

1 Appendix 3 (supplementary to Chapters 2 and 3)

Study regions and biophysical characteristics of study sites in Chapters 2-3

This section describes the biophysical characteristics of study sites used in Chapters 2 and 3. For further information about study sites used in Chapter 4, the reader is referred to Arthington et al. (2012).

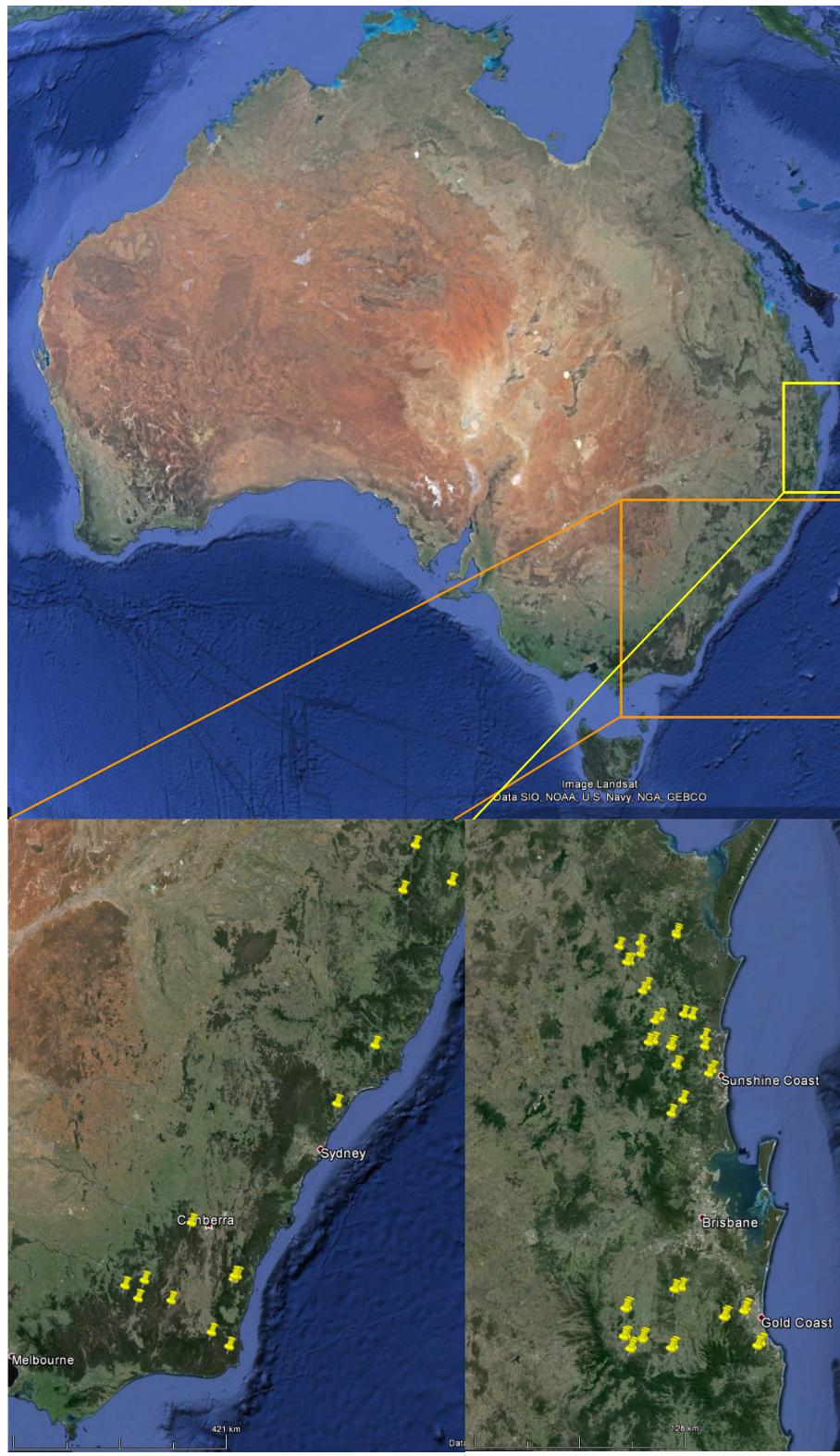


Figure 1.1: Map showing study areas, and geographical distribution of field sites described in Chapters 2 & 3 (lower left) and 4 (lower right) (Google Maps 2015).

