the premise of managing the existing, historical liabilities and the likelihood of future contamination. The former may be dealt with by the measures proposed in a technical note (Entec Ref R07286i1). These involve both better characterisation of potential higher risk sources as well as the application of measures of good practice (e.g. use of appropriate PPE for those involved in groundworks, asbestos management, controlled access to certain areas of contamination, formalised risk assessment of buried ordnance, and further characterisation of suspected contamination). If such management measures are employed these issues should not hinder future military use.
- 13.6.4 To conclude it is assessed that DTA is suitable for continued military use, in the form outlined if suitable management of identified risks is implemented.
- 13.6.5 A summary of the significance of effects in relation to each of the identified receptors is outlined in **Table 13.3** below.

Table 13.3 Summary of Significant Effects

Receptor and summary of predicted effects	Type of effect¹	Significance²
Humans (the public and military users): Contact with contamination through trench digging (military only), walking, climbing, farming etc resulting in health effects	-ve	NS The risk to military personnel is considered to be low to moderate - moderate without mitigation but low with mitigation in place. The risks to non MoD personnel is considered to be low but low to moderate where such personnel come into greater contact with soils and water particularly close to areas of mine waste and the demolished Willsworthy Camp.
Surface and groundwater: pollutant effects from contamination migrating through or over the ground to contaminate water	-ve	NS The risks to surface water (used for abstraction) are low/negligible except in areas close to tin mining waste (moderate) Risks to groundwater (used for abstraction) are low to moderate across most of DTA except within Okehampton Camp and Willsworthy Camp (moderate risk)
Buildings and buried services	-ve	NS Risks are low/negligible
Grazing animals: health effects from direct contact with soils, consumption of vegetation in areas of contamination	-ve	NS Risks are low but moderate in areas of identified sources of potential contamination (areas of munitions use, mine waste, STW outfall, Okehampton, demolished Willsworthy Camp and on the ranges).
Ecological systems: effects on growth of flora from presence of contamination in ground and on fauna from consumption of vegetation grown in contaminated soils.	-ve	NS Risks to fauna and flora are low/negligible but moderate where areas of identified contamination lies within designated sites (mining waste, small arms ranges, former artillery targets, demolished camp).
Unexploded ordnance: risk effects on humans coming into direct contact with UXO.	-ve	NS Existing management measures are considered to minimise the risks associated with UXO to an acceptable level.
Key/footnotes:		
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S Significant or NS Not-significant

This page is intentionally left blank.



DARTMOOR TRAINING AREA

Environmental Appraisal

Surface Water

14

14. Surface Water

14.1 Introduction

- 14.1.1 Military training that currently takes place at Dartmoor has the potential to affect surface water across the site and off-site both directly and indirectly.
- 14.1.2 A number of water quality and run-off issues were identified as potentially being affected by military training activities within the Scoping Report (Entec, 2006). It was considered unlikely that, with current management measures in place, any effects from training are likely to have a significant effect on water quality, but that further work would be undertaken to demonstrate this.
- 14.1.3 Work conducted has been undertaken by water quality specialists with previous experience of military training areas. John Pomfret, BSc (Chemistry), MSc (Biology), MCIWEM undertook the initial scoping study and made recommendations for this work. Tamsin Watt BSC (Physical Geography and Biology) undertook the assessment and wrote this chapter.

14.2 Context

- 14.2.1 The following section sets the context for the surface water assessment at Dartmoor Training Area (DTA). It is important to consider the site from both a legislative and policy context.

14.3 Legislative Context

- 14.3.1 Several pieces of environmental legislation are relevant to the assessment of surface water quality at DTA. This does not just include the relevant water Acts, which are concerned for example with the correct treatment of waste water, foul water, spillages and discharge consents but must also refer to those Acts which are concerned with the correct treatment and disposal of waste, particularly those which if leaked may have adverse affects on surface water runoff, such as oil, paint and antifreeze. These include;
 - Water Resources Act 1991;
 - Water Industry Act 1991;
 - Groundwater Regulations 1998;
 - Pollution Prevention and Control Act 1999 and Pollution Prevention and Control Regulations 2000;
 - EC Water Framework Directive (2000/60/EC);
 - The Environment Act 1995;
 - Environmental Protection Act 1990, Part III;
 - Environmental Protection (Duty of Care) Regulations 1991;

- Control of Major Accident Hazards Regulations 1999 (COMAH);
- Control of Pollution (Oil Storage) (England) Regulations 2001; and
- Special Waste Regulations 1996 (as amended in 2001).

Policy Context

- 14.3.2 This section provides a review of relevant policies for the control and management of water quality across the DTA.
- 14.3.3 Planning Policy Statement 23 (PPS23) is concerned with planning pollution control to protect the quality of land, air and water resources. In accordance with national policies the Government expects Regional Planning Bodies and Local Authorities to adopt a strategic approach to integrate their land use planning processes with plans and strategies for the control, mitigation and removal of pollution, as far as possible and is practicable to do so. Pollution control is concerned with reducing or preventing pollution to the environment to ensure that water quality meet standards that guard against impacts to the environment and human health. PPS23 Annex 1: Pollution Control, Air and Water Quality gives further guidance on control regimes and the planning system for the consideration of any development. Local and regional polices are outlined in **Table 14.1**.

Table 14.1 Relevant Policies and their Implications

Policy Reference ¹	Implications
SWRSS Policy RE6	The region's network of ground, surface and coastal waters and associated ecosystems will be protected and enhanced. Surface and groundwater pollution risks must be minimised so that environmental quality standards are achieved and where possible exceeded.
DNPLP	Dartmoor plays a pivotal role in the water resources of Devon and east Cornwall and is important for supplying drinking, agricultural, industrial and domestic waters as well as a wider network of water dependent habitat. The plan recognises the importance of forward planning and sustainable management of water resources across Dartmoor both now and in a future under the threat of climate change

Note 1 – The full names of the plans and guidance cited are given in Appendix 4.4, which details all policies and guidance that are relevant

14.4 Scope of the Assessment

- 14.4.1 This Section describes the scoping procedures undertaken to produce the Environment Appraisal (EA). Initially a scoping study was conducted by Entec in September 2006 which formed the basis of this work. The Scoping Report identified that it was unlikely that military training is having a significant effect on water quality, however, it was agreed that further data would be obtained and analysed to confirm this. In combination, consultation with various groups and organisations continued throughout the project lifecycle to ensure that the most up to date and relevant information was collected and that all views from all interested parties were able to be expressed. Water quality issues were also discussed as part of the Land Use Working group meetings (see **Chapter 8** for further information on these meetings).

