Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

Available for download from http://www.ramsar.org/doc/ris/key_ris_e.doc and http://www.ramsar.org/pdf/ris/key_ris_e.pdf

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 17, 4th edition).

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

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DD MM YY

Designation date

Site Reference Number

2. Date this sheet was completed/updated:
April 2014

3. Country:
Australia

4. Name of the Ramsar site:
The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.
Interlaken Lakeside Reserve

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only)**:**
a) Designation of a new Ramsar site ❑; or
b) Updated information on an existing Ramsar site ☑

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ☑

or

If the site boundary has changed:
i) the boundary has been delineated more accurately ❑; or
ii) the boundary has been extended ❑; or
iii) the boundary has been restricted** ❑

and/or

If the site area has changed:
i) the area has been measured more accurately ❑; or
ii) the area has been extended ❑; or
iii) the area has been reduced** ❑

** **Important note**: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

In 2001, the boundary of the Interlaken Lakeside Reserve Ramsar site was mapped more accurately and the area was recalculated from 520 to 517ha. The boundary of the site remains the same. The revised area was provided in the 2005 RIS update for this site.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:
The ecological character of Interlaken Lakeside Reserve (ILR) Ramsar site has not changed significantly since the site was added to the Ramsar list in 1982. While some changes in the condition of the site have occurred over this period, none of the limits of acceptable change set for the site have been exceeded. The changes in condition that have occurred were mainly due to a prolonged dry spell from 1998 to mid-2009 and associated low lake levels during this period.

The drying of the ILR wetlands is a natural property of intermittent wetlands and their biota is adapted to such variation in conditions. The impact of heavy rainfall since spring 2009 to present is unknown and monitoring will be important to understand these impacts.

The Ramsar criteria that apply to the site have changed since the time of listing in 1982 and the publication of the previous RIS in 2005 (Department of Primary Industries, Water and Environment (DPIWE) 2005a). This is due to reduced water levels up to mid 2009, the emergence of new scientific data, and changes to the Ramsar criteria or their application.

Criterion 7 was claimed to be met in the 2005 RIS (DPIWE 2005a). However, little justification can be found to support this claim (Casey et al. 2010).

Criterion 9 was added to the Ramsar Criteria list after 1999, and so was not identified as being met in the original RIS published in 1998; however, it is now considered to be met (See justification in Section 14).

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7. Map of site:
Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:
i**) a hard copy** (required for inclusion of site in the Ramsar List): ❑;

ii**) an electronic format** (e.g. a JPEG or ArcView image) ☑ (Attachment 1);

iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** ❑.

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The boundary of the Interlaken Ramsar site includes all of allotment 1 on Central Plan Register (CPR) Plan 5656 from the Tasmanian Information and Land Services, Department of Primary Industries, Parks, Water and Environment. CPR Plan 5656 horizontal datum is Australian Geodetic Datum (AGD66) Universal Transverse Mercator Projection Australian Map Grid (UTM AMG66) and Australian Height Datum (Tasmania) for vertical datum (Attachment 2). The site excludes Certificate of Titles 141006/1, 10053/1 and 138567/102. The site also excludes the portion of the Interlaken Road Reserve adjacent to 141006/1 and 10053/1 from a point nearest to 42°08'19.1"S, 147°10'00"E (GDA94 coordinates) in south-easterly direction to the intersection with Property ID 7122924 at a point nearest to 42°08'39.1"S, 147°10'16.2"E (GDA94 coordinates).

Cadastral information about surrounding land parcels can be obtained from the Land Information System Tasmania (LIST) mapping site http://maps.thelist.tas.gov.au/listmap/app/list/map

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

42°08’ 46”S 147°09’ 27”E

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

ILR is situated in the north-western corner of Lake Crescent, approximately 20 km west of the township of Tunbridge in Tasmania (Attachment 1). ILR is located on the eastern limit of the Tasmanian Central Highlands. It includes marshy areas around the lake perimeter, as well as Lakeside Island and a large section of the dry land between Lake Crescent and adjacent Lake Sorell. Access to Lake Crescent is possible by two-wheel drive. ILR is located in the Central Highlands municipality which had a population of 2,243 in 2006 (Australian Bureau of Statistics 2007).

