This Conservation Advice was approved by the Minister on: 16 November 2011

Approved Conservation Advice for Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion ecological community

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing plans, records or management prescriptions for this ecological community.

Description

The Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion is typically tall open eucalypt forests found on basalt and basalt-like substrates in, or adjacent to, the Sydney Basin Bioregion. The ecological community usually occurs at elevations between 650 m and 1050 m above sea level (a.s.l.) (Keith & Benson, 1988, 1990; Fisher et al., 1995; Tozer et al., 2006), although outliers may occur at elevations as low as 350 m (e.g. closer to the coast) or as high as 1200 m a.s.l. (e.g. on higher plateaux). The ecological community occurs in areas of high rainfall, generally ranging from 1000 to 1800 mm/year (NSW Scientific Committee, 2004; Tozer et al., 2006).

The structure of the ecological community varies from tall open forest to woodland depending on aspect, slope, soil conditions, soil depth, and previous disturbance (Fisher et al., 1995; NPWS & Sydney Catchment Authority, 2003; NSW Scientific Committee, 2004). Typically, the ecological community has a sparse to dense layer of shrubs and vines, and a diverse understorey of native grasses, forbs, twiners and ferns (Keith, 2004). With increasing distance from the coast (and a corresponding decrease in rainfall), the understorey tends to grade from relatively mesic (significant component of rainforest species), to relatively scleric (more drought and fire-tolerant shrubs and a more prominent grass layer) (Benson & Howell, 1994; Fisher et al., 1995). Rainforest elements are also present in the more inland remnants with sheltered aspects and topography, and along watercourses (Benson & Keith, 1990). The ecological community may also be affected by cold air drainage and ponding resulting in a more open, grassy forest.

A more comprehensive description of the ecological community is contained in the Listing Advice (TSSC 2011) which is available on the Internet at: http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl**.**

Conservation Status

The Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion ecological community is listed as **endangered**. The ecological community is eligible for listing as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as, in 2011, the Minister considered the Threatened Species Scientific Committee's (TSSC) advice and amended the list under section 184 to include Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion. The TSSC determined that this ecological community met criterion 2 of the eligibility criteria for listing as endangered because its naturally restricted geographic distribution coupled with multiple demonstrable threats makes it likely that it could be lost in the near future (TSSC, 2011). The ecological community also met criterion 4 of the eligibility criteria for listing as endangered because the ecological community had undergone a severe decline in its functional integrity.

As at 30 January 2011, the ecological community incorporates two NSW-listed endangered ecological communities: 'Robertson Basalt Tall Open Forest in the Sydney Basin Bioregion' and 'Mt Gibraltar Forest in the Sydney Basin Bioregion' (NSW Scientific Committee, 2001; 2004).

Distribution and Habitat

The Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion is generally confined to the Sydney Basin bioregion (IBRA V6.1) in NSW. However, parts of its southern extent at Sassafras, east of Nerriga, NSW may occur just outside the Sydney Basin bioregion boundary. Similarly, patches of the ecological community in the vicinity of Mt Werong, Boyd Plateau and Jenolan Caves occur immediately west of the Sydney Basin bioregion boundary. The ecological community predominantly occupies the Moss Vale, Ettrema, Burragorang, Sydney Cataract, and Wollemi IBRA sub-regions, and may also be present in the Kanangra and Oberon IBRA sub-regions (South Eastern Highlands bioregion) to the west of the Sydney Basin.

Small disjunct patches are scattered across the upper Blue Mountains on residual caps of basalt (or basalt-like substrates), including Mt Wilson, Mt Tomah, Mt Bell, Mt Banks, Mt Caley, Mt Hay, Boyd Plateau (Black, 1982; Keith & Benson, 1998; Tozer et al., 2006), Mt Werong, (Fisher et al., 1995), Mt Irvine, Mt Cameron, Green Hill, Gospers Mountain (Benson & Keith, 1990), Buffers Mountain, Mt Budgery and Mt Coricudgy (Bell, 1998). These areas occur within or adjacent to the Greater Blue Mountains World Heritage Area.

Small pockets of the ecological community survive on microsyenite intrusions mainly on Mt Gibraltar, near Bowral in the Southern Highlands, but are also known from Mt Misery, Mt Flora, Cockatoo Hill and Mt Jellore (Fisher et al., 1995; NSW Scientific Committee, 2004). Other patches of the ecological community are scattered throughout the Southern Highlands on Tertiary basalts (mainly Robertson Basalt, Kangaroo Valley Basanite and Sutton Forest volcanics) on the Robertson Plateau and Cambewarra Range (Fisher et al., 1995; NSW Scientific Committee, 2001; Bowie, 2006).