Consultations

14.4.2 A number of organisations and individuals were contacted during the course of this project to discuss the scope of the surface water assessment at DTA. These included;

- The Environment Agency, which also provided data and took part in working group meetings to resolve issues relating to surface water;
- MoD, who provided further information and clarification relating to training activities and management and mitigation measures across the site;
- Dartmoor National Park Authority (DNPA), provided further information and clarification relating to water levels and quality across the site; and
- South West Water, which provided clarification of uses of and quality within the Meldon and Burrator Reservoirs on site.

Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

14.4.3 The Scoping Report concluded that there were no likely significant effects on water quality from military activities, however, it was agreed that the following areas of work would be undertaken to confirm that there are no significant effects associated with water quality and military activities.

- Environment Agency Data: Obtaining more recent routine sample analysis data from the Environment Agency to check that the conclusions drawn within the scoping report are still valid.
- Reservoir Data: Further investigation of possible contaminants for abstractions from the Burrator and Meldon Reservoirs. These analyses will include some additional parameters to the Environment Agency data obtained for the scoping study. The assessment will be made in relation to users of the public water supply as well as any likely effects on aquatic flora and fauna, including fish.
- Leats: Clarification of the relationship of Devonport Leat to Cramber and Ringmoor Training Areas and to determine the sensitivities of both the Prison Leat, Reddafford Leat and Devonport Leat to effects of military activities.
- Sewage Discharges: Confirmation that treated sewage discharges from the camps are being controlled appropriately.
- Digging Activities: Further investigation to ascertain the extent of digging activities and the potential effects on drainage of standing waters in bog areas.
- Mitigation measures: Further consideration of mitigation measures regarding surface water run-off at the camps. It is considered likely that existing infrastructure and measures in the EMS are sufficient to prevent adverse effects. This is detailed in **Section 14.4**.

14.4.4 It is considered unlikely that, with the current mitigation measures in place, the potential effects from training activities are significant. The above issues will, however be considered as part of the EA in order to determine that this is the case.

Effects Subsequently Scoped-in to the Appraisal

14.4.5 Following production of the Scoping Report, working group meetings and consultation have been held to discuss environmental issues including water quality. There have not been any additional effects scoped-in relating to surface water as a result of these discussions.

Effects Not Requiring Further Consideration

Effects Scoped-out in the Scoping Report

14.4.6 Effects that were scoped-out at this stage include:

- Potential changes to run-off rates are not considered significant due to the very restricted use of vehicles overall within DTA, the EMS limitations on off-road use and the requirement to repair any damage. Management measures are detailed further in **Section 14.4** below.
- Potential drainage of pools and the effects on flushes due to rutting caused by vehicle activity and effects of vehicles on streambeds were scoped out for the reasons stated above.
- The pollution of water courses from fuel or other chemical spillages on site is considered insignificant as there are procedures in place to minimise spillages and to mitigate their adverse effects. This is detailed further in section 1.4 below.
- The potential pollution from liquid wastes, specifically chemical toilet waste is considered insignificant as liquid waste is disposed of off-site by a licensed specialist contractor.

Effects Subsequently Scoped-out of the Appraisal

14.4.7 Following production of the Scoping Report, working group meetings and consultation have been held to discuss environmental issues relating to water quality. From these discussions there have not been any additional effects scoped out.

14.5 Environmental Management Measures

14.5.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Comdt DTA assisted by SLA DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW SOs.

14.5.2 There are a number of management measures in place across DTA which mitigate against, reduce the magnitude of, or compensate for the potential damaging effects to surface water across the site. A number of these measures manage effects to the extent that they have been effectively scoped out of the EA while the introduction of further management measures might assist in the control of other issues identified. The existing mitigation and compensation measures currently in place are detailed below. Provided these controls are implemented effectively it is considered that surface water across the site is managed effectively.

- On-site sewage treatment works at Okehampton and Willsworthy Camps treat sewage to the required level to ensure environmental protection and, at Okehampton, discharge it to river under Environment Agency consent, which is designed to protect the receiving water.

- Measures in place to minimise risk from accidental spillages include; preparation and dissemination of a spillage plan, provision of spill control kits, provision of oil interceptors on surface water drainage from main vehicle parking area and from helicopter and vehicle refuelling areas, installation and maintenance of oil and grease traps, an inspection regime for the refuelling point and locking of refuelling facilities when not in use.
- To avoid pollution or contamination from chemical toilets, self-contained portable toilets are used on the ranges and contents are disposed of appropriately by licensed contractors.
- To avoid ordnance contamination the MoD ensure careful clearance of unexploded ordnance and use of new, modern ordnance that does not leave toxic residue.
- To avoid fuel spillages and contamination, refuelling on DTA is minimised. Where necessary spill control kits are provided for users and operators. HQ control of locations for any refuelling other than jerry can refuelling of individual vehicles is imposed.
- Waste disposal, collection and removal is monitored for all wastes on site to ensure proper control.
- To avoid damage from vehicles and driving activities, off road vehicle use is strictly limited and controlled. Any rutting caused by vehicle damage is repaired.
- Digging is prohibited in areas outside DTA. Inside DTA digging is only permissible in specifically allocated areas and heather areas are avoided. Where digging takes place ground is to be reinstated, trenches refilled and turf replaced.
- Cooking oil is stored in bunded containers and re-cycled by specialist contractors.

