



Land and Environmental Management Plan



Prepared for

**Sporting Shooters Association of Australia (S.S.A.A.)
Lockyer Branch Inc.**

**Shooting Range - Pickerings Road, Black Duck Creek,
Lockyer Valley (Lot 122 CC 841)**

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Executive Summary

This Land and Environmental Management Plan (LEMP) has been prepared to support the Sporting Shooters Association of Australia (S.S.A.A.) Lockyer Branch Inc. development application for a Shooting Range on Lot 133 CC 841 in Gatton Shire.

The LEMP addresses the matters identified in Section 4.2.1 of the Gatton Shire Council Preliminary Assessment Report of 26 September 2001, and includes discussion of:

- The biodiversity values of the subject land and the measures that will be implemented to conserve these values;
- Drainage patterns, geology and soil types; and
- The biodiversity conservation and soil conservation measures that will be implemented during both the construction and operational stages of use.

The proposed Shooting Range development will achieve a very high level of biodiversity conservation and catchment protection. It has been assessed against the recommended land use and management principles and practices in the *Land Use Planning Handbook for the Lockyer Catchment* and found to be fully consistent, meaning that the proposed Shooting Range land use is highly appropriate for the subject land. The proposed development has also been assessed against other relevant legislation, policies and strategies and has been found to be fully consistent.

The proposed Shooting Range development results in a win-win outcome - a win for natural resource management and a win for the needs of the landholder - and Gatton Shire Council is strongly encouraged to give it its full support.

1. Introduction

1.1 Purpose of this Land and Environmental Management Plan (LEMP)

This Land and Environmental Management Plan (LEMP) has been prepared to support the Sporting Shooters Association of Australia (S.S.A.A.) Lockyer Branch Inc. development application for a Shooting Range on Lot 133 CC 841 in Gatton Shire, herein referred to as “the proposed development” on “the subject land”. The subject land is located on Pickering Road, Black Duck Creek, approximately 6km south of Junction View, as shown in Figure 1.

The LEMP addresses the matters identified in Section 4.2.1 of the Gatton Shire Council Preliminary Assessment Report of 26 September 2001, and includes discussion of:

- The biodiversity values of the subject land and the measures that will be implemented to conserve these values;
- Drainage patterns, geology and soil types; and
- The biodiversity conservation and soil conservation measures that will be implemented during both the construction and operational stages of use.

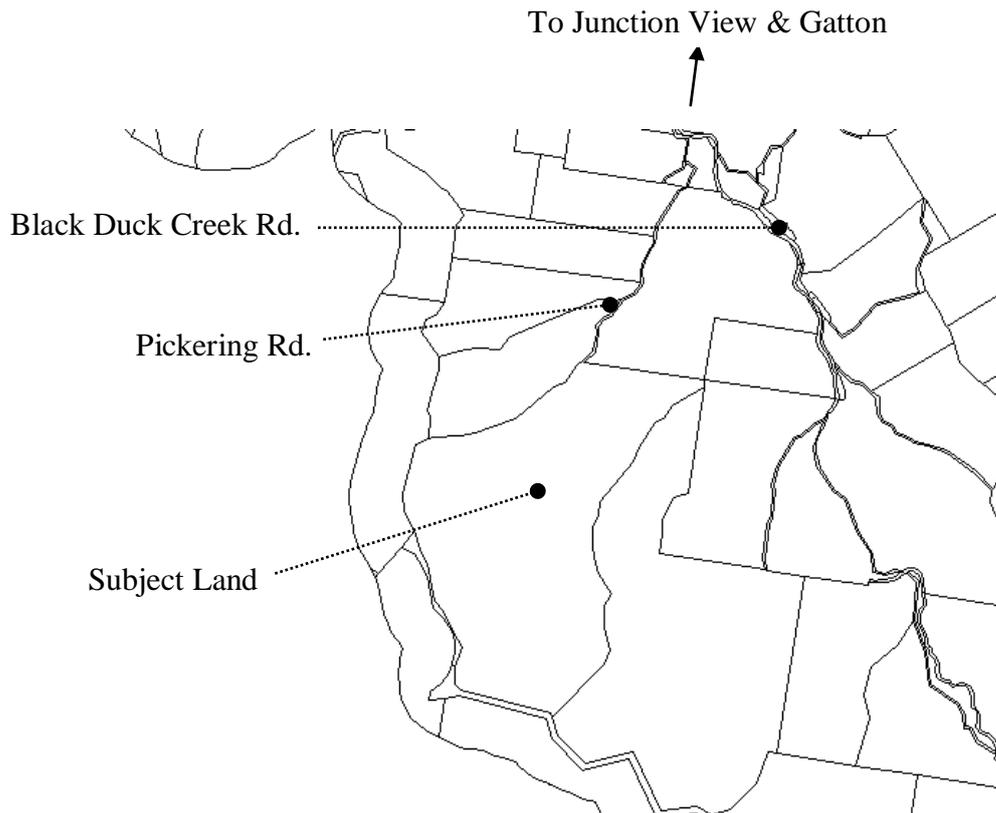


Figure 1. Subject land for proposed S.S.A.A. shooting range (Lot 133 CC 841).