Table 1.1: Biogeographical attributes of study sites.

| <i>Site</i> | <i>IBRA region</i> | <i>Koppen climate zone</i> | <i>Mean annual rainfall (mm)</i> | <i>Mean annual temperature (°C)</i> | <i>Upstream catchment area (m2)</i> | <i>elevation asl (m)</i> |
|--|--------------------------|-------------------------------|----------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| Mammy Johnsons River at Pikes Crossing | NSW North Coast | Warm summer, cold winter | 1136 | 17.5 | 158 | 104 |
| Wallagaraugh River at Princes Highway | South East Corner | Warm summer, cold winter | 925 | 14.9 | 477 | 35 |
| Genoa River at Bondi | South East Corner | Warm summer, cold winter | 815 | 13.0 | 234 | 417 |
| Wadbilliga River at Wadbilliga | South East Corner | Warm summer, cold winter | 842 | 14.8 | 126 | 201 |
| Tuross River D/S Wadbilliga Junction | South East Corner | Warm summer, cold winter | 843 | 15.4 | 918 | 79 |
| Tuross River at Belowra | South East Corner | Warm summer, cold winter | 831 | 15.4 | 564 | 105 |
| Jacobs River at Jacobs Ladder | South Eastern Highlands | Mild-warm summer, cold winter | 563 | 13.9 | 184 | 343 |
| Nariel Creek at Upper Nariel | South Eastern Highlands | Mild-warm summer, cold winter | 982 | 12.8 | 261 | 711 |
| Gibbo River at Gibbo Park | South Eastern Highlands | Mild-warm summer, cold winter | 919 | 12.5 | 390 | 515 |
| Snowy Creek at Below Granite Flat | South Eastern Highlands | Mild-warm summer, cold winter | 1030 | 13.8 | 416 | 331 |
| Mann River at Mitchell | New England Tablelands | Warm summer, cold winter | 865 | 16.7 | 890 | 401 |
| Cataract Creek at Sandy Hill | New England Tablelands | Warm summer, cold winter | 1019 | 16.4 | 237 | 595 |
| Sportsmans Creek at Gurranang Siding | South Eastern Queensland | Warm humid summer | 1094 | 19.1 | 205 | 13 |
| Goodradigbee River at Brindabella | South Eastern Highlands | Mild-warm summer, cold winter | 976 | 12.7 | 432 | 510 |
| Jilliby Creek at U/S Wyong River | Sydney Basin | Warm summer, cold winter | 1110 | 17.7 | 93 | 39 |

Table 1.2: Vegetation characteristics of study sites.