10. Elevation: (in metres: average and/or maximum & minimum)

Average elevation at the site is 800m ASL.

11. Area: (in hectares)

517 hectares

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The site is a significant example of a mid-altitude (800 m AHD) wetland which supports threatened endemic species, wetland vegetation communities and an unusual phytoplankton assemblage. These wetlands are not well represented elsewhere in the region. Endemic species include golden galaxias (*Galaxias auratus)*, which while locally abundant, is only found in lakes Crescent and Sorell and associated wetlands and waterways. This species is listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In addition, an endemic snail (*Austropyrgus* sp.), confined to the lakes Crescent and Sorell system, has been recorded on site.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1	2	3	4	5	6	7	8	9
☑	☑	☑	☑	❑	❑	❑	☑	☑

14. Justification for the application of each Criterion listed in 13 above:
Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1: **A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region**.

Extensive littoral wetlands are a unique feature of the Crescent-Sorell system, especially in comparison to other lakes on the Tasmanian Central Plateau. The wetlands of lakes Crescent and Sorell are shallow, temporary, freshwater systems, and are some of the largest areas of this type of wetland in Tasmania. ILR is a valuable regional representation of two Ramsar wetland types 'O' (Permanent freshwater lakes >8ha) and 'Ts' (Seasonal/intermittent freshwater marshes) within the Tasmanian Drainage Division (DEWHA 2009). Analysis of Tasmania's vegetation mapping (TASVEG) indicates that this is one of the largest intermittent freshwater marshes present in the Tasmanian Drainage Division and it is particularly unusual at this elevation (800 m AHD) (Department of Primary Industries and Water (DPIW) 2009). It is considered to be in good condition relative to other large freshwater wetlands in Tasmania (Kirkpatrick and Harwood 1981).

Criterion 2: **A wetland should be considered internationally important if it supports vulnerable, endangered or critically endangered species or threatened ecological communities.**

Lake Crescent, including ILR, is habitat for the endemic freshwater fish golden galaxias (*Galaxias auratus*) (Fulton 1990; Hardie 2003a). This species is listed as 'endangered' under the EPBC Act as a result of its limited distribution, threats from introduced species (carp and trout) and habitat degradation.

Common Name	Scientific Name	IUCN Status	CMS	CITES	National Status
Fish					
Golden Galaxias	*Galaxias auratus*	-	-	-	Endangered (EPBC Act 1999), endemic

Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

Criterion 3 was claimed to be met in the 2005 RIS. The site is an essential element of the maintenance of ecological diversity in the area. It supports several species which are rare and/or poorly reserved. Southern swampgrass (*Amphibromus neesii*), rare, Tasmanian *Threatened Species Protection Act 1995* (TSPA) was recorded in 1981, however, the presence of *A. neesii* has not yet been confirmed in any subsequent survey (Chilcott, 1986; Heffer, 2003; Smith and Mendel, 2009). The interesting nature of the phytoplankton community, and its differences from nearby Lake Sorrell, are of scientific value. In 2003, 47 species of phytoplankton were recorded (Uytendaal 2003). The wetland provides important habitat for many species of macroinvertebrates, including the hydobiid gastropod (Austropygus sp.), which is endemic to Lakes Sorrell and Crescent (Cleary 1997). Fifty-two species of plants have been recorded in the wetland part of the Interlaken Lakeside Reserve (IFS 2003). One hundred and fifty species of fauna (97 species of birds; 31 species of mammals; 9 reptiles; 7 amphibians and 6 fish) have been recorded in the Lake Cresent area (IFS 2003).

The ILR site supports a significant proportion of the population of the nationally listed golden galaxias (*Galaxiella auratus*). The golden galaxias is endemic to Lakes Sorell and Crescent and associated streams and wetlands. Therefore, the ILR site is considered to support a population of a species important for maintaining the biological diversity of the biogeographical region.

Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

The site provides habitat for the nationally listed golden galaxias during spawning. The intermittent marshes adjacent to the lakes provide an important nursery area for juvenile fish (Hardie 2003a; Jackson 2004).

Therefore, the site is considered to support a population of a species during a critical life cycle stage.

This criterion was claimed to be met in the 2005 RIS, based on the site being a refuge for common waterbirds (ducks and swans) but there is little available supporting information to suggest that the site is critical for mobile or migratory species, or is critical for sustaining non migratory wetland species population in the medium or long-term.