1.2 Geography

The subject land covers an area of 489.037 ha of steep and heavily undulating land on the northern slopes of the Great Dividing Range in the south of the Lockyer Valley. The upper reaches of Doctor Creek, a tributary of Black Duck Creek, are fully contained within the subject land. Black Duck Creek flows into Blackfellow Creek, which is one of the main creek systems of the Lockyer Creek catchment. The subject land is mostly vegetated, with some areas of better soils cleared in the past for agriculture or grazing. The geology is Main Range Volcanics.

1.3 Biodiversity values

The current Queensland Herbarium Regional Ecosystem (RE) map¹ for the area including the subject land shows that the majority of the subject land is native vegetation. The native vegetation on the subject land is part of a much larger area of significant native vegetation extending along the Great Dividing Range, with wildlife corridor linkages to the Glen Rock Regional Park, Mt. Mistake National Park and Goomburra State Forest. An excerpt from the Queensland Herbarium RE map is reproduced in Figure 2. The map shows that the dominant vegetation community on the subject land is RE 12.8.17, which was confirmed during a site inspection. An intergrade of RE 12.8.14 and RE 12.8.9 is present along the main drainage lines. Some areas of RE 12.8.16 may also be present, but these were not observed during the site inspection.



Figure 2. Excerpt from Queensland Herbarium Regional Ecosystem (RE) map.

The biodiversity values of Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17 are summarised in Appendix A, which is an excerpt from the *Biodiversity Recovery Plan for Gatton and Laidley Shires, South-East Queensland*².

The native vegetation on the subject land is in very good condition, with minimal weed invasion, high understorey diversity, evidence of appropriate fire regimes, and the presence of habitat features such as fallen logs and trees with hollows.

While the subject land is mostly vegetated, there are two cleared areas located at the northern end of the subject land. These areas would have been cleared at some time in the past to establish cropping or grazing lands. The two areas feature better quality soils than other parts of the subject land and would most probably have originally featured the dry rainforest vegetation community RE 12.8.21 (also called “softwood scrub”), possibly intergrading with RE 12.8.9 and/or RE 12.8.14. The softwood scrubs of the Lockyer have been extensively cleared, originally for cropping, then giving way to grazing as the soil fertility rapidly declined and/or the soil rapidly eroded. In an attempt to maintain grazing viability most of the scrub soil areas were then subsequently planted with exotic pasture species, in particular the exotic pasture grass green panic (*Panicum maximum*). The scrub soil areas of the Lockyer have also become heavily infested with the weed lantana (*Lantana camara*). The two cleared areas on the subject land are both dominated by green panic (*Panicum maximum*), with infestations of lantana (*Lantana camara*). There is also some regeneration of softwood scrub species (i.e. the species found in RE 12.8.21).

1.4 Catchment values

The part of the Lockyer Catchment where the subject land is located is an important irrigation water supply catchment for the aquifers of the alluvial creek flats to the north of the subject land.

The subject land is in very good condition, with no erosion or landslips identified in the report *Land Degradation in the Lockyer Catchment*³, and no erosion or landslips identified during the site inspection and an inspection of 1:25,000 scale aerial photography.

1.5 Relevant legislation, policies and strategies

Legislation, policies and strategies relevant to the subject land and the proposed development are:

- *Land Use Planning Handbook for the Lockyer Catchment*. Recommends land uses and land management practices for the Basalt Walloons Land System, which is the Land System where the subject land is located.
- *Queensland Vegetation Management Act 1999*. Prohibits clearing of “endangered” Regional Ecosystems (REs) (some exemptions apply). Requires that permits be obtained for clearing all other areas of vegetation identified as remnant on Department of Natural Resources and Mines vegetation maps (some exemptions apply).
- *Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. Requires Commonwealth approval for actions that may have a significant impact on matters of National Environmental Significance (NES) including nationally listed species.

- Gatton Shire Biodiversity Strategy. Recommends a “win-win approach” to biodiversity conservation, where outcomes are sought that result in *both* a win for biodiversity conservation *and* a win for the rights and needs of private landholders.
- Biodiversity Recovery Plan for Gatton and Laidley Shires, South-East Queensland. Recommends biodiversity conservation management principles for Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17.
- Planning Scheme for Gatton Shire (gazetted 1995). Specifies the intent of the Rural Landscape designation, which is the designation where the subject land is located.
- Proposed Gatton Shire IPA Planning Scheme. Specifies the intent of the Rural Uplands Zone, which is the Zone in which the subject land is located.

2. Impact assessment and management

2.1 Assessment of the appropriateness of the proposed land use

The Lockyer Catchment Association Inc. has prepared the *Land Use Planning Handbook for the Lockyer Catchment*⁴ to encourage best land use management practice amongst landholders, government agencies and other stakeholders for sustainable resource management. It is the principal land use and land management reference document for the Lockyer Catchment area.

