Acacia meiantha **Tindale & Herscovitch (Fabaceae)**
Distribution: Endemic to NSW
Current EPBC Act Status: Not Listed
Current NSW TSC Act Status: Endangered

Proposed change for alignment: List on EPBC Act as Endangered

Conservation Advice: *Acacia meiantha*.

Summary of Conservation Assessment

Acacia meiantha is found to be eligible for listing as Endangered under Criterion B2 (a), (b) (iii) (v). The main reasons for the species being eligible for listing in the Endangered category are i) that the species has a highly restricted geographic range with an area of occupancy (AOO) estimated to be approximately 68 km^2 based on seventeen 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2016); ii) a continuing decline is estimated in extent and quality of habitat and the number of mature individuals; iii) all or nearly all mature individuals are observed or inferred to occur within a small number of locations (≤5).

Assessment against IUCN Red List criteria
Criterion A Population Size reduction.
Assessment Outcome: Data deficient.
Justification: Insufficient data to assess.

Criterion B Geographic range
Assessment Outcome: Endangered under Criterion B2 (a), (b) (iii) (v).
Justification: The species has a highly restricted geographic range with an area of occupancy (AOO) estimated to be approximately 68 km^2 based on seventeen 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2016); The extent of occurrence (EOO) was estimated to be 2900 km^2 based on a minimum convex polygon encompassing all known locations, the method for assessing EOO recommended by IUCN (2016).
and at least 2 of the following:

a) the population or habitat is observed or inferred to be severely fragmented or there are ≤5 locations.
   Assessment Outcome: subcriterion met at Endangered threshold.
   Justification: Only three locations known from Clarence, Mullions Range and Aarons Pass. Considered to be severely fragmented as the three remaining locations are separated from each other by large distances that would preclude seed dispersal or pollen movement between them.

b) a projected or continuing decline is observed, estimated or inferred.
   Assessment Outcome: subcriterion met.
   Justification: a continuing decline is estimated in area and extent and quality of habitat and the number of mature individuals due to adverse impacts of habitat loss and degradation, roadworks and vehicle impacts, infrastructure maintenance and the impacts of weeds;

c) extreme fluctuations:
   Assessment Outcome: subcriterion not met.
   Justification: There is unlikely to be extreme fluctuations in *Acacia meiantha* as the species is known to sucker, forming both dense and diffuse clumps of stems arising from the roots of a single plant.

Criterion C Small population size and decline.
Assessment Outcome: Data deficient.
Justification: Total populations size is unknown and the known sites may be a mix of genets and ramets (see Ecology section below). The best estimate is that there are likely to be more than 2,500 plants but less than 10,000. No estimate of the rate of decline. No extreme fluctuations known. It is uncertain if the number of individuals in each population is less than 1000.

Criterion D Very small or restricted population.
Assessment Outcome: Least concern
Justification: More than 1000 plants are known (although this may be revised in terms of the number of genetically distinct individuals). Only known from 3 disjunct populations but not currently subject to a threat that could drive the taxon to Critically Endangered or Extinct in a very short period.

Criterion E Quantitative Analysis.
Assessment Outcome: Data deficient.
Justification: Insufficient data to assess.

Description
The NSW Scientific Committee (2015) state that "*Acacia meiantha* Tindale & Herscovitch (family Fabaceae) is described as 'an erect or sometimes straggling shrub to 1.5 m high or sometimes to 2.5 m; often suckers e.g. resprouting from rootstock after fire; bark smooth, greenish brown to light brown or grey; branchlets ± angled at apices, soon terete, hairy with short ± erect hairs. Phyllodes crowded, straight to slightly curved, subterete to ± flat, 2–5 cm long (range: 1–6.5 cm long), 0.4–1.2 mm wide, glabrous except for a few hairs sometimes near base, veins not evident or sometimes with an indistinct midvein or groove, finely longitudinally wrinkled when dry, apex obtuse with a mucro, 1 gland 0–5.5 mm above base; pulvinus 0.4–2 mm long. Inflorescences 2–19 in an axillary raceme; axis 0.3–7 cm long; peduncles 2–4.5 mm long, usually minutely hairy; heads globose, 4–8-flowered, 3–5 mm diam., yellow to dark yellow. Pods straight or slightly curved, ± flat, ± straight-sided or barely constricted between seeds, 2.7–8.5 cm long, 4–7 mm wide, firmly papery to thinly leathery, glabrous; seeds longitudinal; funicle expanded towards seed' (The Royal Botanic Gardens and Domain Trust PlantNET accessed 19 February 2014). It flowers from July to October and produces fruits from November to December and occasionally in August (Tindale et al. 1992). *Acacia meiantha* is allied to *A. linifolia* and *A. boormanii* but can be distinguished by its non-weeping upper branchlets and phyllodes lacking a visible midvein (Tindale et al. 1992)."