14.5.3 The following additional measures have also been identified.

- Improved waste management and salvage (being addressed in a waste management report, currently under preparation by Enviro).
- Improved waste management and salvage (being addressed in a waste management report, currently under preparation by Enviro)

14.6 Data Analysis

Data Gathering and Survey Work

14.6.1 To address the remaining issues highlighted within the Scoping Report, further data collection has been undertaken and assessed from a variety of sources. Information on current conditions has been collected from the following documents and sources of information:

- Ordnance Survey 1:50,000 scale mapping;
- Cramber Tor Training Area, Dartmoor. Volume 1 Environmental Statement, WSP Environmental, September 2002;
- External Audit of Dartmoor Training Area's Environmental Management System: Final Report – Impact Assessment, Gap Analysis and Recommendations for Improvement. RPS Health, Safety & Environment August 2005;

- Standing Orders for Defence Training Estate South West. 2007 (DTE SW SOs);
 - water quality data for Meldon and Burrator Reservoirs from South West Water;
 - routine sample analysis data from the Environment Agency's website;
 - appropriate discharge consents from the Environment Agency; and
 - Pollution Incident reports from the Environment Agency.
- 14.6.2 A comprehensive review of the above information has been undertaken to provide an assessment of baseline conditions relating to water quality issues at DTA. To date no field survey specific to surface water issues has been undertaken.
- 14.6.3 A key aspect in determining the effects of water quality across DTA was to obtain water quality data for the treatment works at both the Meldon and Burrator reservoirs. These water bodies are used for public supply and it is therefore imperative that the quality of water within them is of a very high standard. In addition a large proportion of the training estate drains towards these supply reservoirs; the Okehampton Training Area, via the west Okehampton river valley to the Meldon reservoir and the Merrivale and Ringmoor Training Areas, via the rivers Plym and its tributary the Meavy to the Burrator Reservoir. This data therefore provides a good overview of the potential effects of training activities on water quality across DTA.
- 14.6.4 In addition further data has been obtained relating to the rules and operations for digging activities across the site, the quality of water in other waterways and water bodies on site and the controls in the operation of treated sewage discharges from the Okehampton and Willsworthy Camps.

14.7 Analysis of Baseline Conditions

- 14.7.1 In order to provide a baseline for water quality across the site a summary of the current conditions relating to all surface water issues is provided below, for clarity issues have been subdivided and described in turn.

Environmental Setting

- 14.7.2 The high ground of Dartmoor forms the principal watershed in Devon, with rivers draining the area running to both the north and south Devon coasts.
- 14.7.3 The northern part of Okehampton Training Area drains northwards via the East and West Okement Rivers, which flow into the River Torridge. The Torridge and the Taw discharge on the north Devon coast through a combined estuary between Bideford and Barnstaple. The West Okement River valley includes Meldon Reservoir, a public water supply reservoir forming part of DTA's boundary.
- 14.7.4 The central part of Okehampton Training Area, Willsworthy Training Area and part of Merrivale Training Area drain westwards via the River Tavy and via the River Lyd, a tributary of the River Tamar. The Tavy and Tamar discharge into the sea on the south Devon coast via Plymouth Sound.
- 14.7.5 The south eastern and eastern parts of Okehampton and Merrivale Training Areas drain towards the south east, via the River Teign and the River Dart, with its tributaries the East and West Dart, Blackbrook River and Cowsic River. The Teign and Dart drain to the English Channel at Teignmouth and Dartmouth respectively.

- 14.7.6 The western part of Merrivale Training Area drains to the south west via the River Walkham, a tributary of the River Tavy.
- 14.7.7 Cramber and Ringmoor Training Areas drain to the River Plym and its tributary the River Meavy. The Plym enters the sea at Plymouth. Burrator Reservoir is a public water supply owned by South West Water on the River Meavy.
- 14.7.8 DTA does not form part of the catchment of the Fernworthy Reservoir, situated on the South Teign River.
- 14.7.9 The catchments within the Training Areas comprise mainly of open peaty moorland and blanket bog, resulting in naturally low pH in many of the rivers leaving the moor. The geology results in the water being 'soft' with little capacity to buffer the effects of acid rainfall and this may reduce the pH further.

Meldon and Burrator Reservoirs

- 14.7.10 Water quality data for the 10 year period 1995 – 2005, for Burrator and Meldon Reservoirs was obtained from South West Water. Data was obtained for water chemistry, microbiology and algae. Data tables can be found in **Appendix 14.1**. An assessment of the data was made comparing monitored determinants with the Environmental Quality Standards (EQS) stipulated in the current Directives.

Water Chemistry

- 14.7.11 Water chemistry at the Burrator water treatment works demonstrate that nitrate and phosphate nutrients both fall into the 'very low' or 'low', GQA class 1 or 2, indicating good water quality. Metals such as dissolved iron demonstrate no failures of the Dangerous Substances Directive EQS and pH ranges from 5.6 to 8.3, reflecting the natural characteristics of the catchment.
- 14.7.12 The microbiology records for coliforms and faecal coliforms were compared against the EQS of the Bathing Water Directive (although this is not a designated Bathing Water). Bacterial counts are very low and all fall within the EQS, indicating no contamination by sewage.
- 14.7.13 Algal counts are perfectly normal for an inland lake or reservoir, showing a seasonal fluctuation, with higher counts experienced during the summer months.
- 14.7.14 The chemistry of water within Burrator Reservoir itself again demonstrate that nitrate and phosphate nutrients both fall into the 'very low' or 'low', GQA class 1 or 2, indicating good water quality. pH ranges from 6.4 to 7.3, reflecting the natural characteristics of the catchment. Ammonia and dissolved oxygen levels reflect excellent water quality. Algal counts are perfectly normal for an inland lake or reservoir and although present for most of the year, show a seasonal fluctuation, with higher counts experienced during the summer months. There were no microbiological data for this sample point.
- 14.7.15 Water chemistry at the Meldon treatment works demonstrate that nitrate and phosphate nutrients both fall into the 'very low' or 'low' GQA class 1 or 2, indicating good water quality. Metals such as dissolved iron demonstrate no failures of the Dangerous Substances Directive EQS and pH ranges from 5.6 to 8.3, reflecting the natural characteristics of the catchment. Counts of total coliforms and faecal coliforms fluctuate throughout the year but indicate no sewage contamination. Algal counts are perfectly normal for an inland lake or reservoir, and although present for most of the year, show a seasonal fluctuation, with higher counts experienced during the summer months.

- 14.7.16 Similarly nitrate and phosphate nutrient within the reservoir itself both fall into the 'very low' or 'low', GQA class 1 or 2, indicating good water quality. Levels of copper and zinc metals are very low, which is excellent as the water is also low in hardness. Ammonia levels reflect excellent water quality. Counts of total coliforms and faecal coliforms are very low, indicating no sewage contamination. Algal counts are perfectly normal for an inland lake or reservoir, and although present for most of the year, show a seasonal fluctuation, with higher counts experienced during the summer months.
- 14.7.17 In summary the water quality of both reservoirs at the treatment works and within the water body itself is excellent. No List 1 or List 2 pesticides exceed any EQS of the Dangerous Substances Directive. Metal and nutrient levels are consistently low for all samples and dissolved oxygen and ammonia levels are excellent. Therefore there is no indication from these data of any contamination or adverse effect arising from military training or indeed any other activity on DTA.