The proposed development has been assessed against the recommended land use and management principles and practices in the *Land Use Planning Handbook for the Lockyer Catchment*. The proposed development has been found to be fully consistent with all of the relevant practices and principles, as shown in Appendix B, meaning that it is a highly appropriate land use for the subject land.

The proposed development has also been assessed against other relevant legislation, policies and strategies. The proposed development has been found to be fully consistent, as shown in Appendix C.

The proposed shooting range land use is likely to be better for the environment than the farming activities currently practised in the area, evidenced by an assessment of other similar land uses in South-East Queensland. For example, the Land Warfare Centre at Canungra in the Gold Coast Hinterland⁵:

The Land Warfare Centre [LWC] is located within a 5500 hectare training area around the Darlington Range, part of the Great Divide. The base is about 75 km South West of Brisbane, 30 km from the Gold Coast, and forms the green link from Tamborine Mountain through to Lamington National Park...In 1996 the training area was placed on the Register of the National Estate for its natural values.

All environmental matters at the LWC are addressed in the 1997 LWC Environmental Management Plan...Army's care of vegetation and promotion of regrowth can easily be seen by comparing the training area with much of the adjacent farming etc. lands.

2.2 Impact assessment and management - development site

The majority of the proposed development will occur within one of the two previously cleared areas on the subject land. This cleared area, herein called the "development site, is identified in Figure 3.

The only development actions that will occur in the remaining part of the subject land, herein called the "conservation area", are the construction and maintenance of access roads and firelines and some bushwalking and orienteering activities.

This section (Section 2.2) addresses impact assessment and management for the "development site". The next section (Section 2.3) addresses impact assessment and management for the "conservation area".

- Briefing contractors and others involved in the range construction about the conservation needs of *Callitris baileyi*.

Soil Conservation

The construction of the shooting range does not involve any major earthworks. Some minor works will be needed to provide soft soil stop butts behind the target area to trap projectiles and rills and depressions to trap surface water. Some removal of rocks and objects that may allow ricochet will need to take place directly in front of the target areas. Any exposed soil areas that result from these works will be stabilised by the planting of local native grass species. The seed of Kangaroo Grass (*Themeda triandra*) can usually be sourced locally.

Water Quality Management

The lead used in projectiles does not pose a risk to water quality. Soft soil stop butts constructed behind the target area trap projectiles. An S.S.A.A. crew sifts the stop butt soil using portable equipment, extracts the lead and then replaces the soil. Rills in the earth direct surface water that may contain projectiles into depressions where the projectiles settle and the water evaporates. An S.S.A.A. crew sifts the depression surface soil using portable equipment, extracts the lead and then replaces the soil. The lead takes a long time to accumulate and is removed as part of regular range maintenance every 5 to 10 years. No leaching occurs, as the lead is not concentrated enough in any one specific area.

Weed Management

S.S.A.A. Lockyer Branch Inc. has initiated a program to reduce infestations of the weed species *Lantana camara* in both the development site and the conservation area. This control program will be continued for the long-term.

No specific program will be implemented to control the exotic pasture grass green panic (*Panicum maximum*). However, it is expected that range management activities such as slashing and revegetation will contribute to the decline of green panic and its replacement with more desirable native species.

Fire Management

The South-East Queensland Fire and Biodiversity Consortium (FABC) has prepared a range of products to assist the implementation of fire management practices that achieve both the protection of life and property and the conservation of biodiversity.

The FABC promotes the concept of “Property Protection Zones” (PPZs), where the zone surrounding the primary infrastructure on a property is managed in a way that protects the zone from the incursion of fire, for example by removing flammable vegetation. Because the proposed development is taking place primarily within a previously cleared area, a PPZ can and will be readily established encompassing the development site. Management practices for the PPZ will include slashing to reduce grass growth, weed removal, the planting of fire retardant vegetation (see below), and planned burning. Planned burning will be conducted in accordance with the FABC *Fire Management Operational Manual*⁶.

The fire management activities in the development site will be complemented by fire management activities in the conservation area (see below).

Revegetation

S.S.A.A. Lockyer Branch Inc. intends to revegetate some of the development site to provide screening between individual firing ranges and to simulate bushland for some range activities. This revegetation will use only local native species selected from the lists on pages 76-77 of *Living in the Lockyer - A Landholders Guide to Land, Water, Wildlife and Vegetation Management in the Lockyer Catchment and Surrounds*⁷. Preference will be given to using plants from List 2, as the development site was most likely to have originally been covered with softwood scrub, and softwood scrub species generally have fire retardant capabilities.

2.3 Impact assessment and management - conservation area

The majority of the conservation area is remnant vegetation, which will be managed primarily for biodiversity conservation and catchment protection. The remnant vegetation comprises Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17. The management principles for these Regional Ecosystems are listed in Appendix A.