Criterion 8: **A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.** The wetlands in ILR provide important breeding habitat for the nationally endangered, endemic golden galaxias. The galaxiid's small, adhesive eggs are typically deposited on aquatic vegetation and rocky substrates, and the intermittent marshes adjacent to the lakes are thought to provide an important nursery area for juvenile fish (Hardie 2003a; Jackson 2004). Adult fish prefer the rocky lakeshore habitat (Hardie 2003a) and, to a lesser degree, marsh habitat. Given the high relative abundance of the Lake Crescent golden galaxias population, the ILR site provides an important spawning, foraging and refuge (from predators) habitat for the species.

Criterion 9: **A wetland should be considered internationally important if it regularly supports one per cent of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.** The ILR wetlands support a significant proportion of the entire golden galaxias population. The golden galaxias is endemic to Tasmania and only occurs naturally in lakes Sorell and Crescent and associated streams and wetlands. Golden galaxias occurs at much higher densities (10 times) in Lake Crescent than in Lake Sorell and this is believed to reflect greater predation pressure of the trout population in Lake Sorell (Hardie 2003a). Habitat critical to its survival includes all areas where the species naturally occurs. Lake Crescent (and associated intermittent marshes) is approximately 2,285 ha while Lake Sorell (and associated intermittent marshes) is approximately 5,212 ha. Given the higher densities of golden galaxias in Lake Crescent, it may contain up to 80% of the population of this species. Given that the ILR wetlands comprise approximately 15% of the wetlands present in Lake Crescent, it is probable that the ILR could regularly support 1% or more of the population of this species.

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Tasmanian Drainage Division

b) biogeographic regionalisation scheme (include reference citation):

Australian Drainage Divisions
Commonwealth of Australia (Bureau of Meteorology), 2011, Australian Hydrological Geospatial Fabric.

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

The ILR site includes: the marshy areas along the north western perimeter of Lake Crescent; Lakeside Island; an area of open water in Lake Crescent; and a section of land between lakes Crescent and Sorell.

The area is underlain by Jurassic dolerite, Tertiary basalt and Triassic sandstone, with alluvial deposits common on flats and swampy ground. The soils tend to be neutral to acidic with a build-up of litter and peat beneath the vegetation. Lake Crescent is a natural lake which has been modified through regulation of its outflow (DPIWE 2005a).

The origin of the lake is obscure, however it is possible that backfilling of the basin in the area of its outlet to the Clyde River has resulted from deposition of large amounts of fine organic particulates produced within the shallows, along with silt generated by wave action. Lake Sorell may be similarly dammed and the narrow neck separating the two lakes also consists of highly organic deposits. This is a

rare phenomenon in south-east Australia, most likely restricted to the few lakes surrounding Sorell and Crescent. The natural course of the small, meandering connecting stream is preserved in these deposits, although flows are now bypassed through an artificial channel. Investigation of streambank deposits, and those exposed in the channel, would allow reconstruction of the history of the lake damming process (Ian Houshold pers. comm., in DPIWE 2005a).

Lake Crescent is a permanent waterbody with a catchment area of 32.8 km^2 (Uytendaal 2003). It has a maximum depth of 2.3 m while the marshland area is generally shallow, averaging 0.5 m in depth (Heffer 2003a). The lake has a surface area of 23.1 km^2, a shoreline of approximately 30 km, holds an estimated volume of 49,386 megalitres, and is subjected to considerable evaporation.

Lake Crescent is connected to Lake Sorell via the Interlaken canal (originally the Interlaken Rivulet). Water passes from Lake Sorell into Lake Crescent via the canal and Kermodes Drain when water levels are high. This flow is controlled by a weir. Both lakes are heavily reliant upon local rainfall as the main water input and are supplied by a few small watercourses and catchment run-off. There is little evidence of ground-water contribution to water input (Jenny Deakin pers. comm., 2008). Outflow from Lake Crescent is through a short canal to the Clyde River. This outlet is also controlled by a weir. Water from the lake is intermittently used for irrigation in the Clyde River valley.