Environment Agency Data Review

Routine River Monitoring Data 2003-2005

- 14.7.18 The results of chemical analysis of monthly samples collected by the Environment Agency over the 3 year period 2003-2005, for their general quality assessment (GQA), for rivers leaving DTA, are given in **Table 14.2**. These cover 'sanitary' parameters (biochemical oxygen demand [BOD₅(atu)], ammonia, dissolved oxygen), which are indicative of organic pollution such as sewage, as well as pH, copper and zinc and the plant nutrients nitrate and phosphates. Results quoted are mean values across all the samples and are the most recent data available on the Environment Agency's website.
- 14.7.19 All of the rivers listed have a water quality objective of RE1, the highest quality objective in the Rivers Ecosystem Classification, which takes into account the sanitary parameters and copper and zinc. RE1 represents water quality high enough to support a good salmonid fishery.
- 14.7.20 All rivers comply with this objective apart from one failing simply on the pH criterion. This is indicated by shading in the pH results column. Note that results are based on percentile compliance data, full details of which are omitted from the table for clarity.

Table 14.2 Environment Agency Routine River Monitoring Data, 2003 -2005

Location	NGR	BOD mg-O ₂ /l	Ammonia mg-N/l	Dissolved oxygen %	pH	Dissolved Copper mg/l	Total Zinc mg/l	Nitrate mg-N/l	Phosphate mg-P/l	Biology no. of taxa	Biology ASP-T (grade)
North Dartmoor (Okehampton, Merrivale and Willsworthy Training Areas)											
East Okement River u/s of Okehampton	SX604946	0.67	0.001	98.19	6.90	1.37	7.63	2.95	0.01	31 (a)	7.13 (a)
River Taw at Sticklepath	SX644940	0.40	0	96.72	7.04	0.22	3.27	0.18	0.01	32 (a)	6.19 (b)
North Teign River at Gidleigh Park Hotel	SX678879	0.33	0.002	95.97	6.84	0.62	1.45	0.87	0.01	27 (a)	6.04 (c)
East Dart River at Postbridge	SX648789	0.77	0.0	97.37	6.25	0.04	1.66	0.76	0.01	26 (a)	6.77 (b)
Cowsic River at Beardown Farm	SX603753	0.45	0.001	96.78	6.08	1.72	4.96	1.37	0.04	25 (a)	6.76 (b)
Blackbrook River at Tor Royal NB d/s of Princetown sewage works	SX602738	0.94	0.025	96.90	6.67	0.36	4.93	4.27	0.03	33 (a)	6.42 (b)
River Walkham at Merrivale Bridge	SX550751	0.31	0.01	94.55	6.61	0.27	2.30	0.68	0.01	22 (b)	6.86 (a)
River Tavy at Hill Bridge	SX532804	0.55	0.001	95.80	7.2	1.92	4.02	2.06	0.01	21 (b)	6.62 (b)
River Lyd at Lydford	SX520845	0.41	0.06	97.08	7.07	0.80	2.17	1.44	0.01	26 (a)	6.73 (b)
West Okement River at Meldon reservoir inflow	SX555906	0.46	0.002	96.50	5.84	0.43	2.66	0.65	0.01	16 (d)	6.31 (b)
South Dartmoor (Cramber and Ringmoor Training Areas)											
River Meavy at weir above Burrator Reservoir	SX567693	0.47	0.0	92.64	6.70	0.57	2.59	0.75	0.01	24 (b)	6.88 (a)
River Plym above Blackbrook	SX565645	0.46	0.02	92.93	6.24	ungraded	ungraded	1.21	0.04	20 (c)	6.55 (b)

- 14.7.21 Nutrient levels are all in the 'very low' or 'low' category used in the Environment Agency's GQA classification system, with the exception of the sampling point on the Blackbrook River, reflecting its location downstream of entry of treated effluent from Princetown sewage treatment works. Slightly elevated nitrate levels are not a cause for concern, however, being in the 'moderately low' GQA class.
- 14.7.22 The slightly acidic pH of the surface waters is an expected phenomenon from a moorland catchment such as DTA and does not indicate contamination that could have arisen from military training. There is no indication at all from these data of any contamination or adverse effect arising from military training on DTA. The results indicate that there is no significant sanitary pollution and probably no natural metalliferous pollution from metal bearing rocks in the area, as copper and zinc levels are very low. This is supported by reservoir water quality monitoring data that has also been examined for other metal contaminants.
- 14.7.23 **Table 14.2** also shows the results of biological analysis of macroinvertebrate sampling data for a single year in the period 2004 to 2005. The results show the number of taxa (in this case biological families from a selected list) and the average score per taxon (ASPT) using the Biological Monitoring Working Party system. These values are compared with expected values predicted by the RIVPACS computer programme, based on physical and basic chemical characteristics of the river at the sample point. The comparison of 'observed' data with 'expected' results gives a grading from (a) to (e), which is also shown.
- 14.7.24 Most results fall into categories (a) 'very good' or (b) 'good'. Bearing in mind that low-pH, nutrient-poor waters tend to have a naturally low productivity and a restricted fauna, the few lower categorisations are not unexpected and the overall pattern remains one of high water quality.
- 14.7.25 Good water quality is also demonstrated by reports from DTE personnel and by RPS that indicate streams within DTA are populated by brown trout and some migratory salmonid fish. Mire areas along Sheepstor Brook have also been reported to support scarce and rare species of dragonfly, the larvae of which are water dependent. Presence of freshwater pearl mussel (*Margaritifera margaritifera*) has also been reported in the vicinity of the Cramber and Ringmoor Training Areas.

Pollution Incidents

- 14.7.26 The Envirocheck report identifies 2 pollution incidents as having taken place within 1km of the Okehampton site. The first was a category 3 (minor incident), and was related to an unknown pollutant into a freshwater stream/river. This was located at NGR 263500 88100. The second was also Category 3 incident and involved process water entering a freshwater stream/river. This was located at NGR 261700 91100.
- 14.7.27 At Ringmoor Training Area the report identifies fifteen pollution incidents to controlled waters, the majority of these were Category 3 (minor incidents) and relate to the China Clay works or unknown pollutants. One major incident was reported at NGR 256150 64500, this was found to relate to quarry extraction water. The incidents largely relate to process water into a freshwater stream/river.
- 14.7.28 At Cramber Training Area the report identifies only one pollution incident to controlled waters, this was a Category 1 (major incident) involving an unknown pollution entering a freshwater stream/river the location of the incident was reported at NGR 260001 73201.
- 14.7.29 In summary there are no pollution incidents that can be related to military activities. Where sources are identified they relate to china clay and quarrying activities.