| Site | Canopy height (m) | Vegetation structure | Dominant species | Site history |
|--|-------------------|---|--|---|
| Mammy Johnsons River at Pikes Crossing | 15 | Closed canopy, abundant subcanopy and limited groundcover | <i>Acmena smithii</i> , <i>Ceratopetalum apetalum</i> , <i>Tristaniopsis laurina</i> | Adjacent smallhold grazing, unfenced, possible historic clearing |
| Wallagaraugh River at Princes Highway | 12 | Closed low canopy, fern dominated ground-cover layer | <i>Tristaniopsis laurina</i> , <i>Doodia aspera</i> | Undisturbed, evidenced by numerous large <i>Eucalyptus viminalis</i> individuals adjacent to site |
| Genoa River at Bondi | 30 | Tall open canopy, abundant subcanopy and groundcover | <i>Eucalyptus viminalis</i> , <i>Pomaderris aspera</i> , <i>Leptospermum brevipes</i> , <i>Calochlaena dubia</i> | Undisturbed, within South East Forest National Park |
| Wadbilliga River at Wadbilliga | 30 | Tall open canopy, abundant shrubs and groundcover | <i>Casuarina cunninghamiana</i> , <i>Eucalyptus cypellocarpa</i> , <i>Acacia floribunda</i> , <i>Melicrytus dentatus</i> , <i>Microlaena stipoides</i> | Within Wadbilliga National Park. Mature forest, but historical clearing / pastoral land use possible. |
| Tuross River D/S Wadbilliga Junction | 30 | Open forest, shrub and groundcover layers dominant, scattered emergents | <i>Casuarina cunninghamiana</i> , <i>Eucalyptus elata</i> , <i>Tristaniopsis laurina</i> , <i>Acacia floribunda</i> , <i>Backhousia myrtifolia</i> , <i>Microlaena stipoides</i> | Within Wadbilliga National Park. Mature forest with large emergents, but historical clearing / pastoral land use possible. |
| Tuross River at Bellwara | 12 | Riparian scrub with emergent streamside <i>Casuarina</i> forest | <i>Casuarina cunninghamiana</i> , <i>Acacia floribunda</i> , <i>Leptospermum brevipes</i> | Within Wadbilliga National Park. Mature riparian scrub vegetation, but historical clearing / pastoral land use possible. |
| Jacobs River at Jacobs Ladder | 14 | Open woodland with some emergent Eucalypts | <i>Eucalyptus rubida</i> , <i>Acacia dealbata</i> , <i>Rubus fruticosus</i> | Within Kosciuzko National Park. In recovery following 2003 fires. |
| Nariel Creek at Upper Nariel | 40 | Open forest, dense fern groundcover | <i>Eucalyptus camphora</i> subsp. <i>humeana</i> , <i>Acacia melanoxylon</i> , <i>Rubus fruticosus</i> , <i>Blechnum nudum</i> | Mature forest, some clearing adjacent to riparian corridor. Historical clearing / pastoral land use possible. |
| Gibbo River at Gibbo Park | 35 | Open forest, abundant shrub layer | <i>Eucalyptus radiata</i> , <i>Acacia dealbata</i> , <i>Lomatia myricoides</i> , <i>Poa labillardierei</i> var <i>labillardierei</i> | Largely undisturbed, some evidence of fire. Within Alpine National Park. Very large emergent <i>Eucalyptus viminalis</i> (>2m DBH) present. |
| Snowy Creek at Below Granite Flat | 20 | Riparian scrub with low emergent Eucalypts | <i>Eucalyptus camphora</i> subsp. <i>camphora</i> , <i>Eucalyptus stellulata</i> , <i>Coprosma quadrifida</i> , <i>Bursaria spinosa</i> , <i>Leptospermum brevipes</i> | Within Victoria State Forest, clearing for forestry was evident downstream. |

| <i>Site</i> | <i>Canopy height (m)</i> | <i>Vegetation structure</i> | <i>Dominant species</i> | <i>Site history</i> |
|--------------------------------------|--------------------------|---|---|--|
| Mann River at Mitchell | 30 | Open grassy forest | <i>Casuarina cunninghamiana</i> , <i>Eucalyptus amplifolia</i> , <i>Lomandra longifolia</i> , <i>Microlaena stipoides</i> | Within Mann River Nature Reserve. Large flood occurred in 2011, historical clearing / pastoral land use is possible. |
| Cataract Creek at Sandy Hill | 30 | Open forest, abundant shrubs and grassy areas | <i>Casuarina cunninghamiana</i> , <i>Eucalyptus tereticornis</i> , <i>Melicrytus dentatus</i> , <i>Lomandra hystrix</i> , <i>Pennisetum clandestinum</i> | Within NSW conservation land, although opposite side of river was cleared pastoral land. Large flood occurred in 2011. |
| Sportsmans Creek at Gurranang Siding | 25 | Closed forest | <i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>Casuarina glauca</i> , <i>Calochlaena dubia</i> , <i>Oplismenus imbecillis</i> | Riparian corridor remnant vegetation. Adjacent to Gunnarang State Conservation Area. Large (>2m DBH) emergent <i>Lophostemon suaveolens</i> individuals indicate relatively undisturbed condition. |
| Goodradigbee River at Brindabella | 25 | Closed forest, abundant shrub layer with sparse groundcover | <i>Eucalyptus radiata</i> , <i>Eucalyptus viminalis</i> , <i>Acacia dealbata</i> , <i>Acacia pravissima</i> , <i>Hovea asperifolia</i> subsp. <i>asperifolia</i> , <i>Leptospermum brevipes</i> | Within Kosciuzko National Park. Fire occurred in 2010. |
| Jilliby Creek at U/S Wyong River | 50 | Vine thickets with emergent Eucalyp | <i>Eucalyptus tereticornis</i> , <i>Eucalyptus resinifera</i> , <i>Commersonia fraseri</i> , <i>Ripogonum album</i> , <i>Lomandra longifolia</i> | Riparian corridor remnant vegetation. Large emergent <i>Eucalyptus</i> individuals (40-50 m tall) indicate relatively undisturbed condition. |

1. APPENDIX 3 (SUPPLEMENTARY TO CHAPTERS 2 AND 3)

PHOTOS