Distribution
The NSW Scientific Committee (2015) state that "*Acacia meiantha* is endemic to New South Wales. Three disjunct populations occur within the Central Tablelands within 100 km of each other. The Clarence population covers approx. 1 ha between Lithgow and Bell on Crown and Railway Corridor land. This population is on the east of the Great Dividing Range (GDR) in a headwater catchment of the Coxs River (Medd & Bower in litt. 2013). The Mullions Range population is west of the GDR, ca. 20 km northwest of Orange. A survey of this population has found that it consists of many widely distributed and disjunct stands covering ca. 5 ha with no stands known to occur on conservation land (R. Medd & C. Bower in litt. 2013). The Aarons Pass population was discovered in October 2011 approx. 18 km northwest of Ilford and is also to the west of the GDR in the Macquarie River catchment. This population is primarily confined to approx. 2.5 km of road easements (R. Medd & C. Bower in litt. 2013)."

Ecology

NSW Scientific Committee (2015) state that "*Acacia meiantha* populations occur on different geologies and in different plant communities with dissimilar species associations (R. Medd & C. Bower in litt. 2013). At Mullions Range it occurs mainly in open eucalypt forest or woodland in association with *Eucalyptus rossii*, *E. mannifera*, *E. dives* and *E. macrorhyncha* as well as *Acacia buxifolia*, *A. dealbata* and *A. gunnii*. Here *A. meiantha* can be found on gravelly clay or brown loamy soil and is generally confined to areas above 860 m a.s.l. where it occurs in clumps due to its suckering habit (Pratten 1986, Tindale et al. 1992). It is not found on rocky outcrops (Tindale et al. 1992). The Clarence population occurs in open eucalypt forest in association with *E. dives* and *E. sieberi* and in an adjacent area of mostly shrubs where the tree overstorey was cleared for power lines; it is found on sandy soil over sandstone at ca. 1000 m a.s.l. (Tindale et al. 1992). The Aarons Pass population occurs in relatively undisturbed old growth low forest and is the dominant understorey species within the main stand; it shares some similarities with respect to geology and species associations with the Mullions Range population (R. Medd & C. Bower in litt. 2013)."

"Across the known populations of *Acacia meiantha* seed set is variable. The Mullions Range population sets seed whereas the Clarence population sets very little seed (D. Benson in litt. June 2013; R. Johnstone in litt. July 2013). Seed set in the Aarons Pass population is unknown. It is unclear whether these differences are similar to those observed in other *Acacia* such as *Acacia anomala* where both clonal and sexual populations are known (Coates 1988)."

"One estimate of the total number of individuals in the Clarence and Mullions Range populations is approx. 1000 in total whereas another suggests that there are approx. 1000 plants in the Mullions Range population alone. A further assessment suggests that several thousand individuals may occur in the Mullions Range population with a further 750–1000 plants at Aarons Pass (R. Medd & C. Bower in litt. 2013). However, *Acacia meiantha* is known to sucker, forming both dense and diffuse clumps of stems arising from the roots of a single plant (Medd & Bower in litt. 2013). Populations are likely to comprise of many more stems than genetically distinct plants making it difficult to estimate the number of individual plants present (R. Medd & C. Bower in litt. 2013)."