No remnant vegetation clearing will take place within the conservation area, and the only development actions that will occur in the conservation area are the construction and maintenance of access roads and firelines and some bushwalking and orienteering activities. Because there is little change from the existing situation, the majority of the overall habitat and specific species management principles for Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17 have already been met. The only additional biodiversity conservation requirements are:

- Fire management;
- Grazing management;
- Access road and fireline management;
- Weed and feral animal management;
- A conservation agreement; and
- Education.

Soil conservation measures are also required.

Fire Management

The South-East Queensland Fire and Biodiversity Consortium (FABC) has prepared ecological guidelines for fire management in the full range of South-East Queensland ecosystems⁸. The FABC advises that active fire management of grassy woodlands is essential and recommends a fire frequency of three to six years. Disturbance by fire maintains diversity by reducing the stature of dominant grasses, removing litter, and creating bare space in which small grasses and other ground layer species can germinate and grow. Burning in grassy woodlands needs to be sufficiently frequent to prevent large-scale recruitment of trees and shrubs, but not so severe as to prevent seedling establishment and recruitment of eucalypts into the canopy. The FABC advises a mosaic approach to planned burning, and recommends variability in the interval between fires, the intensity of fires, and the time of year of fires.

The fire management activities in the conservation area will be complemented by fire management activities in the development site (see above).

Because the native vegetation on the subject land is part of a much larger area of native vegetation that spreads well beyond the boundaries of the subject land, a landscape approach to planned burning is needed. Following consultation with neighbouring landholders, S.S.A.A. Lockyer Branch Inc. will prepare a fire management plan for the subject land using the FABC *Individual Property Fire Management Planning Kit*⁹, the FABC *Fire Management Operational manual*, and the FABC ecological guidelines. S.S.A.A. Lockyer Branch Inc. will complete and commence implementing the fire management plan by December 2002.

Grazing Management

S.S.A.A. Lockyer Branch Inc. envisages that cattle grazing will be continued in the conservation area.

The CSIRO Sustainable Ecosystems Grazed Landscapes Management Project is addressing the issues of ecological health in grazed lands in southern Queensland. The CSIRO project study sites are in grassy woodland ecosystems that are very similar to the Regional Ecosystems found on the subject land.

CSIRO reports that¹⁰:

A survey of grassy woodlands in the Queensland subtropics was conducted, recording herbaceous plant species richness at 212 sites on three properties (2756 ha). A range of habitats typical of cattle grazing enterprises was sampled...Grazing did not have a negative effect on native species richness, except in the closely grazed patches, and then only on the most intensively developed property.

A key product from the Grazed Landscapes Management Project is the learning module *Balancing Conservation and Production*. The "Guidelines and Thresholds for Sustainable Grazing Lands" in *Balancing Conservation and Production* will be used to determine an appropriate grazing management program for the conservation area.

Access Road and Fireline Management

Access roads and firelines will be positioned to avoid impacting on any threatened species identified in Appendix A.

Weed and Feral Animal Management

S.S.A.A. Lockyer Branch Inc. has initiated a program to reduce infestations of the weed species *Lantana camara* in both the development site and the conservation area. This control program will be continued for the long-term.

The only feral animals observed on the subject land to date are feral pigs. A feral pig control program will be commenced in the conservation area by March 2003. Any other feral animal management issues that become evident will be addressed in a timely manner.

A Conservation Agreement

S.S.A.A. Lockyer Branch Inc. will apply for Land for Wildlife Registration for the subject land.

Education

The preparation and distribution of two fact sheets will assist biodiversity conservation in the conservation area. One fact sheet will give an overview of the vegetation communities and significant natural values on the subject land and the actions that range users can undertake to assist conservation efforts. The other fact sheet will address the conservation of the threatened species *Callitris baileyi* (as discussed in Section 2.2).

Soil Conservation Measures

Roads and firelines will be placed, constructed and maintained so as to avoid soil erosion.

Previously Cleared Area

The conservation area also includes the second of the two previously cleared areas on the subject land (located at the northern end of the subject land - see Figure 3). This previously cleared area will be maintained as cleared land.

Other Issues

The noise of gunshot at the levels that will occur with the proposed development are not known to have any negative impact on wildlife. The risk of injury to wildlife from stray projectiles is extremely low.