Water Quality of Artificial Leats

- 14.7.30 There are a number of artificial leats built for collecting and transporting water from the moor. The Prison Leat collects water from the upper valley of the Blackbrook River and Devonport Leat collects water from the upper catchments of the West Dart River and the Cowsic River, in the Merrivale Training area. Reddraford Leat collects water from Willsworthy to feed Wheal Jewel Reservoir and the Mary Tavy hydro electric power station.
- 14.7.31 Where available, sample analysis data has been obtained from the Environment Agency for waterways and water features across DTA. However at the time of report production there was a relative lack of data available for the leats on site, making a relationship between water quality and military training difficult to qualify. Any additional sample data for these waterways or other water bodies would normally be associated with abstraction or discharge consents. There are a number of abstractions and discharges recorded at or near DTA. In general 11 abstractions are recorded, the majority of which relate to domestic or agricultural use and 12 discharges are recorded all of which relate to sewage discharges and are therefore under appropriate control measures. Abstractions and discharges are the responsibility of the Environment Agency and would have associated monitoring data, however the collection and analysis of all abstraction and discharge data is deemed outside the scope of work for this assessment. However, this information has been obtained as part of the Land Quality Assessment work completed by Entec (September 2007).
- 14.7.32 The local authorities contacted are not aware of any groundwater contamination issues at the site. This combined with the good quality of waterways that have been sampled across the site, indicates that any adverse effect upon the leats is unlikely.

Appropriate Control of Sewage Discharges

- 14.7.33 In accordance with the Water Resources Act 1991, the Environment Agency has the responsibility to adequately control sewage discharge consents across the Dartmoor training area and to monitor these at both the Willsworthy and Okehampton camps. Treated domestic sewage discharges at both these locations are monitored to ensure compliance with Environment Agency standards. Water flow is recorded and various water quality tests are carried out which include acidity, temperature, BOD, Ammonia, suspended solids, nitrates, phosphates and zinc.
- 14.7.34 There are a number of criteria that must be complied with that are site specific to each camp, In general discharges must not be found to contain;
- any poisonous, noxious, or polluting matter;
 - any solid waste matter; or
 - any signs of oil or grease.
- 14.7.35 More specifically at Okehampton Camp discharges must not exceed 66m³ in any consecutive 24 hour period and no single sample taken should be found to contain in excess of;
- 40 mg per litre of biochemical oxygen demand for five days at 20 °C;
 - 60 mg per litre of suspended solids (measured after drying for one hour at 105 °C); or
 - 10 mg per litre of ammoniacal nitrogen expressed as nitrogen.

- 14.7.36 At the Okehampton outfall, surface water must be kept separate from treated effluent at all times and irrigation fields associated with outfalls must not fall within 250 m of any well, borehole, spring source or private water supply, 150 m of any existing soakaway or 80 m of any watercourse.
- 14.7.37 At Willsworthy Camp discharges must not exceed 20m³ in any consecutive 24 hours and no single sample taken should be found to contain in excess of;
- 20 mg per litre of biochemical oxygen demand for five days at 20 °C;
 - 30 mg per litre of suspended solids (measured after drying for one hour at 105 °C); or
 - 20 mg per litre of ammoniacal nitrogen expressed as nitrogen.
- 14.7.38 At the Willsworthy outfall, surface water must again be kept separate from any treated effluent at all times and no part of the soakaway associated with the outfall shall be within 200 m of any well, borehole or spring source of private water supply, 100 m of any existing soakaway or 100 m of any watercourse. In addition at this site at least 1.5 m of soil shall be present below the invert level of the soakaway and the invert level of the soakaway shall be at least 1.5 m above the winter water table.
- 14.7.39 Provided these strict standards are maintained, discharges from both the Okehampton and Willsworthy camps are considered to be under appropriate control and it is unlikely that any contamination would take place due to sewage discharges.

Digging Activities

- 14.7.40 Digging activities do take place in certain locations across Dartmoor. These activities have the potential to affect the drainage of peat pools and of flushes which in turn may affect their water dependent habitats and their flora and fauna.
- 14.7.41 To avoid damage to waterways from trench digging and silt intrusion there are strict regulations in place across DTA. Digging is prohibited in any areas outside DTA. Within DTA digging is controlled by Comdt DTA through DTE SW SOs and enforced by DTA staff. Digging is not permitted near watercourses, in peat areas or where there are good stands of heather. After exercises trenches are backfilled and turf replaced.

Summary

- 14.7.42 The activities at both the Willsworthy and Okehampton camps mean that there is a possible risk of contaminated surface water runoff. However the strict management and mitigation measures in place (referred to in **Section 14.4**) combined with the existing infrastructure are considered sufficient to control any potential contamination and prevent adverse effects.



DARTMOOR TRAINING AREA

Environmental Appraisal

Traffic and Transport

15

15. Traffic and Transport

15.1 Introduction

- 15.1.1 Military activities on Dartmoor Training Area (DTA) could be having an effect on road traffic flows. Therefore consideration has been given to traffic flows in the Environmental Appraisal (EA). This chapter has been completed by Rachel Dimmick BSc, MSc, AIEMA.

15.2 Context

1.2.1 Legislative Context

- 15.2.1 There is considered to be no legislation relevant to the context of the appraisal of traffic and transport effects.

1.2.2 Policy Context

- 15.2.2 **Table 15.1** summarises the planning policy context relevant to traffic and transport effects.

Table 15.1 Planning Policy: Traffic and Transport

Policy Reference	Policy Content
DNPALP Policy TF1	Planning permission will not be granted for development that would be unsuited to its location relative to the Dartmoor Route Network; or conflict with the standard, nature, capacity and function of local roads; or result in a material increase in the level or a change in the type of traffic generated which would thereby prejudice road safety.
DNPALP Policy TF6	Development will not be permitted which would increase vehicular traffic on footpaths, bridle paths or byways open to all traffic, to the detriment of their enjoyment by walkers and riders, unless there is overriding social, economic or conservation benefits arising from the proposal.
DNPMP Policy MT.M3	Erosion and damage by military vehicles is avoided.