Threats

NSW Scientific Committee (2015) state that "*Acacia meiantha* is subject to a number of threats. The Clarence population is predominately restricted to the road verge and is vulnerable to roadside activities, vehicle access to maintain dam and power line infrastructure and rubbish dumping (Benson *in litt*. June 2013; Eco Logical Australia 2011). It is also threatened by weeds such as African Lovegrass (*Eragrostis curvula*), St John's Wort (*Hypericum perforatum*), Blackberry (*Rubus* sp.), Apple (*Malus* sp.) and Pine (*Pinus* sp.) (Eco Logical Australia 2011). Some Blackberry infestations occur throughout the nearby dam area while Pampas Grass (*Cortaderia selloana*) has been recorded along the nearby rail corridor and rail access easements (Eco Logical Australia 2011). Threats to the Mullions Range population include habitat destruction associated with land clearing and uncontrolled vehicle access, possible expansion of pine forestry plantation into areas currently under native forest, harvesting of existing plantations where *A. meiantha* occurs and invasion by Monterey Pine (*Pinus radiata*), (R. Medd & C. Bower in litt. 2013). The main threat to the Aarons Pass population is road maintenance but this population may be threatened in the future by road widening to allow access to the proposed Crudine Wind Farm (R. Medd & C. Bower in litt. 2013)."

The impact of fire on the species is not known.

Conservation and Management Actions
There is no recovery plan and no NSW Saving Our Species program for this species. The following is derived from the threat information.

Habitat loss, disturbance and modification

- Prevent clearing or disturbance of known and suitable habitat;
- Ensure infrastructure construction and maintenance (e.g. for roads and tracks) does not damage plants or remaining habitats.
- Instigate appropriate fire management that is not detrimental to the species. This requires consideration of all components of the fire regime and adherence to any fire frequency thresholds developed in the NSW Rural Fire Service Bush Fire Code Threatened Species Hazard Reduction list for plants. http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0017/24335/ThreatenedSpeciesHazardReductionList-Part1-Plants.pdf
- control vehicle access to Mullions Range population.

Invasive species

- In the known sites and associated habitat, identify and remove/control weeds that may be a threat to the species, using appropriate methods.

Ex situ conservation

- Develop a targeted seed collection program for ex situ seed banking that is representative of genetic variation across the three known populations.

Stakeholder Management

- Inform land owners and managers of sites where there are known populations and consult with these groups regarding options for conservation management and protection of the species.

Survey and Monitoring priorities

- Monitor known sites to determine trends in population size over time.
- Monitor impact of weed control on habitat quality.

Information and research priorities

- Undertake further ecological research into the species' life history with a priority to understand conservation genetics and variation between known sites, the response of the species to fire for both standing plants and seed germination requirements relevant to the persistence of the species.

References

Coates DJ (1988) Genetic diversity and population genetic structure in the rare Chittering Grass Wattle, *Acacia anomala* Court. *Australian Journal of Botany* **36**, 273–286.

Eco Logical Australia (2011) Dargan Creek Reserve Plan of Management. Prepared for Crown Lands Division, NSW Department of Primary Industries.

IUCN Standards and Petitions Subcommittee (2016) Guidelines for Using the IUCN Red List Categories and Criteria. Version 12.0. Prepared by the Standards and Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

NSW Scientific Committee (2015) Final Determination to list the shrub *Acacia meiantha* Tindale & Herscovitch as an Endangered Species. Accessed 5th January 2016. http://www.environment.nsw.gov.au/resources/threatenedspecies/determinations/FDAcaciameiaES.pdf

Pratten C (1986) A case for a further flora reserve within Mullions Range State Forest. *National Parks Journal* **30**, 19–21.

Royal Botanic Gardens and Domain Trust (2013) PlantNET – The Plant Information Network System of The Royal Botanic Gardens and Domain Trust, Sydney, Australia (version 2.0). http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Acacia~meiantha (accessed February 2014)

Tindale MD, Kodela PG, Herscovich C (1992) *Acacia meiantha* (Fabaceae, Mimosoideae), a new species from the Central Tablelands of New South Wales. *Australian Systematic Botany* **51**, 761–765.