3. Appendices

3.1 Appendix A - Biodiversity values and biodiversity conservation management principles for Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17

Regional Ecosystem 12.8.9

Habitat area	Regional Ecosystem (RE) 12.8.9
Floristic description (constant characteristic species in bold type)	<i>Lophostemon confertus</i> ± (<i>Eucalyptus tereticornis</i> , <i>Eucalyptus biturbinata</i> , <i>Eucalyptus eugenioides</i> , <i>Eucalyptus melliodora</i> , emergents) ± <i>Allocasuarina torulosa</i> , with mixed rainforest/riparian species and fern species
General structure	Tall open forest
Threatened RE status	Of concern
Threatened plants	<i>Hibbertia monticola</i> (potential occurrence)
Threatened invertebrates	Nil
Threatened amphibians	<i>Kyarranus kundagungan</i> <i>Lechriodus fletcheri</i> <i>Litoria brevipalmata</i> (potential occurrence) <i>Litoria pearsoniana</i> (potential occurrence) <i>Mixophyes fleayi</i>
Threatened reptiles	<i>Coeranoscincus reticulatus</i> <i>Hoplocephalus stephensii</i> (potential occurrence)
Threatened birds	<i>Calyptorhynchus lathami</i> <i>Climacteris erythroptera</i> <i>Cyclopsitta diophthalma coxeni</i> (potential occurrence) <i>Menura alberti</i> <i>Podargus ocellatus plumiferous</i> (potential occurrence) <i>Tyto tenebricosa</i> (potential occurrence)
Threatened mammals	<i>Dasyurus maculatus maculatus</i> (potential occurrence) <i>Kerivoula papuensis</i> <i>Potorous tridactylus tridactylus</i> <i>Pseudomys oralis</i> (potential occurrence)

Management principles for Regional Ecosystem (RE) 12.8.9

Management principles - conservation requirements of overall habitat area

- Retain the maximum possible area of RE 12.8.9.
- Minimise the fragmentation of RE 12.8.9.
- Conserve known populations of the threatened species listed above. Where possible, carry out surveys to identify any additional populations and conserve these populations.
- Prepare a property management plan that conserves the habitat of the threatened species listed above through appropriate fire regimes, appropriate grazing practices, appropriate timber harvesting and thinning practices, and actions for weed, exotic pasture grass and feral animal control.
- Where possible, establish a Nature Refuge Agreement, Land Management Agreement or Land for Wildlife registration.

Management principles - conservation requirements of specific species

- *Kyarranus kundagungan*, *Litoria brevipalmata*, *Litoria pearsoniana* and *Mixophyes fleayi* - maintenance of water quality and conservation of riparian vegetation.
- *Lechriodus fletcheri* - conservation of small ephemeral waterbodies and the surrounding rainforest and wet sclerophyll forest.
- *Coeranoscincus reticulatus* - conservation of leaf litter, surface rocks and logs and subsurface features (e.g. earth cracks and burrows).
- *Climacteris erythrota* and *Hoplocephalus stephensii* - conservation of trees with decorticated bark.
- *Calyptorhynchus lathami*, *Cyclopsitta diophthalma coxeni* and *Tyto tenebricosa* - conservation of trees suitable for nesting.
- *Kerivoula papuensis* - conservation of trees suitable for roosting.
- *Dasyurus maculatus maculatus* - conservation of sites suitable for nesting.
- *Calyptorhynchus lathami* - conservation of *Allocasuarina* food trees species.
- *Cyclopsitta diophthalma coxeni* - conservation of fig tree food species.

Regional Ecosystem 12.8.14

Habitat area	Regional Ecosystem (RE) 12.8.14
Floristic description (constant characteristic species in bold type)	<i>Eucalyptus eugenioides</i> , <i>Eucalyptus biturbinata</i> , <i>Eucalyptus melliodora</i> , <i>Eucalyptus tereticornis</i> ± <i>Eucalyptus crebra</i> ± <i>Angophora floribunda/subvelutina</i> ± <i>Eucalyptus quadrangulata</i> ± <i>Allocasuarina torulosa</i>
General structure	Grassy open forest
Threatened RE status	No concern at present
Threatened plants	<i>Bothriochloa bunyensis</i> <i>Dichanthium setosum</i> <i>Hibbertia monticola</i> (potential occurrence) <i>Picris evae</i> (potential occurrence) <i>Stemmacantha australis</i> (potential occurrence) <i>Wahlenbergia scopulicola</i> (potential occurrence)
Threatened invertebrates	Nil
Threatened amphibians	Nil
Threatened reptiles	<i>Hoplocephalus stephensii</i> (potential occurrence)
Threatened birds	<i>Calyptorhynchus lathami</i> <i>Climacteris erythroptis</i> <i>Dasyornis brachypterus</i> (potential occurrence) <i>Erythrorchis radiatus</i> <i>Ninox strenua</i> <i>Xanthomyza phrygia</i>
Threatened mammals	<i>Chalinolobus dwyeri</i> <i>Dasyurus maculatus maculatus</i> (potential occurrence) <i>Phascolarctos cinereus</i> <i>Potorous tridactylus tridactylus</i> <i>Pseudomys novaehollandiae</i> <i>Pseudomys oralis</i> (potential occurrence)

Management principles for Regional Ecosystem (RE) 12.8.14

Management principles - conservation requirements of overall habitat area

- Retain the maximum possible area of RE 12.8.14.
- Minimise the fragmentation of RE 12.8.14.
- Conserve known populations of the threatened species listed above. Where possible, carry out surveys to identify any additional populations and conserve these populations.
- Prepare a property management plan that conserves the habitat of the threatened species listed above through appropriate fire regimes, appropriate grazing practices, appropriate timber harvesting and thinning practices, and actions for weed, exotic pasture grass and feral animal control.
- Include in the property management plan a fire management plan that establishes fire regimes suitable for the conservation of the threatened plant species listed above.
- Where possible, establish a Nature Refuge Agreement, Land Management Agreement or Land for Wildlife registration.