Between 2000 and 2008, a substantial volume of scientific work was undertaken to examine the influences of low water levels and patterns of water level fluctuations on the Crescent-Sorell ecosystem. These aspects of the hydrological regime of this system directly and indirectly affect important habitats and aquatic vegetation communities (i.e. rocky shores and macrophytes in wetlands) (DPIW, 2008; Hardie, 2003a; Hardie, 2007; Hardie et al., 2007b; Heffer, 2003c; Smith and Mendel, 2009), water quality (Uytendaal, 2003; Uytendaal, 2006), and *G. auratus* populations (DPIW, 2008; Hardie, 2003a; Hardie, 2007; Hardie et al., 2007b).

Water quality and phytoplankton communities in lakes Crescent and Sorell are strongly influenced by water levels (Uytendaal, 2003; Uytendaal, 2006; Uytendaal et al., 2003). Low water levels cause sediment resuspension to become a driving factor which governs levels of suspended sediment, turbidity, light penetration, nutrient concentrations in the water column and phytoplankton biomass (Uytendaal, 2003).

The pH of Lake Crescent is 7 and conductivity is 200 µS/cm (Heffer 2003a). The water in Lake Crescent is notably turbid due to the suspension of inorganic lake bed sediments which are frequently disturbed in the shallow lake system. In addition, plant debris, detritus and a high standing crop of plankton contribute to the turbidity in the water column (Cheng and Tyler 1973).

The site is sub-alpine and experiences frost and occasional to frequent snowfalls during winter. The warmer months of January and February experience a mean maximum temperature of 19.4 ºC and a minimum of 6.4 ºC. July is usually the coldest month of the year with mean maximum and minimum temperatures of 7.5 ºC and -1 ºC respectively (Bureau of Meteorology 2002). Average annual rainfall is 726 mm.

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17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

The surrounding area is also underlain by Jurassic dolerite, Tertiary basalt and Triassic sandstone, with alluvial deposits common on flats and swampy ground. The majority of the catchment is forested with isolated areas having been cleared for agricultural use.

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18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The lakes provide a significant source of fresh water for the region. Whilst only a small proportion of the total lake catchment, the wetlands in ILR attenuate flood pulses, as well as nutrient and sediment peaks from the local catchment. This contributes to the maintenance of acceptable water quality in Lake Crescent and the Clyde River downstream. Water is released into the Clyde River and is used for dryland irrigation of farms downstream and as a town water supply for communities in the middle Derwent Valley (Ian Houshold pers. comm., in DPIWE 2005a). Water in the system is managed under the *Lakes*

Sorell and Crescent Water Management Plan 2005 and the *River Clyde Water Management Plan 2005*. Small changes in the volume of water in the lake can have a significant effect on the water levels within the ILR.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • <u>O</u> • P • Q • R • Sp • Ss • Tp <u>Ts</u> • U • Va • Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

O (approximately 179 hectares) and Ts (approximately 173 hectares)

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The main habitats within ILR include: intermittent marshy areas around the north-west perimeter of Lake Crescent; an area of open scrubby Eucalyptus woodland; and open water. The intermittent marshes are characterised by freshwater aquatic vegetation communities such as *Triglochin procerum* herbland and *Baumea arthrophylla* sedgeland (Kirkpatrick and Harwood 1981). The fauna community on site is dominated by aquatic and semi aquatic species such as native and introduced fish, invertebrates, platypus, frogs and waterbirds.

Diatoms and other phytoplankton flourish in the nutrient-rich shallow water of ILR. Trophic interactions in Lake Crescent include: 1) zooplankton consuming phytoplankton; 2) plankton, benthic fauna and airborne insects that land on the water surface are consumed by small fish such as golden galaxias; 3) small fish are consumed by larger fish such as trout.

Ecosystem services and benefits of the site include provisioning services such as water supply for downstream users and a commercial eel fishery; regulating services such as the trapping of sediment by wetland vegetation which regulates sediment transport, sediment deposition and influences water quality; cultural services such as recreational trout fishing and spiritual and inspirational associations for Aboriginal people; and supporting services such as the provision of habitat and breeding areas for endemic, threatened or unusual flora and fauna species and communities.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS*.