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Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act* 1995 (the Act), has made a Final Determination to list the shrub *Acacia meiantha* Tindale & Herscovitch as an ENDANGERED SPECIES Part 1 of Schedule 1 of the Act. Listing of Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. *Acacia meiantha* Tindale & Herscovitch (family Fabaceae) is described as 'an erect or sometimes straggling shrub to 1.5 m high or sometimes to 2.5 m; often suckers e.g. resprouting from rootstock after fire; bark smooth, greenish brown to light brown or grey; branchlets ± angled at apices, soon terete, hairy with short ± erect hairs. Phyllodes crowded, straight to slightly curved, subterete to ± flat, 2–5 cm long (range: 1–6.5 cm long), 0.4–1.2 mm wide, glabrous except for a few hairs sometimes near base, veins not evident or sometimes with an indistinct midvein or groove, finely longitudinally wrinkled when dry, apex obtuse with a mucro, 1 gland 0–5.5 mm above base; pulvinus 0.4–2 mm long. Inflorescences 2–19 in an axillary raceme; axis 0.3–7 cm long; peduncles 2–4.5 mm long, usually minutely hairy; heads globose, 4–8-flowered, 3–5 mm diam., yellow to dark yellow. Pods straight or slightly curved, ± flat, ± straight-sided or barely constricted between seeds, 2.7–8.5 cm long, 4–7 mm wide, firmly papery to thinly leathery, glabrous; seeds longitudinal; funicle expanded towards seed' (The Royal Botanic Gardens and Domain Trust PlantNET accessed 19 February 2014). It flowers from July to October and produces fruits from November to December and occasionally in August (Tindale *et al*. 1992). *Acacia meiantha* is allied to *A. linifolia* and *A. boormanii* but can be distinguished by its non-weeping upper branchlets and phyllodes lacking a visible midvein (Tindale *et al*. 1992).

2. *Acacia meiantha* is endemic to New South Wales. Three disjunct populations occur within the Central Tablelands within 100 km of each other. The Clarence population covers approx. 1 ha between Lithgow and Bell on Crown and Railway Corridor land. This population is on the east of the Great Dividing Range (GDR) in a headwater catchment of the Coxs River (Medd & Bower *in litt*. 2013). The Mullions Range population is west of the GDR, *ca*. 20 km northwest of Orange. A survey of this population has found that it consists of many widely distributed and disjunct stands covering *ca*. 5 ha with no stands known to occur on conservation land (R. Medd & C. Bower *in litt*. 2013). The Aarons Pass population was discovered in October 2011 approx. 18 km northwest of Ilford and is also to the west of the GDR in the Macquarie River catchment. This population is primarily confined to approx. 2.5 km of road easements (R. Medd & C. Bower *in litt*. 2013).

3. *Acacia meiantha* populations occur on different geologies and in different plant communities with dissimilar species associations (R. Medd & C. Bower *in litt*. 2013). At Mullions Range it occurs mainly in open eucalypt forest or woodland in association with *Eucalyptus rossii*, *E. mannifera*, *E. dives* and *E. macrorhyncha* as well as *Acacia buxifolia*, *A. dealbata* and *A. gunnii*. Here *A. meiantha* can be found on gravelly clay or brown loamy soil and is generally confined to areas above 860 m a.s.l. where it occurs in clumps due to its suckering habit (Pratten 1986, Tindale *et al*. 1992). It is not found on rocky outcrops (Tindale *et al*. 1992). The Clarence population occurs in open eucalypt forest in association with *E. dives* and *E. sieberi* and in an adjacent area of mostly shrubs where the tree overstorey was cleared for power lines; it is found on sandy soil over sandstone at *ca*. 1000 m a.s.l. (Tindale *et al*. 1992). The Aarons Pass population occurs in relatively undisturbed old growth low forest and is the dominant understorey species within the main stand; it shares some similarities with respect to geology and species associations with the Mullions Range population (R. Medd & C. Bower *in litt*. 2013).