At its southern limit, the ecological community occurs on Tertiary basalt at Sassafras, on the inland coastal ranges, south-west of Nowra NSW.

The Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion ecological community occurs within the following Catchment Management Authorities (CMAs) in NSW: Hawkesbury – Nepean, and Southern Rivers.

Threats

The main *identified* threats to Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion are: clearing and fragmentation; impacts from farming and grazing; impacts from adjacent residential development; inappropriate fire regimes; and invasion by weeds and feral animals (TSSC, 2011).

Ongoing small scale clearing or stock grazing of the ecological community can also lead to its degradation and loss. Associated herbicide and fertiliser use may also affect the ecological community either directly or indirectly. Urbanisation results in impacts such as the invasion of bushland by domestic dogs and cats, rubbish dumping, trampling, garden escapes, firewood collection, impacts from vehicles, the creation of informal trails, and arson. Urbanisation also increases pressure to reduce bushfire fuel loads that may be detrimental to the ecological community.

Generally, wet sclerophyll forests burn infrequently, with fire intervals of several decades, and possibly to a few hundred years. While it is difficult to identify an appropriate fire regime to maintain all species in a given area, repeated low intensity burns (e.g. hazard reduction burns) or too-frequent unintentional fires, may run contrary to natural fire regimes for the Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion, affecting the ecology of the ecological community and reducing species composition. The NSW threatened species profile for 'Robertson Basalt Tall Open Forest in the Sydney Basin Bioregion endangered ecological community' (included in the national listing) states that remnants should not be deliberately burned at all.

The main *potential* threats to Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion include stone extraction (ongoing at Mt Gibraltar near Bowral NSW), other mining actions, and climate change.

The following EPBC Act listed Key Threatening Processes (and any associated Threat Abatement Plans), are considered relevant to Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion:

- Land clearance;
- Competition and land degradation by unmanaged goats;
- Predation by European red fox;
- Competition and degradation by rabbits;
- Predation, habitat degradation, competition and disease transmission by feral pigs;
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants; and
- Loss of terrestrial climatic habitat caused by anthropogenic emissions of greenhouse gases.

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Undertake survey work in suitable habitat and potential habitat to locate occurrences of remnants and threatened species that occur in the ecological community, including ground-truthing of existing vegetation maps.
- Support and enhance existing surveys for the identification of sites of high conservation priority and to gain a better understanding of variation across the ecological community.
- Support and enhance existing programs for the production of mapping of pre-1750 extent and current remnants, including mapping of condition.
- More precisely, assess the size and distribution of remnants of the ecological community, their ecological requirements and the relative impacts of threatening processes.
- Encourage the creation of cost-effective corridors and linkages between remnants where possible.
- Design and implement a monitoring program or, if appropriate, support and enhance existing programs for the ecological community and associated threatened species.
- Support research to identify the major weeds in the ecological community and their management.
- Identify appropriate intensity and interval of fire to promote regeneration of the natural vegetation.

Priority Actions

The following regional priority recovery and threat abatement actions can be done to support the recovery of Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion. Note that the listing advice (TSSC, 2011) for this ecological community defines a 30 m buffer around patches to protect them from the potential detrimental effects of adjacent activities such as spray drift.

Habitat Loss, Disturbance and Modification

- Protect and conserve remaining areas of the ecological community. Further clearance and fragmentation of this endangered ecological community should be avoided.
- Investigate formal conservation arrangements, management agreements and covenants on private land, and for crown and private land investigate inclusion into reserve tenure if possible**.**
- Investigate the possibility of incentive funding to purchase high conservation value areas of the ecological community as appropriate.
- Ensure fenced/protected remnants are buffered to at least 30 m as identified in the listing advice.
- Investigate options for linking, enhancing or establishing additional remnants.
- Monitor the progress of recovery, including assessing extent and condition, the effectiveness of management actions and the need to adapt them as necessary.
- Identify roadsides of high conservation value, and sign and manage them. Educate maintenance and road staff in regards to the ecological community. Ensure road widening and maintenance activities (or other infrastructure or development activities) do not adversely impact on known populations.
- Manage any changes to hydrology that may result in changes to water table levels and/or increased run-off, salinity, sedimentation or pollution, such as new residential developments or changes to roads etc.

Trampling, Browsing or Grazing

- Develop and implement a stock management plan for roadside verges and crown land where gazing is permitted.
- Ensure that any livestock grazing uses an appropriate management regime and density that does not detrimentally affect the ecological community i.e. develop grazing regimes that allow for natural regeneration to occur.
- Where appropriate, exclude grazing at important/significant sites through exclusion fencing or other barriers.