Management principles - conservation requirements of specific species

- *Climacteris erythrops* and *Hoplocephalus stephensii* - conservation of trees with decorticating bark.
- *Calyptorhynchus lathami*, *Erythrorchis radiatus* and *Ninox strenua* - conservation of trees suitable for nesting.
- *Calyptorhynchus lathami* - conservation of *Allocasuarina* food trees species.
- *Dasyurus maculatus maculatus* - conservation of sites suitable for nesting.
- *Phascolarctos cinereus* - conservation of food tree species.
- *Phascolarctos cinereus* - protection from attack by domestic dogs.

Regional Ecosystem 12.8.16

Habitat area	Regional Ecosystem (RE) 12.8.16
Floristic description (constant characteristic species in bold type)	<i>Eucalyptus crebra</i> , <i>Eucalyptus tereticornis</i> , <i>Eucalyptus melliodora</i> ± <i>Eucalyptus albens</i> ± <i>Eucalyptus melanophloia</i> ± <i>Angophora floribunda</i> ± <i>Corymbia clarksoniana</i>
General structure	Grassy woodland
Threatened RE status	No concern at present
Threatened plants	<i>Callitris baileyi</i> <i>Hibbertia monticola</i> (potential occurrence)
Threatened invertebrates	Nil
Threatened amphibians	Nil
Threatened reptiles	<i>Hoplocephalus stephensii</i> (potential occurrence)
Threatened birds	<i>Erythrorchis radiatus</i> <i>Ninox strenua</i> <i>Tyto novaehollandiae</i> <i>Xanthomyza phrygia</i>
Threatened mammals	<i>Chalinolobus dwyeri</i> <i>Chalinolobus picatus</i> <i>Dasyurus maculatus maculatus</i> (potential occurrence) <i>Phascolarctos cinereus</i> <i>Potorous tridactylus tridactylus</i> <i>Pseudomys oralis</i> (potential occurrence)

Management principles for Regional Ecosystem (RE) 12.8.16

Management principles - conservation requirements of overall habitat area

- Retain the maximum possible area of RE 12.8.16.
- Minimise the fragmentation of RE 12.8.16.
- Conserve known populations of the threatened species listed above. Where possible, carry out surveys to identify any additional populations and conserve these populations.
- Prepare a property management plan that conserves the habitat of the threatened species listed above through appropriate fire regimes, appropriate grazing practices, appropriate timber harvesting and thinning practices, and actions for weed, exotic pasture grass and feral animal control.
- Where possible, establish a Nature Refuge Agreement, Land Management Agreement or Land for Wildlife registration.

Management principles - conservation requirements of specific species

- *Hoplocephalus stephensii* - conservation of trees with decorticating bark.
- *Erythrorchis radiatus*, *Ninox strenua* and *Tyto novaehollandiae* - conservation of trees suitable for nesting.
- *Chalinolobus picatus* - conservation of trees suitable for roosting.
- *Dasyurus maculatus maculatus* - conservation of sites suitable for nesting.
- *Phascolarctos cinereus* - conservation of food tree species.
- *Phascolarctos cinereus* - protection from attack by domestic dogs.

Regional Ecosystem 12.8.17

Habitat area	Regional Ecosystem (RE) 12.8.17
Floristic description (constant characteristic species in bold type)	<i>Eucalyptus crebra</i> , <i>Eucalyptus melanophloia</i> ± <i>Corymbia clarksoniana</i> ± <i>Corymbia tessellaris</i> ± <i>Eucalyptus tereticornis</i> ± <i>Angophora floribunda</i> ± <i>Eucalyptus melliodora</i> ± <i>Brachychiton populneus</i>
General structure	Grassy woodland
Threatened RE status	No concern at present
Threatened plants	<i>Callitris baileyi</i> <i>Hibbertia monticola</i> (potential occurrence) <i>Picris evae</i> (potential occurrence) <i>Stemmacantha australis</i> <i>Wahlenbergia scopulicola</i> (potential occurrence)
Threatened invertebrates	Nil
Threatened amphibians	Nil
Threatened reptiles	<i>Hoplocephalus stephensii</i> (potential occurrence)
Threatened birds	<i>Erythrorchis radiatus</i> <i>Ninox strenua</i> <i>Tyto novaehollandiae</i>
Threatened mammals	<i>Chalinolobus dwyeri</i> <i>Chalinolobus picatus</i> <i>Dasyurus maculatus maculatus</i> (potential occurrence) <i>Phascolarctos cinereus</i> <i>Potorous tridactylus tridactylus</i> <i>Pseudomys novaehollandiae</i> <i>Pseudomys oralis</i> (potential occurrence)