Note 1 – The full names of the plans and guidance cited are given in Appendix 4.4, which details all policies and guidance that are relevant

15.3 Scope of the Assessment

1.3.1 Consultations

- 15.3.1 Transport and traffic issues have been discussed as part of the Land Use Working Group (LUWG) meetings (see **Chapter 8** for further details). During these meetings, issues regarding traffic congestion on the main access route from Okehampton town centre to Okehampton Camp, were raised. It was agreed that a traffic count would be undertaken and an indication of military traffic flows be provided using the access records for Okehampton Camp.

1.3.2 Effects Requiring Further Consideration

Effects Scoped-in in the Scoping Report

15.3.2 No environmental effects in relation to traffic and transport were scoped-in in the Scoping Report.

Effects Subsequently Scoped-in to the Appraisal

15.3.3 Subsequent to the issue of the Scoping Report, a review of the traffic data flows for the access route to Okehampton Camp has been identified through the LUWG meetings to determine what contribution military traffic makes to road traffic flows.

Effects Scoped-out in the Scoping Report

15.3.4 It was considered that the following traffic and transport effects, which are based on the potential effects from traffic associated with military activities, did not require further consideration in the EA:

- Potential severance effects on the local community: severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. It may result from the difficulty of crossing a heavily trafficked existing road for example, or as a result of a physical barrier created by the road itself. However, there are no predictive formulae, which give simple relationships between traffic factors and levels of severance. Nevertheless, the Institute of Environmental Assessment's 'Guidelines for the Environmental Assessment of Road Traffic' guidelines suggest that only changes in traffic flow of 30% or more are likely to produce changes in severance. Given that no changes in traffic flow are predicted, and that the existing levels of traffic generation are low and unlikely to be causing severance issues, this effect is scoped-out.
- Delays to drivers using the local highway network: delays to existing traffic on the network can occur due to the additional traffic generated by the proposed activity. The Institute of Environmental Management and Assessment (IEMA) guidelines note that these additional delays are only likely to be significant when the traffic on the network in the study area is already at, or close to, the capacity of the system. Given that the existing network within and around DTA is generally not at capacity, this effect is scoped-out.
- Pedestrian delay: changes in the volume, composition or speed of traffic may affect the ability of people to cross roads and therefore result in pedestrian delay. In general, increases in traffic levels are likely to lead to greater increases in pedestrian delay. However, given that no changes in traffic flow are predicted and that the existing levels of traffic generation and pedestrian activity are both low, this effect is scoped-out.
- Pedestrian amenity: this is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. The IEMA guidelines note that changes in pedestrian amenity may be considered to be significant where the traffic flow is halved or doubled. However, given that no changes in traffic flow are predicted, and that the existing levels of traffic generation and pedestrian activity are both low, this effect is scoped-out.
- Fear and intimidation effects on the local population as a result of intimidation from military traffic on local routes: the scale of fear and intimidation experienced by pedestrians is dependant on the volume of traffic, its HGV composition, its proximity to

people or the lack of protection caused by such factors as narrow pavement widths. Whilst there are no commonly agreed thresholds by which to determine the significance of the effect, no changes in traffic flow are predicted, and the existing levels of traffic generation and pedestrian activity are both low. Furthermore, the vehicles in use by the Armed Forces are generally smaller than private HGVs using local roads and are therefore less likely to result in intimidation effects. This effect is therefore scoped-out.

- Accidents and safety issues for local pedestrian and drivers: due to the numerous local causation factors involved in personal injury accidents, the IEMA guidelines do not recommend the use of thresholds to determine significance. However, given that no changes in traffic flow are predicted, and that the existing levels of traffic generation are low, this effect is scoped-out.

Effects Subsequently Scoped-out of the Appraisal

- 15.3.5 No other effects have been scoped-out of the Appraisal since the issue of the Scoping Report.

15.4 Environmental Management Measures

- 15.4.1 Responsibility for the implementation of the mitigation measures lies with the MoD through DTE to Commandant (Comdt) DTA assisted by Senior Land Agent (SLA) DTE SW and MoD's Service Provider. Implementation and compliance will be ensured through DTA's EMS, management plans and DTE SW Standing Orders (SOs).
- 15.4.2 The existing management measures which are in place to minimise effects from traffic associated with the military use of DTA are outlined below.
- In unenclosed areas vehicles are not normally permitted to move more than 15yds from roads.
 - Vehicles are not permitted to leave tracks without the authority of Comdt DTA or Training Area Marshals and Supervisors.
 - No tracked vehicles are to be used within DTA except the BV206, which may be allocated the Okehampton, Merrivale and Willsworthy Training Areas. BV206 routes must be agreed with Comdt DTA..
 - Sites for embussing/debussing must be carefully selected so as not to inconvenience other road users. Traffic sentries are to be posted when necessary and public house car parks should not be used unless the landlord has given prior permission.
 - Vehicular entry and exit is strictly limited to specified access.
 - Ringmoor: vehicular entry and exist is restricted to the metalled roads leading up to and bordering the training areas. No MOD vehicles are to proceed any further north beyond the gate to Brisworthy Plantation.
 - Ringmoor: wheeled vehicles may move up to 15yds off roads provided they do not rut the ground or enter any wooded area. Access to the Refuge (SX 581673) and Ditsworthy Warren House (SX 584663) is only permitted along the track for visiting units using these facilities.

- Cramber: Use of vehicles is limited and only vehicles up to 3/4T. Access is confined to the existing track with access only from the west. Vehicles can only leave the track in an emergency.
- Cramber: Only vehicles up to and including trucks Utility Medium (TUM) are permitted on the tracks from Norsworthy Bridge (SX 568693) to SX 578701 and SX 579688. Only one vehicle is permitted to use the track beyond the gate at a time, except in an emergency. No vehicles are to use the track between SX 602708 to SX 603710 and the track that leads to Nuns Cross Farm between SX 604708 to SX606698.

- 15.4.3 Additional mitigation measures have also been identified through the Land Use Working Group meetings. Although these measures will not have a direct effect on military traffic flows, they will help to reduce overall traffic flows, particularly long distance traffic movements associated with the delivery and supply of goods and services to Okehampton Camp.
- DTA will aim to procure food locally wherever possible and increase existing procurement of local food. This will help to reduce traffic movements associated with deliveries to Okehampton Camp.