Impacts from residential and peri-urban development

- Fence significant remnants in or adjacent to residential areas and exclude access of vehicles for recreational use and off-leash pets.
- Develop public education programs, information products and signage to help the community recognise the presence and importance of the ecological community, and their responsibilities under state and local regulations and the EPBC Act.
- Encourage local patch management through bushcare/landcare groups.

Fire

- Develop and implement a suitable fire management strategy for Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion**.**

- Where appropriate, provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plans, risk register and/or operation maps.

Pests Plants and Animals

- Develop and implement a management plan for the control of pest flora and fauna species in the region.
- Inform and support local landholders to control feral plants and animals.
- Ensure chemicals or other mechanisms used to eradicate weeds do not have an adverse affect on Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion.

Conservation Information

- Develop and disseminate public education programs, information products and signage to help identify the ecological community and responsibilities under the EPBC Act.
- Inform landholders of relevant incentive funding for fencing, weed removal, planting and other recovery actions to protect the ecological community.
- Develop public education programs, information products and signage to help the public recognise the importance of the ecological community and their responsibilities under the EPBC Act.
- Identify industry and interest groups likely to be affected by the listing and engage with them to obtain their support. Ensure they understand the reasons for the listing and their responsibilities under the EPBC Act.

Existing Plans/Management Prescriptions that are Relevant to the Ecological Community

NSW has identified a number of recovery strategies for two ecological communities that form part of the national ecological community: 'Robertson Basalt Tall Open Forest in the Sydney Basin Bioregion' and 'Mt Gibraltar Forest in the Sydney Basin Bioregion'. The strategies for these two NSW endangered ecological communities (EECs) are provided below.

Robertson Basalt Tall Open Forest in the Sydney Basin Bioregion

- Do not burn remnants;
- Do not harvest firewood from remnants (this includes living or standing dead trees and fallen material);
- Fence remnants and exclude stock grazing;
- Fence around sites and revegetate to increase the size of remnants;
- Undertake weed control (taking care to remove only target species);
- Protect all sites from further clearing and disturbance;
- Ensure remnants remain connected or linked to each other; in cases where remnants have lost connective links, re-establish them by revegetating sites to act as stepping stones for fauna, and flora (pollen and seed dispersal); and
- Mark remnants onto maps (of the property, shire, region, etc) and use to plan activities (e.g. remnant protection, rehabilitation or road, development proposals).

Table 1. Priority Actions identified by NSW Office of Environment and Heritage for recovery of Robertson Basalt Tall Open Forest

Recovery Strategy	Action
Habitat Management: Ongoing EIA – Advice to consent and planning authorities	Develop and distribute EIA guidelines
Habitat Protection	Identify key sites for protection and development of management plans
Habitat Rehabilitation/Restoration and /or Regeneration	Develop guidelines for EEC identification, enhancement and management Protect and enhance EEC sites on private land through targeted management and incentive payments
Survey/Mapping and Habitat Assessment	Develop mapping of extent of EEC Undertake surveys on public and private land

Mount Gibraltar Forest Endangered Ecological Community

- Conduct an education campaign to raise awareness of the community, to eliminate threats associated with inappropriate disturbances from urban areas and infrastructure development;
- Undertake hazard reduction burns in nearby areas of vegetation on sandstone to reduce the impacts of wildfire; only construct firebreaks outside of remnants;
- Erect interpretive signs to provide information to visitors and residents;
- Fence around sites and revegetate, to increase the size of remnants and reduce impacts of grazing and trampling;
- Undertake weed control (taking care to remove only target species);
- Protect all sites from further clearing and disturbance; and
- Mark remnants onto maps (of the property, shire, region, etc) and use to plan activities (e.g. remnant protection, rehabilitation or road, development proposals).

Table 2. Priority Actions identified by NSW Office of Environment and Heritage for recovery of Mount Gibraltar Forest

Recovery Strategy	Action
Habitat Management: Ongoing EIA – Advice to consent and planning authorities	Develop and distribute EIA guidelines
Habitat Management: Other	Undertake weed control
Habitat Protection	Identify key sites for protection and development of management plans
Habitat Rehabilitation/Restoration and /or Regeneration	Develop guidelines for EEC identification, enhancement and management Protect and enhance EEC sites on private land through targeted management and incentive payments
Survey/Mapping and Habitat Assessment	Develop mapping of extent of EEC. Undertake surveys on public and private land

These prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

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TSSC (2011). Advice to the Minister for Sustainability, Environment, Water. Population and Communities from the Threatened Species Scientific Committee (TSSC) on an Amendment to the List of Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion.

Detailed profiles for two NSW-listed ecological communities can be viewed on the Internet at:

Robertson Basalt Tall Open Forest
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10732

Mount Gibraltar Forest
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10545