Management principles for Regional Ecosystem (RE) 12.8.17

Management principles - conservation requirements of overall habitat area

- Retain the maximum possible area of RE 12.8.17.
- Minimise the fragmentation of RE 12.8.17.
- Conserve known populations of the threatened species listed above. Where possible, carry out surveys to identify any additional populations and conserve these populations.
- Prepare a property management plan that conserves the habitat of the threatened species listed above through appropriate fire regimes, appropriate grazing practices, appropriate timber harvesting and thinning practices, and actions for weed, exotic pasture grass and feral animal control.
- Where possible, establish a Nature Refuge Agreement, Land Management Agreement or Land for Wildlife registration.

Management principles - conservation requirements of specific species

- *Hoplocephalus stephensii* - conservation of trees with decorticating bark.
- *Erythrorchis radiatus*, *Ninox strenua* and *Tyto novaehollandiae* - conservation of trees suitable for nesting.
- *Chalinolobus picatus* - conservation of trees suitable for roosting.
- *Dasyurus maculatus maculatus* - conservation of sites suitable for nesting.
- *Phascolarctos cinereus* - conservation of food tree species.
- *Phascolarctos cinereus* - protection from attack by domestic dogs.

3.2 Appendix B - How the proposed development achieves consistency with the *Land Use Planning Handbook for the Lockyer Catchment*

Relevant land management principles and practices for the Basalt/Walloons Land System	How the proposed development achieves consistency
<i>Principles</i>	
<ul style="list-style-type: none"> Multiple use of freehold land. 	The subject land is freehold and will be used for the multiple uses of recreation, nature conservation and grazing.
<ul style="list-style-type: none"> Land use and management focused on maintaining the area as a high-quality water supply catchment, and on retaining the natural and scenic characteristics of the area. 	Native vegetation on the subject land will be retained and erosion control measures will be implemented.
<ul style="list-style-type: none"> Land use viability and sustainable resource use practices. 	The proposed development meets a demonstrated recreational need and can be managed for long-term sustainability.
<i>Land uses encouraged</i>	
<ul style="list-style-type: none"> Grazing of native and improved pastures. 	Grazing may be carried out on the subject land.
<ul style="list-style-type: none"> Recreation and tourism in public areas and on private land where owners permit. 	The proposed development involves the use of private land for recreational purposes.
<ul style="list-style-type: none"> Flora and fauna habitat. 	Native vegetation on the subject land will be conserved.
<i>Land management encouraged</i>	
<ul style="list-style-type: none"> Management of grazing pressures to maintain grazing cover. 	Grazing pressure will be carefully managed to ensure the maintenance of pasture cover.
<ul style="list-style-type: none"> Sustainable vegetation management to ensure the supply of good quality underground water to other land systems. 	Native vegetation on the subject land will be retained.

<ul style="list-style-type: none"> • Recreation and tourism managed to reduce human and vehicle impact on natural areas and roads, and to reduce impacts on private landholders. 	<p>The shooting range occupies only a small part of the subject land, with the remainder of the subject land maintained in its natural state. Vehicles will be confined to access roads. [Note - human and vehicle impacts on roads and impacts on private landholders are addressed elsewhere in the SSAA development application.]</p>
<ul style="list-style-type: none"> • Nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management plans for recreation and tourism developments. 	<p>This and Environmental Management Plan (LEMP) addresses nature conservation, fire management and erosion control. [Note - waste and cultural heritage management are addressed elsewhere in the SSAA development application.]</p>
<ul style="list-style-type: none"> • Conservation of flora and fauna habitat. 	<p>Native vegetation on the subject land will be conserved.</p>
<ul style="list-style-type: none"> • Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation. 	<p>Roads, tracks and other services will be carefully located and constructed to ensure that soil erosion, land slippage and other forms of land degradation do not occur.</p>
<ul style="list-style-type: none"> • Management of feral animals and weeds on public and private land. 	<p>Weed and feral animal management programs have been initiated.</p>
<ul style="list-style-type: none"> • Management of fire for the protection of life and property, the conservation of flora and fauna, the maintenance of grazing pasture and the protection of commercial forestry areas. 	<p>This Land and Environment Management Plan (LEMP) addresses nature conservation and fire management.</p>
<p><i>Discouraged</i></p>	
<ul style="list-style-type: none"> • Development that does not conform to stringent social, environmental and scenic guidelines. 	<p>The proposed development conforms to all relevant legislation, policies and strategies.</p>
<ul style="list-style-type: none"> • Clear felling. 	<p>The proposed development does not involve any clear felling.</p>

3.3 Appendix C - How the proposed development achieves consistency with other relevant legislation, policies and strategies