All wetland communities are listed as threatened vegetation communities in Tasmania under the *Nature Conservation Act 2002*. Swamp wallaby grass *(Amphibromus neesii)* was recorded from the site and is listed under the Tasmanian *Threatened Species Protection Act 1995* (TSP). The north-western corner of Lake Crescent supports Mountain clubsedge (*Isolepis montivaga)* which is uncommon but is not listed under the Tasmanian TSP Act. The presence of these species highlight the importance the ILR plays in maintaining biodiversity of the region.

The dominant flora species present at ILR are fine twigsedge (*Baumea arthrophylla*) and water ribbons (*Triglochin procerum*). Running marshflower (*Villarsia reniformis*), floating clubsedge (*Isolepis fluitans*),

amphibious watermilfoil (*Myriophyllum simulans*) and floating pondweed (*Potamogeton tricarinatus*) are also common (Heffer 2003a).

The highly invasive declared weed Gorse (*Ulex europaeus)* is present in the dryland areas of the site (Heffer 2003a).

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The majority of noteworthy fauna are discussed in Section 14. Additional species of note that have been observed at Lake Crescent include the native short finned eel (*Anguilla australis*).

The native golden galaxias is again abundant. Timely rains over the spring period and inflows from Lake Sorell returned the lake to full supply level, allowing the extensive marshlands to fully recover the macrophytes, invertebrates, and amphibians lost during the drought (Inland Fisheries Service 2013).

The platypus (*Ornithorynchus anatinus*) is known to inhabit Lake Crescent, where it feeds on the abundant invertebrate fauna (T Byard pers. comm. 2008).

Frog species such as common froglet (*Crinia signifera*), bull frog (*Limnodynastes dumerili*), brown tree frog (*Litoria ewingi*) and southern toadlet (*Pseudophryne semimormorata*) exist within the ILR (Heffer 2003a).

Depending on seasonal and climatic conditions, the area is locally important for Black swan (*Cygnus atratus*) and ducks as a feeding, resting and breeding area. Reasonable numbers of ducks and juveniles were observed during the 2007-2008 season (Terry Byard pers. comm., 2008). However, there is an absence of data on any of the migratory or listed species of birds using the ILR.

Introduced species include the introduced brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*) and European Carp (*Cyprinus carpio*) (Heffer 2003a).

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Cultural values of ILR predominantly relate to the spiritual associations that Aboriginal people have with the site. Historical evidence of Aboriginal people in the area includes small artefact scatters at the lake shore and a simple rock shelter near the lake edge. George Augustus Robinson noted in the early 1830s that the Lairmairrener people used the resources of the lake for food, including eels and birdlife, at least in the summer seasons (Plomley 1966 in Heffer 2003a).

Today's Aboriginal community undertakes access trips to view sites in the area and to re-connect with the land and its values (through the Tasmanian Aboriginal Land and Sea Council). These trips are important to today's community as the sites in these areas show that the old people regularly used these areas, and through returning to and explaining the importance of these areas, this allows Aboriginal people to continue their long association with the land (C. Hughes, pers. comm., 2008).

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?
No

If Yes, tick the box ❑ and describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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24. Land tenure/ownership:
a) within the Ramsar site:
Mostly Crown land. There are also number of small privately owned land parcels within the Ramsar site (Allotments 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14 on Title 138567 and allotment 1 on Title 138229).

b) in the surrounding area:
Private freehold

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25. Current land (including water) use:
a) within the Ramsar site:
Recreational boating and fishing; commercial eel fishery; and water supply

b) in the surroundings/catchment:
Residential, forestry and agriculture.

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26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:
a) within the Ramsar site:
The principal threat (past, present and potential) to the ecological character of Interlaken Lakeside Reserve is limited inflows. While fluctuation in water level is characteristic of this system, extreme drying out (or water-logging) over an extended period could compromise the flora and fauna communities and habitat on site. A combination of carp management, water use, drought and climate change resulted in low water levels in the years 1998 to mid-2009. The ILR has remained fully inundated by inflows since mid-2009.

Low lake levels deprive the golden galaxias of key spawning habitat amongst the rocky shoreline and macrophyte beds of the wetland vegetation. The galaxiid also depends on seasonal rainfall and water level fluctuations, particularly the rise in level that usually occurs in late winter or early spring (Hardie *et al* 2007). Low lake levels also restrict the ability of wetland vegetation communities to reproduce; and leave the lake surface critically exposed to the effects of wind, resulting in high rates of sediment re-suspension and turbidity. Increases in turbidity alter the light balance and have the potential to impact the biota of ILR.