15.5 Assessment of Potential Effects

Data Gathering and Survey Work

- 15.5.1 A traffic count survey was completed by Count on Us on Tors Road (SX 58791 94444), Okehampton for a seven day period between Thursday 26 July and Wednesday 1 August 2007. To undertake the count, a set of parallel pneumatic road tubes were installed at the monitoring location separated by a distance of 36 inches. The tubes were then connected to an automatic traffic counter which was set to obtain classified directional traffic flows in hourly intervals. Data on the type and speed of vehicles were recorded.
- 15.5.2 The location on Tors Road was selected to represent a likely worst-case scenario for those residents who live along the route from Okehampton Camp to the town centre. Actual levels of traffic on Station Road, closer to the town centre, are greater, as traffic from the residential roads (such as Brandize, Park, Station Road and Klondyke Road) move towards the town centre, thus reducing the percentage of vehicles associated with Okehampton Camp.
- 15.5.3 A review of the access records for Okehampton was also completed to provide data on the number of vehicle movements into and out of the Camp.

Current Conditions

- 15.5.4 **Table 15.2** outlines the results from the traffic survey. Information from the table would indicate that average 24 hour flows are 834 vehicle movements.

Table 15.2 Traffic Count Flows (24 hour period)

Date	Total vehicles	Motor cycles	Cars	LGVs	HGVs	Bus
Thu 26-Jul-07	698	3	608	66	13	8
Fri 27-Jul-07	715	0	621	71	17	6
Sat 28-Jul-07	613	8	563	36	6	0
Sun 29-Jul-07	796	18	715	41	6	16
Mon 30-Jul-07	919	15	802	86	11	5
Tue 31-Jul-07	1080	24	947	95	12	2
Wed 01-Aug-07	1015	19	859	117	12	8
Average	834	12	731	73	11	6

15.5.5 Data on visitors to and users of Okehampton Camp for a similar period provides an indication of typical weekly movements. An estimate of 450 visitors was provided. This is considered to comprise of the following.

- 30 staff working at Okehampton Camp with some taking lunch at home (equating to **100** two-way vehicle movements each day);
- 20 non-MOD visitors/deliveries accessing Okehampton Camp (equating to **40** two-way vehicle movements each day); and
- **50** allocated user vehicles: In the period reviewed a 400 person cadet unit arrived over the weekend. As units travel up to Okehampton Camp and then out onto the moor for training it has been assumed that these movements would only be one-way over a 24 hours period.

15.5.6 Therefore, this would indicate that over a 24 hour period, typically there are 190 vehicle movements associated with Okehampton Camp. A 24 hour period has been considered as vehicle movements associated with movements of military personnel may occur outside typical working day hours and at the weekend. **Table 15.3** shows the percentage contribution of the traffic movements associated with Okehampton Camp over an average 24 hour period.

Table 15.3 Contribution of Okehampton Camp Traffic Flows to Overall Flows

Type of vehicle movement	No. of movements	Average daily 24 hour traffic flows	Percentage contribution to flows at survey point (%)
Staff	100	834	12
Visitor/delivery	40	834	5
MOD	50	834	6
Total	190	834	23

- 15.5.7 The information in **Table 15.5** would indicate that in total, traffic flows associated with Okehampton Camp comprise 23% of the total daily average traffic flows along Tors Road at the survey point. Of this 23% only 6% is associated with the movement of troops.
- 15.5.8 It should be noted that the survey was completed at Tors Road, and that traffic flows closer to the town centre are likely to be greater and therefore the flows associated with Okehampton Camp are likely to be a smaller percentage of the overall flows close to the town centre. Overall, it is considered unlikely that vehicle movements associated with troop movements will comprise more than 10% of the daily traffic flows along the access route from Okehampton Town Centre (in addition to staff movements and movements associated with visitors and deliveries). Furthermore, traffic flows associated with the movement of troops can vary considerably, and on some days no troop movements will occur. On such days, traffic from Okehampton Camp would only constitute 17% of total traffic flows.
- 15.5.9 The effects which have been raised in the LUWG meetings have related to:
- permitted parking either side of Station Road, which limits passing places especially if HGV's are travelling up or down the road. Conversely this improves safety as traffic flow is slowed; and
 - the recently changed junction layout and traffic lights in the centre of Okehampton cause delay, which can be exacerbated if there is a large military vehicle movement.
- 15.5.10 Some of these factors are beyond the control of Comdt DTA, for example, parking on Station Road or junction control in Okehampton, however, it is considered that the mitigation measures in place help to minimise these effects.

15.6 Summary of Significance Evaluation

15.6.1 **Table 15.4** summarises the findings of the appraisal for the traffic and transport effects.

Table 15.4 Summary of Significance Evaluation: Traffic and Transport

Receptor and summary of predicted effects	Type of effect ¹	Significance ²	
Residents along access route from Okehampton town centre to Okehampton Camp: nuisance effects such as noise, severance, traffic congestion	-ve	NS	The traffic flows associated with Okehampton Camp are unlikely to comprise more than 25% of the total traffic flows along Tors Road.
Key/footnotes:			
1.Type of effect	-ve = negative + ve = positive N = Neutral ? = unknown	2. S or NS	Significant Not-significant

Glossary and Abbreviations

Abbreviation	Explanation
Additionality	An effect arising from a development is additional if it would have occurred in the absence of the development.
Ambient noise	The totally encompassing sound in a given situation at a given time - i.e. composed of noise from all sources near and far.
ANPA	Association of National Park Authorities
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQ	Air Quality
AQMA	Air Quality Management Area
ASPT	Average Score Per Taxon
AT	Adventurous Training
ATE	Army Training Estate
BAP	Biodiversity Action Plan
BBS	Breeding Bird Survey
C-Far	MoD run programme of rehabilitation and support for young adult persistent offenders within the South West.
Comdt	Commandant
Counterfactual	The 'reference case' or counterfactual is a statement of what would have happened without the development. Any assessment of a development's effects should be made relative to what would otherwise have happened. Usually it is not enough to describe that starting position or 'baseline' since this is likely to change over time.
CPRE	Campaign for the Protection of Rural England
CROW Act	Countryside and Rights of Way Act, 2000
CTCRM	Commando Training Centre Royal Marines
dB	Decibel: The unit of noise derived from the logarithm of the ratio between the value of sound pressure or sound intensity and a corresponding reference value. The decibel scale provides a linear numbering system which compresses a wide range of values. The threshold of normal hearing is about 0 dB and the threshold of pain between 120 and 140 dB.
dB(A)	Decibels measured using an electronic weighting network ('A' weighting) which differentiates between sounds of different frequency in a similar manner to the human ear. Measurements in dB(A) broadly correspond to people's assessment of loudness. A change of +/- 3 dB is the minimum perceptible under normal conditions, a change of +/- 10 dB corresponds roughly to a doubling or halving of loudness.
DBA	Desk Based Assessment
DCMS	Department of Culture, Media and Sport
DE	Defence Estates
Deadweight	Development or the effects of a development that would in fact have occurred without the proposed development. Within the additionality framework these are the outputs that would arise under the baseline/counterfactual.
DE EST	Defence Estates Environmental Support Team
DET R	Defence Estate Training Resource
Direct Employment	Employment that occurs as a direct result of the development
Displacement	The degree to which the effects of a development are offset by reductions in effects elsewhere. Within