Relevant legislation, policies and strategies	How the proposed development achieves consistency
<p><u>Queensland Vegetation Management Act 1999.</u> Prohibits clearing of “endangered” Regional Ecosystems (REs) (some exemptions apply). Requires that permits be obtained for clearing all other areas of vegetation identified as remnant on Department of Natural Resources and Mines vegetation maps (some exemptions apply).</p>	<p>The proposed development does not involve the clearing of any areas of “endangered” Regional Ecosystem or any other areas of remnant vegetation.</p>
<p><u>Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999.</u> Requires Commonwealth approval for actions that may have a significant impact on matters of National Environmental Significance (NES) including nationally listed species.</p>	<p>As the proposed development is occurring in a previously cleared area, it does not have any impact on any matters of NES.</p>
<p><u>Gatton Shire Biodiversity Strategy¹¹</u>. Recommends a “win-win approach” to biodiversity conservation, where outcomes are sought that result in <i>both</i> a win for biodiversity conservation <i>and</i> a win for the rights and needs of private landholders.</p>	<p>The proposed development achieves a win-win outcome by conserving all of the biodiversity values of the site while at the same time achieving the land use objectives of the landholder.</p>
<p><u>Biodiversity Recovery Plan for Gatton and Laidley Shires, South-East Queensland.</u> Recommends biodiversity conservation management principles for Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17.</p>	<p>The proposed development conserves all of the remnant vegetation on the subject land and conforms to the management principles for Regional Ecosystems 12.8.9, 12.8.14, 12.8.16 and 12.8.17 listed in Appendix A.</p>
<p><u>Planning Scheme for Gatton Shire (gazetted 1995).</u> The subject land is included in the Rural Landscape designation. This designation includes land with natural attributes such as steep slopes, significant topographic features and significant vegetation. It is intended that land within this designation will be retained largely in a natural state, with significant vegetation preserved.</p>	<p>The proposed development is considered to be consistent with the intent of the Rural Landscape designation, as advised by Gatton Shire Council in Section 4.1.1 of the Gatton Shire Council Preliminary Assessment Report of 26 September 2001.</p>

Proposed Gatton Shire IPA Planning Scheme. The subject land is included in the new Rural Uplands Zone. The intent of this zone will be to accommodate a range of recreational, educational or tourism related uses where such uses cause no adverse impact on the natural environment including retention of vegetation and other features of significant ecological value, prevent erosion, and protect downstream water quality; and where such uses will not be at risk of land instability or bushfire.

The proposed development is for a recreational activity that will have no negative impact on the natural environment. Remnant vegetation and ecological values will be retained, erosion will be prevented, downstream water quality will be protected, and the development will not be at risk of land instability or bushfire.

3.4 Appendix D - Publication information

This publication should be cited as:

Boyes, B. (2002), *Land and Environmental Management Plan for S.S.A.A. Shooting Range, Pickerings Road, Black Duck Creek, Lockyer Valley*, Sporting Shooters Association of Australia (S.S.A.A.) Lockyer Branch Inc.

3.5 Appendix E - References

¹ Helidon RE 9342 Version 3.0.

² Boyes, B. (in prep), *Biodiversity Recovery Plan for Gatton and Laidley Shires, South-East Queensland*, Lockyer Catchment Association Inc. Forest Hill.

³ Shaw, J.H. (1979), *Land Degradation in the Lockyer Catchment*, Technical Bulletin No. 39, Division of Land Utilisation, Queensland Department of Primary Industries.

⁴ Boyes, B. (2001), *Land Use Planning Handbook for the Lockyer Catchment*, Lockyer Catchment Association Inc. Forest Hill.

⁵ Lynch, D. (1998), 'Rainforest Restoration - the Army at Canungra', in Boyes B.R. (ed) (1999), *Rainforest Recovery for the New Millenium*, Proceedings of the World Wide Fund For Nature 1998 South-East Queensland rainforest Recovery Conference, WWF, Sydney.

⁶ Tran, C. (2002), *Best Practice Fire Management Manual - Operational Level - Guidelines and Procedures*, South-East Queensland Fire and Biodiversity Consortium.

⁷ Lockyer Catchment Centre (2000), *Living in the Lockyer - A Landholders Guide to Land, Water, Wildlife and Vegetation Management in the Lockyer Catchment and Surrounds*, Lockyer Catchment Centre, Forest Hill.

⁸ Watson, P. (2001), *The role and use of fire for biodiversity conservation in south-east Queensland: Fire management guidelines derived from ecological research*, South-East Queensland Fire and Biodiversity Consortium.

⁹ Watson, P. (2001), *Individual Property Fire Management Planning Kit*, South-East Queensland Fire and Biodiversity Consortium.

¹⁰ McIntyre, S. & Martin, T.G. (2001), 'Biophysical and human influences on plant species richness in grasslands: Comparing variegated landscapes in subtropical and temperate regions', in *Austral Ecology* 26, 233-245.

¹¹ Boyes, B. (2000), *Gatton Shire Biodiversity Strategy*, Lockyer Watershed Management Association (LWMA) Inc. - Lockyer Landcare Group, Forest Hill.