Increased water extraction for irrigation and other downstream uses (e.g. stock and human consumption) is also a potential threat to the ecological character of the site by contributing to low lake levels and the consequent impacts on water quality and the galaxiid populations. The *Lakes Sorell and Crescent Water Management Plan 2005* includes critical management levels in order to protect the environment.

Lakes Crescent and Sorell were modelled as part of the Tasmania Sustainable Yields project (Ling *et al* 2009) which investigated water availability in Tasmania under current and future climate to 2030. The results indicated that the level in the lakes is likely to be lower under future climate due to a decrease in inflows and an increase in evaporation from the lakes. This poses a significant threat to the biota at ILR.

The invasion of exotic plant and animal species also threaten the ecological character of the ILR. The introduction of terrestrial and/or exotic flora species into the ILR would change the vegetation

composition of the communities on site. Exotic fauna such as trout pose a threat to golden galaxias through competition for habitat and food resources, as well as predation.

European carp (*Cypryinus carpio*) was discovered in Lake Crescent in 1995 (Inland Fisheries Service 2004). This species is noxious in Tasmania because of its ability to dominate fish communities and destructive bottom feeding behaviour. Carp destroy aquatic habitats through damaging wetland plants and degrade water quality through sediment disturbance. See question 27 d) for more information on carp status.

Chytrid fungus potentially poses a threat to frog populations within the ILR. Although there is no published data on testing for chytrid within the ILR, the decline of green and gold frog within Tasmania has generally been linked with the spread of the chytrid fungus (Obendorf and Dalton 2006, Obendorf 2005). Green and gold frog was common and widespread within the ILR intermittent marsh habitat in the late 1970s and early 1980s but has not been observed at ILR recently (R. Mawbey pers. comm., 2009).

b) in the surrounding area:
Forestry activities in the surrounding catchment have the potential to impact on the hydrology, geomorphology and the biota of lakes Crescent and Sorell. Changes to the water balance and catchment water yield are likely to occur as a result of forestry activities which in turn may lead to scouring, erosion and downstream deposition of sediments.

The area around lakes Sorell and Crescent has historically had a very low human population. However, a sub-division of approximately seventy lots has been developed along the adjacent western shoreline. This subdivision may cause pollution of the lake through septic tank runoff.

Canadian pondweed (*Elodea canadensis*), a highly invasive aquatic weed, has been recorded nearby in Silver Plains Marsh and Robertsons Marsh (Kirkpatrick and Harwood 1981) and has the potential to out-compete native species at ILR if introduced. It has also been reported in Lake Sorrell.

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27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:
In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ❑;Ib ❑; II ❑; III ❑; IV ❑; V ❑; VI ❑

c) Does an officially approved management plan exist; and is it being implemented?:
The *Interlaken Lakeside Reserve Ramsar Wetland Management Plan* was developed in 2003 by the Tasmanian Inland Fisheries Service (Heffer 2003b). The Lakes Sorell and Crescent Water Management Plan was developed by the Tasmanian Department of Primary Industries and Water and the Inland Fisheries Service (DPIWE 2005b). Due to limited resources there are no immediate plans to update the management plan. However, Tasmania's Parks and Wildlife Service will include a review of this plan on its priority list of planning work across the reserves of Tasmania.

d) Describe any other current management practices:
The Inland Fisheries Service (IFS) has actively reduced carp populations on the site through a combination of the manipulation of Lake Crescent and Lake Sorell water levels, netting, electro-fishing and radio tracking (Inland Fisheries Service 2005). The IFS is of the view that carp have now been eradicated from the Ramsar site and Lake Crescent (T Byard pers. comm., 2012). Despite extensive fishing effort and monitoring over the past seven years no carp have been captured and no evidence of recruitment has been found in the lake (Inland Fisheries Service 2013). This indicates that Lake Crescent is carp free (Inland Fisheries Service 2013). Ongoing advice on the conservation values and management needs of the site is being provided to the carp eradication project.

Other initiatives include the construction of a fence along the boundary of the reserve and the cancellation of a previous grazing licence over the wetland area (Heffer 2003a).