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Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

4. Across the known populations of *Acacia meiantha* seed set is variable. The Mullions Range population sets seed whereas the Clarence population sets very little seed (D. Benson *in litt*. June 2013; R. Johnstone *in litt*. July 2013). Seed set in the Aarons Pass population is unknown. It is unclear whether these differences are similar to those observed in other *Acacia* such as *Acacia anomala* where both clonal and sexual populations are known (Coates 1988).

5. *Acacia meiantha* has an estimated area of occupancy (AOO) of 68 km^2 based on seventeen 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2011). The extent of occurrence (EOO) was estimated to be 2900 km^2 based on a minimum convex polygon encompassing all known locations, the method for assessing EOO recommended by IUCN (2011). Thus the distribution of *A. meiantha* is considered to be highly restricted.

6. One estimate of the total number of individuals in the Clarence and Mullions Range populations is approx. 1000 in total whereas another suggests that there are approx. 1000 plants in the Mullions Range population alone. A further assessment suggests that several thousand individuals may occur in the Mullions Range population with a further 750–1000 plants at Aarons Pass (R. Medd & C. Bower *in litt*. 2013). However, *Acacia meiantha* is known to sucker, forming both dense and diffuse clumps of stems arising from the roots of a single plant (Medd & Bower *in litt*. 2013). Populations are likely to comprise of many more stems than genetically distinct plants making it difficult to estimate the number of individual plants present (R. Medd & C. Bower *in litt*. 2013).

7. *Acacia meiantha* is subject to a number of threats. The Clarence population is predominately restricted to the road verge and is vulnerable to roadside activities, vehicle access to maintain dam and power line infrastructure and rubbish dumping (Benson *in litt.* June 2013; Eco Logical Australia 2011). It is also threatened by weeds such as African Lovegrass (*Eragrostis curvula*), St John's Wort (*Hypericum perforatum*), Blackberry (*Rubus* sp.), Apple (*Malus* sp.) and Pine (*Pinus* sp.) (Eco Logical Australia 2011). Some Blackberry infestations occur throughout the nearby dam area while Pampas Grass (*Cortaderia selloana*) has been recorded along the nearby rail corridor and rail access easements (Eco Logical Australia 2011). Threats to the Mullions Range population include habitat destruction associated with land clearing and uncontrolled vehicle access, possible expansion of pine forestry plantation into areas currently under native forest, harvesting of existing plantations where *A. meiantha* occurs and invasion by Monterey Pine (*Pinus radiate*), (R. Medd & C. Bower *in litt*. 2013). The main threat to the Aarons Pass population is road maintenance but this population may be threatened in the future by road widening to allow access to the proposed Crudine Wind Farm (R. Medd & C. Bower *in litt*. 2013).

8. *Acacia meiantha* is not eligible to be listed as a Critically Endangered Species.

9. *Acacia meiantha* Tindale & Herscovitch is eligible to be listed as an Endangered species as, in the opinion of the Scientific Committee, it is facing a very high risk of extinction in New South Wales in the near future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

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Clause 7 Restricted geographic distribution and other conditions

The geographic distribution of the species is estimated or inferred to be:

(b) highly restricted,

and

(d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
  (a) an index of abundance appropriate to the taxon,
  (b) the geographic distribution, habitat quality or diversity, or genetic diversity; or

(e) at least two of the following three conditions apply:
  (i) the population or habitat is observed or inferred to be severely fragmented;
  (ii) all or nearly all mature individuals are observed or inferred to occur within a small number of populations or locations.

Dr Mark Eldridge
Chairperson
NSW Scientific Committee

Exhibition period: 02/10/15 – 27/11/15 Proposed Gazettal date: 02/10/15

References:

Coates DJ (1988) Genetic diversity and population genetic structure in the rare Chittering Grass Wattle, *Acacia anomala* Court. *Australian Journal of Botany* **36**, 273–286.

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