Abbreviation	Explanation
	the additionality framework it is the proportion of the effects of the development that account for reduced effects elsewhere in the area are of interest. It may occur in both the product and the factor markets.
DNP	Dartmoor National Park
DNPA	Dartmoor National Park Authority
DNPLP	Dartmoor National Park Local Plan
DNPMP	Dartmoor National Park Management Plan
DPA	Dartmoor Preservation Association
Dry Trg	Dry training, which encompasses tactical training, not involving the use of live ammunition, but including the use of pyrotechnics, blank ammunition and other battle simulators and, for the purposes fo this study, non tactical training such as fitness, navigation and adventure training.
DSG	Dartmoor Steering Group
DSP	Devon Structure Plan
DTA	Dartmoor Training Area
DTE	Defence Training Estates
DTE SW SLA	Defence Training Estate South West Senior Land Agent
EA	Environmental Appraisal
EH	English Heritage
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EMS	Environmental Management Systems
EQS	Environmental Quality Standards
ES	Environmental Statement
ESA	Environmentally Sensitive Area
Facade	Measurements taken close to a reflecting surface
Free Field	Measurements which are taken away from the influence of buildings or other reflecting surfaces.
Field Firing	Army training activities involving the use of live ammunition in open country, sometimes using manoeuvre boxes with fixed arcs
FFA	Field Firing Area
FMW	Field Monument Warden, employed to check SM condition by EH
FP	Flag Pole
FTE	Full Time Equivalent: A way to measure a worker's productivity and/or involvement in a project. A FTE of 1.0 means that the person is equivalent to a full-time worker. A FTE of 0.5 may signal that the worker is only half-time, or that their projected output (due to differences in qualification, for example) is only half of what one may expect.
Ha	hectare
HE	High Explosive
HER	Historic Environment Record: archaeological database held by DNP
HLS	Higher Level Stewardship
HQ	Headquarters
HQ DTE	Headquarters of the Defence Training Estate
HQ 43 (Wx) Bde	Headquarters 43 (Wessex) Brigade: based in Bulford and the military organisation who's Commander is Director Ten Tors
IEEM	Institute of Ecology and Environmental Management

Abbreviation	Explanation
IEMA	Institute of Environmental Management and Assessment
ILMP	Integrated Land Management Plan
IRMP	Integrated Rural Management Plan
JCA	Joint Character Area
JSP	Joint Service Publication
LCA	Landscape Character Area
$L_{Aeq,T}$	The equivalent continuous sound level. A notional level of dB(A) having the same acoustic energy as a fluctuating A-weighted sound level over a specified measurement period T.
$L_{A90,T}$	The noise level exceeded for 90% of the specified measurement period. In BS4142 this is defined as the background noise level.
$L_{A10,T}$	The noise level exceeded for 10% of the specified measurement period. This is generally the parameter applied to road traffic noise.
L_{Amax}	The maximum noise level recorded during the monitoring period.
Leakage	The proportion of outputs/outcomes which benefit those outside the area of interest or groups
Lear	An area of hill or moor regarded as 'home' by sheep, cattle and ponies.
LPA	Local Planning Authority
LQA	Land Quality Assessment
LSS	Landmarc Support Services
LUWG	Land Use Working Group
MDP	Ministry of Defence Police
MMTR	Manned Moving Target Range
MoD	Ministry of Defence
MSD	Minimum Separation Distance
NCWG	Nature Conservation Working Group
NE	Natural England
NEC	Noise Exposure Categories
NGO	Non-Governmental Organisation
NVC	National Vegetation Classification
OP	Observation Post
OS	Ordnance Survey
OSS	Open Spaces Society
OTC	Officer Training Corps
PA WG	Public Access Working Group
PALs	Premier Archaeological Landscapes
POL points	Petrol, Oil and Lubrication Points
PPG	Planning Policy Guidance
PPS	Planning Policy Statement
ProW	Public Rights of Way
PSA	Public Service Agreement
RA	Ramblers Association

Abbreviation	Explanation
RAF	Royal Air Force
RDA	Range Danger Areas
REES	Rural Elements of the Estate Strategy
RM	Royal Marines
RN	Royal Navy
RPS	Independent Environmental Contractor who has completed work for MoD connected with Dartmoor
RSPB	Royal Society for Protection of Birds
SAC	Special Area of Conservation
SdiG	Sustainable Development in Government
SLA	Defence Estates' Senior Land Agent
SLM	Sound Level Meter
SM	Scheduled Monument – as defined by the 1979 Ancient Monuments and Archaeological Areas Act (as amended)
SMTOD	Sustainable Military Training on Dartmoor
SMTOD NC WG	Sustainable Military Training on Dartmoor Project Nature Conservation Working Group
SMTOD CH WG	Sustainable Military Training on Dartmoor Project Cultural Heritage Working Group
SMTOD PA WG	Sustainable Military Training on Dartmoor Project Public Access Working Group
Sos	Standing Orders, which set out permanent orders for compliance by authorised users.
SOPs	Standard Operating Procedures lay down set processes to be used in a given situation.
SSSI	Sites of Special Scientific Interest
SWRSS	South West Draft Regional Spatial Strategy
TAMs	Training Area Marshals
TES	Tactical Engagement Simulation
TEWTs	Tactical Exercises without Troops
TOPL	Training Over Private Land
TTF	Trucks Tanker Fuel
UXO	Unexploded Ordnance
WDBC	West Devon Borough Council