The Lakes Sorell and Crescent Water Management Plan identified the key water management and environmental objectives for the catchment, ensuring that the water in the catchment is managed sustainably for the long term (DPIWE 2005b). It was determined that the environmental values of lakes Sorell and Crescent were significantly higher than those of the Clyde River. Therefore, it was recommended that water from the lakes would not be used to support environmental values in the Clyde River, as this could potentially jeopardise the values within the lakes. It was acknowledged that instances may arise where artificial releases from the lakes might be considered where a net environmental benefit to the system as a whole could be achieved (DPIWE 2005b).

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

An extension of the Ramsar site boundary may be considered if further populations of floating club sedge (*Isolepis montivaga)* or swamp wallaby grass (*Amphibromus neesii)* are found. This extension would seek to include the whole lake in the ILR Ramsar site.

29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

A well-equipped hut provided by DPIPWE on the shore of Lake Sorell is frequently used for research and management purposes. IFS also purchased a house in the area for use during the carp control program.

Between 2000 and 2008, a substantial volume of scientific work was undertaken to examine the influences of low water levels and patterns of water level fluctuations on the Crescent-Sorell ecosystem. This work showed that these components of the hydrological regime of this system directly and indirectly affect three broad aspects of the Crescent-Sorell ecosystem: (1) important aquatic habitats (i.e. wetlands and rocky shores), (2) water quality, and (3) *G. auratus* populations.

The response of the Lake Crescent and Lake Sorell ecosystems to water level variability during 2009: a period of drought and post-drought recovery was examined between 2009 and 2010 (DIPWE 2010a).

A wetland vegetation survey in the ILR was undertaken in 2010 (DPIPWE 2010b) to assesses the response of wetland vegetation to inundation during late 2009 – early 2010 following the extended dry period, and is intended to provide additional information to the review of the Lakes Sorell and Crescent Water Management Plan. Survey results were compared with those of Heffer (2003) and Smith and Mendel (2009). This study found that following inundation, the characteristics of wetland vegetation within the Interlaken Lakeside Reserve indicate a shift from a vegetation community with increased abundance of terrestrial and introduced species (Smith and Mendel, 2009) towards a community dominated by native amphibious species.

IFS completed intensive scientific studies in 2002 and 2003, implemented on-ground works and formulated management options to address environmental decline in lakes Sorell and Crescent as part of the *Lakes Sorell and Crescent Rehabilitation Project*. This project was comprised of ten sub-projects targeting key areas of physical and biological importance to the functioning and management of lakes Crescent and Sorell. The ten sub-projects were:

- Lake Crescent Outflow Screen Duplication;
- Mountain Creek Rehabilitation;
- Catchment Management Plan;
- Water Management Plan;
- Water Quality;
- Wetlands;
- Aquatic Fauna;
- Recreational Fisheries;
- Carp Management; and
- Ecological Modelling.

Results of this project are available at www.ifs.tas.gov.au

Lake Crescent and Lake Sorell are included in the annual waterbird surveys conducted at over 80

locations across Tasmania. This data provides overall trends of waterfowl on a statewide basis and includes other Ramsar sites such as Logan Lagoon and Moulting Lagoon. Data has been collected at these locations since 1985.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The Tasmanian Government's Inland Fisheries Service (IFS) holds an annual open weekend at Liawenee in the central highlands (approximately 40 km from the Interlaken site). The two day event showcases all the IFS's activities and includes specific displays about the Interlaken Ramsar site, management activities targeting the enhancement and protection of the native flora and fauna values of the Ramsar site, and Carp eradication actions.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The area is predominantly used by sport anglers. Estimated visitor numbers increased from 950 in 1985/86 to a maximum of 3,600 in 1991/92. The area was closed to anglers in 1995 due to the de-watering of the lake and the risk of transporting carp to other locations. The lake was re-opened for the 2004 season.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Territorial: Central Highlands Municipality.
Functional: Director, Department of Primary Industries, Parks, Water and Environment (DPIPWE), Tasmania. Australia.
Telephone: +61 3 6165 4396.
Information@dpipwe.tas.gov.au

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Department of Primary Industries, Parks, Water and Environment
GPO Box 44
Hobart Tasmania 7000
Australia
Telephone: +61 3 6165 4396
Information@dpipwe.tas.gov.au

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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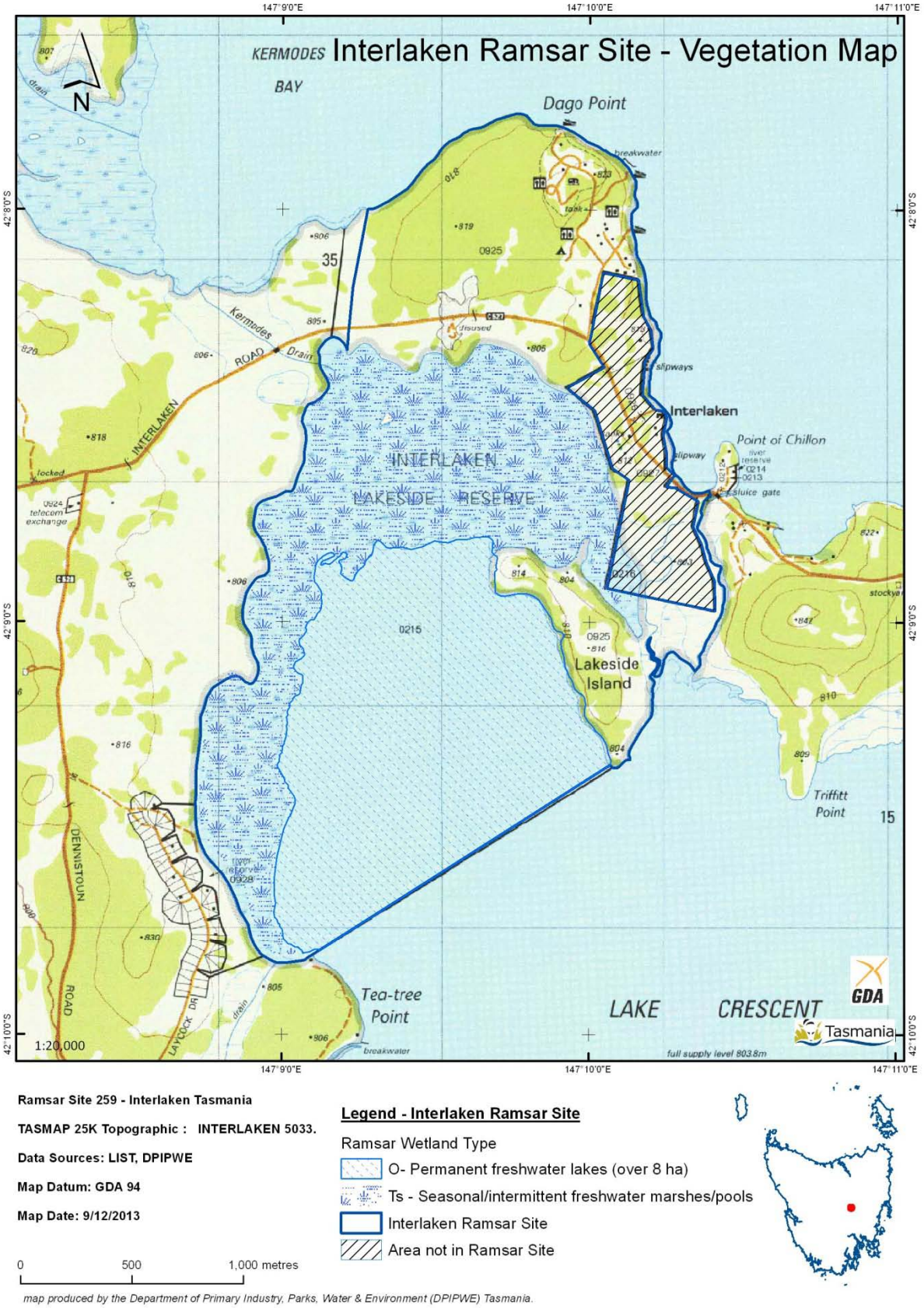
Attachment 1: Location map of the Interlaken Lakeside Reserve Ramsar site including Ramsar wetland types.



Attachment 2: Central Plan Register Plan of the boundaries of the Interlaken Lakeside Reserve Ramsar site